

**Organizational ambidexterity as a strategic decision: its relationship with
strategic decision speed and the moderating role of CEO cognition and
environmental dynamism under the global pandemic**

Mary Skordia

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Abstract

The current study examines organizational ambidexterity as a strategic decision under the COVID-19 pandemic, incorporating ambidexterity in the process of decision making. Based on a survey on 144 organizational decision makers (CEOs) in Greece during the COVID-19 global pandemic crisis, the study examines how organizational ambidexterity is affected by fast decision making and the contingencies that affect this relationship, as well as whether being ambidextrous is beneficial for organizations under a global pandemic. The effects of CEOs' cognitive characteristics and of environmental dynamism are examined as moderating factors in the newly established relationship between strategic decision speed and organizational ambidexterity. This research connects the literatures on strategic decision speed and organizational ambidexterity, by bridging micro and macro perspectives of strategic management. Findings suggest that reaching strategic decisions quickly is associated with achieving organizational ambidexterity, which in turn is associated with superior performance. Further, decision makers' cognition and environmental dynamism moderate the relationship between strategic decision speed and achieving ambidexterity. Overall, this study sheds light on strategic management in dynamic environments, focusing on the decision-making process concerning organizational ambidexterity.

1. Introduction

The purpose of this chapter is to introduce the focus of the research, through presenting information on the background, context, and research questions. Firstly, organizational ambidexterity is introduced and the fact that it is a strategic decision is briefly explained, a decision related with multiple other strategic decisions. Building on previous literature that has recognized ambidexterity as a decision, this study examines this crucial part of corporate strategy as part of strategic decision making. Next, why Greece is an appropriate setting to empirically examine ambidexterity as part of the strategic decision-making process is discussed. This leads to an overview of strategic decision making in dynamic environments, including how both organizational ambidexterity and strategic decision speed are essential parts of it, along with a brief presentation of the role of CEOs as decision makers. Then, research questions are presented. The chapter concludes by highlighting the potential research contribution to be made by the study.

1.1 Background

Strategic management is the field of management “that combines analysis, formulation and implementation in the quest of competitive advantage” (Rothaermel, 2017, p. 72). In this quest of competitive advantage, companies need to be effective in their existing line of business, and at the same time grow and generate new sources of revenues (Ansoff, 1965). Organizations need, thus, to be able to be competitive both in existing activities and in pursuing new activities. Organizational ambidexterity, defined as the ability of a company to simultaneously exploit existing knowledge, systems and competencies, and explore new knowledge and opportunities for growth (He & Wong, 2004; Lubatkin et al., 2006; O’Reilly & Tushman, 2013) is an area within strategic management that has attracted the attention of researchers in the last 30 years. The large number of studies examining ambidexterity has produced interesting results, but there is still room for empirical investigations and scope for new theoretical developments. Exploitation and

exploration are the product of contradictory knowledge-creation processes, creating conflict in the role and actions of decision makers (Floyd & Lane, 2000), reflected in tensions between strategic activities, like adapting versus aligning (Gibson & Birkinshaw, 2004) and radical versus incremental innovation (Jansen et al. 2006). Exploitation includes all those organizational activities that have to do with efficiency, control and improving existing processes, whereas exploration entails flexibility, experimentation, and search (March, 1991). The two activities are by nature contradictory (Luger et al., 2018) and entail tensions. How these tensions are managed and what relevant strategic decisions are made in that context are crucial for organizations (Smith, 2014), making organizational ambidexterity a central strategic decision (Døjbak Håkonsson et al., 2016; Gupta et al., 2006; Kortmann, 2015). Further, ambidexterity is related with other decisions like for example decisions about how knowledge is disseminated within an organization (Mom et al., 2007) or whether a business unit should continue or cease its operations (Hill & Birkinshaw, 2008).

Building on previous work that has recognized organizational ambidexterity as a strategic decision, this study examines this crucial aspect of firm strategy as part of the strategic decision-making process (Elbanna & Child, 2007). This process has to do with the ways in which strategic decisions are reached and their respective context (Elbanna et al., 2020). One key aspect of the strategic decision-making process has to do with the time between starting to discuss a decision and reaching it, which Eisenhardt (1989) introduced as strategic decision speed. In the process of making strategic decisions, organizational leaders gather relevant information and the time until the decision is made significantly affects the decision's outcomes (Forbes, 2007). Organizations that wish to achieve ambidexterity need to be able to identify, evaluate, decide and act on opportunities for both exploration and exploitation. If this strategic decision making process takes too long, there is the risk of the exploration and exploitation opportunities not being available or relevant anymore.

According to the opportunity logic of strategy (Bingham & Eisenhardt, 2008), which is extremely relevant in uncertain and changing environments (Furr & Eisenhardt, 2021) a sustainable competitive advantage is achieved when opportunities are identified and seized earlier and faster than competitors. Under this strategy logic, strategic decision speed affects the timing, pace and outcomes of identifying and seizing strategic opportunities. Hence, deciding quickly is important for achieving a competitive advantage in dynamic environments. With this in mind, and taking into account that decisions about exploration and exploitation opportunities form the basis for achieving organizational ambidexterity, this study examines for the first time the relationship between strategic decision speed and organizational ambidexterity in the dynamic environment of a global pandemic. More specifically, the link between strategic decision speed and organizational ambidexterity is empirically tested during the COVID-19 pandemic in Greece. In addition, the outcome of ambidexterity is investigated, in order to evaluate whether choosing to pursue ambidexterity was beneficial for organizations during the global pandemic.

1.2 Greece as a Research Context

Several different geographical areas were considered as the context for this research, which was conducted between October 2020 and March 2021. During data collection, the global pandemic crisis was in progress and the business environment was severely disrupted. Greece was among the countries to impose a national lockdown in the spring of 2020, and again in the fall of 2020. When data was collected, the pandemic crisis had been already ongoing for six months in Greece, punctuated by discrete events, like lockdowns, curfews, or the occurrence of new variants, which were followed by international travel restrictions, difficulties in the supply of goods across countries, and disruptions in organizational and everyday life activities. In mid-June 2019, a few months prior to the beginning of the pandemic when an appropriate context for this study was

discussed, Greece topped the Global Business Complexity Index 2019 ([TFM Group Report](#)). This report measures complexity “in terms of how complicated and unpredictable a business environment is – and how difficult it is to understand and operate in” (Global Business Complexity Index 2019, p. 4). Therefore, the difficult and complex conditions of the Greek business environment were viewed as the ideal setting to investigate strategic decisions and the process of reaching them; with the country having just recently started to recover from a long and very intensive financial crisis in 2019, the leaders in Greece were facing more tensions and challenges than their peers in other countries.

According to the International Monetary fund (source: <https://www.cfr.org/timeline/greeces-debt-crisis-timeline>), the Greek crisis lasted for ten years (2009-2018). The crisis created multiple problems to organizations operating in Greece, many of which experienced a remarkable decline in their performance (Georgopoulos & Glaister, 2018). Companies that operated in Greece under the crisis have reported negative growth rates and reductions in the number of employees (Giotopoulos et al., 2022). Until 2013, Greece had already lost about 25% of its GDP, whereas unemployment had increased to 27% and there was a decrease in private consumption by 30% (European Commission, 2013). Furthermore, the uncertainty created by the Referendum in 2015 and the financial restrictions that followed made the situation even more difficult for organizations and their leaders in Greece. In general, there was a huge loss of productive capacity, whereas investment activities were paused (Vassilopoulou et al., 2019). This pause of investment activities was repeated also during the pandemic, as indicated in several reports on the pandemic period (please refer to section 7.6). This is in line with Hofstede’s (1980) analysis of Greece’s cultural characteristics, since Greece ranks extremely high on uncertainty avoidance, indicating that adopting a wait and see approach (Bingham & Eisenhardt, 2008) would be the obvious choice under crisis for organizational leaders in Greece. This is also in line with the suggestion that cultural characteristics affect the process of reaching strategic decisions (Dimitratos et al., 2011).

During the Greek crisis, organizations had faced liquidity problems (Tsebelis, 2016), extreme political instability, and social unrest (Lapavitsas, 2019). In 2019, organizations in Greece had just gotten out of a long and intense crisis exhausted, and entered a new one at the beginning of 2020, enormously disruptive and challenging. The Greek financial crisis has severely affected organizations, challenging their sustainability and disrupting business activities over the course of ten years. Functions that were previously relatively simple or standardized became very complicated due to the Greek crisis, like access to supplies or funding. Organizations operating in Greece were, therefore, entering the pandemic crisis disadvantaged compared to organizations in other countries, but at the same time their leaders had experience in managing the challenges created by a crisis. Compared to organizational leaders in other countries, organizational decision makers in Greece were, thus, equipped with more experience in crisis management. Nevertheless, the long Greek financial crisis is not comparable to the COVID-19 pandemic, as the disruption caused by the pandemic occurred in significantly less time. In other words, there were elements of the pandemic crisis with which decision makers in Greece were not familiar and had no previous experience.

The extended duration of the crisis in Greece compared to the effect of the global financial crisis in other countries renders Greece a very interesting research context when investigating business activities in crisis environments (Machias et al., 2016). This research was conducted right after the end of the Greek financial crisis, when a new, global crisis had just begun. Studying decision making and its outcomes in such an environment may provide useful insights in terms of those elements of strategic decision making that are important in order for firms to perform well under crisis. Despite the uniqueness of the Greek environment, findings may be generalized in environments of similarly high levels of uncertainty and unpredictability, as well as in environments of very high complexity.

The very interesting and unique environmental elements of Greece as a context for this research were embedded in research design through examining environmental dynamism as an important dimension in the research model. More specifically, the CEOs that participated in this research were asked to evaluate the environment in terms of how dynamic and rapidly changing its technical, economic, and cultural dimensions were. Further, there were questionnaire items referring to CEOs' perceptions about risk and the impact of false steps, as well as in terms of how stressful, exhausting, and hostile the environment was. This enabled the researcher to examine the impact of the macro environment and of how it was perceived and experienced by different companies and organizational leaders.

To sum up, the decision, to conduct research in Greece was made taking into consideration that studying countries or geographical regions are essential to business and economics research (Gerring, 2016), and was based on the fact that environmental pressures for organizations in Greece were very intense, given the fact that the environment was already very complex prior to the beginning of the pandemic. Thus, there was immense pressure on organizational leaders in Greece to reach effective strategic decisions and examining the strategic decision-making process in the context of the country was expected to provide useful insights. Thus, Greece was the context selected for this research, being perceived by the researcher as a very interesting dynamic context, undergoing change again and characterized by increased unpredictability again, within a very short period of time since change and unpredictability were evident in the environment. Such dynamic environments provide significant insights concerning strategic management. Strategic management in dynamic contexts is briefly discussed in the next section.

1.3 Strategic Management in Dynamic Environments

In uncertain and rapidly changing environments, previous strategic management research has identified organizational ambidexterity as a crucial firm characteristic (e.g. Benner & Tushman, 2003; Junni et al., 2013). Organizational ambidexterity is related with a company's ability to plan for the future, through exploration, and to create clarity concerning current day-to-day organizational tasks, through exploitation (Fourné et al., 2019); both are very important in dynamic environments. Exploitation enables the focus and improvement of existing organizational knowledge assisting organizational members with their short-term challenging tasks in a turbulent environment, ensuring survival; and exploration relates to creating new knowledge that focuses on the firm's long-term success. Indeed, in environments characterized by high uncertainty and rapid change, organizational ambidexterity has proven very beneficial for organizations, since it is associated with enhanced performance, survival and growth (Hughes, 2018; Junni et al., 2013; Raisch et al., 2009). Ambidexterity is a key strategic decision that affects the amount and balance of exploration and exploitation activities (Døjbak Håkonsson et al., 2016) and is related with the decisions concerning seizing the respective opportunities for each. These decisions are crucial in dynamic contexts, as they may affect the firm's survival (Hill & Birkinshaw, 2014).

In dynamic environments, strategic decision speed, like organizational ambidexterity, has also been found to predict organizational success (Baum and Wally, 2003; Bourgeois & Eisenhardt, 1988; Halevi et al., 2015; Hmieleski & Ensley, 2007; Kownatzki et al., 2013). In crisis environments, which are similarly characterized by increased uncertainty and fluidity, decisions are need to both be effective and made in a timely manner (Pearson & Clair, 1998). Previous research has suggested that deciding fast in environments where change is rapid, enables companies to recognize opportunities and take advantage of them before they become unavailable or obsolete (Eisenhardt, 1989). Fast decisions entail rapid information collection and interpretation

regarding the decisions considered (Atuahene-Gima & Li, 2004). Therefore, collecting and interpreting information about exploration and exploitation decisions, i.e. information related to organizational ambidexterity (Im & Rai, 2008), needs to occur fast in a crisis environment. Slow strategic decision making in dynamic environments entails the risk of recognizing opportunities, including opportunities for exploration and exploitation, later than competitors and missing the chance to take advantage of them. Therefore, there are indications of strategic decision speed enabling the recognition and pursuit of exploration and exploitation opportunities in the literature.

The decisions concerning which exploration and exploitation opportunities to pursue are part of strategic decision making, which is the responsibility of top management teams, led by the person who is at the top of the hierarchy, usually the Chief Executive Officer (CEO). Although other top management team members actively participate in decision making, CEOs are ultimately responsible for formulating corporate strategy and are held accountable for the quality of the strategic decisions and their implementation (Crossland et al., 2014; Sariol & Abebe, 2017). Specifically concerning decisions related to organizational ambidexterity, CEOs are the key persons in organizations, as they are assigned with dealing with tensions and issues that arise from pursuing exploration and exploitation (Kiss et al., 2020).

The central role of organizational leaders – and, hence, CEOs – in strategic management is emphasized in strategic choice theory (Child, 1972 & 1997) and upper echelons theory (Hambrick & Mason, 1984; Hambrick, 2007). According to both theories, different organizations may be operating in the same environment, but may be facing different tensions. In other words, it is erroneous to assume that there is a common set of tensions across the environment that all organizations face. It is vital to examine how individual organizational actors interpret and experience these tensions. How individual leaders perceive the environment is important and their individual characteristics (psychological and demographic) are crucial in the process of reaching

strategic decisions and acting upon them. More specifically, both theories underline the role of the decision makers' cognition in interpreting the situation and deciding how to proceed. Strategic choice and upper echelons theory share some assumptions, which are also important in this research:

- 1) decisions made by organizational leaders are important,
- 2) decisions made by organizational leaders are significantly influenced by contextual factors (including organizational and environmental factors), and
- 3) cognition-related characteristics of the decision makers play an important role in the decision-making process.

The second assumption above posits that the environment influences strategic decisions. Supporters of environmental determinism (Hrebiniak & Joyce, 1985), argue that companies are closely linked with their environments (Pfeffer & Salancik, 1978) and thus strategic decisions are affected by environmental characteristics (Hitt & Tyler, 1991). Especially when there is rapid change and the effect of making mistakes may be detrimental for the company, sensemaking and decisions are notably affected by environmental conditions (Le Bris et al., 2019). Additionally, in hostile environments decision makers are not open to new information (Dean & Sharfman, 1993), whereas in munificent environments they tend to incorporate new information faster in decision making (Baum & Wally, 2003). Campling and Michelson (1998) posit that organizations evolve based on the interdependent influences of the strategic choice of leaders and environmental impact. This view is very relevant with this study. The choices that organizational leaders make influence the type of opportunities the companies pursue and have both short-term and long-term impact on the pursuit of competitive advantage. At the same time, the pandemic has created an unpredictable and rapidly changing environment, which affects the types of strategic decisions and the process of reaching them.

To sum up, this study views organizational ambidexterity as the strategic decision to pursue both exploration and exploitation opportunities. The study's focus lies on the process of reaching the ambidexterity decision and on its outcomes. The speed of reaching strategic decisions is considered as an important element of strategic decision making that cannot be overlooked. This study embeds ambidexterity in the strategic decision-making process, examining the relationship between deciding quickly and ambidexterity; strategic decision speed is examined as an antecedent of organizational ambidexterity, based on the opportunity logic of strategy. Drawing on strategic choice theory (Child, 1972 & 1997) and upper echelons theory (Hambrick & Mason, 1984; Hambrick, 2007), CEOs cognitive characteristics, environmental and organizational features, are incorporated in the research, as factors that may influence the speed – ambidexterity relationship. Further, the study examines the outcomes of ambidexterity in terms of organizational performance under crisis. The following section presents the research questions and objectives in more detail.

1.4 Research Questions and Objectives

Strategic decision making is extremely important under crisis, since there is higher risk of non-effective decisions leading to detrimental outcomes and affecting not only firm performance, but also firm survival. Hence, decision making under crisis is a vital process for organizations (Weick, 1988). At the core of strategic decision making are decisions related to the type, number and balance of opportunities that the company will pursue including exploration and exploitation opportunities, as well as how quickly they are reached. However, the connection between rapidly identifying and seizing these opportunities and achieving organizational ambidexterity has not yet been examined. Previous research has shown that slow or ineffective responses to disorder and change in the environment have been proven to negatively affect organizational outcomes (Henderson, 1993) and specifically performance (e.g. Bourgeois & Eisenhardt, 1988; Souitaris & Maestro, 2010). Similarly, organizational ambidexterity has been associated with superior firm

performance (e.g. He & Wong, 2004; Junni et al., 2013). Hence, if both ambidexterity and speed are aspects of strategy associated with enhanced performance, the question about the relationship between the two arises naturally.

This study aims to investigate the relationship between strategic decision speed and organizational ambidexterity under the rapidly changing environment of the global pandemic. Was it those companies that decided faster or slower that were able to capture exploration and exploitation opportunities in the disruptive environment of the COVID-19 pandemic? If there is indeed a relationship between these two key aspects of strategic management, the factors that affect this relationship need to be explored. This research considers potential factors that impact the relationship between strategic decision speed and organizational ambidexterity at multiple levels (individual, organizational and environmental), aiming to incorporate different dimensions of strategic decision making. The impact of individual-level factors on organizational-level outcomes is the focus of microfoundations in organizations; microfoundations examine the origins of macro-level features at the micro (individual) level, with a focus on how individual behavior aggregates to the macro level (Barney & Felin, 2013). This study integrates microfoundations with a multi-level approach, where the interplay between different levels is examined.

Further, organizational ambidexterity has been found to be beneficial for organizations in dynamic environments (e.g. Junni et al., 2013), but little is known at the moment about the outcomes of organizational ambidexterity under an intense and long-lasting crisis like the global pandemic crisis. Crises are dynamic environments (Comfort et al., 2001) since they are characterized by turbulence and uncertainty. However, some crises are very intense, have an extended duration and threaten the lives of individuals, characteristics that are not necessarily characteristics of dynamic environments. In other words, such intense and long-lasting crises like the global pandemic, may be viewed as supersets of dynamic environments, as they entail turbulence and uncertainty, but

also characteristics that are threatening the lives of individuals and create increased levels of anxiety and fear. The study investigates the effect of organizational ambidexterity on performance under the pandemic crisis, acknowledging that pursuing organizational ambidexterity is a difficult task in general (Benner & Tushman, 2003; Smith & Tushman, 2005), let alone in such difficult circumstances. Under such conditions, organizational leaders may prefer to only exploit due to the fact that the results of exploitation are considered more predictable (March, 1991) or they may delay the implementation of strategic decisions, waiting until there is a clearer picture of the situation (Bingham & Eisenhardt, 2008). So, ascertaining whether those CEOs who decided to both exploit and explore during this intense and enduring crisis achieved superior performance is very important, since it would provide insights about the value of pursuing different types of strategic opportunities under crisis.

Understanding CEOs as key organizational decision makers is fundamental for strategic management under crisis. Their characteristics and behaviors have been found to affect organizational ambidexterity in numerous previous studies (e.g. Kammerlander et al., 2014; Lin & McDonough, 2011; Sariol & Abebe, 2017), as CEOs are in essence responsible for managing strategic tensions (Plambeck & Weber, 2010; Smith & Tushman, 2005). This research focuses on CEOs' individual characteristics, and more specifically those related to their cognition, since decision makers' cognition and perceptions are related to their ability to make sense of the situation (Weick, 1993) in order to make strategic decisions. Among cognitive characteristics of leaders, this study focuses on paradox mindset (Miron-Spektor et al., 2018) as a way to deal with the tensions created by the pandemic crisis; optimism (Tiger, 1979) as an unusual framing of an intense crisis; and educational level as a proxy of the overall cognitive abilities of individuals.

The above have led to forming the following research questions:

Q1: What is the relationship between strategic decision speed and organizational ambidexterity?

Q2: How is organizational ambidexterity beneficial for organizations under crisis?

Q3: How do CEOs' cognition-related characteristics, namely paradox mindset, optimism and educational level, affect the relationship between the speed of decision making and organizational ambidexterity?

Q4: How does perceived environmental dynamism affect the relationship between speed of decision making and organizational ambidexterity?

The next section describes how answering these questions contributes to different areas of strategic management research.

1.5 Research Contribution

This project contributes in four areas of management literature. First, it contributes to the strategic management literature by placing organizational ambidexterity within the strategic decision-making framework. Viewing ambidexterity as a decision entails an examination of how the different elements of the strategic decision-making process and context interact with it. This opens new possibilities concerning the kind and number of factors that potentially influence organizational ambidexterity, incorporating different dimensions of the strategic decision-making process and context, and including factors both internal and external to organizations. By empirically examining organizational ambidexterity as part of the strategic decision-making process, hopefully this work will be the starting point for combining research on strategic decision making and organizational ambidexterity.

Secondly, this project contributes to the ambidexterity literature, by adding strategic decision speed to the organizational ambidexterity antecedents. This novel link between these two aspects of strategic management is important, especially since it was tested and validated under the crisis

conditions of the COVID-19 pandemic: a global pandemic that was unprecedented in the recent history (Jang & Lee, 2022). Apart from the theoretical contribution concerning the antecedents of ambidexterity, the relationship between organizational ambidexterity and strategic decision speed also has significant managerial implications for leaders and decision makers; it enables investigating the impact of reaching decisions quickly on managing the exploration-exploitation tension and being able to be flexible and efficient (Adler, Goldoftas & Levine, 1999).

Thirdly, this study contributes to the literature on strategic decisions by providing insights concerning the potentially missing link between strategic decision speed and performance, by inserting ambidexterity as a mediator. Previous research has identified this as a significant question (Eisenhardt, 1989), while previous findings have created confusion about the relationship between time pressure, speed of decision making, and firm performance. For example, in dynamic environments, Forbes (2005) and Perlow et al. (2002) found a negative relationship between strategic decision speed and performance, whereas Baum & Wally (2003) found a positive one. Furthermore, Chen & Hambrick (1995) found a negative relationship between strategic decision speed and firm performance in stable environments. Therefore, although the need for deciding fast has been identified as an important factor related to achieving competitive advantage in dynamic environments, it was not clear how fast decision making actually affected performance in such environments (Perlow et al., 2003) and there is insufficient evidence about the value of fast decision making in stable environments. This study aims to provide insights on how strategic decision speed leads to superior performance.

Last but not least, this study contributes to the crisis literature, by adding to the discussion about the role of ambidexterity during crisis. Previous research has identified the positive impact of ambidexterity on performance when the environment is dynamic or highly uncertain (Du & Chen, 2018; Heracleous et al., 2017; Junni et al., 2013). Further, Raisch et al. (2009) have found that

ambidexterity is positively associated with firm survival under crisis. However, the magnitude and duration of the pandemic crisis has created unprecedented conditions and this study has tested the role of ambidexterity during a long, intense crisis within which smaller nested crises occurred, i.e. a fractal crisis (Topper & Lagadec, 2013). This work contributes in the area of crisis management, by investigating the benefit of organizational ambidexterity under the conditions of a fractal crisis, adding to the discussion concerning the type of opportunities that should be pursued by organizations operating in such environments.

To sum up, this study examines organizational ambidexterity in relation to dimensions of the strategic decision-making process as suggested by Elbanna et al. (2020), whereas it considers multiple demographic and psychological characteristics of organizational leaders simultaneously as suggested by Hambrick (2007). In addition, the study empirically examines for the first time two key aspects of strategic management that have been up till now examined separately, i.e. strategic decision speed and organizational ambidexterity, connecting two so far separate literatures and creating promising new directions for future research. Overall, this dissertation integrates dimensions at the individual level and behavioral approaches of strategic management with strategic decision making at the firm-level, offering an integrated, multi-level view of the process of reaching the decision to pursue organizational ambidexterity and its outcome under the conditions of a fractal crisis.

1.6 Chapter Summary and Thesis Structure

This introductory chapter presented the background of this study, why Greece was selected as the research context, and research questions and contributions. Strategic management is vital for organizations in dynamic and crisis environments, as it may affect the firm's survival. Hence, the nature and process of the strategic decisions reached are very important. One of the major strategic

decisions of organization is related to the balance between exploitation and exploration activities, i.e. organizational ambidexterity. The process of reaching the ambidexterity decision includes strategic decision speed, i.e. how fast the strategic decisions about exploration and exploitation opportunities are reached. Further, individual characteristics of the decision makers and environmental dimensions also affect the ambidexterity decision, which is crucial for organizational performance. Therefore, this study empirically examines for the first time the potential relationship between strategic decision speed and organizational ambidexterity, the factors that may influence this relationship, and the relationship between ambidexterity and performance under the conditions of the global pandemic in Greece. Greece has been selected as the ideal setting for examining strategic management, because of its challenging business environment before the pandemic began. This study contributes to the strategic management literature, the strategic decision-making literature, and specifically to the ambidexterity literature, and to the strategic speed literature. It also contributes to crisis literature examining the strategic responses of Greek companies to the pandemic and assessing the benefits of organizational ambidexterity under a fractal crisis.

This dissertation includes eight more chapters. The second chapter includes an overview of the evolution of research on strategy-related literature, including strategic management in general and under crisis, the microfoundations perspective, the different logics of strategy with a focus on the opportunity logic (Bingham & Eisenhardt, 2008) that is highly relevant in dynamic environments, and the main theories underlying the research: strategic choice (Child, 1972 & 1997) and upper echelons theory (Hambrick & Mason, 1984; Hambrick, 1997). The study's theoretical underpinnings are presented at the end of this chapter.

The third chapter consists of a literature review on the topics relevant to this study, focusing on organizational ambidexterity, strategic decision speed, the specific cognition-related

characteristics examined (i.e. paradox mindset, optimism and educational level), environmental uncertainty, and organizational performance.

The fourth chapter synthesizes the theoretical elements discussed, in order to provide an integrative model on organizational ambidexterity and strategic decision making under crisis. In this chapter, the relationship between the different variables of the study is illustrated based on theory and the six hypotheses tested in this research are presented. This chapter concludes with the research model.

The fifth chapter presents the methodology in terms of ontology and epistemology, but also concerning the research design and how it was implemented. The different research phases are described in detail, along with data management and preparation, quality assurance and research ethics. Further, why survey research and hierarchical regression were selected is explained, along with the choice of the measures for the variables examined. The chapter concludes with presenting the survey questionnaire.

The sixth chapter presents an analysis of the sample in terms of the demographics of both the respondents and their companies. The chapter also presents issues related to construct reliability and validity, while it explains how the sample is a good representation of the Greek business environment.

The seventh chapter presents results based on hierarchical regression, but also other methods used like ANCOVA and mediation analysis. Findings indicate that all hypotheses are supported apart from Hypothesis 4 that is partially supported (because a different type of moderation was hypothesized). At the end of the chapter, there is a synthesis of the results that helps the reader holistically understand the effect of all variables included in the study, including control variables.

The eighth chapter discusses the findings of this study, how they fit within existing literature, and why they are important for both theory and practice. Areas of theoretical and managerial contributions are discussed in detail.

The ninth and final chapter acknowledges research limitations and suggests future research directions for empirical studies that can possibly expand and widen this research's findings. The chapter concludes with some closing remarks and a personal reflection on the process of conducting research in general and more specifically during the pandemic.

2. Strategy and the Rationale of this Study

This Chapter provides an overview of what strategic management is and presents the evolution of research on strategy in an attempt to explain the rationale of this study. In order to better understand the different specific aspects of strategic management, it is essential that strategic management in general and under uncertainty is discussed. Further, the microfoundations perspective in management and strategy is briefly presented, in order to explain how decisions made at the individual level affect organizational outcomes. The different logics of strategy are presented next, illustrating how the opportunity logic of strategy is relevant in dynamic contexts and suggesting that its application can be expanded in other contexts as well. Thus, the process of identifying and seizing opportunities is a central decision-making process in this research and some relevant insights from entrepreneurship research are presented next. The chapter concludes with the two main theories on which the study draws, strategic choice theory and upper echelons theory, and with the strategic decision-making framework as an appropriate framework for this work. Overall, the synthesis of strategic choice and upper echelon with the opportunity logic within the strategic decision-making framework provides this study's theoretical underpinnings.

2.1 Strategic Management and Strategic Management under Uncertainty and Turbulence

Strategy is a set of interrelated activities through which companies aim to produce and capture value (Porter 1996). Strategic management is the field of management that investigates strategy and “combines analysis, formulation and implementation in the quest of competitive advantage” (Rothaermel, 2017, p. 72). Those responsible for strategic management, i.e. top executives, are making strategic decisions in order to achieve desired outcomes concerning the company's performance compared to competitors, through examining and deciding upon viable strategic options, taking into account organizational and environmental constraints (Barney, 1986). These viable strategic options are opportunities (Kirzner, 1997), the recognition and seizing of which is

a key driver of competitive advantage (Bingham & Eisenhardt, 2008). Although there are differences when seeking and pursuing opportunities in unstable environments compared to more stable ones, as opportunities may quickly and unpredictably become unavailable or irrelevant in volatile environments because of environmental change, pursuing opportunities in a timely manner is also important in stable environments, as they may become unavailable not due to environmental change, but because competitors have seized them. Hence, the process of reaching strategic decisions, and how much it takes to do so, is important. Opportunities are central in strategizing in general, both in new ventures and established organizations (Roundy et al., 2018) and their timely identification and pursuit is important in all environments as they can lead to first-mover advantages (Lieberman & Montgomery, 1988).

In unpredictable and changing environments, the usual strategic planning process where there is an effort to predict the future is not enough (Allaire & Firsirotu, 1989), as there is lack of information and lack of certainty about what the future will be, sometimes even in the short term. In fact, dealing with uncertainty is a key challenge of strategic management (Thompson, 1967) and effective strategic management enables organizations to manage uncertainty, through being responsive to environmental change and at the same time shaping the environment (Allaire & Firsirotu, 1989). When there are major disruptions in the environment, like under crisis, it is more difficult to identify opportunities, because of the high levels of uncertainty and the conflicting or difficult to handle amounts of information (lack of information or new information too often) that disruptions produce (Milliken, 1987). Hence, strategizing is more difficult in highly uncertain and volatile environments.

The decisions reached as part of strategizing are crucial in any environment (Elbanna, 2006), but are even more important in dynamic and crisis environments (Janis, 1989). The process of reaching decisions in dynamic environments has been a popular research topic in the field of strategic

management, and interesting – often contradictory, as reported below – findings have been reported. Nevertheless, previous work underlines the importance of understanding environmental conditions: failing to perceive uncertainty and turbulence may lead to reaching detrimental decisions for the organization (Dess & Beard, 1984), hence decision makers need to be able to perceive the level of environmental uncertainty and reach decisions accordingly. Furthermore, since decisions are difficult to alter and to reverse once reached (Wilson, 2003), their impact is crucial under conditions that are threatening the organization.

An important question in strategic management under uncertainty has to do with the effect of rationality in decision making. Contradictory findings have been reported regarding the relationship between rationality, i.e. a reasonable and understandable behavior under given conditions (Butler, 2002), and organizational outcomes under uncertainty. For example, Goll & Rasheed (1997) found that there is a positive relationship between rationality and performance in dynamic environments, whereas Deligianni et al. (2016) found a positive relationship with international performance. Contrarily, Daft & Lengel (1986) have found that when there is uncertainty in the environment, decision makers rely more on intuition. Elbanna & Child (2007a) suggest that decision uncertainty is what makes a difference, and have found that rationality positively relates to the effectiveness of a strategic decision, but this relationship is weaker when the decision is highly uncertain. Moreover, the fact that inconsistent findings have been reported regarding the relationship between company size and rational decision making processes (e.g., Dean & Sharfman, 1993; Fredrickson & Iaquinto, 1989; Papadakis et al., 1998), suggests that indeed the effect of environmental conditions need to be further investigated (Elbanna & Child, 2007b).

Similarly, research on comprehensiveness – also referred to as procedural rationality (Petrou et al., 2020), i.e. the rationality of the process of reaching decisions – of the decision-making process has

produced conflicting findings. Comprehensiveness refers to a process of reaching decisions during which decision makers collect a lot of information, identify multiple different alternatives, and evaluate them prior to reaching the decision (Miller et al., 1998). Previous work suggests that organizational leaders rely on comprehensiveness when reaching important decisions (Meissner & Wulf, 2014). Yet, research concerning comprehensiveness has provided arguments and findings that suggest a negative relationship between comprehensiveness and decision outcomes including performance and innovation (e.g., Albin & Foley, 1998; Dane & Pratt, 2007; Kolbe et al., 2020; March, 2006), but also a positive relationship between the two (Bagozzi et al., 2003; Idson et al., 2004; Samba et al., 2018). Interestingly, in their meta-analysis, Samba et al. (2021) found that environmental dynamism does not moderate the relationship between decision comprehensiveness and outcomes. Similarly, Meissner & Wulf (2014) found that perceived environmental uncertainty does not act as a moderator, but is directly related to comprehensiveness.

Based on the above, it is obvious that examining the effect of environmental characteristics on the strategic decision making process is another important question in strategic management. The actual environmental characteristics are translated into perceptions by decision makers (Miller, 2006) and these perceptions are very important inputs in the decision making process. Dimensions of the environment, such as uncertainty or munificence, have been found to moderate the relationship between decision making processes and organizational performance (e.g., Bourgeois & Eisenhardt, 1988; Fredrickson, 1984; Goll & Rasheed, 1997; Shepherd et al., 2020). On the other hand, Elbanna et al. (2011) found that the environment does not have an interaction effect on the relationship between conflict and decision effectiveness, but environmental dynamism has a moderating effect on the relationship between using both intuition and rationality, and decision quality. Thus, teams that rely both on intuition and on rationality achieve better outcomes than teams that use exclusively intuition or rationality in dynamic environments (Thanos, 2022), a very interesting finding, since it indicates that intuition and rationality may seem contradictory (Tabesh

& Vera, 2020), but are paradoxical and complementary (Kaufmann et al., 2014). Moreover, intuitive decisions are faster compared to rational decisions that require more time (Kaufmann et al., 2017), and the speed of decision making makes a difference in dynamic environments (Eisenhardt, 1989). This dissertation is contributing to the discussion about the effect of environmental conditions on the decision making process, examining the environmental impact on the nature of the reached decisions and the type of strategic opportunities pursued based on those decisions through investigating organizational ambidexterity as a strategic decision.

Organizational ambidexterity is a way to cope with environmental uncertainty and turbulence, because it is closely related to an organization's capacity for change (Judge & Blocker, 2008). When the environment changes rapidly there is the need for the organization to be responsive to the environment by paying attention to the level of both internal fit – reflected in processes and systems, i.e. exploitation – and external fit – reflected in activities related to exploration (Judge & Blocker, 2008). But apart from being responsive to the environment, organizational ambidexterity entails also shaping it: organizational ambidexterity means that the company may be adopting novel technologies (Lubatkin et al., 2006), leading competitors to also adopt them; it may be creating new products or services (Gibson and Birkinshaw, 2004), creating new market niches that did not exist; it may optimize its internal processes (Auh & Menguc, 2005) in ways that competitors also find beneficial and try to apply; or it may penetrate more aggressively in its existing customer base (Lubatkin et al., 2006), making it impossible for competitors to share a part of a specific market. Thus, being ambidextrous implies being able to adapt to environmental change and shaping the environment through the various exploitation and exploration activities, whether this shaping occurs deliberately or not. The beneficial role of organizational ambidexterity as an effective strategy in unstable environments has been proven in previous research (e.g. Junni et al, 2013), as strategic activities and processes related to exploration and exploitation

opportunities enable firms to use and adapt existing knowledge in order to create new knowledge through pursuing new opportunities (Judge & Blocker, 2008).

When strategizing, strategic processes need to consider organizational and environmental constraints (Barney, 1986), but these constraints are not the only ones that must be taken into consideration while strategizing under uncertainty. In order for strategic management to be effective, strategies must also fit with the constraints related to the individual decision makers, and more specifically their psychological characteristics and perceptions (Parnell et al., 2000). Strategic management is a holistic view of a company, both internally and externally, but under uncertainty, it is more closely related with the decision makers' cognition (Furr & Eisenhardt, 2021) that enables them to identify and take advantage of opportunities sooner and faster than their rivals, based on their cognition and psychological characteristics. This view is extremely relevant with this study: under the highly uncertain environment of the COVID-19 pandemic, organizational leaders needed to focus on identifying and taking advantage, sooner and fast than competitors, of opportunities related to exploration and exploitation, based on their perceptions and cognitive skills. Therefore, individual-level characteristics of the decision makers affect outcomes at the organizational level; this is central in the microfoundations perspective in organizations, which is presented as follows.

2.2 Microfoundations in Management and Strategy

Microfoundations as a word includes two parts: micro and foundations, each with equal importance. Micro refers to the significance of the role of individuals and, in agreement with individualism (Simmel, 1974; Weber, 1949), suggests that individuals are the building blocks of societies and social phenomena. As such, individuals and their characteristics are central in examining any social phenomenon. Nevertheless, just examining individuals and individual-level

factors is not enough; the foundation part in the word microfoundations entails that something that is situated elsewhere, at a different level, is founded in this very level, i.e. the micro level. Again in line with individualism, there is the assumption that what is happening at the individual level influences what is being observed at the macro level. In other words, there are effects of micro-level factors on macro-level ones. Using a microfoundations approach, then, is not solely about looking at the individuals and how they interact; it goes beyond examining the micro-micro interactions and includes micro-macro interactions and, more broadly, vice-versa macro-micro effects (Barney & Felin, 2013).

The micro-macro and macro-micro effects are central in social sciences, including management and strategy, which increasingly examine how the individual level, i.e. the micro level, is associated with what occurs at the firm level, i.e. macro level (Harper & Lewis, 2012)¹. Whether focus should lie on the micro or macro level is a key debate across academic fields (Barney & Felin, 2013), the origins of which go back to Durkheim (1962). Durkheim suggested that sociology and the social sciences in general should examine higher-level social factors like religion, culture, and countries, rather than individuals and individual-level features. This view, called Durkheimian collectivism, has been the basic assumption for researchers who emphasize institutions and how institutional factors interrelate, in other words a macro-macro analysis. The main argument of collectivists is that institutional features cannot be further reduced or decomposed; they emerge at the institutional level.

The argument that contradicts the basic argument of collectivism posits that understanding any social phenomenon entails understanding its parts, and that the parts of social phenomena are individuals and their interactions (Simmel, 1974; Weber, 1949). This stream of social science is

¹ The firm level is mentioned as the meso level, usually in cases where the term macro refers to the overall environment.

called individualism and suggests that individuals are the basic elements of societies and social phenomena, and therefore their views, beliefs, and interests should be the starting point for examining what is happening within societies, for investigating social phenomena, and for building social theories. According to individualists, a social scientist needs to shed light on the origins of the various macro factors, and these origins need to be sought at the individual level, by studying individuals and the ways in which they interact (Coleman, 1990). Thus, there is an assumption of causality between the micro and the macro level. The relationship between the micro level and the macro level is at the core of the microfoundations view.

Barney & Felin (2013) have clarified what microfoundations are by addressing relevant misconceptions: a) microfoundations are not just about studying individuals through a focus on psychology or human resources, but about how individual characteristics and behaviors impact macro level dimensions; b) shifting the application of concepts from the individual to the firm level, like for example shifting the application of learning from the individual to organizational learning, is not a microfoundations approach; there is the need for explaining the mechanisms and the changes in the concept underlying this shift; c) microfoundations are not about continuously reducing the scope of analysis, by looking into lower levels within the individual level (e.g. genetic factors); the individual is the basic level, the starting point of analysis; and d) microfoundations do not remove the importance of macro-level dimensions; on the contrary, the microfoundations view acknowledges the significance of the macro level by focusing on identifying the factors that influence it. Overall, microfoundations are about finding the origins of macro-level features at the micro level and examining how individual behavior aggregates to the macro level (Barney & Felin, 2013).

The microfoundations approach in management and strategy implies that there is a connection between individual-level characteristics and organizational dimensions and processes like

innovation, strategic decision making or performance. This study is taking an integrated multi-level approach, by considering how individual perceptions and cognition of CEOs influence the strategic decision-making process at the firm level and the pursuit of organizational ambidexterity under crisis. Therefore, a relationship between the micro and the macro level is assumed and the aim of this dissertation is to shed light on the interaction between them. Furthermore, this work looks at how individual perceptions and cognition scale and are reflected in strategic decisions that affect the organization and its performance. Looking at how scaling or aggregation occurs is an important question that is “scarcely addressed in the extant organizational literature” (Barney & Felin, 2013, p.146). This study adopts the view of aggregation suggested by literature that focuses on top executives, according to which organizations are a reflection of their top executives (Hambrick & Mason, 1984) and their individual perceptions, views, cognition and decisions scale to the firm level and affect organizational outcomes. This view adopted in this study does not imply that top executives are independent of executives at other levels or that their interactions with them are not important; rather, it implies that decisions concerning ambidexterity are reached based on the cognition and perceptions of CEOs, which are formed and informed through their interaction with other individuals and the environment. In other words, this study assumes that decisions about strategy are reached at the higher levels of organizational hierarchy, but they are affected by the interactions of top management with multiple organizational levels.

In order to provide a better understanding of the multi-level approach of this study, it is essential to present the underlying logic of strategy based on which the study is based, which is the opportunity logic (Bingham & Eisenhardt, 2008). The following section briefly presents the three different strategy logics and explain how they are relevant to different contexts. The opportunity logic is described in more detail and how it links the micro, meso and macro levels is explained.

2.3 Strategy, Strategy Logics and Different Contexts

Strategy is at the core of organizational activities, as it is strategy that relates to achieving a competitive advantage (Porter, 1980 & 1996). Scholars have been examining strategy, developing multiple different theories. Among the most popular early theories, Porter's (1980) competitive forces approach was dominating the field in the early 1980s and suggested that a company can defend its position in an industry against competitors, by evaluating five forces that are present in any industry: competition, potential of new entrants, suppliers' power, customers' power and threat of substitute products. Following Porter's (1980) suggestion about strategy that focused on the industry, the focus shifted on the company through revisiting the resource-based view (RBV) of the firm (Penrose, 1959), which suggests that a competitive advantage is related with a company possessing key resources that are rare, inimitable, valuable, and non-substitutable. Hence, under the RBV, companies need to develop or acquire resources that will enable them to perform better than competitors. The RBV of the firm was acknowledged to explain how a competitive advantage can be achieved, but it did not explain how it was sustained (Teece et al., 1997). In an effort to do so, Teece et al. (1997) introduced dynamic capabilities as a potential answer to this question, defining dynamic capabilities as the ability to achieve new forms of competitive advantage and, thus, to sustain it. This theorizing attempt attracted remarkable attention until very recently, with multiple literature reviews on dynamic capabilities being produced (e.g., Ambrosini & Bowman, 2009; Barreto, 2010; Laaksonen & Peltoniemi, 2018; Piening, 2013; Wang & Pervaiz, 2007; Zahra et al., 2006).

Nevertheless, there has also been a lot of skepticism concerning dynamic capabilities for various reasons. Firstly because the plethora of work on reviewing dynamic capabilities is not accompanied by a plethora of respective rigorous empirical work that proves a link between dynamic capabilities and sustainable competitive advantage (Wright, 2021). Furthermore, the

dynamic capabilities framework has been criticized as confusing (Winter, 2003), faddish (Giudici & Reinmoeller, 2012), too simplistic (Arend & Bromiley, 2009), and ambiguous, including a questionable conceptualization of human action (MacLean et al., 2015).

The researcher is sceptic about this framework as well. Adding to the aforementioned flaws of the dynamic capabilities framework, the following fact is perceived as problematic – and it particularly relates to this work: Eisenhardt & Martin (2000) have used the dynamic capabilities framework as a way to explain how competitive advantage is sustained in high velocity contexts, i.e. in highly dynamic environments. However, in a 2020 article by Eisenhardt & Furr on strategy in highly dynamic environments, it is suggested that dynamic capabilities are not relevant in highly, but rather in moderately dynamic environments. This indicates that dynamic capabilities have not been thoroughly conceptualized in the first place. In general, the researcher believes that the concept of dynamic capabilities is too broad and over-simplistic: anything that a company does can be viewed as a dynamic capability, which is a major disadvantage of the specific framework. This is why theorizing based on dynamic capabilities has not been chosen for this work. Yet, the framework is mentioned as it has been perceived as relevant to specific strategy logics, in stable or moderately dynamic environments – another reason why it is not relevant with this study, which was conducted under the highly dynamic environment of the global pandemic.

Strategy in organizations has been examined based on three different logics: the leverage logic, the position logic and the opportunity logic. The leverage logic was the first to be introduced and a major theoretical framework for examining strategy and strategic management, the resource-based view of the firm (Penrose, 1959), is associated with it. The other two strategy logics are posterior. The position logic takes a different perspective on the resource-based view, while the opportunity logic is not relevant with it and suggests a different approach to strategy. All three logics are briefly presented as follows.

2.3.1 The Leverage Logic

According to the resource-based view of the firm, a company's competitive advantage and superior performance are based on the possession of key resources that are rare, inimitable, valuable, and non-substitutable (Penrose, 1959). In this way, companies create combinations of unique resources at the unit and the firm level, which enable them to perform better than competitors (Collis & Montgomery, 2005; Penrose, 1959). The underlying logic of the resource-based view of the firm is the leverage logic (Bingham & Eisenhardt, 2008), under which strategy entails recognizing, creating, and taking advantage of a set of core resources that are rare, inimitable, valuable and non-substitutable in existing markets, and transferring (leveraging) the competitive advantage that they create into new markets, where these same resources still possess the same set of characteristics (value, inimitability, rareness, and non-substitutability).

The leverage logic of strategy is highly relevant in relatively stable markets, where information about which resources possess value, inimitability, rareness, and non-substitutability is available and clear (Furr & Eisenhardt, 2021). However, in highly uncertain and dynamic environments, the leverage logic entails two significant challenges: a) information about which resources are rare, inimitable, valuable and non-substitutable may not be available, specifically under times when the environment is highly disrupted (like under a global pandemic), and b) even if this information exists, it is not static; unexpected, difficult to predict changes in the environment may alter the significance of one or more resources, which used to be, but may no longer be, a source of competitive advantage (Barney, 1991). Hence, the leverage logic and the resource-based view of the firm become less relevant in uncertain, dynamic environments (Bingham & Eisenhardt, 2008; Furr & Eisenhardt, 2021), because the pace of environmental change makes it impossible to know which resources are core for organizational success.

2.3.2 The Position Logic

A second strategy logic is the position logic (Bingham & Eisenhardt, 2008) under which a company achieves and sustains competitive advantage through performing differentiated activities compared to competitors or performing similar activities but in a distinct way (Porter, 1996). The position logic is not based on identifying which resources are valuable, rare, inimitable, and non-substitutable, but on creating inter-resources links that are synergistic and strong, whereas the strength of these connections is continuously enhanced over time. Such tight links among resources, called activity systems (Porter, 1996), enable the company to occupy a unique and valuable strategic position in the market. The difference between the position logic and the leverage logic lies on the fact that the resources that belong in any activity system may not necessarily be individually valuable, rare, inimitable and non-substitutable under the position logic, but their combination is more valuable for the company than any resource individually is, specifically as they become more interdependent and mutually reinforcing (Miller & Friesen, 1980). Again, the position logic refers to the unit level and the firm level, as the resources linked are identifiable at these levels.

Similar to the leverage logic, the position logic is also problematic under rapidly changing and uncertain environments. The position logic assumes a stable, unchanging and unambiguous environment (Bingham & Eisenhardt, 2008; Porter, 1980); when the environment is rapidly changing, what was considered a valuable position at some point in time may not be valuable at a different time point, and the time difference between the two points may not be substantial or predictable. In addition, even if organizational leaders recognize that there is the need to modify the activity system(s) by changing which resources are linked, and how closely they are linked, it is very difficult to disconnect them and rapidly alter the links between them (Lengnick-Hall & Wolff, 1999). Strategy under the position logic focuses on enhancing the links among the different resources in an activity system, while adding more resources to it in order to produce a

progressively reinforced strategic position. The process of enhancing the links among resources decreases the firm's flexibility and ability to adapt to changes in the environment, which is a major disadvantage when the environment is uncertain and volatile.

2.3.3 The Opportunity Logic

A third logic of strategy is the opportunity logic (Bingham & Eisenhardt, 2008), under which strategy has to do with identifying and seizing opportunities faster and more effectively than competitors. An opportunity may be recognized as a market need that has not yet been defined in detail, as a novel way of taking advantage of existing resources that are not fully used or as a way of using new resources (Kirzner, 1997). Eisenhardt & Sull (2001) associated the opportunity logic with opportunities like internationalization, strategic alliances, and new product development. These opportunities are all opportunities for exploration, i.e. they create new revenue. However, Eisenhardt & Martin's (2000) definition of the opportunity logic entails creating revenue and creating profits. Profits stem from opportunities for both exploration (related to creating new revenue streams through introducing new products and services or entering new markets) and exploitation (related with creating profits through cutting costs and optimizing internal systems and processes). Thus, the opportunity logic is related to organizational ambidexterity. Moreover, timing is crucial under the opportunity logic of strategy, as part of the source of competitive advantage is associated with the early capture of opportunities (Bingham & Eisenhardt, 2008). Therefore, strategic decision speed lies at the heart of the opportunity logic, since it helps companies to identify and take advantage of opportunities timely, faster and earlier than competitors, enabling them to achieve a competitive advantage.

Contrarily to the leverage and position logics of strategy that are not relevant in uncertain and dynamic environments, the opportunity logic is highly relevant in such contexts (Furr & Eisenhardt, 2021). Under the opportunity logic, achieving superior performance relies on focusing

on a few organizational processes related to promising opportunities (Bingham & Eisenhardt, 2008). These processes are not tightly linked and firmly structured; rather, they are semi-structured and more flexible (Bingham & Eisenhardt, 2008). The fact that the opportunity logic relates to semi-structured processes allows the company to capture opportunities as they become available and change which resources are used for seizing the opportunities and how they are interconnected. This is possible because the links between resources are not tight, and, thus, modifying the links and removing or replacing the resources in any activity system require less time and entails less complexity. Therefore, the opportunity logic is applicable and relevant in highly uncertain and volatile environments.

Although in previous work the opportunity logic has been associated only with dynamic environments and specific types of organizations in less dynamic environments (Eisenhardt & Bingham, 2017; Furr & Eisenhardt, 2021), it is worth considering that opportunities and their timely pursuit are equally important in different contexts. In reality, the opportunity logic is relevant in all contexts, including crises contexts and stable/predictable environments, because a failure to identify and seize opportunities leaves room for competitors to do so and provides them with a first-mover advantage, an important advantage that needs to be further managed after it has been achieved irrespective of the type of environment that the company operates in (Lieberman & Montgomery, 1988). The leverage logic entails opportunity seeking, in order for the company to be able to recognize in which new markets the existing valuable, rare, inimitable and non-substitutable resources can be leveraged; and the position logic entails opportunity seeking in order for the company to be able to recognize the areas in which the activity systems that link resources are expected to produce the desired outcomes. Hence, in reality, the opportunity logic is relevant in environments with varying degrees of unpredictability and change, as it is inherent in strategizing.

The opportunity logic is extremely relevant with the integrated multi-level approach of this study, as opportunities are identified, evaluated, and pursued by individuals, but the outcomes of pursuing these opportunities concern the firm level. Which opportunities are identified, how they are recognized, and which are pursued are related with individual choices, as suggested by strategic choice theory (Child 1972 & 1997), and these choices depend on individual perceptions, values and interests, as suggested by upper echelons theory (Hambrick & Mason, 1984; Hambrick, 2007). In the process of identifying and seeking opportunities, decision makers act like entrepreneurs, trying to create new activities and new business (Stevenson et al., 1985) in order to achieve superior firm performance. The process of identifying and seizing opportunities is briefly presented in the following section, in order to understand how different decision makers recognize, evaluate and act on opportunities when they are strategizing.

2.4 Identifying and Seizing Opportunities

As explained in the previous section, strategizing under the opportunity logic is an activity that bears similarities with entrepreneurial activities: decision makers identify and pursue opportunities faster, earlier and more successfully than competitors in order to achieve a competitive advantage (Bingham & Eisenhardt, 2008). Therefore, strategizing – which includes identifying and seizing opportunities – requires decision making and acting (McMullen & Shepherd, 2006); it is not enough to identify an opportunity, which is related to thinking (about) strategy; the opportunity needs to also be pursued, which is related to doing strategy. Solely identifying opportunities cannot be characterized as strategizing. However, the opportunity identification phase is crucial, because if an opportunity is not recognized, then it will definitely be missed. Hence, between identifying an opportunity and pursuing it, there is a decision-making process that helps the decision makers evaluate whether the opportunity is worth pursuing or not.

McMullen & Shepherd (2006) provide a two-stage model of how opportunities are identified and pursued by entrepreneurs, which can also be applied to strategic decision makers' process of identifying and seizing opportunities. McMullen & Shepherd's conceptual model suggests that there are two types of opportunities: a third-person opportunity, which is "a potential opportunity for someone in the marketplace" (McMullen & Shepherd, 2006. p. 137), and a first-person opportunity, which is an opportunity that the specific person finds promising. A third-person opportunity is not necessarily an opportunity for everyone; but it reflects the existence of potential for individuals, entrepreneurs and/or decision makers, with the right abilities and characteristics. This is the first stage of the model, where the existence of a third-person opportunity is identified; so the statement *this is an opportunity* is relevant here. The next stage concerns deciding whether the third-person opportunity identified is actually an opportunity for the specific company, i.e. a first-person opportunity; so the question *is this an opportunity for us?* is relevant here. The first stage is the attention stage, where attention focuses on recognizing that there is something that the market does not know related to this opportunity. This idea of market ignorance as a source of opportunity was suggested by Kirzner (1973). So, once the recognition that there is something that the market is missing is made, a third-person opportunity is recognized. The second stage suggested by McMullen & Shepherd (2006) is the evaluation stage, where the uncertainty associated with specific actions related to the opportunity is evaluated. Obviously, without acknowledging the existence of third-person opportunities, i.e. in absence of the attention stage, stage two is not applicable, as the decision maker will not have identified the opportunity that needs to be evaluated and then pursued.

McMullen & Shepherd's (2006) model is very relevant with this dissertation, as it distinguishes between the identification of an opportunity and the decision to seize it, while taking into account the relevant uncertainty. The central assumption of this study is that organizational ambidexterity is a strategic decision, which entails the identification and seizing of opportunities for exploration

and exploitation. Having recognized exploration and exploitation opportunities does not necessarily mean that they will be pursued; decision makers will evaluate these opportunities in order to decide if they are opportunities for the company under the current conditions, based on their individual perceptions, acknowledging that these conditions are not stable and taking into account the pace of environmental change. There will be third-person opportunities for exploitation and exploration that will remain unexploited, because the decision makers may believe that they are not worth pursuing based on their individual perceptions and cognition. Hence, strategy is shaped while some opportunities are ignored, others are evaluated and rejected, and others are evaluated and pursued. The following section presents how different views of strategy take into consideration the process of strategizing, and the degree of relevance of these views with this study, which is based on the opportunity logic of strategy.

2.5 Strategizing as an Entrepreneurial Activity, Strategy Creation view and Strategy-As-Practice

When pursuing opportunities, i.e. under the opportunity logic of strategy, decision makers act like entrepreneurs, since recognizing and seizing opportunities is considered to be a key ability of successful entrepreneurs (Stevenson et al., 1985). To take advantage of available opportunities, decision makers need to identify and evaluate them, before pursuing them (Ardichvili et al., 2003). Opportunities are recognized and pursued as individuals shape basic, initial ideas into strategic action plans, through a) perceiving that there are new market needs and identifying resources that are underemployed, b) discovering which resources fit with these new market needs, and c) connecting previously unconnected needs and resources (Hills, 1995). According to De Koning (2003), opportunity recognition and development entails a sociocognitive process, based on combining a set of cognitive activities (collecting information, thinking, and evaluating resources) with social interactions (discussing with people in the entrepreneur's network). Similarly, Baron

(2006) suggests that identifying opportunities is based on using cognitive frames to analyze and evaluate changes and events in the environment. Hence, thinking and cognition are important in identifying and pursuing opportunities under any context.

Especially under uncertainty, recognizing and seizing opportunities is more challenging and entails some degree of improvisation, as previous experience may or may not be relevant; thus, decision makers combine experimenting with some basic rules of thumb relevant to the decision makers' prior experience (Bingham & Eisenhardt, 2008) when pursuing opportunities in unpredictable and changing environments. Successful strategists are able to decide the varying degrees of combining improvisation and structure, while taking into consideration changes in the environment and the availability of opportunities (Davis et al., 2009). To do so, they are engaged in thinking, based on their cognitive skills that enable them to make sense of the environment (Furr & Eisenhardt, 2021). In other words, strategy by thinking under uncertainty is related with cognition: when the environment is unpredictable and changes rapidly, decision makers are more able to create and execute better strategies when they holistically comprehend the opportunities, the environment, and their own strategies (Ott et al., 2017).

An important suggestion of the opportunity logic is that just recognizing opportunities is not enough. According to Koller (1998), entrepreneurs often recognize opportunities but do not proceed with pursuing them, so the opportunities identified are missed. The process of collecting information on opportunities, analyzing it and taking advantage of the opportunities is not necessarily linear, but it involves multiple iterations (Ardichvili et al., 2003). If these iterations do not lead to strategic actions, opportunities are left unexploited. To seize opportunities, decision makers need to be involved in "strategy by doing" (Eisenhardt & Bingham, 2017, p. 246). Strategy by doing has to do with acting and being flexible in response to environmental changes. When the environment is volatile and uncertain, emphasizing stability and avoiding change leads to missing

current information and novel opportunities (Eisenhardt & Bingham, 2017). Strategy by doing and by thinking are related with recognizing and taking advantage of opportunities and can be combined during strategy formulation (Ott & Eisenhardt, 2020). Overall, strategizing under the opportunity logic lies on a combination of strategizing by thinking, through using cognitive skills, and strategizing by doing, through adapting strategy according to environmental change.

2.5.1 Strategy Creation View

Adding on the concept of strategy by thinking and doing, Furr & Eisenhardt (2021) introduced the strategy creation view of strategy that they view as relevant in uncertain environments, which also includes strategy by shaping. Shaping has to do with realizing that the firm's interaction with the market actually affects the market, and consciously deciding how much of this shaping is achievable and desirable. Hence, the decision makers imagine what the desirable situation would be and create a shared understanding about it within the organization, in order for the relevant actions to be planned (thinking) and taken (doing). When pursuing opportunities in dynamic environments, decision makers are involved in all three types of strategizing: doing, thinking and shaping (Furr & Eisenhardt, 2021). To do so, decision makers need to choose how much shaping versus adapting (through doing and thinking) to the environment will be beneficial and possible. Therefore, strategic management under uncertainty does not rely on resources or the links between them, as suggested by the resource-based-view, but on the processes that generate strategies in order to take advantage of opportunities.

The strategy creation view is a recent suggestion about how strategic management is associated with the degree of uncertainty in the environment. Furr & Eisenhardt (2021) advocate that in stable environments strategy relies on the resource-based view of the firm and is guided by the leverage logic, since it is clear which resources are going to lead to achieving a competitive advantage. Further, when the degree of environmental change is moderate and there is some predictability, a

hybrid strategy is used, based on the resource-based view, under which resources are viewed as dynamic capabilities (Teece et al., 1997). Under this view, organizations renew their resources according to the (relatively low) pace of external change in order to sustain their competitive advantage over time (Eisenhardt & Martin, 2000). To the contrary, in highly uncertain and turbulent environments, the resource-based view strategy and the dynamic capabilities view, which is an extension of the resource-based view, are not relevant. In highly uncertain and turbulent environments, strategy entails being flexible and able to learn, using cognition to make sense of the changes, and shaping the environment while interacting with it. The strategy creation view bears some similarity with another relatively new approach to strategy, which precedes the strategy creation view: strategy-as-practice, presented as follows.

2.5.2 Strategy-As-Practice

Strategy-as-practice posits that strategy is not based on what organizations possess (i.e. on resources), but rather on what organizational actors do (Whittington et al., 2003). More specifically, under the strategy-as-practice lens, strategy entails a main tension as it can be analyzed in recursive and adaptive forms, which occur across multiple levels: macro-institutional, industry, firm, and individual as expressed by the strategists' cognition (Jarzabkowski, 2004). Recursive forms consist of routinized strategic practices and entail the reproduction of past actions with the belief that they can address a new situation (Clark, 2000). Hence, recursiveness in the strategy-as-practice lens may be associated with exploitation activities that are based on existing knowledge. On the other hand, adaptive forms of strategy focus on adjusting strategic activities according to the situation and emphasize strategic choice and the timing of strategic actions (Jarzabkowski, 2004). Therefore, adaptation in the strategy-as-practice lens may be associated with exploration activities that enable decision makers to adjust the company's strategy by creating new knowledge that is used towards change and reorientation. Strategy-as-practice looks into how these recursive and adaptive forms are combined, through identifying indirect effects of

organizational “actors’ practices upon patterns of action that scholars may assert are strategic, despite neither articulating strategic performance goals nor associated strategy processes” (Jarzabkowski et al., 2021).

Strategy-as-practice is a lens that includes several different aspects of strategy investigated in the strategic management literature, but it approaches them in a broader way concerning what strategy actually means and who performs the strategy-related activities. What strategy is relates to activities that are not necessarily associated with performance, but have important consequences on a broader range of organizational members; and those involved in strategic actions are not necessarily top executives, but organizational actors across levels who are involved in strategic activities. Furthermore, the strategy-as-practice stream uses a level-less approach, based on Giddens’ (1984) structuration theory, according to which the autonomy of individuals is affected by structure, and structure is influenced by the exercise of agency. Structuration is, hence, the interface where actors and structure meet. Based on the concept of structuration, strategy-as-practice suggests that the distinction between the micro and the macro level is not necessary, and a level-less ontology is more appropriate, where practice is the interface where individual actors (i.e. the micro level) and the organization (i.e. the macro level) meet and influence each other.

Strategy-as-practice is based on a basic dilemma of strategic decision makers, who need to manage the co-existing and contradictory need for stability and change (Jarzabkowski, 2004). The stability-change tension is similar to the tension between improvisation and structure during the strategy by thinking process of the strategy creation view (Furr & Eisenhardt, 2021). In addition, strategy by doing under the strategy creation view is related to experimentation and trial and learning, which are similar to adaptive forms of strategy under the strategy-as-practice lens. And strategy by shaping suggested by the strategy creation view is relevant to the strategy-as-practice suggestion that strategy practice is a continuing social process that entails an interaction between

organizational actors and the environment, an interaction that can actually shape it (Jarzabkowski, 2004; Jarzabkowski & Bednarek, 2018). Hence, strategy-as-practice includes thinking and cognition, as well as doing and shaping, but with a different focus: instead of focusing on activities by top executives that are traditionally considered strategic, it examines the day-to-day practices of organizational actors at different levels that are defined as strategic according to their degree of influence across a wide spectrum of organizational actors. However, strategy-as-practice is a lens for strategy; it is a broader way to define and examine strategy, whereas the strategy creation view is a suggestion about what strategy entails in uncertain and turbulent environments. The strategy creation view can be viewed under the strategy-as-practice lens, through examining how organizational actors at all levels (and not only top executives) are engaged in thinking, doing and shaping in uncertain and rapidly changing environments.

Table 1 summarizes similarities and differences between the opportunity logic, the strategy creation view and the strategy-as-practice lens. As the table indicates, the strategy creation view is based on the opportunity logic, whereas the strategy-as-practice is an umbrella, a lens that may change the focus of the discussion on strategy and strategic management. The comparison between the three strategy perspectives in Table 1 helps explain why the strategy-as-practice lens is not relevant in this study, although it is recognized as an important and insightful perspective of strategic management.

Table 1: Comparison of Strategy Creation View and Strategy-as-Practice

	Opportunity logic	Strategy creation	Strategy-as-practice
Overview	A competitive advantage stems from identifying and seizing opportunities faster and more effectively than competitors. Strategy is associated with performance (competitive advantage).	Strategy has to do with thinking (cognition and framing), doing (experimentation and trial and error) and shaping (imagination, story telling. Strategy is associated with performance.	Strategy is defined as activities that influence a significant number of organizational actors. Strategy is not necessarily associated with performance, but includes a broader set of activities.
Context	Highly uncertain and rapidly changing environments, but is inherent in strategizing in all types of environments	Highly uncertain and rapidly changing environments	Any context
Level	Top executives	Top executives	Any hierarchical level
Type	General logic underlying strategy, which may include different views of strategy	View of strategy under specific circumstances, which is based on a specific logic	Lens for strategy irrespective of context, including different views and logics

If this study was viewed under the strategy-as-practice lens, optimism and paradox mindset would be considered as strategic practices, since they are not goals related to performance and they are not traditionally viewed as strategy processes. The assumption that paradoxical thinking and optimism are strategic practices would be based on the fact that they are affecting a wide range of organizational actors. Further, viewing optimism and framing as practices would explain examining their indirect effects on the more traditional strategic processes, like strategic decision speed and organizational ambidexterity. Educational level would (again) be used as a proxy of the overall cognitive ability of decision makers, whereas perceived environmental dynamism would reflect the interaction between the organizational actors and the environment. However, this study cannot be based on a level-less ontology, since organizational ambidexterity is viewed as a strategic decision under the basic assumption that strategic decisions are made at the top hierarchical level of organizations. Perceptions and cognition of top executives are extremely relevant with the decision to pursue ambidexterity (Wilms et al., 2019), whereas the actions of

organizational actors at other levels do not significantly affect this decision, although they may affect ambidexterity implementation and, hence, its outcomes (Swart et al., 2019). Hence, a level-less ontology is not relevant, and the strategy-as-practice lens cannot be applied in this study that integrates the micro, meso and macro level.

The strategy creation view is certainly more relevant with this research, as it is related with strategizing under high uncertainty and high levels of change in the environment. Yet, this study has not looked into suggested dimensions of the strategy creation view, like experimentation and learning through trial and error that are included in strategy by doing, or storytelling in order to create a shared vision of the future that is included in strategy by shaping. However, this study is examining strategy by thinking through investigating how decision makers' cognition affects strategic decision making and specifically focuses on the role of framing (paradoxical thinking and positive framing through optimism). This study is based on the opportunity logic of strategy, which is the logic that underlies the strategy creation view.

This research examines the decision-making process that has to do with identifying exploitation and exploration opportunities and seizing them, in order to achieve organizational ambidexterity. Looking into the strategic decision-making process concerning organizational ambidexterity entails the assumption that the decisions made by organizational leaders matter, which is a central assumption of strategic choice theory (Child 1972 & 1997) and upper echelons theory (Hambrick & Mason, 1984; Hambrick, 2007). Further, both theories posit that decision making is influenced by individual perceptions of the environment and by individual cognition, which are central in this study. In the following section, strategic choice theory and upper echelons theory are presented in more detail, as the way to bridge the individual cognitive abilities and perceptions of uncertainty of decision makers, which are related to identifying and pursuing opportunities, with strategic decision making concerning organizational ambidexterity.

2.6 Strategic Choice Theory and Upper Echelon Theory

In 1972, Child criticized previous models explaining organizational evolution and success, which were solely based on considering contextual variables, and introduced strategic choice theory. According to this theory, decision makers exercise strategic choice when they are leading their organizations, through analyzing and evaluating both internal and external information in order to be able to identify opportunities, and their decisions are crucial for organizational success (Child, 1972 & 1997). Strategic choice, hence, posits that organizational success is dependent on decisions made by what Pfeffer & Salancik (1978) called the dominant coalition, i.e. those individuals within the organization that have major impact on strategic goal setting. CEOs are part of the dominant coalition along with other top management team members, but their role is even more crucial, as they are the ones held accountable for the outcomes of strategic decisions (Crossland et al., 2014; Sariol & Abebe, 2017). Hence, the decisions of organizational leaders make a difference for organizational success and are reached taking into consideration the organization's environment. Strategic choice theory integrates the different levels that influence strategic decision making and that are also influenced by it. Figure 1 demonstrates the model suggested by strategic choice theory:

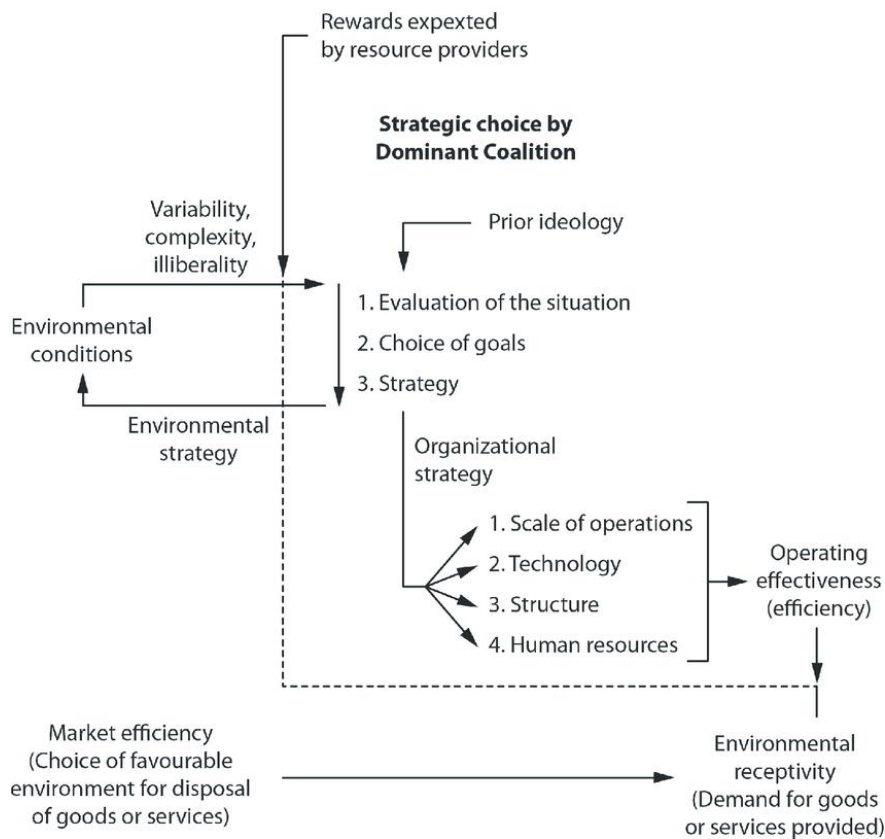


Figure 1 – Strategic Choice Theory (Child, 1972)

As demonstrated in Figure 1, environmental conditions serve as an input to strategic choice, but are also influenced by it. Furthermore, the choices made are influenced by the decision makers' ideology, explained by Child when revisiting the theory in 1997 as the subjective part of strategic choice, related to leaders' values, beliefs, perceptions and interests, i.e. their cognition. In addition, the dual focus of information collection and analysis both internally and externally suggests a link between ambidexterity and strategic choice theory, where internal information is related with exploitation (mentioned as operational effectiveness or efficiency in Figure 1) and external information with exploration (mentioned as market efficiency and environmental receptivity). When revisiting strategic choice theory in 1997, Child mentioned organizational tensions and the paradox of continuity versus change in organizations, which can be viewed as related with exploitation (continuity) and exploration (change), i.e. organizational ambidexterity. Therefore, organizational ambidexterity can be approached through applying strategic choice theory.

Moreover, the goal of gathering and evaluating information for strategic decision making in strategic choice theory is the identification of opportunities (Child, 1972). Thus, there is a link between strategic choice theory and the opportunity logic of strategy, which is the key strategy perspective for this study. Overall, strategic choice theory views the role of organizational leaders and their interaction with the environment as crucial for organizational success (Child 1972 & 1997; Hrebiniak and Joyce 1985).

Strategic choice theory significantly enabled the evolution of strategy research, by suggesting that an organization's position is not only a result of what is happening in the external environment, as was mainly suggested till then based on the environmental determinism perspective (Hrebiniak & Joyce, 1985). Child (1972) suggested that organizational leaders are influencing organizational shapes, structures and processes based on their preferences. The evolution of strategic choice theory suggests that although there are limitations to the impact of the decisions of top executives, due to external and internal conditions, the final outcome of decisions is significantly affected by organizational leaders' decisions (Child, 1997). Thus, the focus shifted from considering solely environmental impact to recognizing that the position of a company is associated to leaders' actions and the degree to which these actions are responsive to the environment (Miles et al., 1978). Strategic management researchers have extensively adopted the strategic choice view (e.g. Campling & Michelson, 1998; Ericson, 2010), which was the basis for forming upper echelons theory (Hambrick & Mason, 1984).

Upper echelons theory (Hambrick & Mason, 1984) builds on strategic choice theory, by explaining how decision makers make strategic choices. Upper echelons theory (Hambrick & Mason, 1984; Hambrick, 2007) suggests that organizational outcomes, and more specifically strategic decisions and performance, are affected by the decision makers' choices, which are in turn affected by the decision makers' characteristics. The theory especially emphasizes those characteristics related to

the decision makers' cognition and values, and posits that these affect strategic choices, which in turn affect performance, but there is also a direct effect of the decision makers' characteristics on performance (Hambrick & Mason, 1984; Hambrick Finkelstein, 1987). According to upper echelons theory, strategic choices entail a significant behavioral element, which “reflects the idiosyncrasies of decision makers” (Hambrick & Mason, 1984, p. 195). These idiosyncrasies are a set of individual characteristics that include information or assumptions about the future, the understanding of different alternatives, and the consequences of selecting each alternative. Hambrick & Mason recognize that this set of individual characteristics is their cognitive base, which along with the decision makers' values are the two filters used for evaluating the situation under consideration. The evaluation phase is based on the values and cognitive base of decision makers and results in strategic choice, as Figure 2 demonstrates:

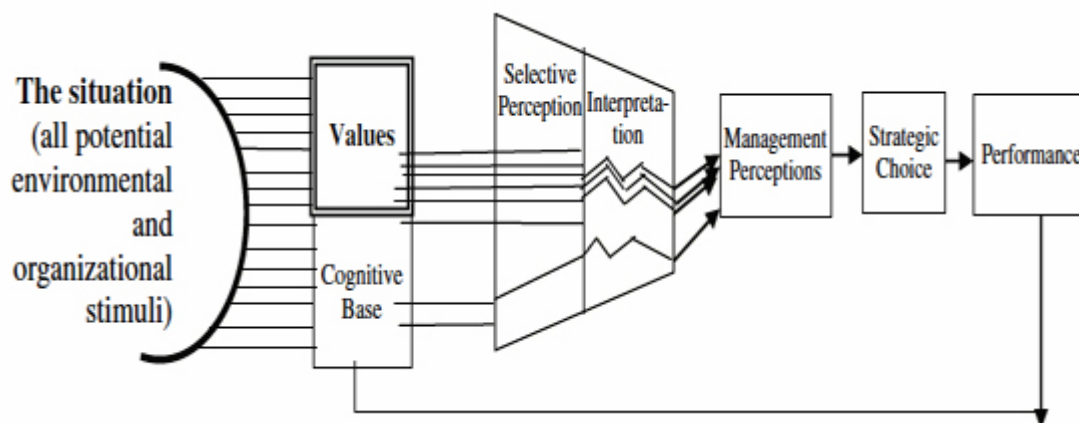


Figure 2 – Upper Echelons Theory (Hambrick & Mason, 1984)

As Figure 2 demonstrates, cognition plays a key role in the analysis and evaluation of information for reaching strategic decisions in upper echelons theory. In their initial seminal work, Hambrick & Mason (1984) suggested that observable (demographic) characteristics of top executives are used as proxies of cognitive skills, since cognitive and psychological characteristics are very difficult to measure. When revisiting upper echelons theory in 2007, Hambrick recognized that it is important to look inside this “black box of organizational demography” (Lawrence, 1997, p.2)

and examined how demographic characteristics are translated into psychological ones. Hambrick (2007) suggested that a possible way of doing so is to measure cognitive and psychological characteristics. In addition, he noted that it is essential that views focusing on the micro level, i.e. the impact of characteristics and processes at the individual level, and the macro level, i.e. the effect of institutional and environmental features, are brought together. In line with the suggestion that organizations and their environments are closely related (Pfeffer & Salancik, 1978), environmental impact is crucial in upper echelons theory. In reality, the very need to interpret situational (including firm and environmental) factors initiates the strategic decision making process. This strategic decision making process is the focus of strategic decision making researchers, who have suggested a framework for examining strategic decision making. The framework is presented in the next section.

2.7 The Strategic Decision-Making Context Framework

Strategy researchers suggested that the process of strategic decision making needs to be examined in more detail. Strategic decision making is concerned with “how strategic decisions are made in organizations” (Rajagopalan et al., 1993, p. 349). Early research in the field emphasized rationality and comprehensiveness in decision making, with different alternatives and their outcomes being very clear (Andrews, 1971; Ansoff, 1965). In addition, it was acknowledged that significant time is devoted to reaching decisions and the variations in the time needed to reach them, i.e. strategic decision speed, have different outcomes (Eisenhardt, 1989). Soon, it became obvious that the process of decision making is very complex and entails a political aspect (Narayanan & Fahey, 1982; Tushman, 1977), including conflicts, power, and different interests and goals within the organization. Today, the strategic decision-making process is viewed as a synthesis of multiple factors, including decision makers’ behaviour and the time aspect of making strategic decisions (Elbanna et al. 2020; Shepherd et al., 2021).

The stream of research on strategic decision making focuses on the different procedures that lead to making decisions and the various factors that affect these procedures. Different terms have been used as this area of research evolved, like strategic decision-making processes (Papadakis et al., 1998), strategic decision-making process (Elbanna & Child, 2007), strategic decision processes (Rajagopalan et al., 1993), strategic decision making (Eisenhardt & Zbaracki, 1992; Miller, 2008; Papadakis et al., 1998), strategy-process research (Hutzschenreuter, T., & Kleindienst, 2006), and strategic decision-making context (Forbes, 2007), to name a few. All these terms were in reality describing the same thing: concepts and relationships that describe strategic decision making, for which, however, a theory has not been yet developed, although the term is mentioned by Baum & Wally (2003) and the need for a theory is emphasized in a recent paper by Shepherd et al. (2021). All work relevant to strategic decision making recognizes that it is a complicated process, affected by multiple factors, situated at different levels, both internal and external to organizations.

One very important aspect of strategic decision making, which is internal to organizations, is strategic decision speed (Eisenhardt, 1989). Strategic speed is the time that organizations need in order to reach strategic decisions, starting from the consideration of different alternatives and ending at the point where a commitment is made for specific actions (Eisenhardt, 1989). In her seminal study, Eisenhardt (1989) found that this time varied significantly across organizations, ranging between less than four months and over a year. Eisenhardt identified several potential problems related with slow strategic decision making, including the inability of decision makers to remain current with the situation, as well as changes in the composition of the decision-making team, which can create even more delays. In addition, when many months are needed to reach strategic decisions, there is an increased risk for misunderstandings (Mason & Mitroff, 1981), as slower decision speed may impede firms from taking advantage of opportunities before they become unavailable (Stevenson & Gumpert, 1985). Thus, strategic decision speed impacts identifying and seizing opportunities.

In general, the process of strategic decision making is complex, and it often involves multifaceted and interrelated decisions (Wu et al., 2017), including decisions about exploitation and exploration opportunities. These decisions are made by individuals (often working in teams or cooperating and interacting with other individuals); they are made at specific times, when firms have specific organizational characteristics (which of course are subject to change), under current environmental conditions (which, again, are most often not stable). Furthermore, different strategic decisions may have various degrees of importance and different motives, affecting their outcomes. Thus, the strategic decision-making context includes four types of factors: decision makers'-specific (individual), company-specific, environmental-specific, and decision-specific characteristics (Elbanna et al., 2020; Elbanna & Child, 2007; Papadakis et al., 1998; Papadakis et al., 2010; Shepherd & Rudd, 2014). Each factor is briefly discussed as follows.

2.7.1 Decision makers' characteristics

As already mentioned, the view that decision makers and their characteristics matter is at the core of strategic choice theory (Child, 1972 & 1997) and upper echelons theory (Hambrick & Mason, 1984; Hambrick, 2007). Previous research in the field of strategic decision making has proven the significance of leaders' characteristics for organizations (e.g. Andreou et al., 2017), including demographics and psychological characteristics (Elbanna et al., 2020) and examining these various characteristics as antecedents (e.g. Wally & Baum, 1994) and/or control variables (e.g. Souitaris & Maestro, 2010) in different studies that included strategic decision speed. In addition, the more demanding the task challenges of higher executives (which is the case in crisis environments), the more important their individual characteristics (Hambrick & Finkelstein, 1987). This explains why leaders' cognition becomes more important under crisis, specifically if there is no previous experience in similar conditions (Hitt et al, 2021).

2.7.2 Company-specific characteristics

A variety of organizational characteristics has been examined as company-specific factors of the strategic decision-making context, as firm performance has been associated with various firm-level features (Hambrick & Mason, 1984). For example, company size (Elbanna et al., 2013; Fredrickson & Iaquinto, 1989; Papadakis et al. 1998), internal systems (Miller, 1987) and type of ownership (Papadakis et al., 1998) have been found to predict how decisions are made, whereas firm size and past performance (Baum & Wally, 2003) or firm size, age and type of industry (Souitaris & Maestro, 2010) have been used as control variables. An interesting effect of company-specific characteristics on how decisions are made is provided by Fredrickson & Iaquinto (1989), who found that a change in a company's size creates a similar effect in decision comprehensiveness, i.e. the degree of analysis of information when reaching strategic decisions (Fredrickson, 1984). In other words, when a company becomes smaller, it applies a less comprehensive and rational decision-making process, whereas when it becomes bigger, decision making becomes more comprehensive and rational. In general, different company-specific characteristics play an important role in strategic decision making and such characteristics have been used as main variables and/or as control variables in previous research (Elbanna et al., 2020).

2.7.3 Environmental dimensions

Environmental impact cannot be ignored when considering the strategic decision-making process. Environmental determinism suggests that a company's position is highly depended on its environment (Hrebiniak & Joyce, 1985; Pfeffer & Salancik, 1978) and that strategic management is significantly influenced by environmental characteristics (Hitt & Tyler, 1991). Specifically in highly uncertain and volatile environments that create threats to organizations, like crisis environments, sensemaking and the nature of the decisions reached are significantly affected by environmental conditions (Le Bris et al., 2019). Hence, organizations operate under both the strategic choice of leaders and environmental impact (Campling and Michelson, 1998), and these

two dimensions interrelate. This study adopts the view that leaders' choices are significantly affected by environmental characteristics and more specifically by the decision makers' perceptions concerning environmental characteristics. During the pandemic, organizational leaders were facing threats and risks inherent in the business environment, threats and risks that decision makers were largely unable to control (Sharma et al., 2021). Perceptions of such environmental characteristics are subjective, and individuals may have different interpretations of the environment, even within the same company (Hardy et al., 2020; Huff et al., 2016). More specifically, perceptions about how predictable the environment is affect how organizational leaders perceive and pursue opportunities (Egfjord & Sund, 2020; López-Gamero et al., 2011). Hence, environmental impact is a central aspect of the strategic decision-making context framework.

2.7.4 Decision-specific characteristics

The last of the four factors in the decision-making context framework has to do with decision-specific characteristics (Hutzschenreuter & Kleindienst, 2006), like decision importance (Shepherd & Rudd, 2014), decision uncertainty (Sharfman & Dean, 1997) and decision motive (Shepherd & Rudd, 2014). Decision importance has to do with the fact that certain decisions are judged as more important than others (Dean & Sharfman, 1996; Shepherd & Rudd, 2014). Therefore, these decisions may be prioritized in terms of time and resource allocation. Moreover, reaching strategic decisions entails uncertainty (Noorderhaven, 1995), because often there is increased unpredictability of the decision's outcomes (Sharfman & Dean, 1997). Increased decision uncertainty has been found to both enhance (Bourgeois & Eisenhardt, 1988) and reduce (Elbanna et al., 2013) decision rationality. Overall, the examination of decision-specific characteristics has produced confusing results (Elbanna et al., 2020).

Figure 3 presents the framework for investigating strategic decisions in organizations suggested by Elbanna et al. (2020). The framework identifies dimensions in all four factors of the strategic decision-making context as input for reaching strategic decisions in organizations, as well as relevant influencing factors.

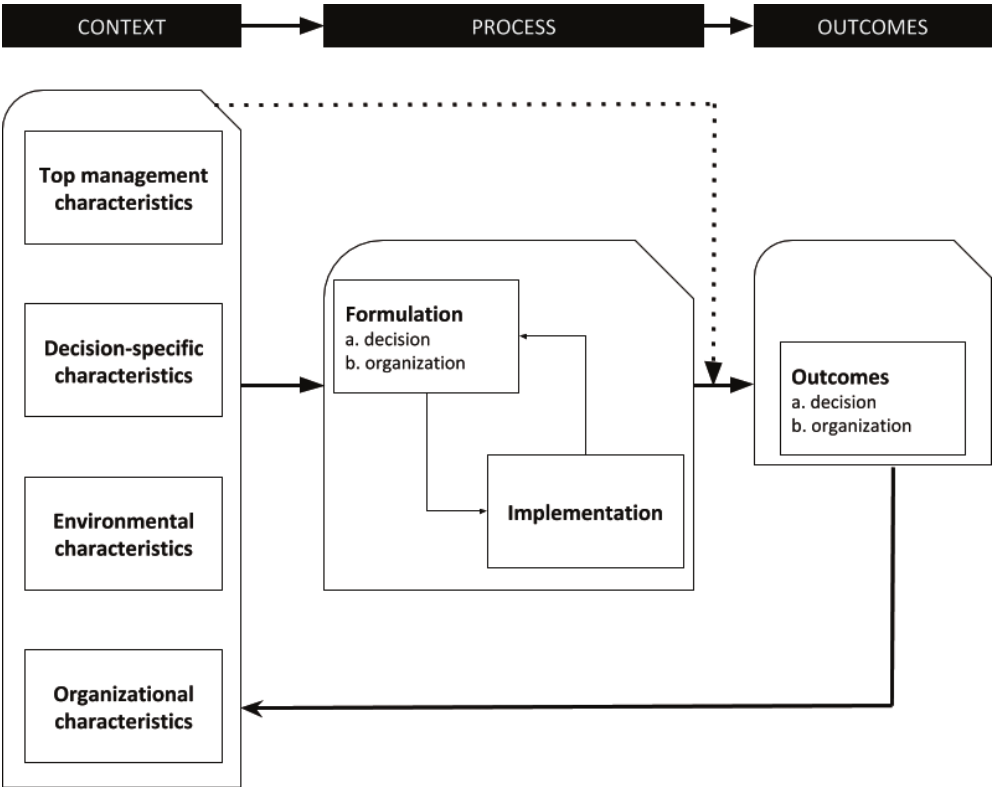


Figure 3 – Integrative Framework for Studying Strategic Decisions (Elbanna et al., 2020)

Through a comparison of figures 1 to 3, it is obvious that strategic choice, upper echelon and the strategic decision-making context framework share significant common elements: a) they all examine how strategic decisions are made with a chronologically increasing focus on the process of reaching them, b) they incorporate factors at different levels (internal and external) that affect the strategic decision-making process, c) they recognize the importance of organizational leaders’ cognition, and d) they recognize the significance of environmental impact. The strategic decision-making context framework further builds on strategic choice theory and upper echelons theory

through adding decision-specific characteristics to the factors that need to be considered when examining strategic decision-making processes and outcomes. Therefore, upper echelons theory is the evolution of strategic choice theory, and the strategic decision-making context framework is an addition to upper echelons theory with a more detailed focus on decision-specific characteristics that were previously not included in the relevant models.

This study uses the strategic decision-making context framework as a tool for connecting the different factors examined across levels. Decision-specific characteristics were not included in this study, since there is only one strategic decision examined and comparisons between different decisions' characteristics would not make sense. In addition, excluding one of the four factors of the strategic decision-making context framework is not problematic, as the inclusion of three of the four dimensions is viewed as sufficient to provide a comprehensive representation of the situation (Elbanna et al, 2020). In this study, the strategic decision-making context is used as the framework in which organizational ambidexterity is incorporated as a strategic option. The theoretical underpinnings of this study are presented in the next section, based on the evolution of strategic management that has been presented so far.

2.8 Theoretical Underpinnings of the Research

According to strategic choice theory, strategic decisions are crucial for organizations, do make a difference and are informed by environmental conditions (Child, 1972 & 1997). These choices are influenced by the perceptions and cognition of the decision makers (Hambrick & Mason, 1984; Hambrick, 2007) according to upper echelons theory. Hence, as strategic decisions, decisions about exploration and exploitation opportunities do make a difference and are affected by the cognition of the decision makers, as well as by environmental conditions. Companies are ambidextrous when both exploitation and exploration opportunities are identified and pursued

(Fourné et al., 2019). According to the opportunity logic, the faster and sooner strategic opportunities are identified and seized, the better for the company (Bingham & Eisenhardt, 2008). Therefore, when organizations are strategically quicker, they reach decisions concerning exploration and exploitation opportunities faster, and this makes strategic decision speed (Eisenhardt, 1989) crucial for achieving organizational ambidexterity.

Strategic speed is essential under the opportunity logic of strategy that emphasizes the early and fast identification and seizing of opportunities. Identifying exploration and exploitation opportunities is not enough for achieving organizational ambidexterity, i.e. strategic decision speed is not tautological with organizational ambidexterity; there needs to be an evaluation phase that will lead to pursuing the opportunities identified, as suggested by McMullen & Shepherd (2006), and how fast this evaluation phase is completed reflects the company's strategic decision speed. This view is in line with Eisenhardt's (1989) definition of strategic decision speed as the time between the beginning of discussion concerning a strategic decision and the agreement to pursue specific actions related to it. Companies may identify multiple opportunities at the same time (Barreto, 2012), including exploitation and exploration opportunities. Therefore, evaluating them quickly in order to decide which opportunities to pursue entails decision making, which needs to be rapid in order to enable organizations to take advantage of the opportunities recognized (Bakker & Shepherd, 2017).

Based on the opportunity logic of strategy and drawing on strategic choice theory and upper echelons theory, this study views ambidexterity as a strategic decision made at the top hierarchical level of organizations; a decision that includes and interrelates with different strategic decisions concerning exploration and exploitation opportunities. Hence, organizational ambidexterity is affected by how quickly the different exploration and exploitation opportunities are evaluated, i.e. by how quickly exploration and exploitation decisions are made. The strategic decision-making

process concerning organizational ambidexterity is affected by perceptions of environmental conditions and by individual cognition-related characteristics of the decision makers. Based on the above, this project’s theoretical underpinnings are presented in Figure 4 below:

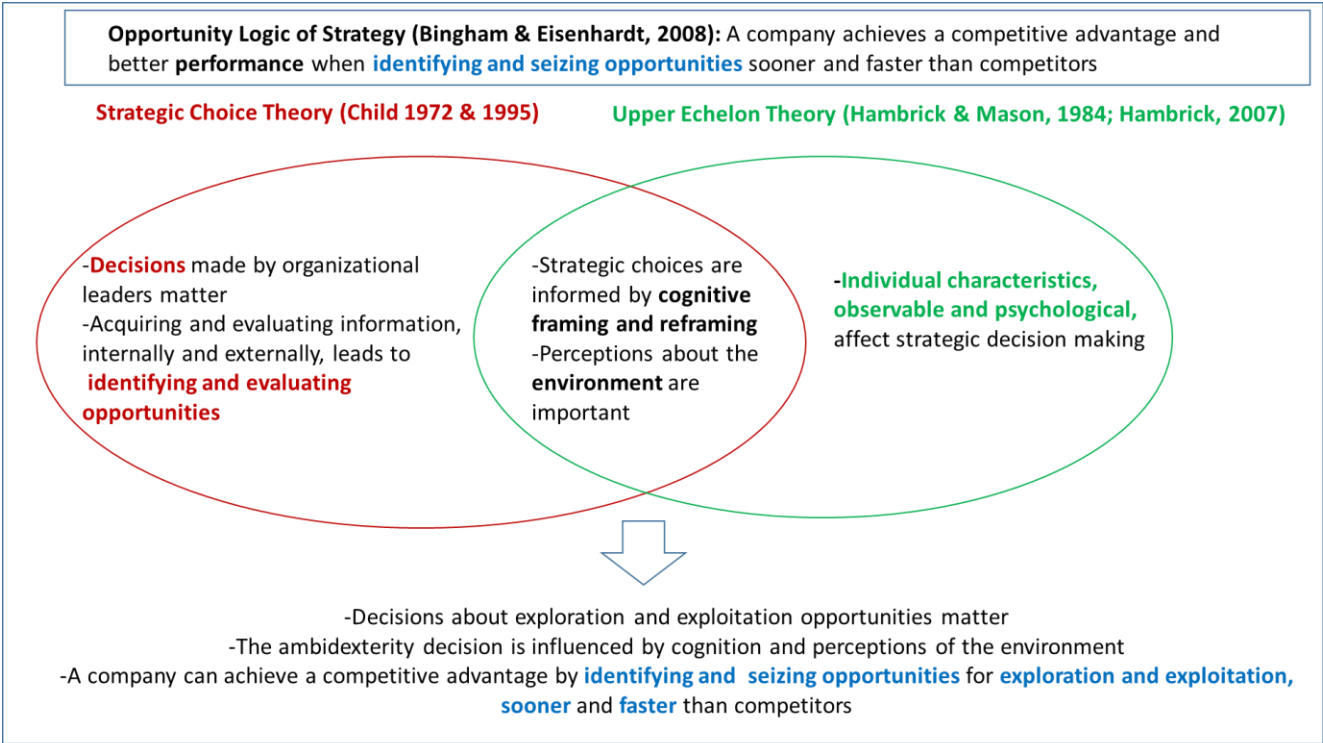


Figure 4 – Theoretical Underpinnings

To sum up, the strategic decisions made by CEOs are important for identifying and seizing opportunities about exploration and exploitation, and the speed of reaching these strategic decisions is important for seizing opportunities earlier and faster than competitors. These decisions are affected by CEOs’ cognition and perceptions about the environment and the speed of reaching them affects the balance between exploration and exploitation opportunities pursued. Hence, this study incorporates organizational ambidexterity in strategy process research (Elbanna & Child, 2007) and empirically examines the link between strategic decision speed and organizational ambidexterity for the first time. Further, whether organizational ambidexterity is beneficial is examined in the dynamic and challenging environment of the global pandemic.

2.9 Chapter Summary

This chapter presented the evolution of strategy research and the different aspects of strategic management and strategic decision making that are relevant with this study. Strategic management has to do with pursuing a competitive advantage (Rothaermel, 2017) and decision makers reach strategic decisions while analyzing and evaluating organizational and environmental constraints (Barney, 1986). This process leads to recognizing possible viable strategic options (Kirzner, 1997), i.e. opportunities, the identification and pursuit of which is a key driver of competitive advantage (Bingham & Eisenhardt, 2008).

There are significant differences when strategizing in stable and unstable environments; among the three logics of strategy, i.e. the leverage, the position and the opportunity logic, the opportunity logic is the only one viewed as relevant in dynamic environments and it is the underlying logic for this study. Firms with a strategy based on the opportunity logic are able to recognize and take advantage of opportunities earlier, faster and more successfully than competition, and are thus more able to deal with uncertainty and change that might quickly render identified strategic opportunities irrelevant, unavailable or obsolete. Evaluating and acting quickly concerning promising opportunities, including exploration and exploitation opportunities, means that organizations decide fast concerning strategic issues (Bingham & Eisenhardt, 2008), exhibiting strategic decision speed (Eisenhardt, 1989). Furthermore, companies that operate under the opportunity logic avoid the risk of failing due to a lack of internal balance between flexibility and efficiency (Davis et al., 2009), which indicates that they are ambidextrous (He & Wong, 2004). Therefore, the opportunity logic is used as the basis for assuming that there is a relationship between strategic decision speed and organizational ambidexterity, since deciding fast means that opportunities for exploration and exploitation are identified and seized earlier, faster and more effectively than competitors, leading to a competitive advantage.

Examining ambidexterity as a strategic decision, entails considering the strategic decision-making process and the outcomes of ambidexterity. Therefore, how quickly the organization reaches decisions (i.e. strategic decision speed) about strategic opportunities is important, as is identifying the factors that affect the strategic decision-making process. Whether a company takes advantage of opportunities in a timely manner is related to how quickly it reaches the decisions that concern these opportunities (Judge & Miller, 1991), but is not determined only by strategic decision speed. The type of opportunities pursued, i.e. whether there is a balance of exploration and exploitation opportunities is also important and the impact of organizational ambidexterity on firm performance is also examined in this study. Moreover, strategic decisions are framed by decision makers' cognition (Fredrickson & Mitchell, 1984) and are informed by perceptions of environmental conditions (Child, 1997; Hambrick, 2007). Hence, strategic decision speed, organizational ambidexterity, the relationship between them and the potential factors that affect them are crucial in this dissertation, along with firm performance. The following chapter briefly reviews the literature on these topics.

3. Literature Review

This Chapter presents a literature review on organizational ambidexterity and strategic decision speed, based on the fact that they are crucial aspects of strategizing, both in general and in dynamic environments. In addition, brief overviews of the literature on the moderators used in this study are provided, along with a synopsis of the importance of performance in strategic management.

3.1 Organizational Ambidexterity

Organizational ambidexterity is a central aspect of strategy for organizations, because it relates to how a firm chooses to allocate resources (Cao et al., 2009; Voss et al., 2008) and to compete in its field of activities, ensuring short-term and long-term viability (Levinthal & March, 1993). Ambidexterity is the concurrent pursuit of exploitation, i.e. of strategic activities related with efficiency, control and processes' optimization, and exploration, i.e. of activities related with flexibility, experimentation, and search (March, 1991). In other words, exploitation entails focusing on existing knowledge, operations, and systems, whereas exploration implies focusing on creating new knowledge and growing. Exploration and exploitation are contradictory (He & Wong, 2004; Luger et al., 2018), since they require a different focus on knowledge (existing versus new), but they are not mutually exclusive; they can be simultaneously pursued (e.g. Adler et al., 1999; Gibson & Birkinshaw, 2004).

Ambidexterity's association with positive outcomes like firm survival (Hughes, 2018) and enhanced performance (e.g. Junni et al., 2013) has highlighted ambidexterity as a key research topic in management research, specifically because it has been found beneficial in various different circumstances and contexts. Organizational ambidexterity is important for young firms (Hughes et al., 2021), but also for established firms (Kammerlander et al., 2014); for smaller firms (e.g. Chang & Hughes, 2012; Chang et al., 2011; Lubatkin et al., 2006), but also for larger firms (e.g.

Jansen et al., 2009; Mom et al., 2015; Park et al., 2020). The plethora of research work on organizational ambidexterity has led to different conceptualizations and has examined its relationship with several phenomena occurring at different levels in organizations (individual, team, organizational, inter-organizational). Although a doctoral thesis cannot fully present previous work on ambidexterity, the researcher attempts to create a clear understanding of what ambidexterity is and how it has evolved over time in the past five decades. In order to better understand the concept of organizational ambidexterity, it is essential that paradoxes and paradox theory (Smith & Lewis, 2011) are briefly presented.

3.1.1 Paradoxes, Paradox Theory and Organizational Ambidexterity

A paradox involves “contradictory yet interrelated elements that exist simultaneously and persist over time” (Smith & Lewis, 2011, p. 382). Therefore, a paradox includes at least two parts that contradict one another and this contradiction does not disappear over time. At the core of paradox theory lies the fact that these contradictory elements do not necessarily entail an *either/or* decision, which means that they do not necessarily represent two (or more) mutually exclusive, alternative options; on the contrary, they can be combined and the one may complement the other. Paradox theory has provided a new perspective in strategic management, since it has explicitly expressed how leaders can make decisions combining contrasting elements and manage the tensions between them. While doing so, organizational leaders use paradoxical cognition, i.e. the ability to acknowledge that contradictory elements are not always mutually exclusive (Smith & Tushman, 2005). Organizational leaders are, thus, able to use a *both/and* approach when making decisions concerning conflicting activities (Kearney et al., 2019), like exploitative and exploratory activities of the firm’s strategy.

The ability to use a *both/and* approach and to avoid perceiving all decisions as pertaining mutually exclusive alternatives is important, because people working together in organizations experience

several paradoxes every day. Organizational paradoxes are mainly grouped in four categories (Smith & Lewis, 2011): a) belonging, b) learning, c) organizing, and d) performing. For instance, belonging paradoxes include individual versus collective identities (Pratt & Foreman, 2000) learning paradoxes include building on the company's history versus destroying the past when building the future (March, 1991); organizing paradoxes include autonomy versus control (Lüscher & Lewis, 2008); and performing paradoxes include social versus financial performance goals (Margolis & Walsh, 2003).

The combinations of the aforementioned organizational paradoxes' main categories lead to interesting subcategories, covering a wide spectrum of organizational activities. For this specific study, two specific subcategories are extremely relevant: a) the learning/performing paradoxes that include existing versus new knowledge (Andriopoulos & Lewis, 2009), and b) the learning/organizing paradoxes that include efficiency versus flexibility (Eisenhardt & Martin, 2000). Both paradoxes are related to the essence of organizational ambidexterity, which was initially introduced as the dilemma between exploration and exploitation in organizational learning (March, 1991) and has also been defined as focusing on adaptability and alignment (Gibson & Birkinshaw, 2004). Today, organizational ambidexterity is widely defined as the concurrent pursuit of exploration and exploitation, based on the combination of exploratory & exploitative innovation strategies suggested by He & Wong (2004).

Hence, exploration and exploitation are contradictory organizational activities that need to be pursued simultaneously as part of a company's strategy in order for organizational ambidexterity to be achieved. The decision that concerns them is not an *either/or*, but a *both/and* type of decision for companies that are aiming to achieve organizational ambidexterity. Organizational ambidexterity means that leaders recognize that exploration and exploitation are not mutually exclusive, but paradoxical strategic activities. The decision to pursue both is central in strategic

management and, as such, examining the factors that affect this decision is essential. To better understand how the ambidexterity decision is made, it is important to first comprehend what ambidexterity is, how it is implemented, and what its antecedents and outcomes are. A review of these topics is provided in the next sections.

3.1.2 Organizational Ambidexterity Definitions and Implementation

Twenty five years after the introduction of Duncan's (1976) dual organizational structures, as a potential answer to the problems arising when companies are facing conflicting demands, March (1991) revisited this work and underlined the necessity for companies to not focus either on exploitation or exploration, but on both. Viewing exploration and exploitation as activities related to organizational learning, March suggested that balancing the two has beneficial outcomes for organizational performance. This seminal paper was the basis for further evolution in the field of strategic management, since it shed light for the first time on how exploration and exploitation can be combined and why it is important to do so. A few years later, Tushman & O'Reilly (1996) defined as ambidextrous those organizations that manage to successfully implement both minor, incremental change, as well as more substantial, revolutionary change. Although the terms exploration and exploitation were not mentioned in the Tushman & O'Reilly (1996) article, revolutionary change was associated with strategic activities related to new environments and technologies, similar to March's explorative activities, whereas incremental change was associated with improving efficiency, reducing costs and optimizing internal processes, describing a set of activities similar to March's exploitation.

Since then, organizational ambidexterity has been defined in multiple ways. Although Tushman & O'Reilly (1996) did not mention the term ambidexterity, but rather the term ambidextrous organization, there are multiple examples of research that defines organizational ambidexterity as "mastering evolutionary and revolutionary change" (Tushman & O'Reilly's, 1996, p. 24).

Organizational ambidexterity is also defined as a focus on both adaptation and alignment (Gibson & Birkinshaw, 2004), a definition that has also been extensively used in the literature. Another definition of organizational ambidexterity is related to He & Wong's (2004) suggestion of concurrent pursuit of exploratory & exploitative innovation strategies. The aforementioned definitions are quite similar, as they both describe a both/and approach towards exploration and exploitation, but with using different words. In general, organizational ambidexterity is widely defined as simultaneously pursuing exploration and exploitation (e.g. Gupta et al., 2006; Jansen et al., 2008; Lavie & Rosenkopf, 2006; Lubatkin et al., 2006). In reality, all different definitions can be reflected and incorporated in the widely accepted definition of simultaneous pursuit of exploration and exploitation (He & Wong's, 2004), which is also the definition used in this study.

Despite the richness of findings and insights of the ambidexterity literature, there is still some confusion concerning how it is defined and implemented. There are different ways to implement ambidexterity and these different implementations that have been generally referred to as approaches of ambidexterity have undergone multiple shifts. Initially, Duncan (1976) had introduced a sequential approach (temporal separation) of explorative and exploitative activities. In 1996, Tushman & O'Reilly observed a structural approach to pursuing exploration and exploitation, with each strategic activity being assigned to different units. Next, contextual ambidexterity was introduced by Gibson & Birkinshaw (2004), where a single unit pursued both exploration and exploitation. Slightly after the introduction of contextual ambidexterity, Lavie & Rosenkopf (2006) suggested that exploration and exploitation can be pursued across different domains, like when organizations balance their exploratory and exploitative activities over time when forming strategic alliances (Lavie & Rosenkopf, 2006 & 2011). The domain approach was also expanded to include domains that may be separated internally and externally, at the project level (Hoand & Rothaermel, 2010; Bahemia & Squire, 2010) or through acquisition and development activities (Ferraris et al., 2019).

Table 2 presents the conceptualization of ambidexterity in the literature in terms of its definitions and different ways of implementing it, along with some important findings and the methodologies used to examine ambidexterity in organizations, after having reviewed a selection of seminal papers in the years 1976 – 2009 (a more complete table that also includes a plethora of papers published in the years after 2009 is included in the Appendix (Appendix 1). As Table 2 indicates, there is a historical evolution of the conceptualization of ambidexterity concerning how compatible exploitation and exploration are viewed. At first, exploitation and exploration were viewed as mutually exclusive activities that could not be combined or pursued within the same unit or by the same people. As research in the field evolved, this has changed and today exploitation and exploration are viewed as contradictory activities that can, however, be simultaneously pursued by the same group of people or individually.

It is useful to consider some milestones in the historical evolution of ambidexterity as a field of research. 1976 was the year when Duncan introduced dual structures, and exploitation and exploration, and 2009 was the year when Andriopoulos & Lewis (2009) proposed a detailed framework, based on qualitative work, that explained the connection of paradox with organizational ambidexterity. Earlier, Adler et al. (1999), Gibson & Birkinshaw (2004), and Judge & Blocker (2008) had suggested that exploration and exploitation should not be viewed as mutually exclusive, but as paradoxical activities, shifting the discussion concerning the two activities from an *either/or* to a *both/and* approach. In the aforementioned time period (up to the year 2009), ambidexterity has been defined as the paradoxical pursuit of exploration and exploitation, it has been introduced at different levels within and across organizations, and its measurement has been established. As the table indicates, initially exploration and exploitation were viewed as activities that needed to be separated, either over time (sequential ambidexterity) or through assigning them to different units/departments (structural ambidexterity), but as research

in the field evolved, exploration and exploitation were no longer viewed as mutually exclusive and the paradox approach prevailed. However, there were some cases in the past few years where the relationship between exploration and exploitation was viewed as a dilemma (Døjbak Håkonsson et al., 2016) or as a trade-off (Lee & Puranam, 2016). Yet, in both cases the focus was not on ambidexterity, but on exploration and on exploitation as activities per se.

Today, organizational ambidexterity is generally accepted as a paradoxical strategic decision and activity, entailing both exploration and exploitation. It is noteworthy that ambidexterity implementation is either mentioned in the paper as ambidexterity approach or judged by the researcher, based on the organizational ambidexterity literature so far. For example, the paradox approach is often not stated in the respective article, but is implied in cases where contextual ambidexterity is mentioned. This is understandable as paradox theory is posterior to some work on ambidexterity, like for example the work by Adler et al. (1999), but the approach described is the paradox approach, even if the authors did not know it/mention it at the time. In reality, the terms contextual ambidexterity and paradox approach in Table 2 are interchangeable.

Table 2: The Conceptualization of Ambidexterity in the Literature

Authors	Ambidexterity concept/definition	Suggestions/ Findings	Ambidexterity implementation	Methodology/ empirical setting
Duncan (1976)	First introduction of organizational explorative and exploitative activities.	Organizations use dual structures when facing contradictions, by using cyclicity regarding exploration and exploitation	Sequential ambidexterity	Case studies
Tushman & O'Reilly (1996)	In order for organizations to be able to achieve long-term success, they have to be ambidextrous.	Different, separate business units focus on alignment and others on adaptation.	Structural ambidexterity	Case studies research in the semi-conductor sector
Adler et al. (1999)	Pursuing efficiency and flexibility entails trade-offs that can be more easily overcome by ambidextrous organizations.	Efficiency & flexibility were enabled by applying 4 organizational mechanisms (meta-routines, job enrichment, role switching, partitioning the company's structure). Leadership, learning and trust were crucial during the transition.	Contextual ambidexterity/ paradox approach (moving from <i>either/or</i> to <i>both/and</i> approach)	Case study of the TOYOTA Production System/ Qualitative research (interviews)
Gibson & Birkinshaw (2004)	Business units are able to simultaneously align and adapt, through contextual ambidexterity.	There is no trade-off between adaptability & alignment. Successful business units use simpler organizational structures and less formality.	Contextual ambidexterity/ paradox approach.	Combination of qualitative and quantitative data; survey with 4,195 respondents from 41 business units
He & Wong (2004)	The concurrent pursuit of exploratory & exploitative strategies (new product development/new markets entry) and innovative strategies (improving current status through technological innovation)	An imbalance between exploratory strategies and exploitative ones concerning innovation, has a negative effect on sales growth rate. Organizations with low levels of exploration or exploitation should not be viewed as ambidextrous.	Continuous balance of exploration/ exploitation through time.	CEOs survey on 206 manufacturing firms

Smith & Tushman (2005)	Ambidextrous organizations have differentiated, separate business units assigned with exploration and exploitation	Top management teams develop cognitive capabilities that help them balance contradicting demands: short-term efficiency (exploiting) versus long-term innovation (exploring)	Structural ambidexterity for the organization with separated units, but contextual approach for top management executives (both/and approach).	Theoretical model based on literature review
Lubatkin et al. (2006)	The aptitude of organizations to simultaneously exploit present competencies and explore novel competencies. This combination leads to organizational learning.	TMT behavioral integration is critical to attaining ambidexterity in SMEs. The simultaneous focus on both exploration and exploitation positively affects performance. Ambidexterity is possible at the business unit level.	Contextual ambidexterity/ paradox approach; inseparable nature of exploration and exploitation as facets of organizational learning.	Survey in 139 SMEs, both CEOs and team members
Lavie & Rosenkopf (2006)	The concept of ambidexterity is expanded to strategic alliances formation. Firms tend to balance their exploratory and exploitative activities over time and across domains, when forming strategic alliances.	Organizations intensively involved in R&D alliances that generate knowledge, shift to marketing/production partnerships that leverage knowledge. A focus on exploration in a specific domain is balanced by a shift in focus on exploitation on another.	Structural ambidexterity in partnerships, but paradox approach is used over time (sequential implementation) and across domains.	Pooled time series analysis of alliances formed by U.S. software firms
Lin et al. (2007)	A firm's alliance behavior is viewed as a form of exploration and exploitation. Exploitative alliances aim to enhance existing capabilities, whereas exploratory alliances aim to discover	Firm size matters: Larger firms benefit from ambidextrous strategic alliances, whereas smaller ones benefit more when an alliance is either exploratory or exploitative.	There is no single implementation of ambidexterity; the approach needs to take into account the various external environments and	Analysis of empirical data from 5 U.S. industries in 8 years, and expansion of theoretical insights to the

	new opportunities and to develop new capabilities.		organizational characteristics.	network level by building a computer simulation model.
Mom et al. (2007)	The ability to both explore, so as to be prepared for the future, as well as exploit and meet current demands.	Top-down knowledge positively relates to exploitation activities; bottom-up and horizontal knowledge positively relate to exploration activities.	Individual ambidexterity. Contextual implementation concerning units, but structural concerning individuals (production managers focus on exploitation, product market managers on exploration).	Survey of managers in an international electronics firm (104 responses)
O'Reilly & Tushman (2008)	A capability and it refers to the managers' ability to adapt to changing demands.	The role of the leadership team is critical; cognitive and behavioral flexibility are needed. No trade-off between efficiency and innovation. Senior teams must be flexible in order to enhance exploration and exploitation.	Structural ambidexterity for units; paradox approach at the organizational and individual level.	Theoretical paper based on literature review
Wang & Li (2008)	There is an optimal degree of exploration and exploitation. Exploring and exploiting beyond the optimal level should not be considered as ambidexterity.	Overexploration and overexploitation are harmful for organizational performance. However, overexploration's harmful effect on performance is lower when there is increased environmental dynamism.	Contextual ambidexterity/ paradox approach	Data drawn from S&P's Compustat, U.S. patent data, and the U.S. Census of Manufacturers

Judge & Blocker (2008)	Ambidexterity has to do with exploring new markets and exploiting existing ones.	Organizational capacity for change is an antecedent to strategic ambidexterity, moderated by environmental uncertainty and organizational slack (ability to adapt to dramatic external environment shifts).	Paradox approach: ambidexterity is not a dilemma (<i>either/or</i> approach)	Theoretical paper based on literature review
Andriopoulos & Lewis (2009)	Ambidextrous firms exploit existing products and this leads to incremental innovation; and explore new opportunities and this leads to radical innovation.	Managing paradoxes and making ambidextrous decisions is a responsibility that is shared across units and levels in an organization, and is not the responsibility solely of top management.	Paradox approach: strategic intent (profit versus breakthroughs), customer orientation (tight versus loose coupling), and personal drivers (discipline versus passion).	Data collection over 4 years: (1) semi-structured interviews, (2) archival data, (3) observation.

The work on organizational ambidexterity has been based on different methodologies and designs, including qualitative research, quantitative research, mixed methods, and theoretical papers. The large amount of research work on organizational ambidexterity has allowed examining its outcomes in various sectors, in companies with various characteristics and in multiple contexts. An overview of the outcomes of ambidexterity identified in the literature so far is presented in the following section.

3.1.3 Organizational Ambidexterity Outcomes

Table 3 presents some key findings concerning ambidexterity outcomes in the literature. As the table indicates, the dominance of firm performance as an outcome of ambidexterity is evident in

the literature. In addition, other positive outcomes for organizations have also been associated with organizational ambidexterity, like firm survival and long-term success.

Table 3: Organizational Ambidexterity Outcomes

Authors	Outcome	Outcome Level	Context
Tushman & O'Reilly, 1996	Firm's long-term success	Firm	Companies in the semi-conductor and Swiss watch industries
Gibson & Birkinshaw (2004)	Firm survival	Firm	Multinational firms in Canada, Japan, USA, India, France and South Korea
He & Wong (2004)	Firm performance	Firm	Manufacturing companies in Asia
Lubatkin et al. (2006)	Firm performance	Firm	SMEs in the USA
Geerts et al. (2010)	Firm growth	Firm	Belgian service firms
Patel et al. (2013)	Firm performance	Firm	High-tech SMEs in the USA
Hill & Birkinshaw (2014)	Survival of corporate venture business unit	Firm	Companies in 8 countries in Europe and North America
Mudambi & Swift (2014)	Firm performance	Firm	Manufacturing firms in the USA
Solis-Molina et al. (2018);	Firm performance	Firm	Colombian manufacturing firms
Úbeda-García et al. (2018)	Firm performance	Firm	Spanish companies in the tourism industry
Venugopal et al. (2020)	Firm performance	Firm	Indian SMEs
Kafetzopoulos (2021)	Firm performance	Firm	Greek firms
Iyer et al. (2021),	Brand management processes and brand performance	Firm	Companies in the USA
Belhadi et al., 2021	Sustainable supply chain performance	Firm	Companies in Africa, Europe and Asia
(Silva et al., 2021)	Speed of SMEs internationalization	Firm	Portuguese SMEs
Borini et al. (2022)	Knowledge creation concerning new product development, operations/production, marketing or environmental management practices	Firm	Subsidiaries in Brazil

In general, ambidexterity has been associated with positive outcomes, as it has been found to be a major driver of firms' long-term success (Tushman & O'Reilly, 1996) and has been positively connected with the growth of a firm (Geerts et al., 2010), the survival of a firm (Gibson & Birkinshaw, 2004) and the survival of a corporate venture business unit (Hill & Birkinshaw, 2014). Ambidexterity has also been associated with superior organizational performance, in numerous different circumstances, both in the manufacturing and in the service industries, and across different countries. Some examples include manufacturing companies in Asia (He & Wong, 2004); SMEs in the USA (Lubatkin et al., 2006); high-tech SMEs in the USA (Patel et al., 2013); manufacturing firms in the USA (Mudambi & Swift, 2014); Colombian manufacturing firms (Solís-Molina et al., 2018); Spanish companies in the tourism industry (Úbeda-García et al., 2018); Indian SMEs (Venugopal et al., 2020) and Greek firms (Kafetzopoulos, 2021). Moreover, in dynamic industries where conditions are not stable, organizational ambidexterity has a significant positive effect on performance (Junni et al., 2013). These findings indicate the importance of organizational ambidexterity, as it has been proven beneficial irrespective of the geographical location or industry type.

The absence of ambidexterity, contrarily, i.e. a significant imbalance between pursuing exploratory opportunities and exploitative ones, as well as low levels of exploration and exploitation, both have negative effects on sales growth rate (He & Wong, 2004). Similarly, overexploration and overexploitation are harmful for organizational performance (Wang & Li, 2008). In addition, firms' tendency to balance exploration and exploitation in strategic alliances is beneficial for larger firms, but smaller companies are doing better when an alliance is either exploratory or exploitative (Lin et al., 2007). Thus, a negative effect of ambidexterity in strategic alliances has been reported for smaller firms. Hence, in the majority of previous work, ambidexterity has been validated as a driver of superior firm performance for organizations.

Very recently, different outcomes of ambidexterity apart from performance have been examined, all at the organizational level. Examples of different outcomes of organizational ambidexterity considered include knowledge creation (Borini et al., 2022), brand management processes and brand performance (Iyer et al., 2021), sustainable supply chain performance (Belhadi et al., 2021), and speed of SMEs internationalization (Silva et al., 2021). Ambidexterity has been found to be positively associated with these outcomes, which are either dimensions of the firm's overall performance (like for example brand performance) or associated with it (like for example knowledge creation). Hence, the novel links between ambidexterity and outcomes other than firm performance may very well be associated with firm performance as different aspects of it or as leading to it. Overall, the relationship between organizational ambidexterity and performance is a key relationship and, as such, it has been examined in this study under the conditions of the global pandemic crisis.

Since organizational ambidexterity is beneficial for firm performance and performance is the key driver of organizational activities, it is important to understand what needs to be done in order to achieve ambidexterity. Organizational ambidexterity's antecedents are presented in the next section.

3.1.4 Organizational Ambidexterity Antecedents

Ambidexterity antecedents have been identified at multiple organizational levels (individual, team, firm and environment). Historically, there is a trend on the antecedents of ambidexterity research: from examining antecedents at the macro level (external environment) in the early years, to the meso level (organizations) starting in the first half of the first decade of the millennium, and increasingly the micro level (team and individual level) in the past ten years. This historic shift of focus concerning ambidexterity is important, since after a certain point (around the year 2005), antecedents at different levels were examined in parallel. Similarly, the level where ambidexterity

was observed has shifted from the organization and unit to the team and the individual level. However, organizational ambidexterity – that is examined in this study – occurs at the firm level. Table 4 presents a selection of important antecedents of ambidexterity and their historical evolution.

Table 4: Antecedents of Ambidexterity

Authors	Antecedents	Antecedent level	Level of ambidexterity
Duncan (1976)	Contradictions	Environmental	Organizational
Tushman & O'Reilly (1996)	Discontinuous change of the environment (political and economic, competitors' strategies, industry conditions)	Environmental	Organizational
Kaplan & Henderson (2005)	Major shift in the external environment	Environmental	Organizational
Gibson & Birkinshaw (2004)	Context of stretch, discipline, trust, and support	Unit	Unit
Smith & Tushman (2005)	Team design and leader coaching that enhance the creation of paradoxical framing and cognitive processing of contradictions	Team (TMT) level	Organizational
Beckman (2006)	Founding team members' common prior affiliation, as well as diverse prior affiliations	Team (TMT) level	Organizational
Lavie & Rosenkopf (2006)	Inertia combined with absorptive capacity	Organizational	Organizational
Lubatkin et al. (2006)	Behavioral integration of top management team (free flow of information, open communication, joint decision making)	Team (TMT) level	Organizational
Jansen et al. (2008)	Shared vision of senior team	Team (TMT) level	Organizational
Tiwana (2008)	Strong ties and bridging ties between individuals at different firms	Individual, inter-firm level (external)	Alliance ambidexterity (external, project level)
Andriopoulos & Lewis (2009)	Strategic intent, customer orientation and personal drives	Organizational and individual level	Organizational

Mom et al. (2009)	Managers' decision-making authority, participation in cross-functional teams and connectedness to other organizational actors	Individual	Individual
Simsek et al. (2009)	HR practices and routines promoting creativity, innovation, flexibility & teamwork; strong technology orientation; strategic intent, shared management vision, strategic alliances/interfirm mechanisms; communicating knowledge within and across organizations	Organizational and inter-organizational	Organizational
Simsek (2009)	Structural separation, organizational context, and TMT characteristics	Organizational and team	Organizational
Cao et al. (2010)	CEOs' network extensiveness and communication richness, functional complementarity and power decentralization in the TMT	Individual and TMT	Organizational
Chang & Hughes (2012)	Centralized decision making and cooperation across levels	Organizational	Organizational
O'Reilly & Tushman (2013)	Environmental uncertainty and increased competitiveness	Environmental	Organizational
Rogan & Mors (2014)	Sparse external networks of senior managers	Individual, inter-firm level (external)	Individual
Chang (2015)	High performance work systems	Organizational	Unit
Kortmann (2015)	Ambidexterity-oriented decisions	Team level	Organizational
Laureiro-Martinez et al. (2015)	Attentional control, i.e. refocusing attention and selecting actions related to goals	Individual level	Individual
Jansen et al. (2016)	Team-level cohesion and efficacy	Team	Team
Kauppila & Tempelaar (2016)	General self-efficacy of employees and paradoxical leadership of group managers	Individual	Individual
Luo et al. (2016)	CEO ambidextrous leadership and TMT-member risk propensity	Individual and TMT	Team

Ajayi et al. (2017)	Culture based on openness and knowledge-sharing and decentralized decision-making	Organizational	Individual
Caniëls et al. (2017)	Supportive organizational culture	Organizational	Organizational
Dai et al. (2017)	A venture's new product development alliances	Organizational	Organizational
Hughes et al. (2018)	Marketing differentiation	Organizational	Organizational
Soto-Acosta et al. (2018)	IT capability, knowledge management capability and environmental dynamism	Organizational and environmental (external)	Organizational
Zimmermann et al. (2018)	Understanding the need for ambidexterity by frontline employees	Individual	Organizational
Rialti et al. (2018)	Big data analytics-capable business process management systems (BDA-capable BPMS)	Organizational	Organizational
Swart et al. (2019)	Integration, role expansion, and tone setting for senior managers; gap filling for knowledge specialists	Individual across levels	Individual
Rao-Nicholson et al. (2020)	Formalized HR practices	Organizational	Organizational
Venugopal et al. (2020)	Behavioral integration	Team	Organizational

As the table indicates, Duncan (1976) initially suggested that environmental characteristics (contradictions) create the need for using dual structures. The existence of “discontinuous environmental change” (Tushman & O’Reilly, 1996, p.11) was perceived as the main requirement for evolutionary and revolutionary change in the early years of ambidexterity. Environmental change is an important driver of ambidexterity, as has been validated in more recent studies (Kaplan & Henderson, 2005; O’Reilly & Tushman, 2013). However, not all companies that face the same environmental challenges are ambidextrous. Therefore, internal organizational factors need to also be examined and this is very relevant to this research.

At the team level, TMTs' cognitive capabilities (Smith & Tushman, 2005) and agreement in the senior team concerning the ambidextrous strategy enhance organizational ambidexterity (O'Reilly & Tushman, 2011). Further, team composition (concerning the different levels of experience of founding members) is crucial for young companies (Beckman, 2006), whereas for SMEs the behavioral integration of the top management team is crucial (Lubatkin et al., 2006). In addition, shared vision by the senior team is essential in large companies (Jansen et al., 2008). And irrespective of company size, ambidexterity-oriented decisions made by the top management team (Kortmann, 2015) and team cohesion and efficacy lead to team ambidexterity (Jansen et al., 2016).

At the individual level, antecedents have been mainly related to leaders' characteristics and behaviors; antecedents of ambidexterity include sparse external networks (Rogan & Mors, 2014), attentional control (Laureiro-Martínez et al., 2015) and general self-efficacy (Kauppila & Tempelaar, 2016). Further, ambidexterity depends on individual employees' work-related actions like integration, on role expansion, on tone setting for senior managers, and on gap filling for knowledge specialists (Swart et al., 2019). Moreover, organizational actors at different levels also play an important role: Andriopoulos & Lewis (2009) found that personal motives of employees at different levels are important drivers of ambidexterity, whereas frontline managers who directly form firm mechanisms and processes must understand the need for the simultaneous pursuit of exploration and exploitation in order for ambidexterity to be achieved (Zimmermann et al., 2018).

At the unit level, firms that provide a context of discipline, trust, and support, create the circumstances for contextual ambidexterity (Gibson & Birkinshaw, 2004). This means that a culture of support and trust, coupled with a certain degree of structure, are associated with ambidexterity at the unit level. In addition, Hill & Birkinshaw (2014) reported a combination of antecedents for ambidexterity at corporate venture units, i.e. units that become separate from the organization, but are controlled by it, and are responsible for exploring new business opportunities.

Hill & Birkinshaw (2014) found that ambidexterity in such units is predicted by the existence of strong relationships with three diverse categories of actors: top executives of the parent firm, managers within the business unit, and distinguished venture capitalists. Further, high performance work systems at the organizational level have been found to enhance unit-level ambidexterity (Chang, 2015), showing once again that the antecedents may be located at a different level(s) than the level at which ambidexterity occurs.

At the organizational level, strategic intent and customer orientation are drivers of organizational ambidexterity (Andriopoulos & Lewis, 2009); inertia combined with absorptive capacity enhance ambidexterity (Lavie & Rosenkopf, 2006); and a culture based on openness and knowledge-sharing also promotes organizational ambidexterity (Ajayi et al., 2017). Similarly, HR practices that promote creativity and flexibility, as well as a strong technological orientation enhance ambidexterity (Simsek et al., 2009). Moreover, a culture that encourages a trial and error culture, as well as focusing on goals, promotes exploration and exploitation respectively (Alghamdi, 2018). In the recent years, antecedents related to the use of information technology (Dezi et al., 2018; Ko & Liu, 2019; Rialti et al., 2018) and HR design (Ferraris et al., 2019; Garaus et al., 2016; Park et al., 2019; Rao-Nicholson et al., 2020) have been repeatedly found to be antecedents of ambidexterity.

Among the numerous findings concerning organizational ambidexterity antecedents, there are some contradictory findings within companies of the same size. For instance, in SMEs, centralized decision making and cooperation between different levels of the firm enhance explorative and exploitative innovations and have a positive effect on performance in a dynamic environment (Chang & Hughes, 2012). But also in SMEs, decentralization, more shared knowledge and responsibility, and rapid reconfiguration to suit new circumstances, enhance employees' engagement, which leads to ambidexterity and increases the chances of firm survival (Ajayi et al.,

2017). Thus, mixed results have been reported concerning the effect of centralized cultures on organizational ambidexterity in SMEs. Such contradictory findings are noteworthy and particularly interesting, since they have the potential of altering the interpretation and analysis of theory (Post et al., 2020). Centralization and decentralization constitute different processes of decision making, indicating that how decisions are reached, i.e. the decision-making process, affects organizational ambidexterity.

Despite the fact that various ambidexterity antecedents have been identified at the firm level and that strategic decision speed is considered a significant aspect of strategy at the firm level, strategic decision speed has not so far been examined as an antecedent of ambidexterity. Establishing a relationship between the two would advance the discussion about strategic management, as both strategic decision speed and organizational ambidexterity are crucial parts of strategy. This study contributes to the discussion on ambidexterity antecedents by suggesting a new direction for research, acknowledging the possibility that the aforementioned contradicting findings about ambidexterity antecedents are attributed to different decision-making processes concerning ambidexterity. This study examines strategic decision speed as an ambidexterity antecedent for the first time, which opens up a direction of examining various other aspects of strategic decision making as ambidexterity antecedents in the future. Hopefully, this study can serve as the starting point for incorporating how different parameters of the strategic decision-making process interact with organizational ambidexterity. One key aspect of the strategic decision-making process, strategic decision speed, is examined in more detail in the following section, along with its antecedents and outcomes.

3.2 Strategic Decision Speed

As already mentioned, strategic decision speed is a central aspect of strategic decision making. Its introduction by Eisenhardt in 1989 led to an important discussion around the pace of reaching strategic decisions, which is still lively today, thirty years after the concept was introduced. The main discussion concerned, and still concerns, whether deciding fast has a positive or negative effect on decision accuracy (Dane & Pratt, 2007), with accuracy being judged by the decision's outcomes. With organizational performance being one of the most important organizational outcomes, the research on strategic decision speed has focused on the relationship between strategic decision speed and performance. Of course, antecedents and contingency factors have been examined as well. The following sections briefly present a selection of important studies in strategic management that include strategic decision speed, which are relatively few (Shepherd et al., 2021) especially compared to the number of studies that include organizational ambidexterity. This indicates that this area of strategic management research is still evolving. This study significantly contributes to this evolution, through introducing the link between strategic decision speed and organizational ambidexterity.

3.2.1 Definitions of Strategic Decision Speed

Eisenhardt (1989) introduced the speed of strategic decision making by describing it as the time that organizations need to reach strategic decisions; counting this time starts with identifying different alternatives and ends when a commitment to acting in a specific way is made. This descriptive definition, although not stated as a definition in Eisenhardt's (1989) paper, is widely adopted by researchers and is used until today. However, other definitions of strategic decision speed or of different types of speed have also been introduced in the literature.

Different types of speed that are important for organizations have been introduced following Eisenhardt's seminal work. Kessler & Chakrabarti (1996) defined innovation speed as the time between the early stages of development of innovation, including identifying the opportunities and the actions to take in order to innovate, and commercializing the innovation process through the introduction of a new product or service. This definition is based on Eisenhardt's conceptualization of decision speed, but it focuses on the innovation process. Similarly, Prashantham & Young (2009) apply Eisenhardt's speed concept on the process of internationalization and focus on what is happening after a firm has launched international activities, defining post-entry speed as "the pace of international expansion" (Prashantham & Young, 2009, p.277) after that point. In a similar way, Homburg & Bucerius (2006) focus on mergers and acquisitions and define the speed of integration as the time period required to achieve the desired integration of processes, structures, and organizational activities of the two companies. All these definitions are activity-specific and are expanding Eisenhardt's (1989) initial conceptualization.

A more generic definition of strategic decision speed has been recently proposed by Dykes et al. (2019). This definition makes the distinction between recognition, decision, and execution of strategic decisions. More specifically, recognition speed is defined as the pace of recognizing opportunities, decision speed as the speed of reaching decisions, and execution speed as the promptness with which these decisions are implemented. This definition divides the strategic decision speed that Eisenhardt (1989) had introduced into steps; the second type of organization speed defined by Dykes et al. (2019) is what Eisenhardt (1989) described as decision speed and is used as strategic decision speed in the literature (and in this study). Thus, the term strategic decision speed that is used in this project refers to Eisenhardt's conceptualization as the time generally required for a firm to reach strategic decisions, i.e. decide how to act, without including the respective actions related to execution of the decisions.

3.2.2 Strategic Decision Speed Antecedents

Although this study does not focus on the antecedents of strategic decision speed, it is important to provide an overview of the factors that have been found to enhance fast decision making, in order to facilitate a better understanding of the strategic decision speed concept overall and to consider more broadly the position of strategic decision speed in the strategic management literature. As Table 5 presents, the antecedents of strategic decision speed are identified at multiple levels, including the individual level. Among the individual-level antecedents of strategic decision speed identified in previous work, the most relevant to this study is cognitive ability (Wally & Baum, 1994), which also includes educational level as a proxy of cognition. The fact that cognitive ability is found to be positively associated with strategic decision speed is very interesting, since this study examines the interaction effects of different combinations of strategic decision speed and cognitive ability (paradoxical thinking, optimism, and an overall proxy of cognitive ability, i.e. educational level) on ambidexterity.

Table 5: Antecedents of Strategic Decision Speed

Authors	Antecedents	Antecedent level	Endogenous/exogenous
Eisenhardt (1989)	-Highly experienced decision makers -Number of alternatives considered	Individual/team	Endogenous
Judge & Miller (1991)	-Highly experienced decision makers, but this effect is contingent on environmental velocity -Number of alternatives considered simultaneously	Individual/team	Endogenous
Wally & Baum (1994)	CEOs' risk tolerance, cognitive ability, and intuition	Individual	Endogenous
Baum & Wally (2003)	-Decentralization of strategic management -Decentralization of operations -Formalization of routines -Informalization of non-routines (enhancing the use of tacit knowledge and intuition)	Organizational	Endogenous
	Environmental dynamism and munificence	Environmental	Exogenous
Zehir & Özşahin (2008)	Participation and autonomy of decision makers	Individual	Endogenous
	Technological sophistication and industrial competitiveness of the environment	Environment	Exogenous
Souitaris & Maestro (2010)	Polychronicity, i.e. multitasking ability, of decision makers	Team	Endogenous
Gu et al. (2012)	CEO's transformational leadership	Individual	Endogenous
Clark & Maggitti (2012)	TMT potency, i.e. the confidence of the decision-making team that it is capable of reaching effective decisions	Team	Endogenous
Chen & Chang (2012)	Organizational structure: formalization impedes strategic decision speed	Organizational	Endogenous
Elbanna et al. (2013)	Intuition	Individual	Endogenous
Kownatzki et al. (2013)	Relationship between headquarters and strategic business unit: transparency, orientation towards the outcomes, enhanced participation, trust, and timely feedback	Organizational/unit	Endogenous

As indicated in Table 5, previous research has examined factors that are both internal and external to organizations as antecedents of strategic decision speed. Concerning factors internal to organizations and how they operate, Eisenhardt (1989) identified the presence of highly experienced decision makers as being positively related to strategic decision speed, however subsequent research has found this relationship to be dependent on the industry, varying between for-profit and not-for-profit firms (Judge & Miller, 1991). Moreover, CEO's leadership style has been found to affect strategic decision speed; Gu et al. (2012) found that CEOs' transformational leadership positively impacts strategic decision speed. Similarly, CEOs' risk tolerance, cognitive ability, and intuition have been identified as predictors of strategic decision speed (Wally & Baum, 1994). In addition, the number of alternatives examined was found to positively impact strategic decision speed (Eisenhardt, 1989), and specifically the number of them examined simultaneously (Judge & Miller, 1991). This was to some extent captured by Souitaris & Maestro (2010), who found that the multitasking ability of decision makers predicts decision speed. Moreover, TMT potency, i.e. the confidence of the decision-making team that it is capable of reaching effective decisions (Lester et al., 2002) has also been identified as an antecedent of strategic decision speed (Clark & Maggitti, 2012).

Further, internal processes related to control and formalization have been found to impact strategic decision speed. Decentralization of strategic management, decentralization of operations, formalization of routines, and informalization of non-routines that enhance the use of tacit knowledge and intuition have been positively associated with strategic decision speed (Baum & Wally, 2003). Chen & Chang (2012) reported negative effects of formalization on strategic decision speed. Similarly, Kownatzki et al. (2013) found that the way in which headquarters control the activities of strategic business units has a significant impact on the units' strategic decision speed: transparency, orientation towards the outcomes, enhanced participation and trust, and timely feedback are positively related with the speed of making decisions in these units.

Factors that affect strategic decision speed and are external to organizations include environmental dynamism and munificence (Baum & Wally, 2003), with dynamism referring to the degree of unpredictability and change in the environment, and munificence to the existence of growth opportunities within it as indicated by sales growth (Dess & Beard, 1984). It is worth mentioning that environmental factors have also been examined as moderators in relationships that include strategic decision speed (e.g. Shepherd et al., 2021) and as control variables (e.g. Bourgeois & Eisenhardt, 1998). In this study, the impact of the environment is examined as a moderator. Moreover, choosing to conduct the research in the specific country at the specific time is also related to controlling for environmental factors, since the Greek environment was extremely dynamic and the pandemic crisis was at its peak when data was collected. Overall, this study incorporates factors both internal and external to organizations, taking an integrated multi-level approach.

3.2.3 Strategic Decision Speed Outcomes

Strategic speed has mainly been associated with positive outcomes like enhanced performance (e.g. Bourgeois & Eisenhardt, 1988) and innovation (e.g. Chen & Chang, 2012), but it has also been found to have negative effects on performance (e.g. Perlow et al., 2002). What seems to be a key factor concerning the nature of strategic decision speed's outcomes is the degree and pace of change in the environment: the more volatile and unpredictable the environment, the more beneficial the outcomes of strategic decision speed according to previous work.

Reaching decisions slowly entails risks for organizations, related to having analysed information that is irrelevant when the decision is finally being made and with falling in the trap of inertia concerning strategy (Fredrickson and Iaquinto, 1989). Companies that delay decisions and responses to environmental changes are missing opportunities, because opportunities disappear quicker than the companies respond to them (D'Aveni et al., 2010). The above risks related to

slow strategic decision making are relevant in any environment and have been found extremely important when the external environment is highly volatile. Hmieleski & Ensley (2007) confirmed the need for fast strategic decision making in dynamic environments and emphasized that fast decisions need to also be comprehensive, in accordance with Eisenhardt (1989), who suggested that reaching decisions quickly does not mean that less attention is devoted to strategic decision making. Contrarily, fast decision makers have been found to consider more alternatives and analyse more information than those deciding slower (Eisenhardt, 1989). So, decision quality may be harmed if collecting information is neglected in order to decide fast (Kahneman et al., 1982), but fast decision making does not mean that information is not collected or that the decision-making process is less comprehensive (Eisenhardt, 1989; Priem et al., 1995).

These arguments are supported by the multiple positive outcomes of strategic decision speed identified so far. Table 6 presents findings related to strategic decision speed outcomes in the literature, while reporting the environmental conditions under which the study was conducted. When the environment changes rapidly, shorter decision-making time frames enhance performance (Bourgeois & Eisenhardt, 1998; Judge & Miller, 1991) and this may be related to first-mover advantages for companies that decide fast (Eisenhardt, 1989; Lieberman & Montgomery, 1988; Makadok, 1998; Tippins & Sohi, 2003). A higher pace of strategic decision making has been found to predict subsequent profitability and firm growth in dynamic environments (Baum & Wally, 2003). In addition, Chen & Chang (2012) identified a positive relationship between strategic decision speed and organizational innovation, while strategic decision speed has also been positively associated with the financial performance of new ventures (Souitaris & Maestro, 2010). Further, strategic decision speed is positively related to international performance of SMEs (Adomako et al., 2021), whereas Rahimnia & Molavi (2021) report the mediating role of strategic decision speed on the relationship between effective communication between decision makers and performance.

As already mentioned, despite the mainly positive outcomes of strategic decision speed in the literature, some negative ones have been reported as well. Perlow et al. (2002) found that companies in which decision making focused on reaching decisions quickly fell in a "speed trap" (Perlow et al., 2002, p. 947); decision makers who felt obliged to make every decision quickly created a pathological context, reproducing the need for fast decisions even when decisions needed to be carefully examined and required more time, leading to inferior performance. Similarly, Forbes (2005) reported a negative impact of fast decisions on performance, and Chen & Hambrick (1995) found that when large firms deviate from their typical behaviour of deciding slower, they damage their performance. Shankar & Carpenter (1998) found that innovative companies who do not move fast, i.e. innovative late movers, outperform first-movers; however, they did not measure the speed of decision making, but the timing of entrance in the market. Findings concerning strategic decision speed outcomes are summarized in Table 6:

Table 6: Outcomes of Strategic Decision Speed

Authors	Outcome	Positive/Negative	Environment
Bourgeois & Eisenhardt (1988)	Organizational performance	Positive	Dynamic
Eisenhardt (1989)	Organizational performance	Positive	Dynamic
Judge & Miller (1991)	Organizational performance	Positive	Dynamic
Chen & Hambrick (1995)	Organizational performance	Negative	Stable
Forbes (2001)	Performance (of new ventures)	No effect	Dynamic
Perlow et al. (2002)	The speed trap created a negative effect on organizational performance	Negative	Dynamic
Baum & Wally (2003)	-Profitability -Firm growth	Positive	Dynamic
Forbes (2005)	Firm survival (of new ventures)	Negative	Dynamic
Zehir & Özşahin (2008)	Innovation performance	Positive	Dynamic
Souitaris & Maestro (2010)	Financial performance of new ventures	Positive	Dynamic
Chen & Chang (2012)	Organizational innovation	Positive	Dynamic
Shepherd et al. (2021)	Decision quality (self-reported)	Positive	Dynamism: moderator
Adomako et al. (2021),	International performance of SMEs	Positive	Dynamic
Rahimnia & Molavi (2021)	Innovation performance	Positive	Dynamic

From what has been mentioned so far, it is obvious that the speed of making strategic decisions has been found to be crucial for firms in dynamic environments, but there have been some conflicting findings and it is not yet clear how focusing on speed impacts organizational outcomes and performance (Shepherd et al., 2021). This is a major contribution of this study, as it adds a piece to this puzzle: organizational ambidexterity, which has not been examined as an outcome of strategic decision speed yet. Further, based on the different findings concerning the outcomes of strategic decision speed, it makes sense to support that its outcomes also depend on other factors, which possibly are in-between strategic decision speed and firm performance. In addition, organizational ambidexterity and strategic decision speed share many common outcomes: firm performance, firm growth, firm survival, international performance, and innovation, specifically in dynamic environments. Therefore, it makes sense to explore the potential existence of a relationship between these two key aspects of strategic management in an uncertain and volatile environment. This study explores this relationship in the context of the COVID-19 global pandemic crisis. It is, hence, essential to define what a crisis is and what it means to strategize under crisis, which are presented in the following sections.

3.3 A Paradox View of Crisis

Organizations usually evolve through periods of incremental change interrupted by gaps/discontinuities, where more significant change is observed (Tushman & O'Reilly, 1996). Such discontinuous and unexpected changes can be characterized as “environmental jolts” (Meyer, 1982, p. 516) or “cataclysmic upheavals” (Meyer et al., 1990, p. 93). Such situations require repeated activity mapping (Ancona et al., 2001) and make individuals’ connections between the past, present and future (Butler, 1995) more complex. A crisis’ evolution, with its unexpected and disruptive events, makes time perceptions and sensemaking by decision makers crucial, as this evolution is not easily predictable or linear.

If the world is viewed as linear, its linearity is occasionally interrupted by events that introduce change, different rules and different dynamics in the environment (Bertuglia & Vaio, 2005). Under the systems view of the world, organizations operate in a system, where the aforementioned nonlinear events are crises (Almond et al., 1973). A system would not normally be in crisis; a crisis is an atypical event that denotes an important change, the outcome of which is a problem that needs to be urgently solved (Luecke & Barton, 2004). On the other hand, the socio-political view of crises suggests that a crisis is a disaster or a cultural breakdown that occurs due to erroneousness or lack of adopted norms and beliefs (Turner, 1976). In other words, a crisis occurs when the ideologies and cultural symbols fail to provide a shared meaning to society or system members (O'Connor, 1987; Weick, 1993).

Whether viewing the world as a system or adopting the socio-political view of the world, the crisis per se can be viewed under two different lenses: the crisis as event lens (Hermann, 1963; James et al., 2011) and the crisis as process lens (Mitroff & Pearson, 1993; Roux-Dufort, 2007; Turner, 1976). The former defines a crisis as an unusual, low-probability, but high-impact event that creates change and threats to organizations (Pearson & Clair, 1998). Under this view, the crisis starts with the occurrence of the unexpected event and ends after a specific, although unknown a priori, period of time. On the other hand, the crisis as process lens suggests that a crisis is a procedure with an extended incubation period that is identified under the influence of an event, while it includes several phases like the warning signals prior to the event occurrence, the event occurrence and the phase right after it, an intensification period, and then resolution (Turner 1976; Mitroff & Pearson 1993; Gatot & Jacques, 1999).

However, in reality, many crises are a combination of the two approaches; a crisis is a process triggered by an event, including several phases, but it may also include multiple events. It is not

the initial event alone that defines and affects the crisis evolution, but rather the occurrence and interaction of the different events within a crisis that dynamically create the crisis itself. Further, decisions during the crisis affect its evolution and may solve problems or create new ones, impacting the intensity and duration of the crisis. In this paradox view of a crisis under both as an event and as a process, there are smaller crises nested within the main crisis. This view of multiple crises within the crisis, which bear similarity to the main crisis, was described by Topper & Lagadec (2013) as a fractal crisis.

A fractal in geometry is a geometric shape comprising of parts, which are similar to the initial shape in a reduced size (Mandelbrot, 1982 & 2005). The smaller parts are copies of the initial shape and this property is described as self-similarity. The crisis literature has advanced using the concept of fractal crises, specifically in cases of mega crises (Helsloot et al., 2012), i.e. of very large crises that last significantly longer than expected and create major disruption. The concept of fractal crisis becomes increasingly important, as these mega crises are considered as becoming the norm (Lagadec & Topper, 2012). Contemporary history with the global pandemic and the recent war between Russia and Ukraine unfortunately verify that this is increasingly true.

The crisis as event view is appropriate for describing a crisis that is attributed to a single event and has a relatively short duration (e.g. up to 6 months); the crisis as process view can describe more intense crises with a slightly longer duration; and the fractal crisis view is suitable for describing mega crises that last significantly longer and are characterized by smaller crises nested within the main crisis. Hence, the global pandemic crisis is a fractal crisis, with a prolonged duration and multiple crises within it. The impact of a fractal crisis on decision making cannot be ignored (Lagadec & Topper, 2012). A better understanding of how the environment affects strategic decision making can be obtained by interpreting different types of environmental dimensions, presented briefly in the following section.

3.4 Environmental Impact: Environmental Uncertainty, Turbulence, Velocity and Dynamism

This study acknowledges the significance of environmental factors in strategic management and strategic decision making (Hrebiniak & Joyce, 1985; Hough & White, 2003) and adopts the view that three of the four decision-making context factors need to be included in research work in order to have a complete framework for strategic decision making (Elbanna et al., 2020). Thus, the impact of the environment is viewed as a factor that cannot be overlooked when examining the decision to pursue ambidexterity and the process leading to this decision. Indeed, the nature of the environment has been found to be essential for ambidexterity and strategic decision speed, since, in unpredictable and turbulent environments, ambidexterity is more likely to occur (e.g. Jansen et al., 2006, O'Reilly & Tushman, 2008) and strategic decision speed is considered to be more beneficial for organizations (e.g. Chen & Chang, 2012; Rahimnia & Molavi, 2021; Souitaris & Maestro, 2010).

In order to understand the impact of environmental characteristics on strategic management, it is important to comprehend how the different environmental features are defined. Aldrich (1979) and Dess & Beard (1984) defined environmental dynamism as the rate and unpredictability of change in the environment. According to this definition, dynamism includes turbulence and uncertainty (Aldrich, 1979). In 1997, Volberda & Van Buggen defined environmental dynamism as how often and how intensely an environment changes, whereas Mitchell et al. (2011) defined dynamic environments as those characterized by high unpredictability and unstable rates of change. On the other hand, Freel (2005) has conceptualized uncertainty, a dimension of dynamism, as the degree of change and the level of turbulence across levels (environment, industry, and firm). Similarly, Boyne & Meier (2009), Danneels & Sethi (2011), and Rego et al. (2022) defined the other dimension of dynamism, environmental turbulence, as the degree and unpredictability of change

in the environment; but this definition does not differ from Aldrich's (1979) and Dess & Beard's (1984) definition of dynamism.

Another concept similar to environmental dynamism is environmental velocity defined by Bourgeois & Eisenhardt (1988) as "rapid and discontinuous change in demand, competitors, technology and/or regulation, such that information is often inaccurate, unavailable, or obsolete" (Bourgeois & Eisenhardt, 1988, p.816). Hence, high velocity environments are those characterized by a high pace of change, which is discontinuous, and a high degree of unpredictability, due to the lack of information. Further, environmental velocity has multiple dimensions: competition, demand, technology, regulation and products (McCarthy et al., 2010). Furthermore, an environment may offer limited or multiple opportunities, irrespective of its rate of change and unpredictability. The number of opportunities in the environment is reflected in describing it as hostile or munificent (Dess & Beard, 1984), i.e. whether it entails threats, is dangerous and offers limited opportunities versus offering abundant opportunities for growth.

Overall, multiple environmental characteristics have been introduced and empirically tested in the literature. The various dimensions of environmental characteristics and their definitions bear similarities and differences. For example, the main difference between dynamism and velocity lies on the fact that high velocity environments are described as environments with discontinuous change, whereas this is not included in the definition of dynamic environments. However, dynamic environments are viewed as environments with discontinuities (e.g. Tushman & Anderson, 1986). Hence, the different definitions of environmental dynamism and the proximity between the definitions of different environmental variables have created some confusion, with different environmental terms often describing the same concept. In general, it seems that the concept of environmental dynamism has prevailed compared to other environmental characteristics in strategic decision-making research, as is obvious in Table 6 above.

Previous research has incorporated different environmental dimensions in strategy research with interesting findings, including moderation effects of environmental characteristics on relationships that include strategic decision speed (e.g. Baum & Wally, 2003; Judge & Miller, 1991; Shepherd et al., 2021) or organizational ambidexterity (e.g. Jansen et al., 2006). For example, in dynamic environments strategic decision speed leads to better decision quality (Shepherd et al., 2021). In addition, organizational leaders' perceptions of the environmental conditions are more significant than the conditions per se concerning decision making (Child, 1972; Duncan, 1972; Hambrick & Snow, 1977; Miller, 1988, Weick, 1969). This means that an environment may be unpredictable and fluid, but if decision makers perceive it as relatively stable, they will adjust their decision making according to their perceptions; and vice versa, they will be making decisions that they deem as appropriate for uncertain and changing environments to an environment that is relatively stable, if they perceive it as dynamic (Freel, 2005; Hambrick & Snow, 1977). Furthermore, centralized decision making is viewed as an effective response to unstable environments (Staw et al., 1991), as the conflict that may arise from discussions and disagreements when decision making is not centralized may create delays to reaching decisions (Hickson et al., 1986, Mintzberg et al., 1976). Therefore, in dynamic environments, the role of CEOs as decision makers and their perceptions are very important.

In this study, environmental dynamism has been selected as the variable that reflects the situation in the environment, based on the definitions by Aldrich (1979) and Dess & Beard (1984). Therefore, in this study, a dynamic environment is viewed as an environment characterized by high uncertainty and a high turbulence (or pace of change). Environmental dynamism has been measured by measuring its dimensions (uncertainty and turbulence) based on the perceptions of the CEOs of companies in the research sample. Environmental munificence has not been measured, although items 2 and 4 in the construct used to measure dynamism refer to environmental hostility, risks, and threats. The following section discusses how crises are dynamic

environments, but also how fractal crises are a superset of dynamic environments, and presents strategic management responses to the crisis at the firm level.

3.5 Crises versus Dynamic Environments and Crisis Management at the Firm Level

As already mentioned, dynamic environments have been extensively examined in strategic management. Crises are examples of dynamic environments, since under crisis external change is rapid and there is increased unpredictability (Comfort et al., 2001). Specifically environments affected by crises related to health issues have been viewed as dynamic environments (Corbacioglu et al., 2016), because of their high degree of uncertainty and rapid change. In a dynamic environment, like a crisis environment is, environmental conditions need to be incorporated in strategic decision making, as the company's survival is at stake (Weick & Sutcliffe, 2006).

On the other hand, a fractal crisis is more challenging than a dynamic environment. Fractal crises are not single-event shocks, after which the environment can start recovering. As explained by Topper & Lagadec (2013), the crises experienced lately by humanity (and these did not include the COVID-19 pandemic, because it had not occurred when the paper was written) have shifted the dimensions of crises: from large scale to off-scale, affecting the whole planet and threatening hundreds of millions of lives; from being complex to being unreadable, making it very difficult to deal with multiple disruption dynamics; from being tightly-coupled to being completely interdependent, with crises within the crisis affecting one another; from fast-paced to instantaneous, with very short or no time intervals between the different fractals of the crises occurring in different places, while they are covered by global media instantly; and from locality to dislocation, with the direct vicinity of the initial event that caused the crisis being totally irrelevant with the geographical areas that are affected by the crisis. Last but not least, fractal crises shift the crisis' experience from uncertainty to ignorance. Decision makers are not just dealing

with uncertainty, which is a dimension in every crisis; they are constantly dealing with the unknown, with a complete inability to make any assumptions about the future or to create possible scenarios.

The COVID-19 pandemic crisis generated all the aforementioned shifts and repeatedly created major disruptions in the personal and professional lives of decision makers. As Jang & Lee (2022) explain, the COVID-19 global pandemic crisis had the combined effect of a natural disaster and an economic crisis; it threatened the lives of individuals within and outside the organization; it disrupted international and local business systems, processes and infrastructures; and its wide impact was self-enhancing, with nested crises creating further shocks and disruptions. This fractal crisis affected the whole planet and challenged the physical and mental health of decision makers (Pfefferbaum & North, 2020) making it very difficult for them to handle the stress, anxiety, fear and emotional distress experienced by individuals during the pandemic (Xue et al., 2020). Hence, the context of this study is a dynamic environment, but also goes beyond it. Therefore, investigating the impact of the pandemic fractal crisis on strategic management, taking into account that decision makers and organizations in Greece were already exhausted from the Greek financial crisis, can shed light on how previous findings in dynamic environments compare to strategic responses to this crisis.

Organizational responses to crises are diversified (James & Wooten, 2005) and previous work has identified a typology of them that includes four distinct responses stemming from different environmental conditions when the crisis occurs (Smart & Vertinsky, 1984). Smart & Vertinsky found that organizational responses to a crisis may be short-term or long-term. More specifically, they suggest that when the crisis discontinuities occur in a previously turbulent environment, this will induce long-term strategic responses, as organizations are already trying to cope with change and understand that a long-term entrepreneurial effort is needed to deal with the discontinuity.

Similarly, a long-term response that has to do with planning is evoked when the crisis discontinuities occur in a predictable environment, as managers are more certain about the future when the crisis begins and feel more able to use preventive strategies against the crisis and develop long-term coping responses.

On the contrary, short-term responses are enacted when the crisis' discontinuities occur in static or complex environments. In a static environment prior to the crisis, organizations are executing their strategic plans with a long-term focus, due to the lack of uncertainty. Hence, they are less flexible to making long-term changes to their plans when the crisis occurs, and focus on making incremental, adaptive responses that Smart & Vertinsky (1984) describe as firefighting. Indeed, used to operating in a static environment, companies may not be able to understand the need for long-term changes and adopt these fire-fighting strategies as possible ways of addressing the crisis, hoping that minor corrections in the short-term will be enough. Last but not least, and this is most relevant with this study, when companies operate in a complex environment prior to the crisis, organizations cannot easily predict the future because of the interaction of different complexity factors. Hence, organizational efforts focus on the short-term tactical aspects of strategy, which bring attention to strategic actions with immediate impact. These differ from firefighting activities in the sense that firefighting relates to incremental actions with limited impact, whereas tactical actions entail wider impact on the company's strategy, but still in the short-term.

Crisis management responses according to the type of environment in which the crisis occurs are summarized in Table 7. It is worth noting that static environments are not the same with predictable environments, since an environment may be undergoing change, but this change may still be predictable.

Table 7: Firm-Level Strategic Responses to Crises

Type of environment	Response	Time Horizon	Response Type
Static	Firefighting	Short-term	Adaptive
Predictable	Planning	Long-term	Adaptive
Turbulent	Strategic	Long-term	Entrepreneurial
Complex	Tactical	Short-term	Entrepreneurial

The Greek business environment was characterized by increased complexity right before the pandemic crisis began. In mid-June 2019, as already mentioned, Greece topped the Global Business Complexity Index 2019 ([TFM Group Report](#)). Therefore, the discontinuities caused by the global pandemic occurred in the case of Greece in a highly complex environment. Organizations operating in Greece are, hence, expected to have used tactical responses to the crisis, focusing on the short-term but considering the wider impact of these decisions. On the other hand, leaders who have experience in complex contexts are able to also consider the long-term effect of their strategic decisions (Holling, 1978). So, although companies operating in Greece when the pandemic began are expected to have preferred tactical strategic responses, the experience of their leaders may have led them to also consider the long term. Hence, once again it is obvious that Greece is a very interesting research context for examining strategy under the pandemic; it provides a good opportunity to examine the impact of individual decision makers' characteristics on organizational outcomes in a complex environment that is expected to have enacted tactical short-term responses related to exploitation, but where it is also possible that leaders were able to consider long-term strategic responses related to exploration. Where organizational leaders focus their attention is crucial for strategic decision making under crisis (Weick & Sutcliffe, 2006) and it occurs at the individual level. Strategic decisions and strategic decision making under crisis with a focus on the individual level is presented in the following section.

3.6 Strategic Decisions and Strategizing under Crisis: a Microfoundations Approach based on Cognition

Strategic decisions are significant for organizations at all times, since they affect their advancement in time and their overall success (Walters & Bhuian, 2004). Such decisions entail a commitment to certain actions and specific resources (Mintzberg et al., 1976). Strategic decisions can be considered in two ways: a) in terms of the types of strategic decisions being made, and b) in terms of the procedures that lead to making strategic decisions. The former is covered by strategy content research and the latter by strategy process research (Elbanna & Child, 2007). When examining strategic decision-making processes, it is important to examine the procedures that lead to selecting goals and the factors affecting them (Elbanna & Child, 2007; Noorderhaven, 1995). Obviously, the content and processes of strategic decision making are interrelated (Mintzberg & Waters, 1985), whereas decision outcomes are related to both. These outcomes may be either intended or unintended (Elbanna, 2018; Papadakis et al., 1998; Shepherd & Rudd, 2014).

Crisis environments are very challenging for strategic decision making and the way in which leaders analyse and interpret the environment is very important (Marcy, 2015). The will to solve any problem depends on the problem's interpretation (Kiesler & Sproull, 1982), therefore how decision makers perceive the situation is very important; if they interpret it as too uncertain or difficult to address, they might not exert the will to take action. But leaders under crisis are required to take action (James & Wooten, 2005). Deciding to remain inactive under crisis may create undesired outcomes, because reaching decisions and acting under crisis entails that feedback on the actions is available and learning occurs (Weick, 1988). An unwillingness to make decisions and take action under crisis leads to a less clear understanding of the situation and, possibly, more mistakes (Weick, 1988). Thus, reaching strategic decisions and acting on them is important under crisis.

Decision makers do not know what to expect from their strategic decisions under crisis, due to uncertainty (James & Wooten, 2005). Strategic decisions may, thus, have unintended outcomes, which may be beneficial or negative for organizations. The risk of a non-beneficial decision being detrimental for an organization is higher under crisis, rendering decision making under crisis a crucial process (Weick, 1988). In such conditions, decision makers may tend to focus on survival and short-term strategies, but they also need to focus on the long-term and be prepared for the future (Hitt et al., 2021). Missing opportunities, including opportunities for exploration and exploitation, because of ineffective decisions under crisis may not be damaging in the short term, but it may very well be so in the long term. But strategic decision making that concerns both the short term and the long term indicates that the organization is ambidextrous. In other words, the decision to pursue ambidexterity under crisis is extremely important for a firm and it is driven by the individual perceptions and understanding of the decision makers. Major external changes caused by crises affect organizations by making organizational tensions more salient (Smith & Lewis, 2011), making decision makers realize that they need to manage these tensions.

The role of individuals in crisis environments is extremely important, as they experience the tensions caused by the crisis. Indeed, a crisis cannot be disconnected from the perceptions of those who are experiencing it (Habermas, 1975), as these individually experienced tensions aggregate to organizations and societies. A crisis entails change, a loss of shared meaning and increased ambiguity (Weick, 1993). Pearson & Clair (1998) explain that decision making under crisis is driven by perceived time constraints and cognitive limitations. A decision maker needs to understand that there is change, to perceive a problem and to feel time pressure in order to view a situation as a crisis (Billings et al., 1980). This process involves making sense of the situation, which entails decisions and actions (Weick, 1988). The unwillingness to be involved in sensemaking creates delays in understanding and facing the issues related to the crisis, and

produces more problems. Organizational leaders need to perceive that there is a crisis and try to make sense of it, while realizing that time is a significant dimension of the decision-making process. But how fast decision makers realize that there is the need to understand the crisis situation and act is related to how fast the decisions will be reached, i.e. strategic decision speed. Time is an important element of every crisis, since time for taking action is limited and there is the urgency of making both timely and effective decisions that will undo the damage created by the crisis (Pearson & Clair, 1998). Thus, the faster the decision makers understand the need to make choices and start doing so, the better the crisis is managed, making strategic decision speed a crucial aspect of decision making under crisis.

From what has been said so far, it is obvious that there is a link between how individuals (decision makers) perceive the crisis situation, including the opportunities and threats it entails, and making effective decisions under crisis that affect organizational outcomes. This suggests a microfoundations approach to strategic decision making under crisis, based on how individual decision makers interpret the situation. The interpretation and representation of the world by individuals is defined as cognition (Thagard, 1996). Individuals cannot acquire all information available in the world and, therefore, cannot perceive every single alternative available concerning any decision, so they use simpler, cognitive representations of reality to guide their decision making (Simon, 1955). Cognition includes the mental processes associated with acquiring, evaluating, using and retrieving information, as individuals attempt to understand a situation and simplify the problem or issue considered (Johnson-Laird, 1983). Hence, cognition is what helps individuals make sense of a situation (Weick, 1990) and what enables them to cope with the limited ability of processing information (Halford et al., 1993).

The role of cognition in strategic management has been identified as crucial, as cognition may explain the inability to respond to a changing environment, i.e. organizational inertia (Garud

Rappa, 1994). In addition, cognition and cognitive representations influence how and whether search is conducted in a new environment, and how strategy is formulated and implemented based on organizational leaders' view of the world (Tripsas & Gavetti, 2000). A very influential view about the role of cognition in strategic management has to do with accepting that strategic management is shaped by how decision makers recognize and interpret change, and subsequently translate this interpretation into strategic choice (Daft & Weick, 1984). In other words, strategic management and strategic decision making enables organizations to cope with uncertainty and change (Allaire & Firsirotu, 1989), based on organizational leaders' individual cognition that guides strategic decision making and strategic actions. This study accepts this view and posits that individual cognition, including mental processes, individual framing, representations of reality, and perceptions of the environment, influence organizational processes like strategic decision speed, and organizational outcomes, like organizational ambidexterity and firm performance, and their interactions.

The responses required by firms in order to be able to survive in crisis environments are shaped by individuals and may differ from usual strategic planning and actions (Du & Chen, 2018). In a stable environment, the need to decide fast has not been viewed as necessarily imperative (Baum & Wally, 2003; Priem et al., 1995). Firms that take more time to reach decisions through using a longer comprehensive process in stable environments have not been reported to achieve inferior performance (Fredrickson, 1984; Fredrickson & Jaquinto, 1989; Fredrickson & Mitchell, 1984). Still, deciding very slowly in a stable environment leaves room for competitors to capture opportunities and achieve first-movers' advantages, which are relatively easy to maintain in unchanging conditions (Lieberman & Montgomery, 1988). In addition, not pursuing organizational ambidexterity in stable environments will not necessarily harm performance, because opportunities for exploration and exploitation are addressed through existing routines (Ossenbrink et al., 2019). However, in uncertain and rapidly changing environments,

ambidexterity is related to firm survival (O'Reilly & Tushman, 2008), enabling organizations and organizational leaders to take advantage of exploitation and exploration opportunities, and avoid neglecting either type of opportunities which could create substantial threats. Hence, this study aims to shed light on the impact of decision makers' cognition and perceptions on strategic decision making, specifically related to strategic decision speed and ambidexterity, during the pandemic.

Decision makers are accountable for strategy, including achieving ambidexterity and superior performance, as well as for shaping the decision-making process, by choosing how decisions are reached and by reaching them in a timely manner. CEOs under the pandemic crisis have been described as Chief Crisis Officers (Liu et al., 2022), since they were responsible for facing the crisis-related threats and for navigating the situation in a way that helped the organization overcome the difficulties, uncertainty and turbulence caused by the pandemic. The role of CEOs in strategic management and strategic decision making is presented in the next section.

3.7 The Role of the CEOs

If, in general, the role of individuals during crisis is very important (Habermas, 1975), the role of CEOs, as the ultimate decision makers in organizations operating in crisis conditions is crucial. CEOs or company owners need to handle the crisis, by facing and eliminating the threats to firm survival and by protecting the interests of stakeholders (Im et al., 2021; Steinbach et al., 2021). CEOs are responsible for making the right decisions, including decisions concerning exploration and exploitation opportunities, as they are the key persons in formulating strategic decisions (Crossland et al., 2014; Sariol & Abebe, 2017). Under any circumstances, stakeholders hold CEOs accountable to the firms' overall goals, as well as those related to innovation (Berger et al., 2016).

The choices that CEOs make include a variety of strategic decisions and significantly affect important organizational outcomes, including performance (Adams et al., 2005).

When there is disruption in the environment, top executives must recognize the need to act fast and make decisions quickly based on previous experience in similar situations (Oliver & Roos, 2005). To do so, they use affective reactions as mental shortcuts that enable them to decide fast (Netz et al., 2020). But what happens when CEOs do not have relevant experience in similar situations, like in the case of a global pandemic, on which they can draw for making decisions? Decision makers may experience a lack of knowledge concerning the causal effects of their actions even under non-crisis conditions (Mosakowski, 1997), but under crisis this causal ambiguity is even more intense. When changes in the environment demand rapid collection and effective interpretation of information (Atuahene-Gima & Li, 2004), but there is no prior knowledge and experience in similar circumstances, it is decision makers' perceptions about the environment that guide their decision. This involves a sensemaking process (Maitlis & Sonenshein, 2010), which has a significant impact on how firms adapt and react to the crisis.

From what has been said so far, strategic decision making under crisis is related with how CEOs, act within – and interact with – the decision-making context. CEOs interpret the dimensions of the context based on their cognition, in line with strategic choice theory (Child, 1972 & 1997) and upper echelons theory (Hambrick & Mason, 1984; Hambrick, 2007). There is a bidirectional interaction between decision makers' cognition/behaviors and the environment, which affects organizational outcomes, specifically in unstable and turbulent environments (Wood & Bandura, 1989). This study examines perceived (by CEOs) environmental dynamism and cognition-related characteristics of CEOs as potential moderators of the relationship between strategic decision speed and organizational ambidexterity, based on a multi-level, integrated approach to strategic management that embraces the microfoundations view.

As follows, the three CEOs' cognition-related characteristics included in the research model are presented: a) paradox mindset (Miron-Spektor et al., 2018) as it is very relevant to managing tensions, b) optimism (Seligman, 1991) as a way of thinking that would be contradictory to a crisis, which is usually framed using negative framing (James et al., 2011), and c) educational level as a proxy of the CEOs' overall cognitive ability (Hambrick & Mason, 1984).

3.7.1 Paradox Mindset

Before presenting paradox mindset, it is important to define what a mindset is, as there are different conceptualizations of mindsets across different disciplines. The cognitive psychology stream defines mindset as the aggregate cognitive processes related to a specific mission (Gollwitzer and Bayer, 1999; Gollwitzer 2012), connecting mindset to cognition concerning a particular task. On the other hand, the positive psychology stream defines mindset as a set of beliefs that serve as guidance to the way a situation is interpreted (Dweck, 2006); and the social psychology and organizational leadership stream definition views mindsets as cognitive filters (Gupta and Govindarajan, 2002) that are used as a frame of reference (Benson & Dvesdow, 2003) that structures our thinking (Oyserman et al., 2009). For this study, the social psychology and organizational leadership definition is more relevant, since it emphasizes cognition and individual perceptions about a situation (in this case the crisis). Mindset is, hence, used as guidance that leads to further action (in this case action concerning strategic decisions). In general, mindset research is considered appropriate when examining links between the individual and the organizational level (French, 2016) and strategic decision making.

Paradox mindset is the mindset related to paradoxical thinking and to dealing with the paradoxes that are salient in multiple different activities in organizations (Smith & Lewis, 2011). Therefore, paradox needs to be recognized, understood, and managed by organizational members (Handy,

1995). Miron-Spektor et al. (2018) defined the abilities related to recognizing, accepting, and viewing tensions in a positive way as paradox mindset. By its definition, it is obvious that a paradox mindset is crucial when aiming to transform tensions into potential (Miron-Spektor et al., 2018). When facing tensions, individuals use paradoxical framing in order to not only perceive their existence, but also in order to not be overwhelmed by them. Using a paradox mindset means that tensions and contradictory demands do not bear a negative connotation a priori, and are not viewed as dilemmas, but rather as paradoxes, where contradictory options are not mutually exclusive and can be combined.

A paradox mindset is expected to be an essential cognitive ability under crisis conditions, since it enhances complex thinking, i.e. the ability to analyze and combine opposing elements (Miron-Spektor et al., 2018; Tetlock et al., 1993). The application of paradoxical framing by individuals enhances managerial sensemaking and leads to inaction avoidance (Lüscher & Lewis, 2008), which means that a paradox mindset and the abilities related to it are crucial under crisis, where inaction could be detrimental for organizations (Weick, 1998). Further, a lack of resources makes paradoxical tensions more salient (Miron-Spektor et al., 2018; Smith & Lewis, 2011); but in crisis environments, there is often low availability of organizational resources (Campling & Michelson, 1998). Thus, a paradox mindset is an essential cognitive ability of decision makers under crisis, enabling them to deal with the paradoxical tensions that the crisis entails. Part of the definition of a paradox mindset has to do with viewing tensions in a positive way. The ability to do so is also connected with optimism, which is presented as follows.

3.7.2 Optimism

Optimism is the "mood or attitude associated with an expectation about the social or material future- one which the evaluator regards as socially desirable, to his [or her] advantage, or for his [or her] pleasure" (Tiger, 1979, p. 18). Optimism has to do with viewing positive factors as

permanent and connected to the individual self, while negative ones as disconnected with the individual self, impermanent and situation-specific (Seligman, 1991). Optimism is, therefore, a cognitive ability of individuals, as it has to do with a positive representation of the self, of a situation or of the self within a situation (Peterson, 2000). Individuals' decisions and actions are based on motivation, which entails comparing personal intentions, interests, and goals with expected outcomes, described by Wood & Bandura (1989) as cognitive comparison. In reality, optimism is both motivating and motivational, as it entails a cognitive evaluation dimension and an emotional dimension related to the need to be optimistic about certain issues (Peterson, 2000). Hence, someone may consciously decide to be optimistic.

The fact that optimism entails a degree of choice is reflected in its description as intentionally expecting that more positive than negative things will occur (Hmieleski & Baron, 2009; Langabeer & DelliFraine, 2011). Seligman (1991) defined flexible optimism as the ability of an individual to alternate from optimistic to pessimistic explanatory styles in situations that are risky and require prevention. So, individuals can apply optimism or pessimism according to the situation and the risks involved. This can also be related to paradoxical thinking, since the same individual can be both optimistic and pessimistic, depending on the circumstances, rather than being optimistic or pessimistic in general. Thus, decision makers may choose to be optimistic or pessimistic in different circumstances or may choose to view different decisions with varying degrees of optimism. This is related to strategic choice theory (Child 1972 & 1997), since choosing to be optimistic versus pessimistic about specific decisions could make a difference to the decisions leaders reach and to their outcomes.

The fact that individuals have a choice concerning optimism implies that optimism is not stable, but it can be viewed as a state-like capacity, which may be changed and developed (Luthans & Youssef, 2007a and 2007b). Optimism along with other positivity-related capacities can be a

source of competitive advantage for organizations (Luthans et al., 2007a, 2007b, 2010). Positivity in organizations leads to change and produces exceptional performance and extraordinary outcomes (Luthans 2002), through emphasizing advantages, strengths, and potential rather than focusing on difficulties, threats and feebleness (Cameron, 2008). Further, optimism has been associated with technological and business innovation, as well as the ability to build relationships (Gao et al., 2020).

On the other hand, too much focus on positivity can be harmful for organizations, as in the case of false hope (Snyder & Rand, 2003); positivity beyond a certain level can be delusional, and optimism has been found to harm new ventures' performance (Hmieleski & Baron, 2009). Thus, whether optimism is beneficial for organizations is associated with the context. This study examines the effect of leaders' optimism under a fractal crisis, as a cognitive characteristic (Peterson, 2000) that plays an important role in strategic decision making (Langabeer & DelliFraine, 2011). Similarly to optimism, the education of decision makers as a proxy of their overall cognitive abilities, is expected to have a significant impact on strategic decision making, and it is presented in the next section.

3.7.3 Education and Educational Level

Upper echelons theory (Hambrick & Mason, 1984) suggests that demographic characteristics of top executives can be viewed as proxies of their cognition (Hambrick, 2007). Among the various demographic characteristics, education is considered very important, as it has been linked with enhanced cognitive ability (Herrmann & Datta, 2005). In previous research, education-related characteristics of leaders have been used as a proxy of their cognitive ability, skills and knowledge (Batsakis & Theoharakis, 2021; Hambrick & Mason, 1984; Herrmann & Datta, 2005; Mom et al., 2009). Previous research has repeatedly examined the effect of education on strategic management, mainly in two forms: educational background (e.g. Jukka, 2021) and educational

level (e.g. Dollinger, 1984). This study focuses on the level of education of decision makers as an important factor in reaching strategic decisions.

Previous literature has extensively examined the role of educational level in management and strategy. Highly educated decision makers are more able to learn and can more easily adjust to environmental changes (Bantel & Jackson 1989). Similarly, those with higher levels of education are greater innovators and more open to change (Kimberly & Evanisko, 1981; Wiersema & Bantel, 1992). Furthermore, individuals with higher educational achievements tend to gather more information and analyse it better (Dollinger, 1984), an ability that is particularly useful under crisis. Overall, the education level of individuals is extremely important in the strategic decision-making process, as it enhances their ability to reach quality decisions, to respond better to change and to find new ways of doing things. These abilities are extremely important in crisis situations, when there are high levels of unpredictability, disruption and change, and the requirement to make decisions that won't harm the organization is imperative (Pearson & Clair, 1998). Therefore, the educational level of CEOs has been included in this project as a moderator, in accordance with previous research (e.g. Zhu et al., 2018).

All cognitive characteristics of CEOs serve as filters that are used to make sense of the situation, in order to achieve superior performance. Organizational performance, its significance, and its different dimensions are briefly reviewed in the next section.

3.8 Organizational Performance

Organizational performance is by default important in organizations (Venkatraman & Ramanujam, 1986), as organizations that do not perform well are facing threats related to their survival. On the contrary, those who achieve better performance are in an advantageous position concerning how

they invest, and plan for the future. In other words, performance is the actual test of effectiveness for any strategic decision (Evered et al., 1980) and, therefore, it has been used in a plethora of studies in management research.

The conceptualization of performance has typically been based on financial data and economic indices in the past few decades (Haggerty & Wright, 2009). In the early years of management research, organizational performance has been described in various ways: Etzioni (1964) related performance to the realization of firm goals, like sales and profitability; Yutchman & Seashore (1967) to how resources internal and external to the organization are used; and Thompson (1967) to the degree of fulfilment of the stakeholders' needs, including internal and external stakeholders. In the following years, organizational performance was revisited in more detail. When companies were reluctant to provide performance data, subjective evaluations of performance were introduced as proxies of observed performance (Dess & Robinson, 1984). Further, performance started being viewed as a combination of financial data and included more than one dimension, like profits *and* growth of sales *and* stock performance (Judge & Miller, 1991). When possible, performance data was collected retrospectively or at multiple time points, and averages were used as better indications of organizational performance over time (e.g. Priem et al., 1995), and past performance was used as a predictor of future performance (e.g. Fredrickson, 1985).

A significant milestone in strategic management research was Porter's (1998) seminal work that suggested that successful strategic management entails organizations not only achieving, but also sustaining superior performance. Different dimensions of performance became salient both prior to and around the time that Porter's work was published and they were examined in numerous studies including employee productivity (Bae & Lawler, 2000; Cappelli & Neumark, 2001), organizational productivity (Huselid, 1995), return on assets and investments (e.g. Haleblian & Finkelstein, 1993), or customer satisfaction (Delaney & Huselid, 1996), among others.

The vast majority of work on strategic decision making has focused on performance at the organizational level combining more than one financial indicator (e.g. Papadakis et al., 1998), and this is the approach of this study. As organizational-level performance is crucial for the survival of a firm under crisis, it is not enough for organizations to achieve high levels in one or some specific dimensions of performance. It is superior firm performance that makes a difference, not just superior performance concerning specific activities. In addition, a strong positive relationship between organizational ambidexterity and organizational performance has been repeatedly validated in previous work (e.g. Junni et al., 2013), whereas conflicting findings have been reported concerning the relationship between strategic decision speed and performance (e.g. Perlow et al., 2003). This study examines firm performance under the COVID-19 pandemic and how it is related with other aspects of strategy, aiming to shed light on strategic decision making under a fractal crisis.

3.9 The Key Debates

Strategic management literature has significantly advanced in the past decades, shifting from focusing on the external environment as the main input in the process of strategizing, to simultaneously examining different levels, internal and external to organizations as factors that influence strategy. Yet, there are some important debates that are still ongoing concerning different aspects of strategic management and this study aims to add to the discussion concerning some of these key debates. These debates can be categorized as relating more generally to strategic management and strategic decision making versus relating to specific aspects of strategy, like strategic decision speed or organizational ambidexterity that are both examined in this study.

The first key debate has to do with strategic management in general and concerns the level of influence that managers have, i.e. to what extent the characteristics and decisions of decision makers affect organizational outcomes, while viewing organizational ambidexterity as a key strategic decision. Strategic choice theory (Child, 1972 & 1997) and upper echelons theory (Hambrick & Mason, 1984; Hambrick, 2007) advocate that managerial choices and characteristics make a big difference. However, is this true under crisis conditions when there is increased environmental dynamism? In other words, to what level and in which ways can decision makers influence firm level outcomes related to strategy under the challenging environmental conditions of a crisis? The main paper on which this study aims to build concerning this debate is Furr & Eisenhardt's (2021) article on strategy under uncertainty, which suggests that in dynamic environments strategy has to do with thinking, doing and shaping. The study aims to contribute to the understanding of whether this is true and to what extent decision makers are involved in thinking, doing and shaping as strategists under crisis.

Another key debate that relates to strategic management in general, closely related to the first debate presented above, has to do with the factors that affect strategic decisions and their interaction, described as the context of strategic decision making by Elbanna et al. (2020). In other words, which factors affect the nature of strategic decisions and the process of reaching them, and how do they affect one another? A specific focus of this discussion has to do with the interplay between environmental impact and managerial actions, viewing environmental, individual and organizational characteristics as contextual factors of the decision-making process. This discussion on the context of strategic decisions making is a discussion that this study aims to add on, building on Elbanna et al.'s work (2020) through empirically considering different contextual factors simultaneously and examining their interplay. More specifically, this study incorporates individual characteristics related to CEO cognition, environmental dimensions and organizational features, and takes a holistic view of strategic decision making at different levels. Further, this study follows

Elbanna et al.'s (2020) suggestion to borrow concepts and ideas from the area of strategic decision making and applying them in a fundamental field of strategic management research, i.e. organizational ambidexterity.

The third debate relevant to this study specifically concerns strategic decision speed and the ongoing discussion concerning the effect of reaching strategic decisions quickly. The question here has to do with whether a high pace of reaching strategic decisions is beneficial for organizations or not, and previous research has produced mixed and contradictory findings: in some cases deciding quickly about strategic issues has been associated with superior performance (e.g. Baum & Wally, 2003), in others with poor performance (e.g. Perlow et al., 2002) and there were also cases where it was found to not affect firm performance at all (e.g. Forbes, 2001). The main paper on which this study aims to build on is the paper by Shepherd et al, (2021), which examines the decision quality of strategic decision speed. In this study, decision quality is specifically related with the outcomes of strategic decision speed and whether they are positive or negative for the organization. The potential outcomes of strategic decision speed examined in this study are organizational ambidexterity, empirically examined for the first time as an outcome of deciding quickly about strategy, and firm performance, which has been repeatedly examined with mixed findings.

The fourth and last debate relevant to this study is specific to organizational ambidexterity and has to do with whether it is beneficial and achievable for organizations in different contexts, specifically in dynamic and crisis contexts. So far, ambidexterity has been proven beneficial under uncertainty and instability (Heracleous et al., 2017) and when the environment is highly volatile, uncertain, complex, and ambiguous (Du & Chen, 2018). However, the outcomes of organizational ambidexterity have not yet been sufficiently researched under crisis (Jang & Lee, 2022), and especially under a fractal crisis like the global pandemic. Although there are indications of a

positive relationship between organizational ambidexterity and positive outcomes under crisis (e.g. Dolz et al., 2019; Jang & Lee, 2022), there is the need for multiple studies that examine the outcomes of organizational ambidexterity under different types of crisis and/or under different phases of the same crisis. Further, if it is beneficial for companies to pursue ambidexterity under crisis, an important issue arises: how easy is it for companies to achieve ambidexterity under crisis, when environmental dynamism is very high? This study aims to contribute to this discussion, viewing the Du & Chen (2018) article as a key paper in this discussion, since it raises the issue of applying ambidexterity in challenging environmental conditions.

Overall, this study is taking an integrated multilevel approach on strategic management, while focusing on strategic decision making under crisis, with the aim to add to the discussion on the three key debates presented above.

3.10 Chapter Summary

When the environment is rapidly changing and difficult to predict, previous literature has identified reaching decisions quickly and pursuing organizational ambidexterity as beneficial for organizations (e.g. Eisenhardt, 1989; Junni et al, 2013). A literature review on these key strategic aspects of organizations indicated that they share the same outcomes, like innovation, superior firm performance or firm survival. Hence, the question arises concerning whether strategic decision speed and organizational ambidexterity are related, based on the fact that how quickly opportunities are identified and pursued affects how quickly exploitative and explorative opportunities are recognized and seized. Strategic speed and organizational ambidexterity are both part of the strategic decision-making process in organizations. Strategic decision making is important at all times, but is even more crucial during a crisis. Therefore, apart from the literature on strategic decision speed and organizational ambidexterity, a brief preview of crisis literature

was presented and the fact that pandemic crisis is a fractal crisis (Topper & Lagadec, 2013) was explained.

Organizations respond to crisis in four different ways according to environmental conditions when the crisis began. When the environment is complex, like in the case of Greece, companies are expected to use tactical responses that focus on the short-term. However, the role of decision makers is very important, as they are required to make sense of the situation in order to make decisions and take action (Weick, 1988). How decision makers perceive the crisis is crucial (Habermas, 1975), as reaching strategic decisions under crisis is based on perceived time constraints and cognitive limitations (Pearson & Clair, 1998). Therefore, the role of CEOs and their cognition is extremely important, as are perceptions about environmental factors. All the above influence strategic decisions reached under crisis, the process of reaching them and their outcomes, with the crucial outcome being firm performance. Hence, a presentation of the specific individual cognitive characteristics examined in this study, i.e. paradox mindset, optimism, and educational level, and the role of the environment, as well as performance were briefly reviewed.

Based on the rationale and theoretical background presented in Chapters 2 and 3, the following Chapter explains how hypotheses were formed and presents the research model under examination.

4. Organizational Ambidexterity and Strategic Decision Making under Crisis: an Integrative Model

This chapter includes the deductive reasoning based on which the hypotheses for this study have been formed. In this dissertation, organizational ambidexterity is viewed as part of strategic decision making. This means that the study is focusing on the process of making the strategic decision to be ambidextrous and not on how the decision to pursue ambidexterity is implemented. However, the study examines whether the decision has been effectively implemented, i.e. whether firms in the sample have achieved organizational ambidexterity. Furthermore, apart from the strategy formulation part, the outcomes of organizational ambidexterity are examined, i.e. whether this has led to superior performance. Therefore, this study is concerned with what happens prior to making the decision to pursue ambidexterity or the set of decisions that the ambidexterity decision entails, and after having reached the decision(s).

The decision concerning the pursuit of ambidexterity may not be conscious, i.e. top executives may decide to pursue both exploration and exploitation without being familiar with what exploration and exploitation mean. However, ambidexterity requires decision makers to reach strategic and investment decisions that enable a balance between exploration and exploitation opportunities (Fourné et al., 2019). Thus, if ambidexterity is achieved, it means that the ambidexterity decision has been made at some point (consciously, or not). If ambidexterity is not achieved, there are three possible explanations concerning why the company is not ambidextrous: firstly, a decision has been reached to only focus on either exploration or exploitation opportunities, i.e. the company pursues one of the two types of opportunities; secondly, ambidexterity is pursued, i.e. the company is trying to pursue both types of opportunities, but ambidexterity implementation is problematic; or thirdly, the company is performing low both on explorative and exploitative activities, which may occur if a company remains strategically

inactive, i.e. is not implementing decisions concerning exploration and exploitation opportunities. In any case, whether decision makers realize it or not, they are involved in the strategic decision-making process related to ambidexterity.

As follows, the specific aspects of incorporating ambidexterity in the strategic decision-making process that are relevant to this study are described.

4.1 Strategic Decision Speed and Organizational Ambidexterity

Time is a basic dimension in all organizational phenomena, and it is inherent in behavioral research (Jones & Coviello, 2005). Strategic speed is a basic dimension of decision making related with time and there are important variations concerning the time needed by different companies to reach strategic decisions (Eisenhardt, 1989), leading to different organizational outcomes.

According to previous research, reaching strategic decisions quickly is essential in dynamic environments (e.g Halevi et al., 2015; Hmieleski & Ensley, 2007), because delaying decisions may lead to being misaligned with the pace of external change and missing opportunities (Shepherd et al., 2021); the missed opportunities include opportunities for exploitation and exploration. In dynamic environments, slower decision making entails the risk of basing the decision on obsolete information (Eisenhardt, 1989; D'Aveni et al., 2010); this may mean that the opportunity may no longer be available or relevant when the decision is made. So, reaching decisions quickly enables opportunity capture in dynamic environments, including exploration and exploitation opportunities. Therefore, strategic decision speed is expected to be positively associated with ambidexterity in dynamic environments.

On the other hand, reaching strategic decisions quickly in non-dynamic environments is also beneficial for opportunities identification and seeking, because in case of delays, opportunities will be taken by competitors; competitors will then enjoy first-mover advantages in an environment that is not significantly changing, which entails that they learn more by possible mistakes as early adopters and make the required changes quickly in order to impede late movers from capturing the opportunity (Lieberman & Montgomery, 1988). Thus, fast decision making enables the effective capture of opportunities (Bakker & Shepherd, 2017), including opportunities for exploration and exploitation, in non-dynamic environments. In other words, strategic decision speed is expected to be positively associated with ambidexterity in non-dynamic environments as well.

Furthermore, firms that act instead of just planning and waiting, exploit existing internal knowledge (Pfeffer & Sutton, 2000), while deciding fast creates new knowledge with leaders making more decisions in the specific time period and learning from them (Eisenhardt, 1989; Mosakowski, 1997). Thus, being ambidextrous requires deciding quickly based on using existing knowledge, in order to try to identify and capture the opportunities based on what is known so far – related to exploitation. At the same time, being ambidextrous requires trying and learning new things in order to pursue the opportunities, enhancing the creation of new knowledge – related to exploration. Delays in decisions entail not acting, hence neither using existing knowledge nor creating new knowledge. But knowledge and learning are inherent in organizational ambidexterity according to March (1991) who had initially conceptualized ambidexterity as the dilemma between exploratory and exploitative activities in organizational learning. In other words, fast decision making enhances opportunities identification and capture and enhances the use of existing knowledge (exploitation) and the creation of new knowledge (exploration) in organizations in all environments.

Overall, in any environment, opportunities for achieving ambidexterity are related to opportunities for creating new products or entering new markets and market segments (exploration opportunities), or to the improvement and optimization of internal systems, processes, and technologies (exploitation opportunities) (Benner & Tushman, 2003; Fourné et al., 2019). When the relevant decisions are reached fast, both types of opportunities have higher chances of being recognized and seized, both in dynamic and in non-dynamic environments. Strategic speed implies that exploitation and exploration opportunities are not overlooked, due to not being identified on time, and are not missed due to no longer being available because competitors have already seized them. This leads to forming the first hypothesis:

HYPOTHESIS 1: *Strategic speed is positively related to organizational ambidexterity.*

4.2 Strategic Decision Speed and Organizational Ambidexterity Relationship

Contingencies

Previous literature has separately examined relationships that include strategic decision speed (e.g. Shepherd et al., 2021) and organizational ambidexterity (e.g. Judge & Blocker, 2008) for moderating effects, using various factors as moderators, including individual leaders' characteristics and environmental factors. Recognizing the importance of moderators in correlational relationships, the proposed relationship between strategic decision speed and organizational ambidexterity was tested for moderators. The rationale behind each moderating hypothesis is presented as follows.

4.2.1 Paradoxical Thinking under Crisis

The COVID-19 global crisis entailed multiple paradoxes for organizations with some of them, like short-term versus long-term focus, social impact versus financial performance, performing versus

learning, and individual versus social focus, being recognized as crucial (Carmine et al., 2021; Sharma et al., 2021). Paradoxical thinking has been recognized as endogenous in human thought since the Ancient Times (Frazer, 2015) and as a central way of thinking that helps dealing with tensions (Smith & Lewis, 2011). When the tensions experienced by organizational actors are viewed through adopting a *both/and* approach (Seo et al., 2004), paradoxical thinking is enacted (Smith & Lewis, 2011). Paradoxical thinking becomes more important when major exogenous shocks affect the business environment (Smith & Lewis, 2011) and such shocks were created by the pandemic crisis. COVID-19 has had huge impact on the business environment, an impact with an extended duration that rendered the tensions that organizations faced salient and urgent (Carmine et al., 2021; Sharma et al., 2021).

When managing organizational tensions, leaders who use paradoxical thinking are able to combine agendas that may appear incompatible (Lewis, 2000; Smith & Tushman, 2005), like simultaneously recognizing and pursuing opportunities for exploration and exploitation. Therefore, decision makers who apply paradoxical thinking are not expected to view exploration and exploitation opportunities as mutually exclusive; combining these two types of opportunities in their strategic portfolio seems perfectly possible for them, even under crisis. Moreover, under crisis decisions need to be made quickly (Corbacioglu et al., 2016), something that further enhances the tensions experienced by organizational leaders. Paradoxical thinkers are expected to be more prone to navigate these tensions, including the tensions related to exploitation versus exploration opportunities.

Previous research findings suggest that a paradox mindset positively moderates the relationship between experiencing tensions and innovation, as well as experiencing tensions and in-role job performance (Miron-Spektor et al., 2018). But innovation is part of a company's exploratory activities and in-job role performance is part of its exploitative activities. In addition, high levels

of a paradox mindset are beneficial for creating new products or services when resources are limited (Miron-Spektor et al., 2018), which is usually the case during a crisis. Thus, a paradox mindset is expected to affect organizational ambidexterity when there are tensions in the environment, like in the case of a crisis. Paradoxical thinkers are expected to both exploit and explore more than leaders who do not have a paradox mindset when there are tensions in the environment, since their individual tendency of accepting contradictions is a helpful mechanism that enables them to deal with the contradictory challenges (Lomranz & Benyamini, 2016).

Tensions experienced by decision makers are further enhanced, when there is the need for speed in decision making (Smith & Lewis, 2011). Decision makers who are required to decide fast under crisis and possess a paradox mindset are, therefore, expected to be able to recognize the tensions created by the crisis, not to be frustrated by them and to be able to think more clearly about their strategic options (Miron-Spektor et al., 2018). Paradoxical thinkers who reached decisions quickly under the pandemic are expected to have been able to understand that a quick decision should not ignore different options and should not be based on settling for suboptimal strategies (Miron-Spektor et al., 2018), as these leaders are more able to expand their attentional span and to be engaged in a more balanced examination of their options (Rothman & Melwani, 2017). In addition, paradoxical thinking is associated with inaction avoidance (Lüscher & Lewis, 2008), thus with taking action that is based on decisions; thus, decisions are not delayed. Therefore, leaders with a high paradox mindset, who are reaching decisions quickly under crisis, are expected to be more able to manage the tensions inherent in fast decision making, to consider the different opportunities that exploitation and exploration entail, and to pursue a balance of both in their strategy.

On the contrary, leaders who reach decisions fast under crisis and have a low paradox mindset are more likely to be overwhelmed by the time pressure and the tensions, and to probably focus on exploitation opportunities that are simpler to analyze. Under time pressure, individuals usually

prefer solutions that entail lower risk and are less motivated to be creative (Bechtoldt et al., 2010). Non-paradoxical thinkers are expected to exhibit these typical behaviors under time pressure, which also include not considering multiple options (Amabile et al., 2003) and rejecting radical ideas (Madjar et al., 2011). The absence of a paradox mindset makes it seem natural that strategic decisions about opportunities are *either/or* ones, as the idea that one cannot do everything under time pressure prevails. Under the pressure to decide fast under crisis, those with low levels of paradoxical thinking are expected to base their strategic decisions on the idea that there are trade-offs, and one needs to make choices between alternatives instead of combinations. Contrarily to those with a high paradox mindset, non-paradoxical thinkers view exploration and exploitation opportunities as mutually exclusive, and probably preferred to play it safe under crisis. Non-paradoxical thinkers are less able not understand that deciding fast and combining different types of opportunities can lead to a competitive advantage, as the opportunity logic suggests (Bingham & Eisenhardt, 2008), because they are overwhelmed by the time pressure and are less able to deal with the tensions it creates.

To sum up, decision makers with a higher paradox mindset are more likely to pursue both exploitation and exploration opportunities under crisis, as their paradoxical thinking helps them apply a both/and rationale concerning the uncertain and risky decisions under crisis. Thus, it is expected that, under crisis, a paradox mindset moderates the relationship between strategic decision speed and organizational ambidexterity. This leads to the formation of the second hypothesis:

HYPOTHESIS 2: Under crisis, a paradox mindset moderates the relationship between strategic decision speed and organizational ambidexterity, such that this relationship is stronger at higher levels of CEO paradox mindset and weaker at lower levels.

4.2.2 Positivity and Optimism under Crisis

Crises place an undeniable psychological pressure on individuals (Pearson & Clair, 1998), as they challenge their belief that bad things cannot happen to them and the assumption that taking the right actions will produce a positive outcome (Janoff-Bulman & Frieze, 1982). This pressure is even greater for organizational leaders, because crises “threaten the most fundamental goals of organizations” (Weick, 1988, p. 305) and it is the leaders’ responsibility towards their companies and employees to make sure that these goals are still achieved. Identifying any positive aspects in a crisis sounds like a very difficult task. Optimism has been described by Seligman (1991) as the cognitive ability to expect a positive outcome and react to negative situations with an enhanced sense of confidence. Remaining positive in the face of adversity has proven to be beneficial (Carver et al., 2002), since believing in a positive outcome has been associated with improved psychological adjustment to the factors that are causing pressure and stress (Scheier & Carver, 1992).

It is somehow unexpected that when facing a crisis that creates increased pressure and stress, a person responds with a positive view of the situation, but this is what optimistic individuals do. Optimists can better adjust to difficult situations using their positive emotions as a motivation (Solberg Nes et al., 2009). Moreover, optimism has been found to moderate the relationship between limited work resources and engagement, weakening the negative effect of the limited resources’ (Salminen et al., 2014); and resources are limited during a crisis. Specifically during the pandemic crisis, individual optimism was found to have a positive relationship with the ability to adjust to work from home (Biron et al., 2020). This indicates that optimism enabled individuals to better adapt to change caused by the pandemic crisis. In addition, optimistic individuals experienced less fear during the pandemic and engaged in fewer preventive behaviors (Jovančević & Milićević, 2020).

Optimistic organizational leaders, as optimistic individuals, are expected to experience less fear under crisis; therefore, they are expected to be bolder and less worried about negative outcomes even when there is the pressure to reach decisions quickly. As decision makers, optimists that need to decide fast are expected to find it easier to pursue exploratory opportunities, the outcomes of which are not always clear (March, 1991), because they disconnect themselves from negative outcomes or they perceive them as temporary (Seligman, 1991). Under the opportunity logic, organizations' strategy is led by the "attractiveness of opportunities flows" (Bingham & Eisenhardt, 2008, p. 250) and by the speed of decision making while deciding which opportunities are attractive. The more optimistic the decision makers, the more able they are to perceive both exploitative and explorative opportunities as promising and attractive, when they need to decide fast under changing and unpredictable conditions. In other words, optimistic leaders who reach decisions quickly in dynamic environments are more likely to consider and pursue both types of ambidexterity opportunities and do not reject opportunities a priori, because of their expectation that things will be fine in the end.

On the contrary, operating under the opportunity logic has the opposite effect for pessimistic leaders. The opportunity logic suggests that strategic decision makers apply simplified rules when deciding quickly (Bingham & Eisenhardt, 2008; Furr & Eisenhardt, 2021); these simplified rules applied by less optimistic or pessimistic leaders would be based on expecting non-beneficial outcomes in general and even more so when there is uncertainty and strategic decision speed, harming ambidexterity under crisis in two ways: firstly because pessimistic leaders will perceive the outcomes of exploration as negative and will not consider pursuing opportunities for exploration, and secondly by expecting negative outcomes overall, leading them to strategic inertia (Fredrickson and Iaquinto, 1989), not considering or pursuing strategic opportunities at all.

Overall, optimistic leaders were less scared during the pandemic (Jovančević & Milićević, 2020); hence, they are expected to not be afraid to pursue both exploration and exploitation opportunities when deciding quickly, as the fear of making the wrong decision due to the high pace of reaching decisions would be lower. Therefore, when making fast decisions, the identification and pursuit of opportunities for both exploration and exploitation would be easier for more optimistic leaders, compared to less optimistic ones who might focus solely on opportunities related to exploitation that have a more certain outcome. This leads to the formation of the third hypothesis:

HYPOTHESIS 3: Under crisis, CEOs' optimism moderates the relationship between strategic decision speed and organizational ambidexterity, such that strategic decision speed has a stronger impact on ambidexterity when leaders are more optimistic.

4.2.3 Decision-makers' Educational Level

As already explained, education is generally considered a proxy of individuals' cognition (Hambrick & Mason, 1984). This is evident in the amount of previous research work that has used the educational level of leaders as a proxy of the cognitive ability, skills, and knowledge of decision makers (e.g. Hambrick & Mason, 1984; Herrmann & Datta, 2005; Mom et al., 2019). The educational level of decision makers has been tested and validated as a moderator in relationships that include aspects of strategic management and their outcomes (e.g. Zhu et al., 2018).

The education level of individuals has been associated with the degree of information seeking and analysis (Dollinger, 1984). Thus, the more educated decision makers are more able to perceive, analyse and evaluate different strategic options. Previous research indicates that the level of education of CEOs enhances their capacity to solve complex issues (Goll et al., 2007) as well as to be involved in different activities (Papadakis et al., 1998). The opportunity logic suggests that perceiving and seizing opportunities early and quickly is central in a company's strategy (Bingham

& Eisenhardt, 2008); thus, highly educated CEOs that reach decisions quickly are expected to find it easier to be engaged in the process of identifying and pursuing different types of opportunities in general, and related to exploration and exploitation in particular. When reaching decisions quickly, highly educated CEOs are expected to be more able to address the complex situation related to pursuing both explorative and exploitative opportunities.

On the contrary, decision makers with lower levels of education lack the motivation to generate the cognitive processes related to facing complex issues and cannot easily handle the tensions created by strategic decision speed, falling in the trap of cognitive inertia (Arogyaswamy et al., 1995). Based on the opportunity logic, a key challenge in decision making is the challenge of maintaining an optimal level of simplicity (Bingham & Eisenhardt, 2008) under strategic decision speed. Leaders with lower education levels may find it difficult or lack the motivation to process the information needed in order to identify this optimal level, which combines flexibility and structure, i.e. they are expected to find it difficult to reach ambidexterity under time pressure. Strategic speed entails time pressure, which makes it difficult to follow rules (Davis et al., 2009) and decision makers need to rely on their cognitive ability when prioritizing or reprioritizing strategic options (Le Bris et al., 2019). Less educated decision makers are expected to be overwhelmed by these challenges, and to look for the simplest way to avoid conflicts and tensions in strategic decision making under crisis. To them, identifying and pursuing both exploration and exploitation opportunities when there is shortage of time would seem too complex a task. Thus, when deciding fast under crisis, less educated leaders are expected to try to reduce complexity by considering fewer opportunities instead of multiple types of opportunities, and by possibly focusing on exploitative ones that are more easily evaluated. The above lead to forming the fourth hypothesis:

HYPOTHESIS 4: Under crisis, CEOs' educational level moderates the relationship between strategic decision speed and organizational ambidexterity, such that the relationship is stronger for those with a higher educational level.

4.2.4 Environmental Dynamism

The impact of the environment is crucial for strategic decision making (Hrebiniak & Joyce, 1985; Hitt & Tyler, 1991). Previous research posits that how managers perceive the environment is actually more significant than the environment itself, and when it is perceived as uncertain and rapidly changing, decisions that are viewed as appropriate for unstable and volatile environments are more likely (Freel, 2005; Hambrick & Snow, 1977).

Under the opportunity logic, strategy is based on recognizing and seizing opportunities faster and earlier than competitors (Bingham & Eisenhardt, 2008). The entrepreneurship and applied psychology literatures offer conflicting perspectives on the effect of uncertainty on individual behaviour related to the identification and pursuit of opportunities, specifically those related to exploration; according to some researchers, uncertainty makes individuals experiment and try to find new solutions (Griffin et al., 2008), and hence leads to identifying new opportunities (Shane & Venkataraman, 2000; Van Gelderen et al., 2000). In line with this stream of research, previous work suggests that organizations are more likely to pursue ambidexterity in dynamic environments; Jansen et al. (2006) have found that firms with multiple units create ambidextrous units when competing in dynamic environments, whereas Jansen et al. (2005) found that environmental instability and change predicted organizational ambidexterity.

On the contrary, another stream of research suggests that uncertainty and rapid change leads to psychological entropy due to individuals experiencing tensions and conflict concerning their perceptions about options and opportunities (Hirsh et al., 2012). The increased level of uncertainty

about different opportunities makes decision makers exert avoidance behaviors, limiting the identification and pursuit of opportunities in general, with a trend to particularly avoid explorative opportunities (Hirsh et al., 2012; March, 1991; McMullen & Shepherd, 2006). Therefore, in line with this stream of research, one would expect that increased uncertainty and change would harm ambidexterity. The psychological entropy created by a fractal crisis would impede exploration, due to the high level of dynamism in a fractal crisis.

Hence, there is evidence of both positive and negative effects of environmental dynamism on pursuing opportunities in general and explorative ones in particular, in previous literature. Taking into account both streams of research, in this study it is expected that leaders who recognized the high levels of environmental dynamism that the fractal pandemic has created, were hesitant to pursue ambidextrous opportunities. A natural tendency for decision makers would be to either prefer safer opportunities or to wait and see concerning opportunities (Bingham & Eisenhardt, 2008), taking some time to evaluate the situation, and waiting until conditions and options about ambidexterity are clearer. The CEOs who actually perceived the pandemic as bearing the characteristics of a fractal crisis, are expected to have preferred the safe options related to exploitation opportunities (March, 1991) or to create a delaying effect in identifying and pursuing opportunities overall, as suggested by Bakker & Shepherd (2017).

Reaching strategic decisions quickly under a fractal crisis is expected to increase the perceived risks associated with pursuing both exploration and exploitation of opportunities, because the already high levels of unpredictability and ambiguity of the environment would be further enhanced by pursuing the unpredictable – in terms of outcomes – explorative opportunities (March, 1991). Furthermore, the lack of confidence about the outcomes of pursuing opportunities in general (Dess & Beard, 1984) is expected to be even more intense under a fractal crisis, leading to delaying the pursuit of both exploratory and exploitative opportunities, even after the decisions to pursue them

has been made. Thus, those leaders who decide fast and perceive the environment as extremely dynamic are expected to either prefer exploitation over exploration, or to not proceed with the implementation of decisions that concern ambidextrous opportunities, weakening the effect of strategic decision speed on organizational ambidexterity. This leads to forming the fifth hypothesis:

HYPOTHESIS 5: Under crisis, environmental dynamism moderates the relationship between strategic decision speed and organizational ambidexterity, such that the relationship is weaker at higher levels of perceived environmental dynamism.

4.3 Ambidexterity and Performance under Crisis

Organizational ambidexterity has been found to be a major driver of firms' long-term success (Tushman & O'Reilly, 1996), being positively associated with new venture and firm survival (Gibson & Birkinshaw, 2004; Hill & Birkinshaw, 2014), firm growth (Geerts et al., 2010) and organizational performance (e.g. Gieske et al., 2020; He & Wong, 2004; Lubatkin et al., 2006; Patel et al., 2013). More importantly, ambidexterity is considered extremely useful and beneficial under uncertainty and instability (Heracleous et al., 2017), characteristics of dynamic environments. Being ambidextrous enhances value creation for the customer when volatility, uncertainty, complexity, and ambiguity (VUCA) in the environment are high (Du & Chen, 2018). Ambidextrous organizations are more able to focus on the crucial and contradicting elements of strategic management that have to do with the time element of crisis: they can face short-term issues that disrupt everyday activities by seizing exploitative opportunities, as well as pursue opportunities that ensure revenues and profits in the long term through exploration.

The opportunity logic of strategy (Bingham & Eisenhardt, 2008) suggests that the early and faster than competitors' recognition and pursuit of opportunities helps companies achieve a competitive advantage, specifically in dynamic environments (Bingham & Eisenhardt, 2008). Ignoring one type of opportunity, i.e. overlooking opportunities for either exploration or exploitation, would mean that this type of opportunity is not recognized early and fast, leading to missing these opportunities and to inferior performance, while leaving room for competitors to achieve superior performance. Previous findings support the link between ambidexterity and performance in dynamic environments (Junni et al., 2013; Lee et al., 2003; O'Reilly & Tushman, 2013; Simsek et al., 2009; Tempelaar & Van De Vrande, 2012). More specifically, Kafetzopoulos (2021) found that the link between ambidexterity and performance was higher for those companies who perceived the environment as highly uncertain.

Crises are highly uncertain environments, but the ambidexterity – firm performance link has not yet been sufficiently researched under crisis (Jang & Lee, 2022). Cao et al. (2009) suggest that balancing exploration and exploitation is beneficial for the performance of companies that operate in resource-constrained environments and crisis environments are characterized by limited resources. However, Doblinger et al. (2022) discovered a U-shaped relationship between ambidexterity and performance under crisis, where lower and higher levels of ambidexterity lead to better performance compared to mediocre levels of ambidexterity. However, once organizations are able to achieve a sufficiently high level of ambidexterity, i.e. a threshold of ambidexterity, further increasing exploration and exploitation positively impacts performance. Further, ambidexterity has been found to enhance firm survival under crisis (Dolz et al., 2019) and to predict superior performance under the COVID-19 pandemic crisis (Jang & Lee, 2022).

Based on the above, it is expected that ambidexterity is beneficial for companies operating in crisis environments. The argument that ambidexterity enhances performance during a crisis is based on

the negative expected outcomes of focusing solely on exploitation or exploration under crisis (Schmitt et al., 2010). By focusing solely on exploitation during a crisis, there is the danger that the crisis discontinuities render strategic decisions outdated and since no new knowledge is created, the company falls in a trap of being unable to respond to change. The risk of an organization's inability to remain current on ongoing issues is higher when the environment is changing and ambiguous (Halevi et al., 2015; Hmieleski & Ensley, 2007), i.e. under crisis. Thus, performance is harmed when only exploitation opportunities are pursued under crisis; evidence of this happening was provided by D'Aveni (1989), who found that firms that go bankrupt are focusing more on existing strategies compared to firms who survive under crisis. Further, firms who do not survive a crisis focus more on internal processes related to exploitation, compared to surviving firms (D'Aveni & MacMillan, 1990).

Similarly, if companies solely rely on exploration opportunities during a crisis, there is the risk that the investment made to pursue exploration is too big for the company to handle, since too many firm resources are assigned to uncertain endeavours (Schmitt et al., 2010). The investments entailed by exploration may not yield returns (Levinthal & March, 1993) or may yield returns that are not enough to support the continuation of the company's operations. Under crisis, pursuing exclusively exploration opportunities may bring the company in unfamiliar situations that are difficult to handle and that may require a large proportion of the organization's financial and human resources, which are already limited under crisis (Schmitt et al., 2010). In case the exploration activities do not yield returns, resources that could be used for ensuring the firm's survival are lost. Hence, an exclusive focus on exploration under crisis may harm performance and negatively affect firm's survival.

Therefore, there is the need for balancing the recognition and pursuit of exploitation and exploration opportunities under crisis; the new knowledge created through exploration

opportunities will lead to generating new revenues, while the optimization of internal processes through exploitation will ensure the firm's survival. In uncertain and rapidly changing environments, firms need to continuously acquire new knowledge, aligned with the external conditions at any given point in time, because information, product and service offerings may become quickly obsolete (Sørensen & Stuart, 2000). At the same time, companies need to integrate this new knowledge in their internal processes and systems, in order to achieve superior performance. Thus, identifying and pursuing both exploitation and exploration opportunities, i.e. organizational ambidexterity, is expected to have a positive effect on performance under crisis. This leads to the formation of the sixth hypothesis:

HYPOTHESIS 6: *Under crisis, organizational ambidexterity is positively related to organizational performance.*

4.4 The Research Model

Table 8 presents all the aforementioned hypotheses. Hypotheses 1 and 6 entail the examination of a direct relationship each, whereas Hypotheses 2 to 5 entail the examination of four moderation hypotheses concerning the direct relationship in Hypothesis 1. The first three moderation effects are hypothesized as positive (strengthening moderation effects), whereas the fourth one (Hypothesis 5), is hypothesized as negative (weakening moderation effect).

Table 8: Research Hypotheses

Hypothesis 1	Strategic speed is positively related to organizational ambidexterity.
Hypothesis 2	Under crisis, a paradox mindset moderates the relationship between strategic decision speed and organizational ambidexterity, such that this relationship is stronger at higher levels of CEO paradox mindset and weaker at lower levels.
Hypothesis 3	Under crisis, CEOs’ optimism moderates the relationship between strategic decision speed and organizational ambidexterity, such that strategic decision speed has a stronger impact on ambidexterity when leaders are more optimistic.
Hypothesis 4	Under crisis, CEOs’ educational level moderates the relationship between strategic decision speed and organizational ambidexterity, such that the relationship is stronger for those with a higher educational level.
Hypothesis 5	Under crisis, environmental dynamism moderates the relationship between strategic decision speed and organizational ambidexterity, such that the relationship is weaker at higher levels of environmental dynamism.
Hypothesis 6	Under crisis, organizational ambidexterity is positively related to organizational performance.

Based on the hypotheses formed, the model under examination is presented in Figure 5 below:

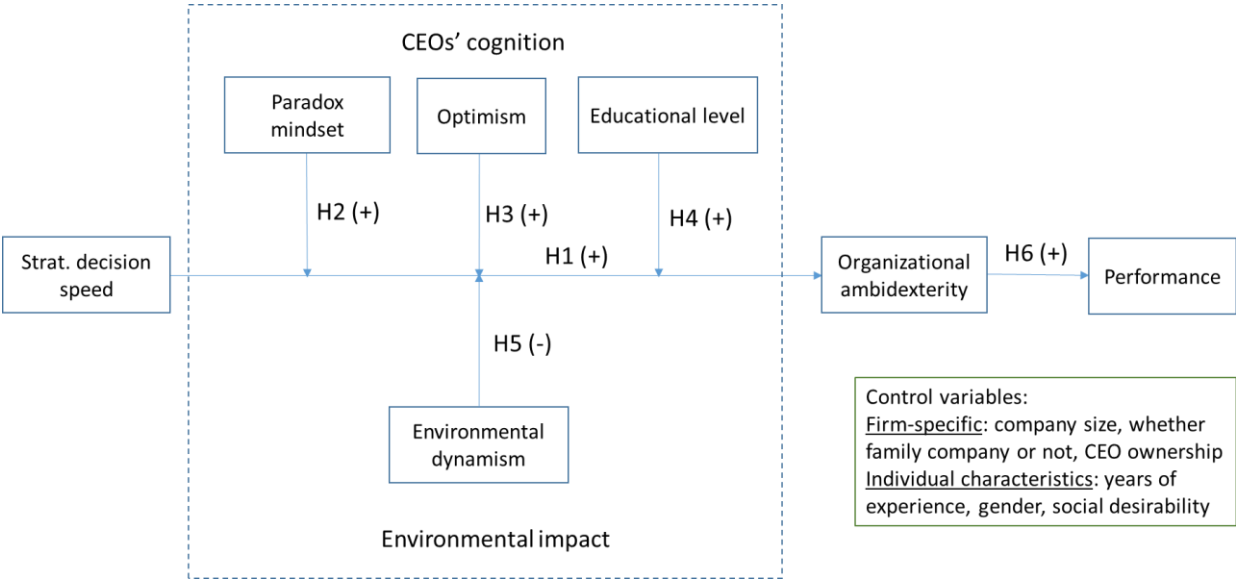


Figure 5 – Organizational Ambidexterity as a Strategic Decision under Crisis

In this study, organizational ambidexterity and strategic decision speed are the model’s organizational characteristics. Strategic speed is not connected to one specific decision, but to the usual, average pace of reaching decisions at the firm-level (Adomako et al., 2021), including all

decisions about exploration and exploitation opportunities. Based on what has been previously presented in terms of how the speed of reaching decisions affects identifying and seizing opportunities for exploration and exploitation, strategic decision speed is examined as an antecedent of ambidexterity. The outcome of the decision to pursue ambidexterity is also examined in terms of relative performance compared to competitors, based on the suggestion that the effectiveness of a strategic decision is based by its impact on firm performance (Dane & Pratt, 2007).

Further, CEOs' cognition-related characteristics and environmental impact are examined as moderators of the relationship between strategic decision speed and ambidexterity under crisis. Concerning decision makers' characteristics, this study includes cognition-related ones, namely educational level, paradox mindset and optimism. The choice of these three specific individual characteristics is based on the following: a) educational level has been used as a proxy of the overall cognitive ability of individuals in previous research (e.g. Batsakis & Theoharakis, 2021; Mom et al., 2009), b) paradox mindset (Miron-Spektor et al., 2018) as relevant to managing tensions entailed by crises (Smith & Lewis, 2011), and c) optimism (Seligman, 1991) as a contradictory framing for a crisis, which is usually interpreted using negative framing (James et al., 2011). Concerning environmental impact, the environment is a significant source of data and information that is used for analyzing and evaluating strategic decisions (Scott, 1981); hence, through their perceptions of the environment, decision makers incorporate environmental features in the strategic decision-making process. In this study, the effect of environmental characteristics on strategic decisions (Hitt & Tyler, 1991) is included through the examination of environmental dynamism, which reflects the degree of unpredictability and the pace of change in the environment (Dess & Beard, 1984), as a moderator of the first direct relationship examined.

4.5 Chapter Summary

This Chapter explained how deduction is used to form the hypotheses tested by this research and presented the research model under examination, based on the theoretical background and the assumptions presented in the two preceding Chapters. Two direct relationships are tested in this study: the relationship between strategic decision speed and organizational ambidexterity, and the relationship between organizational ambidexterity and firm performance. Both relationships are examined under crisis, and more specifically under the fractal COVID-19 crisis. In addition, four moderation effects are examined on the relationship between strategic decision speed and organizational ambidexterity: the effects of paradox mindset, optimism, and educational level, related to CEOs' cognition, and the effect of perceived environmental dynamism. The next Chapter presents the methodology followed in order to answer the research questions and to test the six hypotheses included in the research model.

5. Methodology

This Chapter presents the methodology of this study and explains the researcher's views on methodological issues. First, predominant research epistemologies in the field of social sciences and management (positivism, critical realism, interpretivism, post-modernism and pragmatism) are presented, followed by a presentation of research ontologies (deductive, abductive, and inductive research). Epistemological assumptions guiding the selection of research methods are presented in order to explain why a deductive, positivism approach is chosen for this study. A detailed examination of the research context and an explanation of how the context was incorporated into project design are presented next. Next the project phases are described, including sampling and data collection. Further, the ethics process, quality assurance process and the respective tools used are presented. The final sections of the Chapter present the variables and measures used, along with the rationale behind the selection of the specific measures.

5.1 Philosophy of Research

Social science research aims to explain, explore or describe how phenomena occur (Hart, 1998), while the Research Excellence framework defines research as a method of investigation that creates new understandings (HEFCE, 2009). It is essential for researchers to reflect on the diverse philosophical positions in research and identify a research paradigm that they view as representative of their view of the world before choosing the methodological approach for any specific research project (Guba & Lincoln, 1994). Research questions can be investigated using a qualitative, quantitative, or mixed approach. Hence, selecting an appropriate research paradigm should precede selecting a research method. Researchers need to comprehend and consider the different philosophical positions of research in order to be able to design the research and determine the nature of the study and its focus (Benton & Craib, 2010).

The concept of a research paradigm was introduced by Kuhn (1970), who defined it as a position about research and theory based on common views and ideas in a field. Subsequently, a research paradigm has been defined as a “basic belief system or world view that guides the investigator, not only in the choices of method but in ontologically and epistemologically fundamental ways” (Guba & Lincoln, 1994, p.105). Thus, a research paradigm includes the basic principles and beliefs that explain the relationship between the world and its parts (Guba & Lincoln, 1994); it offers a description of what is considered important and suitable to research, providing a view of the world based on which researchers make relevant decisions on research design and methodology (Smith, 2004).

Different research paradigms were introduced as research philosophy evolved over time. The predominant philosophical paradigms or research philosophies, as well as the different methodological choices, strategies and techniques are demonstrated in Figure 6:

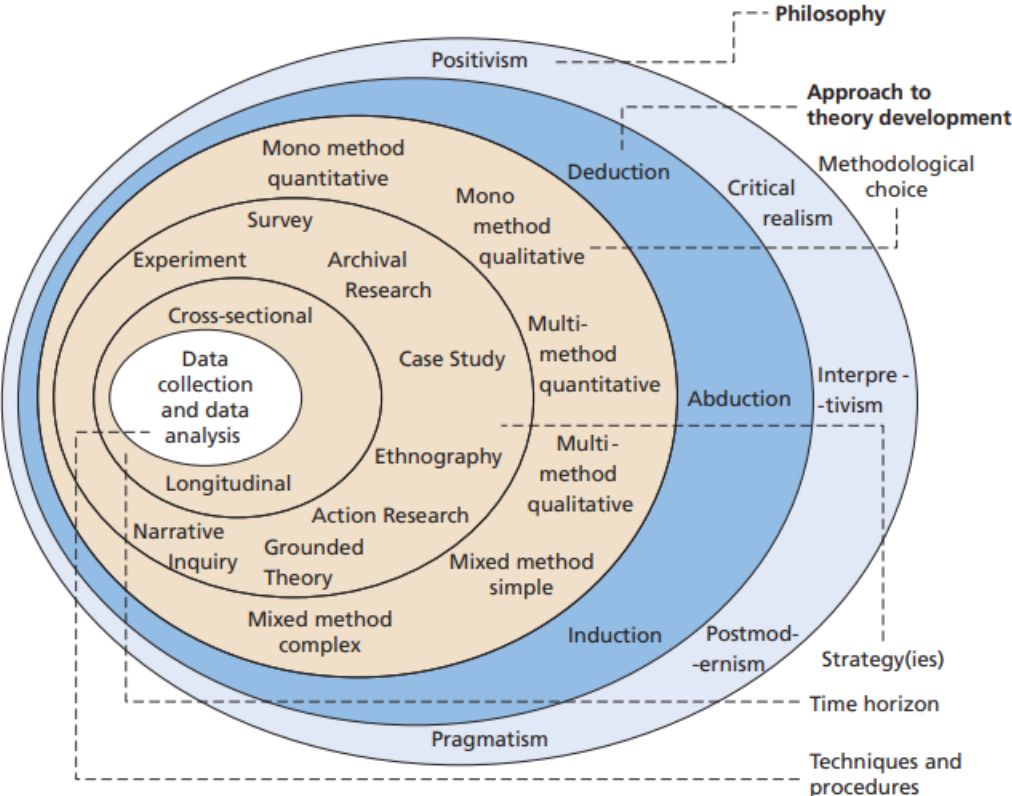


Figure 6 – The Research Onion (Saunders et al., 2019)

Figure 6 illustrates different ways of approaching research and seeking answers to research questions. However, a common question that underlies any attempt to conduct research is related to the nature of the world and of reality. Research ontology is related to answering this question, and it is briefly presented in the following section.

5.2 Research Ontology

A basic issue in research philosophy is whether there is a commonly shared, objective reality for everyone. Research ontology deals with the question of the nature of reality, a question that is related with how a researcher understands the world (Saunders et al., 2019). There are two basic views on this issue: objectivism and subjectivism. Objectivism suggests that reality and objective evidence exists in the social world, and it can be measured (Becker et al., 2012; Bryman, 2012). This means that science and scientific tools can be used to conduct objective measurements of the objective – independent of perceptions – reality. On the other hand, subjectivism posits that there is not one objective reality, but reality is created by the perceptions and actions of social actors (Saunders et al., 2019). Therefore, reality is continuously created and managed by social objects that gather knowledge based on their individual, subjective meanings, shaping phenomena and realities within their well-defined social contexts (Wahyuni, 2012). There are also different nuances concerning how subjective reality is created: constructivists believe that knowledge and reality do not exist independently of the social world, but they are constructed and formed by the interactions of social actors locally (Kelemen & Rumens, 2011). The substantial difference between subjectivism and constructivism is that according to subjectivism, meaning is imposed by the individual, whereas according to constructivism, meaning emerges from the interplay of the individual with the world.

Management, and therefore strategic management, is a social phenomenon that can be researched in different ways, subjectively and objectively (Saunders et al., 2019). The researcher adopts the objectivism view, where management is perceived as an “objective entity” (Saunders et al., 2019, p.136) and the essential function of management is considered to be quite similar across organizations, although specific aspects of it may differ. Taking the objectivism ontological stance, the researcher investigates management behavior and tries to establish relationships between different aspects of strategic management under the global pandemic. Personal beliefs have been consciously set aside while conducting this study; however, the researcher understands that a degree of subjectivity is embedded in the research design, concerning which variables to measure and the selection of specific methodologies. It is worth noting that a large part of previous work on strategic management and strategic decision making in general, as well as on organizational ambidexterity and strategic decision speed in particular, has adopted an objectivism approach (e.g. Lubatkin et al., 2006; Shepherd et al., 2021).

Based on the fact that ontology and epistemology are related, different research epistemologies were considered. The following section briefly presents research epistemology and the five predominant paradigms (or philosophies) in management research (Saunders et al., 2019), and explains why a positivistic paradigm is adopted for this quantitative study.

5.3 Research Epistemology & Research Paradigms

Epistemology has to do with assumptions about knowledge. More specifically, the questions that epistemology aims to answer have to do with the ways in which knowledge can be sought, what constitutes acceptable knowledge, which data are considered good quality, and what are the different ways of contributing to knowledge (Saunders et al., 2019). The question of what constitutes acceptable knowledge is central in epistemology: what can be considered as legitimate,

valid, and acceptable knowledge (Burrell & Morgan, 2016). Saunders et al. (2019) describe this as adequate knowledge. The nature of management is multidisciplinary, so various different types of knowledge are considered legitimate, valid and acceptable, including different types of factual data (e.g. numerical data, texts, images and other visual data) and data based on opinions expressed in interviews, announcements, narratives, autobiographies, stories etc. Hence, there is a variety of choices concerning how to collect adequate knowledge, and different epistemologies are related to various ways of seeking adequate knowledge in research.

The main five epistemologies used in management research are positivism, critical realism, interpretivism, postmodernism and pragmatism (Saunders et al., 2019). Interpretivism studies in-depth the meanings that individuals attribute to social phenomena focusing on individual differences within the same experience (Tsoukas & Chia, 2011), perceiving researchers as part of what is being researched. Postmodernism examines how language and power relations affect ways of thinking and enable marginalized views to be expressed (Saunders et al., 2019). For postmodernists, what is researched is not independent of the researchers, as there are power relationships between the two (Calás & Smircich, 1997), whereas reality is not objective, but socially constructed (Chia, 2003). Interpretivism and postmodernism take a subjectivism approach, and are, hence, not relevant with the views of the researcher or with this study.

Pragmatism focuses on research that leads to advancing organizational practice (Saunders et al., 2019), through claiming that a concept is relevant only where it supports specific action (Kelemen & Rumens, 2008). For pragmatists, reality can be subjective or objective, and research begins when a problem that needs practical solutions is recognized (Saunders et al., 2019). Pragmatists are less interested in abstract distinctions and focus on practical outcomes, aligning their research design, strategy, and methods with the research question; the research question concerns practical outcomes and guidance for future actions. Pragmatists accept that the world may be interpreted in

different ways and, hence, no single view can provide a complete picture of any situation. Pragmatism allows for the use of mixed or multiple methods, yet it is not implied that pragmatists always use more than one method; rather, they select the method(s) that enable them to collect data that are reliable and relevant to the research problem (Kelemen & Rumens, 2008). A pragmatist approach can be considered in this study: strategizing under crisis can be viewed as a problem that requires practical solutions and it can be considered the starting point of this research. However, the researcher is interested in abstract distinctions and theoretical implications, and not just in practical outcomes. Indeed, the focus of this study lies on outcomes that are not strictly practical, whereas findings entail theoretical contributions. Hence, a pragmatist epistemological approach was not adopted.

The remaining two paradigms, positivism and critical realism, both take an objectivism ontological approach. Positivism is the main philosophical stance of natural scientists and suggests that there is an objectively observable and measurable social reality; this reality can be used in order to produce generalizations (Crotty, 1998). Positivism is based on an objectivistic approach, taking the view that research produces accurate knowledge. Under positivism, understanding and analyzing theory serves as a way to explain the objective reality that is observed (Easterby-Smith et al., 2012). The majority of positivists usually use quantitative data and statistical methods, but there are cases where other methodologies are used (Saunders et al., 2019). Similarly to positivism, critical realism (Bhaskar, 2008) also takes an objectivism view, but a slightly different one: it examines not only what is observed, but also what is experienced. Critical realists perceive reality as external, like positivists do, but for them reality is not necessarily directly accessible by observation. Instead, they suggest that what we observe is not always an accurate representation of reality, because there is the possibility of being deceived by our senses and perceptions. Hence, what is observed is a representation of what is real, of the objective reality, through two steps: firstly, the observation, and secondly the mental processes that follow the observation and turn it

into an experience (Saunders et al., 2019). These mental processes occur not only at the time of observation, but continue for some time afterwards, when individuals think about events in the past and reason backwards (Reed, 2005). Critical realists posit that what is observed is a part of reality, and there is a need to try and understand the bigger picture. For critical realists, the focus of research lies in identifying which mechanisms lead to specific outcomes in a specific context (Jones, 2010); this was described by Brönnimann (2022) as “context-mechanism-outcomes model” (Brönnimann, 2022, p. 18).

The researcher believes that reality can be observed and measured, and hence measurable data are valuable. At the same time, depending on the research question, qualitative data are also useful as they enable researchers to gain a deeper understanding of a situation and are valuable and credible as well. This study, however, seeks to identify a relationship between strategic decision speed and organizational ambidexterity, and how this relationship may be affected by cognitive characteristics of CEOs and their perceptions of the environment, based on a deductive methodology, where understanding and analyzing theory serves as a way to explain what is observed (Easterby-Smith et al., 2012). Positivism’s suggestion that knowledge is validated by observing and assessing phenomena through measurements, which can refer to a phenomenon or its various different aspects (Krauss, 2005), is viewed as very relevant with this study. For this purpose, quantitative data have been used as the basis for identifying and measuring relationships and patterns within the phenomenon observed.

Hence, the study draws on the positivism view and its main ontological assumptions (Bryman 2012; Saunders et al., 2012). More specifically, the following assumptions are relevant: (a) objective evidence exists and it can be measured, (b) such measurements can be used to explain the relationships between different variables, and (c) statistical analysis may be used in order to predict outcomes in specific contexts. Survey research was used as an appropriate method for

examining relationships between latent constructs (Thietart, 2001) and statistical methods were used to analyze the data. Furthermore, cognitive interviewing, i.e. the collection of additional verbal information about the questionnaire by respondents, was used as a way of evaluating the design of the research and the questionnaire (Beatty & Willis; Presser et al., 2004; Willis, 2005). Overall, this study tests hypotheses related to the link between ambidexterity and strategic decision speed in the evolving field of behavioral strategy, bringing together cognitive and social psychology with strategic management (Powell et al., 2011).

Survey research is briefly reviewed as follows.

5.4 Survey Research

This is a quantitative research study, where responses were collected via a survey. A survey is defined as a way of gathering data from individuals with the aim of examining and/or assessing their behaviors and interactions in a standardized manner (Arlene & Mark, 1995). Surveys include “quantitative or numerical descriptions about some aspects of the study population” (Fowler, 2009, p. 2), through asking the respondents to answer a list of questions. These responses are the survey data, which then need to be processed and analyzed. In the vast majority of surveys, only a fraction of the whole population participates in the data collection process through answering the survey questions. Surveys and their findings are easy to interpret (Saunders et al., 2019) and they provide the opportunity to examine the relationship(s) between variables (Thietart, 2001). Hence, a survey seemed the appropriate choice for this project, where the relationship between strategic decision speed and organizational ambidexterity is empirically examined for the first time.

In this quantitative project, the units of analysis are companies operating in Greece in 2020. Data was collected through an online survey of top executives of companies in Greece, mainly CEOs,

but also General Managers and company owners. The researcher has translated theory in specific hypotheses (stated above), which were subsequently tested in the specific context of a global crisis affecting an environment that had just recovered from a long-term crisis. Evidence was found in the literature to form and test hypotheses and a deductive approach (Bryman, 2012) was used. All measurements were based on existing scales (see sections 5.10 to 5.12), i.e., no new scales were developed and the relationships between different variables were tested. As some relationships were empirically tested for the first time in this project (e.g. the relationship between strategic decision speed and organizational ambidexterity), it was important that the existence of such a relationship is tested and validated using quantitative data and statistics.

5.5 Research Context and Design

At the time when the research data was collected, the external environment was characterized by high uncertainty and turbulence. Most people were working remotely from home, some regions were in lockdown, and there was a night-time curfew in numerous cities across the country, including Athens and Thessaloniki where about 60% of the population lives. People had to send an SMS when going out of the house, indicating the reason for leaving the house and also their destination. Organizational leaders communicated with peers and employees online, and teams were not meeting in person. Further, there were major disruptions in the supply chains, and several sectors experienced huge decreases in revenues because consuming some goods and services was simply not possible while being restricted at home. Other sectors did not experience a decline in revenues (e.g. supermarkets), but they experienced dramatic changes in the way business was done: people were no longer physically in the shops, but mainly relied on online purchases. This has created immense pressure on decision makers who had to upgrade the technology available and find a way to deliver their products to almost 100% of their clients, when previously a relatively small percentage of clients was buying products online in Greece.

Another important aspect to consider is that this research was conducted in Greece during the pandemic crisis, with Greek companies having just recovered from the long Greek financial crisis. Organizational leaders were under more pressure because of their responsibility to ensure the sustainability of their companies again, within a short period of time that they were facing similar challenges, dealing with uncertainty and immense change. Time was very important while dealing with this change, because changes in regulations, restrictions and access to resources changed in a very short period of time and unexpectedly. Despite all this pressure, it is appreciated that the survey respondents took the time to fill in the questionnaire, and the pilot phase respondents devoted even more time required to provide feedback on the research design.

The research was designed as an online survey (via Qualtrics) before the pandemic began, which means that no changes were required concerning the way to collect data. The decision to conduct the survey online was based on the significant advantages of online surveys compared to paper surveys (Frippiat & Marquis, 2010), the most important of which are related to lower costs (Loosveldt & Sonck, 2008), the easier and faster collection of data (Schaefer & Dillman, 1998), accessibility to wider geographical audiences (Frippiat & Marquis, 2010), better data quality in terms of mistakes and omissions (Dolnicar et al., 2009) and easier data storage and processing (Cavana et al., 2001). Apart from those widely accepted advantages of online surveys, the decision to collect the data online proved even more important, as no changes needed to be made to the data collection process due to COVID-19 restrictions. The questionnaire was designed after conducting a literature review and having formed the hypotheses, with particular attention being paid to the selection of measures.

The online survey was created and uploaded on Qualtrics in Greek. All questions were translated by the main researcher (Greek native speaker) and the usual back translation process was followed.

Back translation is the process of translating a text to its original language, after having translated it first to another language (Brislin, 1970), with the purpose of identifying differences with the original text after the back-translation. Although back translation does not mean that errors will not be made and there is some degree of inherent subjectivity in the process (Behr, 2017), back translation usually helps researchers identify at least a part of mistakes and confusing phrases. The back translation process included the following steps:

1. Translation of the questionnaire in Greek by the main researcher.
2. Discussion about the Greek version with two more native Greek speakers: one member of the supervisory team and one person external to the team, who is the Managing Editor of a highly ranked international academic journal.
3. Adjustments to the Greek version to facilitate understanding based on step 2.
4. Back translation of the Greek version into English by the main researcher.
5. Comparison of the original and back-translated versions of the questionnaire and identification of differences.
6. Discussion of the differences with the two persons mentioned in step 2, and evaluation of suggestions about what should be done concerning each difference.
7. Finalization of the pilot phase questionnaire in Greek.

Prior to the first wave, a pilot study with 10 CEOs was conducted. It was important to get feedback from business leaders concerning the design of the research, which was obtained through conducting short informal discussions with CEOs of companies in Greece. All ten participants in the pilot phase were contacted by phone and after these discussions, it was obvious that they felt extremely pressured by time and were experiencing the exploration – exploitation tension. Time pressure had to do with decision making, as well as carefully choosing how to spend their time. The hesitance expressed by most of them concerning participating in multiple waves of data collection led to the creation of a short questionnaire for the main survey and to a second wave

including only one question on relative performance. The pilot phase feedback was very helpful and led to actions aimed at improving the possibilities of participation for CEOs. According to pilot phase participants' feedback, adjustments were made to the survey questionnaire, which was finalized after the end of the pilot phase in the beginning of November 2020. Feedback was in line with previous suggestions according to which CEOs are more likely to fill in short surveys, surveys that are endorsed by other elite members and that offer an incentive, like a findings report (Bernard & Westphal, 2006). All these strategies were used in the research design.

Hence, although the way of collecting data was not affected by the pandemic as an online survey was already planned, the actual data collection was affected; organizational decision makers were overwhelmed by the disruption created by the pandemic and viewed responding to a survey under these circumstances as an item quite low in their priorities' list. One would expect the overall number of respondents to the survey after six months of effort to be higher; however, academic research was negatively affected and difficulties in collecting data during the pandemic have been reported by academic researchers especially in the first year of the pandemic (Fernandes, 2020; Mobaraka et al., 2022). In addition, the pressure CEOs felt in terms of time altered the initial design for the second wave, which was initially planned to include more questions.

Although the number of responses in both the main survey and the second wave were affected by the time pressure and overall pressure that the pandemic created for top executives, it is worth critically reflecting on the process of data collection. During the research planning phase, different recruitment strategies were considered. A strategy used lately for recruiting survey respondents is to use one of the platforms available, like for example Prolific (<https://www.prolific.co/>). Unfortunately the number of top executives of companies in Greece that were registered in the platform at the time was very low (below 10), so Prolific could not be used. Another possible way to recruit more participants would be to continue collecting data for a longer period of time.

However, given the constraints of a PhD project and the fact that the environment was rapidly changing, prolonging the data collection period was rejected. Overall, the experience of conducting research during a pandemic has been valuable and the lessons learnt will be very useful in future research work.

As follows, the various research phases are presented in a chronological order.

5.6 Research Phases

Deciding how to proceed in order to answer the research questions, entailed some preliminary research in terms of the research context. Initially, several different geographical areas were considered. The final decision, to conduct research in Greece, was based on the following criteria: (a) studying cases of countries or geographical regions are essential to business and economics research (Gerring, 2016), (b) the Greek environment was particularly interesting because there had already been a long financial crisis that ended about one year before the pandemic began. Examining how Greek executives responded to the disruption caused by the pandemic was simplified by the fact that the main researcher was Greek, eliminating potential language-related issues that non-Greek speakers might face. After deciding to conduct the research in Greece, the literature review was conducted and ethics approval was received. The detailed literature review supported by methodological decisions led to the creation of the questionnaire based on existing constructs, which was then translated in Greek and uploaded on an online platform. Then the questionnaire was technically tested and a pilot study was conducted, which was followed by changes in the questionnaire based on the pilot phase's feedback. After the questionnaire was finalized, the first wave of the survey was launched, followed by a second wave, which however had a low response rate. The last phases of research included analyzing the quantitative data collected and reporting findings. The following figure presents research phases:

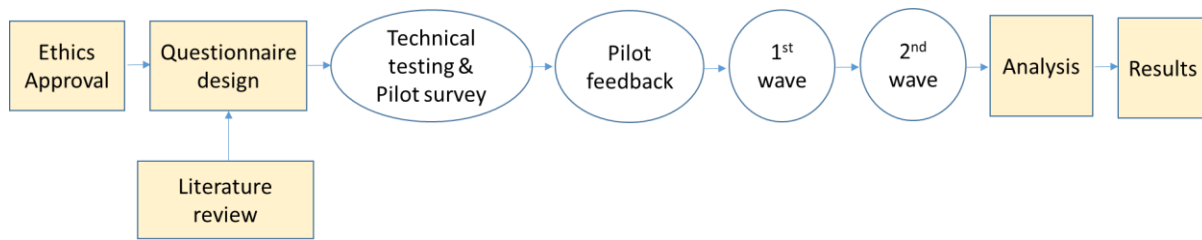


Figure 7 – Research Phases

In the diagram, the rectangles represent background work conducted by the researcher without the participation of respondents, whereas ellipses and circles represent the stages where respondents were involved, and for which the respective analysis is presented.

5.6.1 Pilot Phase

The Pilot phase lasted about one month, from early October 2020 to early November 2020. Ten top executives, who were all at the top position of the company’s hierarchy, were sent the questionnaire link, after having been contacted via telephone by the researcher in order for information to be provided about the research, its purpose and the intention to send the survey link. The companies in the pilot phase were selected in a way that companies with activities in the field of manufacturing, services, and groups of companies were represented with at least one participant (top executive) in this phase; in other words, it was assured that at least one manufacturing, services company and group of companies was included in the pilot. Pilot phase respondents were part of the researcher’s wider network, so the researcher either already knew them or was referred to them. All ten executives replied to the survey (four of which had to be sent a reminder via email).

In order to better evaluate the research and the questionnaire design, participants in the pilot phase were either contacted by phone or had a virtual meeting on Zoom with the main researcher, in

order to provide feedback based on the practices of cognitive interviewing (Presser et al., 2004; Willis, 2005). Cognitive interviewing can be defined as “the administration of draft survey questions while collecting additional verbal information about the survey responses, which is used to evaluate the quality of the response or to help determine whether the question is generating the information that its author intends” (Beatty & Willis, 2007, p. 287). It is important to note that cognitive interviewing is a non-qualitative method (Beatty & Willis, 2007) and that this is not a qualitative or a mixed methods project. However, cognitive interviewing involves discussions with respondents who belong to the target audience of the quantitative research, before the survey is launched, and obtaining feedback concerning the following: (1) how they chose to answer in the specific way they did, (2) how they understand the meaning of the questions, (3) any misunderstandings or issues they encountered, or (4) anything they believe that is relevant to the circumstances related to the research.

There are different ways in which cognitive interviewing may be conducted and analyzed (Beatty & Willis, 2007; Willis, 2005). Among them, the researcher chose to take notes during the discussions and analyzed them afterwards. Cognitive interviewing in this study was based on a semi-scripted protocol (Beatty & Willis, 2007), which included a few questions. The researcher paid attention to the evolution of the discussion during the phone calls and made sure to note things that were mentioned and were not included in the questions. The semi-scripted protocol used by the researcher is presented as follows.

5.6.1.1 Semi-scripted Discussion Guide for Pilot Phase Feedback

Introduction: The researcher thanked the survey respondent, briefly introduced herself and explained the purpose of the discussion, which was to make sure that the research design facilitates top executives’ participation and that the right questions in terms of strategic management are included in the questionnaire. It was explained that the focus of the research was on strategic

decisions and actions. Next, the researcher asked for some information on the respondent's position in the company and the company industry, while she noted the participant's gender.

Questions:

- 1) How did you find the survey overall? How long did it take you to complete the survey?
- 2) Did you identify any mistakes/issues? Was what you had to do clear, while feeling out the survey and moving from question to question?
- 3) How do you feel about participating in a similar second wave of the survey?
- 4) What are the main challenges you are facing now in terms of strategic decision making? Are you facing any tensions/contradictory demands?
- 5) What are the strategic decisions/actions you are making/taking?
- 6) How is the company doing? How do you perceive the business environment and how does it affect your strategic decisions?

Do you think that we have left something out? Please feel free to mention anything you find relevant.

5.6.1.2 Pilot Phase Analysis

Table 9 presents information about participants of the pilot phase. As the table indicates, there was only one female respondent in the pilot phase and the companies of which CEOs participated in the pilot phase had activities in various sectors.

Table 9: Profile of Participants in the Pilot Phase

	Gender	Position	Industry
1	Male	CEO	Production of coatings
2	Male	CEO	Pharmaceutical
3	Male	Managing Director	Group of companies (car retailer, airline industry)
4	Male	CEO	IT services
5	Male	Country General Manager	Retail (food & beverages)
6	Male	CEO	Production and distribution of coatings
7	Male	CEO	Manufacturing (Agricultural/environmental products)
8	Male	CEO	Fertilizers manufacturing
9	Female	CEO	Cosmetics
10	Male	Managing Director	Agricultural products

Responses in the pilot phase, both in terms of answers to survey questions and in terms of cognitive interviewing insights (please see below), were analyzed in order to identify issues and mistakes. The following issue was identified based on the pilot phase data collected: a co-founder of a company replied “No” to the question “Have you or your family founded the company”, because he assumed that “Yes” meant that he was the sole founder. Thus, “co-founding” was also added in the wording of the question, which was now worded as follows: “Have you or member(s) your family founded/cofounded the company”.

This stage of looking into the pilot survey data was followed by analyzing the cognitive interviewing notes.

5.6.1.3 Cognitive Interviewing Phase and Preliminary Analysis

As already explained, the pilot phase participants were contacted by the main researcher in order to provide feedback on the survey design and to gain some insight on strategic management under the pandemic, in order to decide whether the right variables were included in the survey. Seven discussions were conducted over the phone, whereas three were conducted via Zoom. Most discussions lasted about 30-45 minutes, with the Zoom discussions lasting slightly longer (about

1 hour). During all ten cognitive interviews, the researcher took notes. At the beginning of each discussion, the pilot phase participants were thanked for their contribution, and the aim and focus of the research was explained. The feedback provided was highly informative for the subsequent research design, as well as views on the business environment and on the strategic decision-making process.

More specifically, concerning questions 1) *How did you find the survey overall? How long did it take you to complete the survey?* and 2) *Did you identify any mistakes/issues? Was what you had to do clear, while filling out the survey and moving from question to question?* of the semi-scripted protocol, feedback is summarized as follows:

- 1) Some typos were identified and corrected.
- 2) In the educational level scroll down menu, the College (2-year degree) option was inserted twice and the University Degree option was missing from the education level question.
- 3) The introductory parts of specific questions were confusing.
- 4) Specific minor rephrasing suggestions of survey items were made.
- 5) The fact that question headers in questions with multiple items were not visible for the lower items of the questions was reported as a problem.
- 6) The Ingram et al. (2016) Paradoxical Thinking scale was considered confusing by most participants. The main issues reported concerned items 2 and 3, i.e. two of the three items of the scale, namely:
 2. It is possible to embrace the traditions that made this firm successful, while simultaneously changing to meet the demands of our current market.
 3. It is possible to emphasize efficiency and standardization of work processes, while simultaneously looking for new ways to do things and finding new opportunities.

Concerning item 2, many pilot phase respondents stated that they did not understand what it meant to embrace traditions, while at the same time change in order to respond to current market

needs, while others claimed that this is not possible and that traditions often need to be left out of the future of a company when change is needed. Similarly, concerning item 3, most respondents viewed pursuing standardization and finding new ways of doing things as mutually exclusive. This scale was included in the pilot phase as an alternative for the recently (at the time) introduced Paradox Mindset scale (Miron-Spektor et al., 2018). During cognitive interviewing, the pilot phase participants reported an issue only with one item (out of the nine items overall) of the Paradox Mindset scale; although some confusion was expected due to respondents not being familiar with the concept of paradox, it seemed that the Ingram et al. (2016) Paradoxical Thinking scale more difficult to understand compared to Paradox Mindset. Hence, Paradox Mindset was preferred, both because it was clearer and because it included more items and removing one item of nine, in case this was decided after data collection, would create no problem with the measurement's reliability.

- 7) The fact that the Optimism subscale was the only one on a Likert-type scale from 1 to 6 was mentioned as an observation by one participant.
- 8) Six pilot phase participants mentioned that they wondered how someone can feel uplifted when realizing that two opposites are true, a statement that is mentioned in item 8 of the Paradox Mindset (Miron-Spektor et al., 2018) scale. The researcher initiated, then, a short discussion about paradoxes and a mindset that embraces them; all six participants said they were not familiar with paradox and when they were asked whether the question made more sense after having been informed about it, they all said yes. Because the concept of paradox was expected to be new to the main survey's respondents as well, it was decided to evaluate responses related to this specific item versus the other items of the scale when data collection would be completed. As described in section 5.11, this item was removed after conducting scale reliability analysis.

For issues 1) to 5), all suggested corrections were made by the researcher. Concerning issue 7), no action was taken, because the permission to use this subscale of the Positive Psychological Capital

questionnaire (Luthans & Youssef, 2004 & 2007) was provided under the conditions that no changes would be made. However, the researcher decided to include the research permission statement for the use of this construct in the respective items.

Concerning question 3) *How do you feel about participating in a similar second wave of the survey?* in the semi-scripted protocol that concerned participants' willingness to participate in a similar second wave of the survey, only three out of the ten participants stated that they were willing to fill in a second wave of similar length. These were the three participants who seemed really interested in the research and with whom the discussions lasted longer than 30 minutes. The remaining seven participants stated that their time was limited, that there was a lot of time pressure from their work, that they had to carefully select how to spend their time, and that they probably would not fill in a second wave of a similar length. The respondent asked those participants whether they would answer a shorter second wave, and six out of the seven participants replied no, encouraging the researcher to obtain all the information in this wave. One participant stated that he would consider if the survey took less than 3 minutes. Taking all these into consideration, the researcher decided to only include one question in the second wave, in order to make it less time consuming for respondents. The questions that were not included in the second wave concerned a second measurement of organizational ambidexterity that is the dependent variable in the strategic decision speed – organizational ambidexterity relationship, a second measurement of environmental dynamism to examine whether perceptions about the environment have changed, and some forward-looking questions concerning how respondents felt about the future.

Furthermore, the researcher also sought feedback on the respondents' view of the research content, with the aim of making sure that the right questions related to strategic decision making were asked and nothing that they viewed important and was part of strategic decision making was left out. The discussion concerning this part was guided by questions 4) to 6) of the semi-scripted protocol.

Concerning question 4) *What are the main challenges you are facing now in terms of strategic decision making? Are you facing any tensions/contradictory demands?* in the semi-scripted protocol, many respondents mentioned that a key challenge was that, due to COVID-19 related restrictions and the lockdown, rules and the overall situation about how the business was run (including employees presence or absence from the workplace, supply chain issues, competitors' responses to the pandemic and prices) were changing quickly. They underlined the need to be updated on such changes at least weekly (some even said daily depending on the issue) and that decisions had to be altered accordingly. Some said they could not rely on decisions made one month ago, while others more generally stated that strategic decision making needed to be fast and flexible. The content of these discussions led to the conclusion that including strategic decision speed in this research was a good decision. Furthermore, some participants mentioned that an important challenge was the difficulty of pursuing long-term performance goals, while making sure that the company did not fail in the long-term, which can be related to organizational ambidexterity (although the term ambidexterity was not mentioned).

Concerning question 5) *What are the strategic decisions/actions you are making/taking?* in the semi-scripted protocol), all respondents mentioned an effort to cut costs and to optimize processes like improving production/service times and quality assurance processes. These activities were related with exploitation, although no one among respondents mentioned this term. On the other hand, respondents also mentioned trying to establish strategic alliances that would facilitate supply chain issues, activities expansion to include more online channels of interaction with customers, and efforts to create new products/services in response to changes in demand due to the pandemic. This set of activities was viewed as closely related to exploration, although again this term was not mentioned by participants. The combination of activities in the two sets, which were pursued simultaneously, was viewed as an effort to achieve organizational ambidexterity, although this

term was not mentioned. Hence, although respondents were not necessarily familiar with the term organizational ambidexterity, they mentioned strategic decisions that suggest that some level of ambidexterity was pursued. So, the decision to include ambidexterity in this study was evaluated as appropriate. In addition, many pilot phase respondents mentioned contradicting demands in their answers while answering what strategic actions they were taking (e.g. reducing costs and at the same time improving the quality of products), but when they were asked whether they were dealing with tensions or contradicting demands, they replied that they did not. The above indicate that top executives in Greece may very well be unfamiliar with the concepts of tensions or contradictions in general, and with the concept of organizational ambidexterity.

Concerning question 6) *How is the company doing? How do you perceive the business environment and how does it affect your strategic decisions?* of the semi-structured protocol, some respondents surprisingly recognized that despite the fact that this was a difficult environment to operate in, it was not viewed as extremely difficult or stressful, but rather as moderately difficult and stressful. One respondent claimed that Greece has been a difficult environment for more than a decade, but there were other countries in which the environments were more hostile. Another respondent stated that executives need to be optimistic about the future, even under a pandemic, otherwise they will definitely fail. Another interesting response was that of an organizational leader who claimed that it is a leader's job to pursue the impossible under crisis, even if this is not realistic, because this is the only way to motivate employees to try to achieve superior performance. These responses were connected to optimism and paradoxical thinking, as they entail recognizing some negative aspects of the environment, yet choosing to remain positive and optimistic about the outcomes of operating in it. Responses concerning how the company was doing varied, with some respondents saying they believed they were doing better than competitors, others being in a similar position with competitors and some saying that they felt that they were somehow outperformed by their rivals.

Last but not least, responses to question 7) *Do you think that we have left something out? Please feel free to mention anything you find relevant* varied; one participant mentioned that it is important for leaders to stay true to their values under crisis, another mentioned that the corporate strategy emphasized exports (which is related to exploration), another mentioned the need to continue investing (again related to exploration), and quite a few mentioned the need for more communication internally and mentioned different ways of doing that compared to ways of communication prior to the pandemic. The statements concerning values and communication were viewed as very interesting, but it was beyond the scope of this research to examine them, since this is quantitative research focusing on the relationship between strategic decision speed and organizational ambidexterity, and examining the effect of values and changes in the ways of communication would require a different focus and a different research design (qualitative).

In general, the feedback provided through the discussions in the cognitive interviewing phase was very useful. After this phase, preliminary findings of the pilot phase were discussed and it was decided how to move forward. The questionnaire had significantly improved and was ready to be launched, in order for the main phase of data collection to begin. Moreover, the researcher was reassured that the study included variables that are important when studying strategic decision making in general and under crisis. About ten days after the completion of the pilot phase (during which a preliminary analysis of the ten pilot questionnaires was conducted, along with the analysis and discussion of the cognitive interviewing findings), the main survey of this study was launched.

At the end of the pilot phase, the decisions on which scales to use in order to measure both the main and the control variables in this study had been reached.

5.6.2 Main Survey Phase and Data Collection

The main phase of the data collection began in mid-November 2020 and ended at the end of March 2021. 144 responses were collected in total from top executives of companies operating in Greece.

The ICAP Greek Financial Directory (ICAP is an affiliate of the Gallup International Association in Greece) was used as a communication data source. ICAP is viewed as the most extensive list of Greek companies (Mavrommati & Papadopoulos, 2005; Souitaris, 2002) and has been extensively used in previous work on organizations operating in Greece (e.g., Machias et al., 2019; Metaxas & Tsavdaridou, 2013), including work on strategic management in Greek companies (e.g., Beneki et al., 2012; Souitaris, 2002). Hence, the ICAP directory was viewed as a reliable source. Companies that are not included in the ICAP directory are usually very small companies, usually sole proprietorships owned by freelancers or very small local businesses (for example small local bakeries, etc.). Including this type of companies was beyond the scope of this research.

It was decided to include companies with both manufacturing and service companies in the sample, so CEOs from both types of companies were contacted. CEOs were invited to participate in the survey via email followed by two reminders, whereas phone calls were made to their assistants to inform them on the research. In general, Greece is a difficult context for conducting research without recommendation (Souitaris, 2002), and previous quantitative research studies used snowballing as an effective method of data collection in Greece (e.g. Dodd & Patra, 2002; Souitaris, 2002). Initially, there were no plans to use snowballing and the ICAP Directory was used as a source of contact information about CEOs of Greek companies. However, after 5-6 weeks of sending emails to CEOs that were left unanswered and of unsuccessful efforts of trying to reach them on the phone, it was evident that indeed Greece is a very difficult research context when researchers are not referenced. Hence, it was decided that snowballing would be used, not only in line with aforementioned previous work in Greece, but also because CEOs belong in the

organizational elite and are, thus, very willing to help other elite members (McDonald & Westphal, 2011). Therefore, each CEO identified in the ICAP Directory that responded to the invitation to participate in this research was kindly asked to provide the contact information of at least one of their peers to the researcher. Snowballing proved once again an effective recruitment strategy for Greece and 144 responses were collected from CEOs of companies of various sizes and in various industries in Greece (10 in the pilot phase and 134 in the main survey phase). Although this research is not based on a narrowly defined random sample and the researcher was unable to control for company characteristics, the organizations in the sample were selected according to whether their CEO happened to know a previous respondent, indicating random selection. Hence, the sample includes companies from various industries, due to “the complex web of personal networks that are dominant in Greek management culture” (Souitaris, 2002, p. 886) and is a fairly good representation of the Greek business environment (please see section 6.1.1). Similar conclusions about the effectiveness of using snowballing in terms of the produced sample have been reported in previous work as well (e.g., Souitaris, 2002).

5.6.3 Second Wave

A second wave of data collection that included only one question (relative performance) was conducted six months after the end of the main survey. At the time when the second wave of data was collected (Fall 2021), there was major disruption caused by the pandemic globally and business in Greece and worldwide were struggling. An email was sent the CEOs who had responded in the first wave reminding them of the purpose of the research, assuring anonymity and confidentiality and kindly asking them to reply to the second wave question on relative performance. Unfortunately, the response rate in this second wave was very low; only 43 responses were collected from the 144 participants in the main survey, corresponding to a 29.86% response rate. This indicates that less than one out of three initial respondents replied to the second wave question. This percentage was similar to the percentage of respondents in the pilot phase who

replied that they would be willing to fill in a second wave for the purposes of this research. Despite the fact that reminder emails were sent and were followed by phone calls, the number of respondents in the second wave remained low. In several cases, the researcher was unable to directly speak to the organizational decision makers (CEOs and company owners) and instead talked to their personal assistants, who confirmed that they had informed the person who had replied in the first wave, but he/she was very busy and not available to participate in the second wave.

Since the second wave response rate was low and the data gathered could not be used, correlation analysis was conducted between the second wave relative performance responses and the first wave respective responses (respondents were matched by their email). The Pearson correlation between the two measurements of performance was 0.696. After evaluating the situation, it was decided to use only the first wave of data including relative performance data, accepting that a correlation of approximately 0.7 between the two measurements allows for the first measurement to be used as a proxy of organizational performance at time point 2, when the second wave incomplete data were gathered.

5.7 Data Management and Preparation

Managing and preparing data for analysis is a substantial part of any research project (Cox & Verbaan, 2018). Data management and preparation includes safely storing the data, ensuring respondents' anonymity by removing personal data, ensuring confidentiality by limiting access to the data only to specific people, as well as getting the data in a suitable format for statistical analysis (Saunders et al., 2019). Data management related to safety, anonymity and confidentiality, according to the University of Sheffield research ethics protocols and international research ethics and integrity standards, as already described.

Concerning data preparation for statistical analysis, this process is significantly simplified and facilitated through the use of online surveys (Sánchez-Fernández et al., 2012). The online survey was conducted on Qualtrics (www.qualtrics.com) and the statistical analysis was conducted using SPSS. Qualtrics offers various export options, as well as the option to directly export data to SPSS. However, the researcher preferred to export the data gathered on Qualtrics to an Excel file, in order to conduct some basic data management tasks related to coding and then imported the data to SPSS from the Excel file. After the end of data collection at the main survey (wave 1), all data collected was password protected and stored in a secure location. The emails of respondents were not removed yet at this stage, in order for the researcher to be able to send them the link to the second wave (single question on relative performance).

The basic data management tasks conducted in the Excel file included the coding or recoding of categorical variables. For example, the items of the educational level from the drop-down menu available in the questionnaire were assigned numerical values from 1 to 7, as follows: the lowest level of education (below high school) was assigned the number 1, and the highest level of education was assigned the number 7, with a 1-point difference between the consecutive items in-between. In a similar way, the drop-down menu items in the company industry question were assigned values from 1 to 17 respectively (there was no company with activities in waste management and environmental protection in the sample, so this sector was eliminated from the analysis). Similarly, categorical variables where the possible answers were Yes or No were assigned the values of 1 and 0 respectively. For the gender variable, the answer “Other” was not selected by any respondent; hence, the value of 1 was assigned to women and the value of 0 to men. The clean dataset file was then imported to SPSS.

5.8 Technical Testing

As this research was planned to include an online survey, potential technical issues had to be resolved prior to the research launch. The researcher set up the questionnaire in Qualtrics and a few test rounds were conducted in order to make sure that the language used was grammatically correct and easily understood, that all responses were recorded properly, that the logical flow and sequence of questions was correct, and that the appropriate messages appeared at all stages of the questionnaire. Minor corrections were made to typos and the technical testing was completed at the end of September 2020, after which the Pilot phase began.

5.9 Research Ethics & Integrity

The researcher applied for and obtained Ethics Approval for this project in October 2019. All the ethical requirements related to conducting research were taken into consideration for this project, with all relevant risks being assessed. Potential participants, including participants in the pilot phase, received the Information Sheet and Consent Form in the initial e-mail that invited them to participate in this project, in order for them to decide whether they wish to participate or not. Follow-up phone calls were used in order for the researcher to be able to answer any questions the participants had. And follow-up emails were sent and served as reminders, along with phone calls when needed.

The Participant Information was sent as an attachment in the initial and follow-up emails, inviting top executives to participate in the research. The content of all emails sent to participants are included in the Appendix (Appendix 2 and Appendix 3). The Participant Information was also the landing page (first page) of the link leading to the survey, whereas the Consent Form was the landing page after participants clicked on the 'Next' button. In this way, participants needed to read the Participant Information page and give their consent before filling in the survey, by ticking

a box stating that they agree to participate in the research and wish to proceed with the online questionnaire. The Participant Information and the Participant Consent Form are presented in the Appendix (Appendix 4 and Appendix 5).

5.9.1 Data Confidentiality and Data Security

Data confidentiality and security have been considered, according to the University of Sheffield guidelines on conducting research (<https://www.sheffield.ac.uk/library/rdm>). Data was securely stored on the University's networked file servers, and copies were kept on the researcher's laptop. The files were encrypted and a password was needed in order to open them. The password is only known by the researcher. Also, the researcher's laptop is kept at home (remote student) and it is also encrypted (password access). Any personal data (like e-mails of respondents or URLs, which would make them traceable after filling in the online questionnaire) were removed from the data set before the data analysis phase began. Regular backup was conducted with the aid/guidance of the IT University staff. Passwords were changed on a regular basis according to the IT staff suggestions.

As already mentioned, the researcher was taking notes during the discussions, which were afterwards analyzed. The analysis of the pilot phase and on the cognitive interviewing phase are presented as follows.

5.10 Main Variables Measures

5.10.1 Organizational Ambidexterity Measurement

The literature on organizational ambidexterity offers different scales that measure exploration and exploitation in different contexts, usually as separate dimensions that are then combined to produce a measure for organizational ambidexterity. Often, exploration and exploitation may be termed differently (e.g. “adaptability” and “alignment” respectively by Gibson & Birkinshaw (2004)). Table 10 presents an overview of the different measures of organizational ambidexterity introduced in the years after 2000, their methodological assumptions and relevant terminology. Research articles that used one of these measures (again) after their initial introduction are not included in the table, since this would entail repetition. All different measures considered for the measurement of organizational ambidexterity are included in the Appendix (Appendix 6).

Table 10: Different Ways of Measuring Ambidexterity in the Literature

Authors (year)	Scales and terminology	Sample & methodology	Hypotheses/Findings
Gibson & Birkinshaw (2004)	Adaptability and alignment for contextual ambidexterity (multiplying these separate dimensions measures ambidexterity)	- Survey of 4,195 individuals in 41 business units of multinational companies: top executives and randomly selected employees. - Separate items for adaptability and alignment	- Context is critical - Ambidexterity mediates the relationship between contextual characteristics and performance
He & Wong (2004)	Explorative innovation strategy and exploitative innovation strategy (separate dimensions)	- Survey of 206 CEOs of manufacturing firms - Only firms engaged in technological innovation	- Ambidexterity requires a balance between exploration and exploitation - A context of innovation is assumed to make a difference
Auh & Menguc (2005)	Exploration and exploitation as the two poles of the organizational learning continuum (separate measures)	- Survey of 260 CEOs - Average firm size 676 employees - Variety of sectors: food, mining, automotive, construction materials, and chemicals. - 51% of firms were freestanding and 68% were business-to-business type firms.	- Changing environmental conditions matter - Firm performance is divided in efficient and effective - Different types of ambidextrous activities relate to effective firm performance for those with strong orientation towards exploration and exploitation respectively.
Lubatkin et al. (2006)	Exploratory orientation and exploitative orientation (the addition of the two dimensions measures ambidexterity)	- Survey of 154 CEOs and 405 TMT members from 139 SMEs - SMEs considerably older than startups (average 24 years of age) - 90% of the firms privately held - three industries mainly represented in the sample: manufacturing, scientific & technical	- SMEs have access to less resources than larger companies, which is why: - The role of top members and their teams is critical

		services, and construction	
Mom et al. (2007)	Managers' exploration activities, managers' exploitation activities (viewed as separate dimensions of individual-level ambidexterity possessed by managers)	- Survey of 104 managers and interviews with 12 managers in an international electronics firm's specific division (with over 7,000 employees)	The way that knowledge flows across the organization makes difference (bottom-up versus top-down)
Jansen et al., (2009a)	Exploratory innovation & exploitative innovation (separate measures, not examined concurrently)	- Survey at multiple autonomous branches of a large financial services firm - 89 CEOs and 305 senior team members (different questionnaire for each category of respondents) - Average branch size: 128.74 employees	- Environmental dynamism plays a critical role - The type of leadership (transformational versus transactional) plays a critical role
Cao et al. (2010)	Organizational ambidexterity (single-factor ambidexterity measure)	- Survey at 122 SMEs - Both the CEO and the CTO of each firm participated in the survey - High technology industry	- CEOs and TMTs are critical for ambidexterity - The role of the CEO is more important in SMEs than in larger companies - CEOs networking is important in transitional economies
Chang & Hughes (2012)	Explorative innovation and exploitative innovation (separate measures, their absolute difference is considered balanced innovation and is labelled "BD")	-243 SMEs in Scotland -79 manufacturing companies, 164 service companies -Managing Directors and Chief Product Design Managers	-Product Design Managers play a vital role in innovation
Patel et al. (2013)	Exploration and exploitation (ambidexterity level is their average; congruence is absolute difference)	- CEOs Survey at 215 high-tech small SMEs	- The role of CEOs is more important in SMEs, because there are fewer hierarchical levels

As expected, there is a chronological evolution of ambidexterity measures with researchers building upon /altering previous constructs developed by their colleagues. For example, Lubatkin et al. (2006) built upon the He and Wong (2004) scale, taking into consideration the Benner and Tushman (2003) conceptualization of ambidexterity, which expanded He and Wong's (2004) approach of product design-related ambidexterity to also include, apart from a company's technology/product features, a proximity of innovation that relates the existing market and customer base. In a similar way, Cao et al. (2010) built on the Lubatkin et al. (2006) ambidexterity scale considering the importance of top management teams in the process of achieving organizational ambidexterity. In the same way, Chang & Hughes (2012) built on the Jansen et al. (2009a) scale and concluded that there was separation of exploration and exploitation (Chang & Hughes, 2012). Interestingly, there is evidence that exploration and exploitation cannot be substituted, may co-exist and the one may reinforce the other (Cao et al., 2009; Gibson & Birkinshaw, 2004; He & Wong, 2004; Lubatkin et al., 2006).

In general, researchers have combined exploration and exploitation in various ways in order to create a measure for organizational ambidexterity: a product of the two has been suggested by Gibson & Birkinshaw (2004), as well as He & Wong (2004); the latter also suggested subtracting them, whereas Lubatkin et al. (2006) have thoroughly examined their mathematical combinations and concluded that their addition was a better measure, as it entailed the minimum information loss compared to alternatives.

Given the different measures of ambidexterity available, the researcher had to critically examine which were more relevant for this specific project. Some scales were rejected due to their narrow focus. For instance, the innovation ambidexterity scale created by Lin et al. (2012) was not selected for this project (and not included in Table 10), as it is quite narrow; the specific scale measures a firm's performance concerning incremental product innovation, which is viewed as a very specific

aspect of ambidexterity (specifically of exploration). Similarly, the product exploration, product exploitation, market exploration and market exploitation measures developed by Voss & Voss (2013) were not selected (again not included in Table 10), because of their very specific focus and context (artistic industry).

When trying to select the measure of organizational ambidexterity, it is important to take into account the context of previous research, as well as the level considered, and to choose a measure that is most relevant with this study's context and level. Therefore, it is important to identify the different meaning of exploration and exploitation opportunities in different contexts (O'Reilly & Tushman, 2013). For example, in research where solely service companies are included, an explorative opportunity may refer to the introduction of a new way of offering the service, like a new business model; whereas in research where only manufacturing firms are included, exploration opportunities are usually related to the creation of a new product. Thus, it was important to select scales and measures that have been used and validated in previous research where both service and manufacturing companies were included in the sample, where established companies were considered (not new ventures), and where SMEs were a significant part of the sample (in this project where 83.3% of the companies are SMEs). Keeping this in mind, the Hill & Birkinshaw (2014) measures for exploration and exploitation were excluded, since they were developed specifically for new corporate venture units, which constitute a completely different context of organizational activity compared to established companies. Similarly, measures of individual ambidexterity were not considered (e.g. Mom et al., 2007; Ajayi et al., 2017), since this study examines organizational ambidexterity at the firm level. However, the Mom et al. scale was included in Table 10, as it has had a significant impact on posterior research (e.g. Alghamdi, 2018; Tamayo-Torres et al., 2017). Similarly, measures of team ambidexterity were not considered (García-Granero et al., 2018; Jansen et al., 2016).

Apart from context and level considerations, the ambidexterity measure choice was also based on the existence of similar assumptions. One of the main assumptions of this project is the microfoundations approach, i.e. the focal role of top executives in SMEs. This assumption was essential in Lubatkin et al.'s (2006) work, which also included both service and manufacturing firms. Moreover, Lubatkin et al. view ambidexterity as a broader process, beyond the narrower focus of other studies. Further, this scale is validated on CEOs and its reliability has been validated in subsequent studies (Kammerlander et al., 2014-SMEs, Ou et al., 2015, Venugopal et al., 2018; Mammassis & Kostopoulos, 2019). Consequently, the Lubatkin et al. (2006) scale for organizational ambidexterity was viewed as the right choice for this project. The scale was adjusted to range from 1 = Strongly disagree to 7 = strongly agree instead of from 1 = Strongly disagree to 5 = strongly agree, in order to be consistent with response ranges among different questions.

5.10.2 Strategic Decision Speed Measurement

When Eisenhardt (1989) introduced strategic decision speed, she used qualitative data. However, she measured the time required for each of the decisions that were studied by noting the time difference between the starting point, i.e. the first time that an action related to the decision was mentioned (like arranging a meeting to discuss the decision), and the ending point, i.e. the time when commitment to specific actions was achieved. Then, Eisenhardt coded as fast those companies that had the lowest reported times concerning reaching decisions, and as slow those requiring more time. Hence, this initial measurement of strategic decision speed was not objective, but rather comparative, based on the different decision times reported for reaching strategic decisions. Yet, this initial measurement of strategic decision speed served as the basis for introducing different measures used in subsequent quantitative studies. This type of measurement requires ethnographic research, where the researcher is present in discussions that concern decisions and, thus, has the opportunity to observe and report how much time passes from the first time of discussion concerning a specific decision until the decision is made.

Strategic speed has been measured in three main ways in previous studies that were either purely quantitative or included a quantitative part (mixed method studies):

- a) asking research participants to reflect on which was the most important strategic decision the company made previously; report how much time it took them to reach this strategic decision (Judge & Miller, 1991); and then creating a scale by attributing low strategic decision speed to those decisions that required longer time to reach,
- b) asking about the time required to reach a decision concerning three specific scenarios (acquisition scenario, new product introduction scenario, and adopting a new technology scenario), and calculating the average of the three (Baum & Wally, 2003), and
- c) asking participants to rate on a Likert-type scale how quickly the company reaches strategic decisions in general (Souitaris & Maestro, 2010).

Table 11 presents the different measure instruments used for strategic decision speed in the literature. Studies using the first way of measuring strategic decision speed (noted as a) above) are reported as using the Judge & Miller (1991) measurement scale, those using the second as using the Baum & Wally (2003) scale, and those using the third way are reported as using the Souitaris & Maestro (2010) scale.

All the different scales of strategic decision speed that have been considered for this study were used in quantitative and mixed studies and they are included in the Appendix (Appendix 7). Measures used in strictly qualitative studies or in studies that requested ethnography were rejected, because this is a quantitative study. Hence, the scale by Souitaris & Maestro (2010) was selected for measuring strategic decision speed. The choice of this scale was based on the following four arguments: firstly, it has been in quantitative methods studies (surveys); secondly, it is a self-reported scale, thirdly it has been validated on top executives, and fourthly, it is considered as an

appropriate instrument when measuring usual (average) speed of making strategic decisions (Adomako et al., 2021) at the firm level.

Table 11: Different Ways of Measuring Strategic Decision Speed in the Literature

Authors (year)	Terminology	Measure	Scale	Methodology
Bourgeois & Eisenhardt (1988)	Decision speed	Fast or slow decision making attributed to companies by the researchers	No scale	Mixed methods study (interviews and survey)
Eisenhardt (1989)	Decision speed/strategic decision speed	Time difference between the first time there was an action related to the decision and the commitment to specific actions	No scale; coding firms as slow or fast based on qualitative data	Mixed methods study (interviews and survey)
Judge & Miller (1991)	Decision-making speed	Reporting the duration of decision making for the most important strategic decision over the study period; highest duration was 24 months; each value subtracted from 25 to create a reverse scale	Intuitive scale created by the researchers based on the data	Mixed methods study (interviews and survey)
Chen & Hambrick (1995)	Response announcement speed, response execution speed and action execution speed	Response announcement speed, response execution speed and action execution speed using Eisenhardt's (1989) measure	No scale; using the reported times for each the three speeds based on Eisenhardt's (1989) method	Mixed methods study (survey and publicly available qualitative data)
Perlow et al. (2002)	Speed	Total time spent in management meetings divided by number of strategic decisions	No scale; using the average time per strategic decision as a proxy of total amount dedicated to each decision	Ethnography
Baum & Wally (2003)	Strategic decision-making speed	Average of the time required to reach a	Scale ranged from 2 to more than 180 days to reach the	Quantitative (survey)

		decision concerning three hypothetical scenarios	decision (and was reversed)	
Forbes (2005)	Decision speed	Identification similar to Judge & Miller (1991)	Judge & Miller (1991) method	Quantitative (survey) in new ventures
Zehir & Özşahin (2008)	Strategic decision-making speed	Average of the time required to reach a decision concerning three hypothetical scenarios as in Baum & Wally (2003)	Baum & Wally (2003) scale	Quantitative (survey)
Soutaris & Maestro (2010)	Strategic decision speed	Adjusting the Schriber & Gutek (1987) work pace scale to create a self-reported measure of strategic decision speed	New, self-reported 5-point Likert type scale, with three items	Quantitative (survey)
Chen & Chang (2012)	Decision speed	Expanding Baum & Wally's idea of three scenarios to five important strategic decisions; participants reported the firm speed of reaching each of the five decisions	New, self-reported scale 5-point Likert type scale with five items	Quantitative (survey)
Clark & Maggitti (2012)	TMT Decision Speed	Participants chose how fast the TMT makes decisions, compared to competitors, and compared to the pace of environmental change	New, self-reported scale 5-point Likert type scale with three items	Mixed methods
Mwangi (2012)	Strategic decision speed	Participants report how fast the firm makes decisions	Combination of the Chen & Chang (2012) and Soutaris & Maestro (2010) scale	Quantitative (survey)
Shepherd et al. (2021)	Decision speed	Similar to Clark & Maggitti (2012) scale, but Shepherd et al. used the observed time for a specific decision, whereas Clark & Maggitti asked whether the usual decision time is under three months	Adjustment of the Clark & Maggitti (2012) scale	Quantitative (survey)

Adomako et al. (2021)	Strategic decision speed	Souitaris & Maestro (2010) method	Souitaris & Maestro (2010) scale	Quantitative (survey)
Rahimnia & Molavi (2021)	Strategic decision-making speed	Mwangi (2012) method	Mwangi (2012) scale	Quantitative (survey)

The scale was adjusted in terms of the Likert-type scale to range from 1 = Strongly disagree to 7 = Strongly agree (while the initial scale was on a 5-point Likert-type system), and the third item was slightly rephrased compared to the initial item, in order to better express the question in the Greek language. Therefore, the scale used in this study for measuring strategic decision speed is the Strategic Decision Speed scale by Souitaris & Maestro (2010).

5.10.3 Organizational Performance Measurement

A general overview of how organizational performance has evolved as an essential variable in the management literature is provided in section 2.9. This section examines measures used in strategic management research and specifically in strategic decision-making studies and organizational ambidexterity studies. Table 12 presents the different types of measures for performance used by a selection of previous studies both in the area of strategic decision making and in the area of ambidexterity. As it is obvious from the table, more than one measure of performance has been used in the majority of studies, while relative and self-reported measures of performance have been increasingly used in the past two decades.

Table 12: Measurement of Organizational Performance in the Strategic Decision Making and Organizational Ambidexterity Literature

Authors (year)	Measure	Scale	Methodology	Area
Fredrickson (1984), Fredricskon & Mitchell (1984)	Two measures of performance in the past five years combined: average after-tax return on assets, and (2) percentage change in gross sales	No scale; using actual performance data	Mixed methods (interviews, scenario and survey)	Strategic decision-making literature
Bourgeois & Eisenhardt (1988)	Combined measures of actual and perceived performance: (1) order backlog for each product, (2) relative effectiveness compared to competitors on a 0-10, and (3) profits and sales.	Combination of self-reported scale by CEOs and actual performance data; Effectiveness scale relative to competitors reported by CEOs	Mixed methods (interviews and survey)	Strategic decision-making literature
Eisenhardt (1989)	Two measures of performance in the study period combined: (1) return on sales, and (2) sales trend	No scale; using actual performance data	Mixed methods (interviews and survey)	Strategic decision-making literature
Chen & Hambrick (1995)	Four combined measures of performance: (1) market share change, (2) percentage market share change, (3) Profit margin, (4) total operating profit per revenue passenger mile (RPM)	No scale; using actual performance data on the two market-related and two profitability-related measures used	Mixed methods (survey and publicly available qualitative data)	Strategic decision-making literature
Baum & Wally (2003)	Two measures of performance in the past 4 years combined: sales and employees growth combined into a growth measure, and profit as a percentage of assets	No scale; using actual performance data	Quantitative (survey)	Strategic decision-making literature
Souitaris & Maestro (2010)	Two combined measures of performance: (1) return on total assets, (2) return on sales	No scale; using actual performance data	Quantitative (survey)	Strategic decision-making literature

Shepherd et al. (2021)	Return on assets used as a control measure	No scale; using actual performance data	Quantitative (survey)	Strategic decision-making literature
He & Wong (2004)	Single measure of performance: compounded average sales growth rate of last three years, self-reported	No scale; using self-reported sales growth rate, but checking its correlation with a database of 90 companies in the industry	Quantitative (survey)	Ambidexterity literature
Gibson & Birkinshaw (2004)	Measuring the performance of the business unit based on a 4-item, self-reported scale	Self-reported scale on business unit performance	Quantitative (survey)	Ambidexterity literature
Auh & Menguc (2005)	Two combined measures of performance in the last 3 years: effectiveness (profit growth, sales growth, and market share growth) and efficiency (profitability, return-on-investments, return-on-sales, and return-on-assets).	Two relative performance scales adjusted from Spanos & Lioukas (2001) in two subcategories, reported by CEO	Quantitative (survey)	Ambidexterity literature
Lubatkin et al. (2006)	Multiple performance measures including sales growth, market share growth, return on equity, And return on total assets, compared to competitors from 1 (much worse) to 5 (much better)	Scale of relative performance compared to competitors, reported by CEO (8 items taken from the 12 items of Gupta & Govindarajan (1986)	Quantitative (survey)	Ambidexterity literature
Chang & Hughes (2012)	Measuring the performance of the company based on a 4-item, self-reported scale	Self-reported Gibson & Birkinshaw (2004) 4-item performance scale, adapted to firm level; reported by Managing Director and Chief Product Design Managers	Quantitative (survey)	Ambidexterity literature

Patel et al. (2013)	Single measure of performance in the last three years: growth, but with two dimensions: (1) sales, and (2) employees growth	No scale; using the average of actual data on sales and employee growth for the last three years	Quantitative (survey)	Ambidexterity literature
Luger et al. (2018)	Two measures of performance combined: return on equity and total shareholder return	No scale; using the average of actual data on return on equity and stock price returns for the last three years	Quantitative (survey)	Ambidexterity literature
Kafetzopoulos (2021)	Measuring the change to performance over time in terms of profitability, gross margin, profit, productivity and return on investment	Self-reported scale on the company's performance	Mixed methods (survey and interviews)	Ambidexterity literature

The main self-reported performance measurement scales and their respective items are presented in the Appendix (Appendix 8). Self-reported measures of performance are being used when companies are not willing to disclose performance data, due to confidentiality reasons. This is often the case with private companies and small companies (Lubatkin et al., 2006). Further, there is evidence that self-reported measures of performance are highly correlated with actual performance data, specifically when the person reporting performance is the CEO (Dess & Robinson, 1984; He & Wong, 2004; Lubatkin et al., 2006). In addition, the use of relative performance measures has the advantage of considering the differences among firms and not just the absolute performance of a company (Gupta & Govindarajan, 1986). This is important because examined on its own, a company may be doing well, but the reality when compared to competitors may be very different.

Taking into account all the above, the search was narrowed down to self-reported measures of relative performance compared to competitors, which include several performance dimensions and are reported by CEOs. Among them, the Spanos & Lioukas (2001) scale was selected, based on

the following factors: a) the scale combines multiple measures of performance, b) it has been used in previous research in private firms (e.g. Auh & Menguc, 2005; Schreiner et al., 2009) that – just like small firms – are often reluctant to disclose objective performance data for research purposes and, thus, seemed relevant to this project where all firms are private and the majority are SMEs, c) it has been validated on CEOs who are the respondents in this study, and d) it measures relative performance, which is a better indication of performance under crisis than absolute performance. Indeed, many companies may experience a deterioration of performance during crisis, and this can be perceived as problematic viewed on its own; but if examined compared to what other companies in the industry are doing, it may very well be the case that the company is doing well in terms of performance.

Although the initial Spanos & Lioukas (2001) scale has a retrospective timeframe of three years, the researcher decided to change the timeframe to six months, since the pandemic started affecting Greece six months before this research began. Therefore, it made no sense to ask CEOs to reflect on their performance compared to competitors in the last three years, because the situation in the past six months was significantly different from the situation one year ago for example. Hence, organizational performance was measured in this study using the Spanos & Lioukas (2001) Performance scale, adjusted on a six-month retrospective timeframe.

5.11 Moderators

This section presents the constructs used in order to measure the moderators in this study, i.e. paradox mindset, optimism and educational level. All these moderator variables are individual-level variables, i.e. refer to the individual organizational decision makers (CEOs).

5.11.1 Paradoxical Thinking Measurement

Diverse measures of paradoxical thinking were examined, all presented in the Appendix (Appendix 9). It is important, here, to make the distinction between paradoxical thinking as a cognitive ability and its application in various activities, like leadership: the ability to think paradoxically is part of an individual's cognition, whereas paradoxical leadership is the application of this cognitive ability while performing the work of a leader. Thus, paradoxical leadership can be viewed as the ability to use paradoxical thinking in leadership, and not as a measurement of paradoxical thinking per se; one may be a paradoxical thinker, but may choose to not apply the paradox approach while leading or to apply the paradox approach in some aspects of leadership and not apply it in others. This study examines as a cognitive ability and not its applications.

However, various scales on paradoxical leadership were considered, in order to make sure that focusing rather on the cognitive ability than on its application was the right approach. For example, Zhang et al.'s (2015) scale of paradoxical leadership behaviors, as well as Zhang & Han's (2019) subsequent improvement of this scale, the "Paradoxical Leader Behavior in Long-term Corporate Development Scale" (Zhang & Han, 2019, p. 47), examine whether individuals are paradoxical in their leadership-related job tasks. Although both scales measure whether paradoxical behaviors are put in place by leaders, these measurements are limited to specific paradoxical actions (e.g. pursuing flexibility and stability or planning for the short- and the long-term) and do not measure the overall tendency of a leader to recognize and embrace paradox. Measuring a specific set of paradoxical behaviors of leadership may neglect to measure other such behaviors, which may be used by a leader while the ones measured may not be used (e.g. maintaining a global and local focus). Thus, scales measuring specific paradoxical leadership behaviors, while leaving out others, have been excluded. In addition, Kearney et al. (2019) suggest that empowering and visionary leadership are contradictory forms of leadership, since the former entails communion and the latter agency. Kearney et al. (2019) created a paradoxical leadership measure based on a synthesis of

these previously separate leadership constructs. The Kearney et al. (2019) paradoxical leadership measure requires leaders to be evaluated by their subordinates, whereas in this study responses were collected by CEOs themselves. Overall, paradoxical leadership scales, although very useful in examining specific aspects of leadership behavior, were not selected in this study that examines the role of decision makers' cognitive abilities in general, and not related to specific tasks.

Among the scales measuring paradoxical thinking as a cognitive ability, the Ingram et al. (2016) Paradoxical Thinking scale was considered. This was viewed as a scale that was closer to what was being measured, i.e. respondents' paradoxical thinking as part of their cognition, since it measures whether they view combining conflicting elements as possible. This scale was introduced earlier than the Paradox Mindset scale Miron-Spektor et al. (2018) and it is noteworthy that Ingram was part of the research team that developed the Paradox Mindset scale. Hence, it is evident that the Paradox Mindset construct by Miron-Spektor et al. (2018) is an evolution of the Ingram et al. (2016) scale. The Paradox Mindset scale's advantage lies on the fact that it measures whether the respondents experience tensions, how they feel about experiencing these tensions, and whether they are able to manage them using a both/and way of thinking. Hence, it takes a more holistic approach to paradoxical thinking than the Ingram et al. (2016) scale. Thus, this scale has been viewed as the most appropriate for this project. However, since the Paradox Mindset construct is relatively new and had not been extensively tested when the survey was launched, the Ingram et al. (2016) scale was also included in the pilot study, in order to compare this measure to the more recently introduced Paradox Mindset measure by Miron-Spektor et al. (2018). Nevertheless, it was a common comment by participants in the pilot study that two out of the three items in the Ingram et al. (2016) scale were very confusing, and consequently the scale was withdrawn from the questionnaire after the pilot phase. Therefore, the Miron-Spektor et al. (2018) scale was selected as the measure of paradoxical thinking for this study.

5.11.2 Optimism Measurement

Optimism has been measured in previous work as part of a wider scale that also included items not related to optimism. The main scales, in which optimism is also included, used recently in the literature include the revised Life Orientation Test (Scheier et al., 1994), the Positive Psychological Capital questionnaire (Luthans & Youssef, 2004 & 2007), the Psychological Well-being Scale (Diener et al., 2010), and the Positivity Scale (Caprara et al., 2012).

The Psychological Well-being Scale (Diener et al., 2010) only includes a single item that measures optimism (“I am optimistic about my future”). Although this would make sense in a more general scale that measures a person’s overall wellbeing, this study focuses on optimism and single-item scales are considered problematic, in general, concerning their predictive validity (Diamantopoulos, 2012). Thus, this scale was not chosen. The Life Orientation Test was initially introduced by Scheier & Carver (1985) and was later improved by Scheier et al. (1994). This scale is based on viewing optimism as dispositional, which means that it is viewed as a stable personality variable. However, this is an outdated view of optimism, which is considered a state-like capacity that can be enhanced and learnt (Luthans & Youssef, 2004); therefore this measure was not selected. Similarly, the Positivity Scale by Caprara et al. (2012) uses the optimism Scheier et al.’s optimism scale (1994), which views optimism as a stable personality characteristic was rejected for the same reason.

On the other hand, the optimism subscale, which is part of the Positive Psychological Capital questionnaire, views optimism as an unstable state-like capacity. This scale is still considered relevant and is still being used in research work (e.g. Chen et al., 2021; Grözinger et al., 2021; Yao et al., 2022), although it was developed almost thirty years ago. In addition, the scale has been used in studies where organizational performance was examined (e.g. Baluku et al., 2016; McKenny et al., 2013; Guo et al., 2020), where CEOs were surveyed and performance was

examined (e.g. Peterson et al., 2009), as well as in difficult situations faced by organizations that required the use of coping mechanisms (Fang et al., 2020). Thus, the optimism subscale included in the short Positive Psychological Capital questionnaire was considered appropriate for this study, since it has been used in research under similar conditions, where the respondents were also CEOs.

Consequently, in this study optimism was measured using the Positive Psychological Capital (Luthans et al., 2007a) respective subscale, where optimism is not viewed as a stable characteristic, but is subject to learning and development. A permission to use the short version of the scale that includes two items was obtained by its creators. The permission was obtained to use the scale in this research, with the limitation of using it as it is. Thus, the optimism items were the only items rated on a 6-point Likert-type scale, as follows: 1 = Strongly Disagree, 2 = Disagree, 3 = Somewhat Disagree, 4 = Somewhat Agree, 5 = Agree, 6 = Strongly Agree. This scale has been used in a plethora of previous studies in the area of management, some of which are presented in Table 13.

A sample item from this scale is presented in the Survey Questionnaire section, as the scale creators only provide permission to display only one scale item of the construct.

Table 13: Optimism Scale in Psychological Capital Questionnaire in Management Research

Authors (year)	Work outcome associated with PsyCap
Larson et al. (2006)	Job satisfaction and organizational commitment
Luthans et al. (2008)	Employees' performance, satisfaction, and wellbeing
Avey et al. (2008)	Employees empowerment and problem solving (through examining a wider set of alternatives)
Avey et al. (2009)	Lower stress and lower intention to quit
Cole et al. (2009)	Employees' wellbeing
Peterson et al. (2009)	Transformational leadership (used three of four positive psychological traits: hope, optimism, and resiliency)
Clapp-Smith et al. (2009)	Team performance through the mediation of trust
Avey et al. (2010)	Extra-role organizational citizenship; lower cynicism, intention to quit and counterproductive behaviors.
Rego et al. (2010)	Performance (self-reported, but not supervisor-reported)
Walumbwa et al., (2010)	Leader PsyCap positively related to follower performance through the mediation of service climate
Avey et al. (2011)	Job satisfaction, commitment, well-being, citizenship, multiple performance measures (perceived self-performance, supervisor evaluation, and objective performance), low cynicism, stress, and anxiety.
Rego et al. (2012)	Creativity (hope and self-efficacy only)
McKenny et al. (2013)	Organizational financial performance (linked with organizational-level psychological capital)
Baluku et al. (2016).	Startup success (financial rewards, survival time, owner's satisfaction and generated employment)
Baron et al. (2016)	Wellbeing and low stress
Joo et al. (2016)	Work engagement
Baluku et al. (2018)	Entrepreneurial success (job satisfaction, commitment, meaning in life).
Bogler & Somech (2019)	Team-leader PsyCap is linked with team organizational citizenship behavior
Sun & Huang (2019)	Innovative behavior
Fang et al. (2020)	Coping mechanisms post-disaster and organizational resilience
Sri Ramalu & Janadari (2020)	Organizational citizenship behavior
Gao et al (2020)	Innovation and organizational performance.
Guo et al. (2020)	Political skill, social networks and organizational performance
Chen et al. (2021)	Organizational performance
Grözinger et al. (2021)	Creative innovation and performance (associated with firm-level positive psychological capital)
Yao et al. (2022)	Moderating the relationship between work engagement and job performance

5.11.3 Educational Level Measurement

Educational level was a categorical variable ranging from below high school to PhD/Post-doctorate Degree. Similar or identical scales measuring educational level have been used in multiple cases in previous research (e.g. Herrmann & Datta, 2005; Mom et al., 2009; Rahimnia & Molavi, 2021). Often in previous work, some educational level categories were grouped together in the data analysis phase (e.g. Papadakis et al. (1998) created one category including CEOs with university degrees and grouped those without one together) through the creation of a dummy variable. This method was also used in this study's data analysis phase, as an appropriate method used when examining a categorical variable as a moderator (Dawson, 2014). Thus, educational level was measured as a categorical variable with seven categories (Lower than High School Degree; High School Degree; Some university lessons, but no university degree; Post-secondary 2-year degree; University Degree; Master's Degree; and PhD/Post-doctorate Degree) and a dummy variable was created in the data analysis phase (described in section 7.2.3).

5.11.4 Environmental Dynamism Measurement

In the process of deciding which measures to use in order to conceptualize environmental dynamism, constructs used in previous literature were examined. Since dynamism includes two dimensions, uncertainty and turbulence (Aldrich, 1979; Dess & Beard, 1984), constructs measuring these environmental characteristics were also considered apart from constructs measuring dynamism. All different measures considered for environmental impact are presented in the Appendix (Appendix 10).

One measure of environmental dynamism considered was the one used by Protojerou et al. (2012). This measure includes three items, one on the rate of change of products, one on the rate of change of technology and one that concerned the intensity of competition. This scale measures rate of

change in terms of product and technology and competition, but it fails to consider unpredictability. Another measure considered was Volberda & Van Bruggen's scale (1997) which includes 19 items for environmental turbulence, based on Dill's (1958) previous work. This scale was excluded because it is too long, although it is very comprehensive. Jansen et al. (2006) used a scale of environmental dynamism by choosing five items from the Volberda and Van Bruggen (1997) scale. However, the scale used by Jansen et al. (2016) does not address the degree to which the environment is predictable or not, something that was included in the Volberda and Van Bruggen (1997) scale. The predictability of the environment or, reversely, its degree of uncertainty was a key environmental feature under the global pandemic. It is the high degree of environmental unpredictability during the pandemic that made the judgment performed by the decision makers particularly important when reaching strategic decisions. Thus, the inclusion of a scale that includes uncertainty was essential. The Perceived Environmental Uncertainty scale by Waldman et al. (2001) measures the degree of uncertainty of the environment relating uncertainty not only to how quickly the environment changes, but also to how risky and stressful it is for decision makers to operate in such an environment. All these environmental features were extremely relevant under the global pandemic crisis.

Nevertheless, the aforementioned scale alone was not sufficiently capturing the turbulence dimension of environmental dynamism and its effect on the company-specific market in term of products and customers. Thus, Wilden & Gudergan (2015) Market Turbulence subscale was also included in the survey, a scale that was part of the Environmental Turbulence scale by Wilden & Gudergan (2015) (i.e. Market Turbulence was a subscale in Wilden and Gudergan's scale). This scale was an evolution of the Jaworski & Kohli (1993) scale, which was also considered, but the Wilden & Gudergan scale seemed more relevant to a crisis context. The Market Turbulence subscale combines the perception about the industry as well as demand, customers and products, with the first item combining customers, products and demand. Thus, this subscale seemed like a

good complementary scale for Waldman et al.'s (2001) Perceived Environmental Uncertainty scale, which captures the impact of the overall environment. Both scales combined address the effect of the pandemic crisis on the (Greek) environment, both concerning the external environment overall and concerning company-specific related environmental characteristics, as suggested by McCarthy et al. (2010). Therefore, the two scales (with the Perceived Environmental Uncertainty scale being adjusted on a 7-point Likert type scale) were combined into a single scale of 8 items for measuring environmental dynamism.

5.12 Control Variables

Control variables are used in quantitative studies to capture any alternative explanations to the model being examined. They are included in survey research in order to control for extraneous factors, making the analysis and results more accurate (Spector & Brannick, 2011). If the variable of interest is significant in a regression model after controlling for a set of other variables, then the relationship between the variables examined is viewed as valid. However, the blind use of control variables can be problematic (Spector, 2021). Spector (2021) describes a 7-step process, called Hierarchical Iterative Control (HIC) Approach, which ensures that control variables are meaningfully selected. This process starts with (1) generating the research question through conducting an initial literature review and continues with (2) conducting background literature review, (3) identifying the main relationship examined (in this case the relationship between strategic decision speed and organizational ambidexterity), (4) discussing potential control variables, (5) testing them empirically, (6) interpret results, and (7) test for new/more control variables.

The steps of the HIC approach were followed in order to select the control variables in this study. The selection of the first group of potential control variables was based on the initial and the

background literature reviews conducted, which revealed that CEO demographics, company characteristics and environmental factors have been used as control variables in previous work that included ambidexterity and strategic decision speed. Different control variables in these three categories (individual, organizational and environmental factors) were considered and tested as suggested in the HIC approach, and results were interpreted and discussed. The list of control variables used in this study is presented in Table 14:

Table 14: List of Control Variables Considered for this Study

Control variable considered
Gender
Years of work experience
Owner/CEO
Family company
Company size
Social desirability

The rationale behind the selection of the control variables and their measurement is discussed as follows.

5.12.1 Company and CEOs' Demographics

CEO and company demographics have been extensively used as control variables in previous studies on strategic decision speed. For example, Baum & Wally (2003) have used firm size and decision makers' characteristics as controls; Souitaris & Maestro (2010) have used firm size and age, along with demographics of top management team members as controls (age, tenure, education level, education diversity among others). Similarly, in studies focusing on ambidexterity, examples include Mom et al. (2009), who have used managers' characteristics as controls; García-Granero et al. (2018), who have used both managers' and company characteristics, as well as Jansen et al. (2006) and Birkinshaw & Gibson (2004), who have both

used company-specific characteristics as control variables. Such organizational and decision makers' features have been found to impact the process of strategic decision making (e.g., Hambrick, 2007; Miller et al., 1998).

Among the company-specific variables, this study uses CEO ownership as a control, based on previous findings that managers who are also company owners are more motivated to increase company value, because of bearing the costs of not doing so, and thus achieve better performance (Mueller & Spitz-Oener, 2006). Moreover, owners of Greek companies have been found to reach decisions less rationally than managers of multinational companies, when operating in Greece (Papadakis et al., 1998). Similarly, family ownership of a company affects decision making, since family members that run the company usually desire to retain control over decisions and are less tolerant to risk (Miller et al., 2009). Company size has also been found to affect the decision-making process, as small companies are usually able to decide faster and may not pay detailed attention to environmental constraints (Brouthers et al., 1998). Therefore, these three company-specific variables, i.e. CEO ownership, family ownership and company size, were considered essential as control variables.

Among the decision makers' demographic characteristics, gender has been used in studies that examined ways of thinking and where the micro perspective was central (e.g. Miron-Spektor et al., 2018). Given the increasing amount of women in top positions in the past few years and the tendency to appoint women CEOs during crisis (Sun et al., 2015), as well as the fact that almost one out of four respondents in this study were women (23.6%), including gender as a control variable was considered important. Further, this study was conducted under the global pandemic crisis and focused on cognition-related managerial characteristics. Decision makers' experience is important for cognition, since having previous experience in similar conditions offers an advantage for reaching decisions faster (Oliver & Roos, 2005); and the longer the professional experience of

CEOs, the more different conditions they have experienced. Therefore, years of experience was selected to test whether those CEOs with more experience were reaching decisions in a different way. Finally, social desirability was used as a control variable for reasons related to quality assurance and research bias.

Based on the HIC approach, years of experience, gender, and social desirability, along with company size, family company, and CEO ownership, were used as control variables in this study. All measurements of control variables, apart from social desirability, have been made using standard practices in previous research, where respondents selected their gender, whether a company is family-owned or not, etc., and have inserted their years of experience, number of company employees, etc., in respective fields. Social responsibility was measured using two items from the Crowne & Marlowe (1960) scale. The scales used to measure all control variables are presented in the Survey Questionnaire, as follows.

5.12.2 Social Desirability

Social desirability has to do with respondents in research surveys and experiments providing inaccurate responses in order to positively affect their image with their answers (Larson, 2019). Previous research has suggested that social desirability bias needs to be examined when self-reported measures are used (Perinelli & Gremigni, 2016), otherwise the value of the findings may be weaker (Kuokkanen & Sun, 2016). One appropriate solution for measuring and investigating social desirability bias is the use of a social desirability scale, which is used as a control variable (Fisher & Katz, 2000; Larson, 2019). There has been some criticism concerning this method, mainly related to the fact that some social desirability scales entail a self-deceptive component associated with personality traits (Paulhus, 1991). Among social desirability scales that have been developed in order to measure this effect, the two dominant are the Crowne & Marlowe (1960) scale and the Balanced Inventory of Desirable Responding (BIDR) Scale developed by Paulhus

(1998). Both scales are quite long, with the Crowne & Marlowe scale including 33 items and the BIDR scale including 40 items (short versions of the scales are included in the Appendix); hence, a common practice in quantitative research is to use a few items of either scale as a control variable. Between the two scales, the Crowne & Marlowe scale has been proven more reliable in identifying fake answers (Lambert et al., 2016) and is also considered as independent of the component related to self-deception (Fisher & Katz, 2000). Although the initial Crowne & Marlowe scale was a True – False scale, it has been adjusted and used as a Likert-type scale in previous work (e.g. Sepulveda et al., 2020). Therefore, the Crowne & Marlowe Social Desirability Scale was selected for this study, adjusted on a range from 1 to 7, with two items being used as control variables.

5.13 Survey Questionnaire

The Survey questionnaire is presented below (please note that only one item of the Optimism subscale of the Positive Psychological Capital scale is presented (Luthans & Youssef, 2007a), due to restrictions by the construct's creators). All items were measured on a 7-point Likert scale ranging (in general) from 1=Strongly disagree to 7=Strongly agree, apart from the Optimism scale which was measured on a 6-point Likert Scale (used exactly as in the Positive Psychological Capital Construct according to the permission of use granted). The order of the items has been chosen in order to achieve proximal separation of items of the independent and dependent variables (Podsakoff et al., 2003; Weijters et al., 2009).

Organizational ambidexterity (Lubatkin et al., 2006)

In the following questions, please select the one that is closer to your company's strategy in the past six months, ranging from 1= Strongly disagree to 7 = strongly agree.

Exploratory orientation:

In the past six months, the firm:

1. looks for novel technological ideas by thinking “outside the box,”
2. bases its success on its ability to explore new technologies,
3. creates products or services that are innovative to the firm,
4. looks for creative ways to satisfy its customers’ needs,
5. aggressively ventures into new market segments, and
6. actively targets new customer groups.

Exploitative orientation:

In the past six months, the firm:

7. commits to improve quality and lower cost,
8. continuously improves the reliability of its products and services,
9. increases the levels of automation in its operations,
10. constantly surveys existing customers’ satisfaction,
11. fine-tunes what it offers to keep its current customers satisfied, and
12. penetrates more deeply into its existing customer base.

Paradox Mindset (Miron-Spektor et al., 2018)

1. When I consider conflicting perspectives, I gain a better understanding of an issue.
2. I am comfortable dealing with conflicting demands at the same time.
3. Accepting contradictions is essential for my success.
4. Tension between ideas energizes me.
5. I enjoy it when I manage to pursue contradictory goals.
6. I often experience myself as simultaneously embracing conflicting demands.
7. I am comfortable working on tasks that contradict each other.
8. I feel uplifted when I realize that two opposites can be true.
9. I feel energized when I manage to address contradictory issues.

(As already explained, items 6 and 8 from the original scale were removed in the analysis phase).

Optimism (sample item from Luthans et al., 2007a)

I always look on the bright side of things regarding my job.

Strategic Decision Speed (Souitaris & Maestro, 2010)

1. We prefer to make strategic decisions quickly. (Rephrased in order not to be Reverse)
2. We generally believe in making quick strategic decisions.
3. Our company emphasizes on speed when planning or thinking about strategies. *

*Adapted from initial item: Please tick the extent on which your company places on: speed when planning or thinking about strategies.

Marker variable

I daydream and fantasize, with some regularity, about things that might happen to me.

Social desirability items (Crowne & Marlowe, 1960)

No matter who I am talking to, I am always a good listener.

I'm always willing to admit it when I make a mistake.

Performance (Spanos & Lioukas, 2001)

For the following questions, please select how your firm is performing compared with your main competitors in the past six months, from 1 = Much worse than competitors to 7 = Much better than competitors.

(1 = Much worse than competitors, 7 = Much better than competitors)

1. Sales volume
2. Growth in sales volume

3. Market share
4. Growth in market share
5. Net profits
6. Profit margin
7. Return on own capital

Environmental Dynamism

a) Perceived Environmental Uncertainty (Waldman et al., 2001)

How would you characterize the external environment within which your corporation functions?

In rating your environment, where relevant, please consider not only the economic but also the social, political, and technological aspects of the environment.

1. Very dynamic, changing rapidly in technical, economic, and cultural dimensions.
2. Very risky, one false step can mean the firm's undoing.
3. Very rapidly expanding through the expansion of old markets and the emergence of new ones.
4. Very stressful, exhausting, hostile, hard to keep afloat.

b) Market turbulence (Wilden & Gudergan, 2015)

5. In our kind of business, customers' product preferences change quite a bit over time.
6. We are witnessing demand for our products and services from customers who have never bought them before.
7. We cater to many of the same customers that we used to in the past.
8. It is very difficult to predict any changes in this marketplace.

(As already explained, items 6 and 8 were removed in the analysis phase)

Demographics

Educational level

Please select your level of education:

Lower than High School Degree

High School Degree

Some university lessons, but no university degree

Post-secondary 2-year degree

University Degree

Master's Degree

PhD/Post-doctorate Degree

Work experience

Please indicate how many years of work experience you have: ____

Gender

Please indicate your gender: Male Female Other

Experience abroad

Please tick the box in case you have also worked in other countries other than Greece:

Experience in a multinational company

Please tick the box in case you have worked in a multinational company in Greece or abroad:

Educational background

Please select your main educational background:

Engineering / Informatics / Sciences

Business Administration

Social sciences

Art / Humanities

Medicine or life sciences

Accounting / finance

CEO ownership

Are you the owner of the company? Yes ____No____

Company founders

Have you or your family founded the company? Yes ____No____

Family company

Is this a family company? Yes ____No____

Company age

When was the company established? _____

Company size (now and pre-Covid)

Number of employees in your firm: in the end of: December 2019 __Now__

Company industry

Please select the industry in which your company operates:

Forestry, fisheries, agriculture, agriculture

Real estate / real estate management

Mining / Ores

Professional, scientific or technical services

Utilities

Construction company

Production / processing

Waste management / environmental protection

Educational services

Wholesale

Retail

Health / social protection services

Arts / entertainment

Transportation, storage & logistics

Tourism / Catering

Telecommunications / Informatics

Insurance / Financial Services

Management of other companies / group of companies

[Coding of Data](#)

Tables 15 and 16 present data coding for educational background and company industry.

Table 15: Educational Background – Assigned Values

Please select your main educational background:
Engineering / Informatics / Sciences = 1
Business Administration = 2
Social sciences = 3
Art / Humanities = 4
Medicine or life sciences = 5
Accounting / finance = 6

Table 16: Company Industry – Assigned Values

Please select the industry in which your company operates:
Forestry, fisheries, agriculture, agriculture = 1
Real estate / real estate management = 2
Mining / Ores = 3
Professional, scientific or technical services = 4
Utilities = 5
Construction company = 6
Production / processing = 7
Waste management / environmental protection (Not coded, because frequency was 0)
Educational services = 8
Wholesale = 9
Retail = 10
Health / social protection services = 11
Arts / entertainment = 12
Transportation, storage & logistics = 13
Tourism / Catering = 14
Telecommunications / Informatics = 15
Insurance / Financial Services = 16
Management of other companies / group of companies = 17

The following table presents a summary of information on the data collected related to the numerical variables measured:

Table 17: Variables and Coding

Variable	Items	Coding	Scale
Organizational ambidexterity (exploration and exploitation)	12	explor1, explor2 explor3, explor4 explor5, explor6 exploit1, exploit2 exploit3, exploit4 exploit5, exploit6	Lubatkin et al., 2006
Paradox mindset	9	Paradox1, Paradox2, Paradox3, Paradox4, Paradox5, Paradox6, Paradox7, Paradox8, Paradox9	Miron-Spektor et al., 2018
Optimism	2	Optimism1, Optimism2	Luthans et al., 2007
Strategic decision speed	3	str_speed1, str_speed2, str_speed3	Souitaris & Maestro, 2010)
Social desirability	3	Soc_des1, Soc_des2	Crowne & Marlowe,1960
Marker variable	1	MarkerVari	Braun et al., 2015
Performance (relative)	7	relperf1, relperf2, relperf3, relperf4, relperf5, relperf6, relperf7	Spanos & Lioukas, 2001
Perceived Environmental Dynamism	8	env_uncer1, env_uncer2, env_uncer3, env_uncer4 (environmental uncertainty) mkt_turb1, mkt_turb2, mkt_turb3, mkt_turb4 (market turbulence)	Waldman et al., 2001 Wilden et al., 2015

All measurements were conducted using 7-point Likert-type scales, with the exception of Optimism, which was measured on a 6-point Likert-type scale due to restrictions by the construct's creators. In addition, Qualtrics has built-in features that facilitate the minimization of response errors. For example, the selection of the respective number from 1 to 7 (or from 1 to 6) from a drop-down menu ensures choosing a one-digit number in the specific range as a response, or answering a question is compulsory before moving to the next question. In this way, data entry

mistakes and missing data were avoided. In the same way, data entry mistakes and missing data were avoided in the demographic section of the survey, which is presented in the following section.

5.14 Quality Assurance & Research Bias

The quality of a research, and therefore of the results and conclusions generated, may be negatively affected by different types of biases that are entailed by the measurement methods applied (Podsakoff et al., 2012). Common method bias is related to the variance generated by the measurement method rather than what is being actually measured (Podsakoff et al., 2003). Among the several types of common method biases related to research, relevant to this project are those related to surveys. The most common biases in survey research are social desirability bias and consistency motif.

5.14.1. Investigating and Controlling for Social Desirability Bias

As already mentioned, social desirability bias (SDB) may affect the results of research surveys and experiments (Larson, 2019), as respondents are concerned with their image and may often decide to provide certain answers that will make them look better. Apart from using a social desirability scale as a control variable, other measures than can reduce social desirability bias have been used at the research design phase, including assuring response anonymity and confidentiality, according to previous research findings and suggestions (Dodou & De Winter, 2014; Larson, 2019). The respondents were reassured that their responses would remain anonymous and confidential, and that no one but the researcher would have access to them. These assurances were repeated both in the Participant Information section, as well as in the Participant Consent Form, as presented below.

Other methods of reducing the effect of SDB include changing the wording of research items (Kuncel & Tellegen, 2009; Podsakoff et al., 2012), in order to eliminate words in self-descriptive items. However, since the questionnaire was constructed using items from existing scales, the

researcher preferred to use the original existing scales, which have been used and tested for validity (including tests for SDB) in various previous studies without changing the wording. Results related to social desirability bias are presented in the Results section (6.3).

5.14.2 Consistency Motif

Consistency motif has to do with the desire of participants to appear consistent in their answers, and hence try to find similarities between different questions and provide similar answers, whereas they might give a different answer if they weren't aware of such similarities (Johns, 1994; Podsakoff et al., 2003). This may affect the identified relationships between predictor and criterion variables. A solution to this problem is to collect data from different sources (Podsakoff et al., 2012) like different people, or people and secondary data sources (for example, two different data sources were used by Miron-Spektor et al. (2018) when they developed the Paradox Mindset scale). When using data from two sources is not possible, like in this project, a potential solution to the consistency motif issue is to apply proximal separation of items for the predictor and criterion variables (Podsakoff et al., 2003; Weijters et al; 2009). This decreases the participants' ability to identify relationships between items, which they would easily do if the items were closely located. Thus, the items measuring the dependent and those measuring the predictor variable in the model under examination were separated (proximal separation) and the order of the items was carefully examined, in order to decrease consistency motif.

Overall, the constructs and scales used in this research have been developed in previous work and tested taking into account different types of common method bias, with respective results having been published in esteemed peer-reviewed journals. Using existing scales is, hence, advantageous compared to using new ones concerning common method bias, and significantly reduces the risk of the types of common method bias that could be related to this project.

5.14.3 Marker Variable

Marker variables are used in survey research, and more specifically in cross-sectional research, in order to detect common method variance (Simmering et al., 2015). According to Lindell & Whitney (2001), marker variables that are not related theoretically to the variables in the study can be used as a way to examine whether the data suffers from common method variance. If conceptually there is no reason to expect a marker to be associated to other variables in the study, then the marker variable should not correlate with them. In this study, an item from the Interpersonal Reactivity Index (Braun et al., 2015) was used as a marker variable: “I daydream and fantasize, with some regularity, about things that might happen to me.”, as theoretically it is not associated with any of the variables used in the study. The relevant results are presented in section 5.7.

5.15 Hierarchical Regression and Moderation

Hierarchical linear regression (Aiken & West, 1991) is a statistical method of analysis used in quantitative research when there is interest in examining the amount of variance in the dependent variable explained by different independent variables. In hierarchical linear regression, the different independent variables are added in different steps in order to examine their individual and combined effects as they are added progressively. Furthermore, moderation occurs when the size or the nature of the effect of an antecedent on an outcome varies under certain conditions (Aguiis et al., 2017; Dawson, 2014). Hence, at least one contingency factor (or more), the moderator (or multiple moderators), affects the magnitude of the relationship between the antecedent and the outcome. When the moderator is a continuous variable or a binary categorical variable, the method that is commonly used is moderated multiple regression (Aiken & West, 1991).

Hierarchical linear regression in which moderators are examined is called multiple moderated hierarchical regression. This method is considered suitable when examining how a moderating variable enhances or reduces the effect of the independent variable on the dependent one (Baron & Kenny, 1986; Cramer, 2003; Schriesheim, 1995). Further, multiple moderated hierarchical regression is appropriate when the data cases are not nested (Hofmann, 1997), in other words there is no shared variance among them; an example of shared variance would be gathering responses from employees of the same department, in which case these data should be compared to the data gathered from employees in another department of the same firm.

In this study, respondents were CEOs of different companies operating in Greece, therefore data were not nested. Furthermore, the relationship between strategic decision speed and organizational ambidexterity was examined, and potential moderators of this relationship were considered. In line with multiple cases of previous research where multiple moderated hierarchical linear regression was used to examine moderating effects of relationships that include organizational ambidexterity (e.g. Li, 2013; Tuan, 2016; Zhang et al., 2017), moderated hierarchical linear regression was used in this project. The measures of the variables used in the model under examination are described in the next section.

5.16 Chapter Summary

This Chapter presented the methodological design of this study, based on the researcher's views on methodological issues. Different research paradigms were briefly presented and the choice of positivism was explained. Further, the reason for selecting survey research was explained, along with an overview of the Greek context and why it is an interesting setting for examining strategic decision making under crisis. Next, how the context was incorporated into project design was illustrated and the research phases were discussed. Hierarchical regression and moderation were briefly presented as quantitative research methodologies. In addition, the Chapter included a

description of the research ethics and quality assurance process, as well as a detailed explanation of the choices of variables and the measures used. The Chapter concluded with the Survey Questionnaire, the creation of which was based on the literature review and the methods and processes described in the Chapter. The following Chapter presents research analysis, including a presentation of the sample demographics and analysis related to construct validity.

6. Sample Analysis, Construct Reliability and Validity

This Chapter presents an analysis of the sample demographics, both in terms of the decision makers who responded to the survey as well as their companies. Further, descriptive statistics and bivariate correlations are presented, whereas common method bias and construct reliability are analyzed. The Chapter concludes with construct validity and a presentation of the model fit.

6.1 Sample Description and Demographics

Demographics of both the respondents (individual decision makers at the top hierarchical level of companies in Greece) and their companies were collected, in order to a) better comprehend the degree of homogeneity, diversity and representativeness of Greek companies in the sample gathered for the purposes of this study, and b) enable the examination of various demographics as potential control variables in the research model, according to the Hierarchical Iterative Control (HIC) Approach described in section 4.8. One specific demographic at the individual level, educational level of the respondent, which is considered a proxy of the cognitive ability of respondents as already explained in section 2.11, was examined as a moderator of the relationship between strategic decision speed and organizational ambidexterity. Table 18 presents a summary of the types of demographic data collected and their respective levels:

Table 18: Type of Demographic Data Collected

Variable	Type	Response type	Level
Educational level	Categorical	Drop-down menu selection	Individual
Work experience	Numerical	Fill in	Individual
Gender	Categorical	Yes/No	Individual
Experience abroad	Categorical	Yes/No	Individual
Experience in a multinational company	Categorical	Yes/No	Individual
Educational background	Categorical	Drop-down menu selection	Individual
CEO ownership	Categorical	Yes/No	Individual
Company founders	Categorical	Yes/No	Individual
Company age	Numerical	Drop-down menu selection	Company
Company size	Numerical	Drop-down menu selection	Company
Company industry	Categorical	Drop-down menu selection	Company

The final sample consisted of 144 companies, represented in the sample by 144 decision makers (CEOs). There were a few cases where the respondent did not hold the title of the CEO, but was still at the top of the company's hierarchy. Such cases included subsidiaries of multinationals that had a Country General Manager or Managing Director in Greece and a CEO in another country, and smaller companies where the top executive held the position of General Manager (i.e. there was no CEO). In all cases, the respondents were at the top of the hierarchy of the organization in

terms of decision making. For simplicity reasons, and since all executives that participated in this study were at the top of the hierarchy and the vast majority of them held the title of CEO, they are referred to as CEOs. As follows, the sample characteristics, based on the demographic data collected, are presented.

6.1.1 Company Demographics

The following tables present the company demographics of the organizations in the sample, in terms of size, age and industry sector. As already mentioned, the fact that snowballing was used as a recruitment strategy made it difficult for the researcher to influence the type of organizations included in the sample. However, the final sample is a satisfactory representation of Greek companies, as explained below, and the random selection of companies – based on the criterion of whether their CEO was in the network of a CEO that had already responded to this research – led to a sample that was not confined to a specific industry, but included multiple different sectors in Greece (please see Table 21).

Table 19 presents the distribution of the companies in the sample in terms of size, which was measured as the number of the employees working in the company when the data collection was conducted:

Table 19: Company Size

Company Size	Number	%
SMEs	120	83.33
Large	24	16.67
Total	144	100

SMEs are the backbone of the Greek economy. In total, 99.9% of companies in Greece are SMEs (source, Hellenic Statistical Authority website). However, although the percentage of companies

operating in Greece are SMEs is close to 100%, in 2020 they accounted for 83% of employment (Source: [European Union SME Country's Factsheet](#)). If this study included 99.9% small and medium size enterprises, this would entail that larger enterprises, in which about 17% of Greek employees work, would be completely left out. If the whole population of Greek companies was included in the sample, then the 0.1% percentage that they represent in the total sample, would mean that thousands of large samples would still be included. But in a sample of 144 companies, a percentage of 0.1% corresponds to 0.144 companies, i.e. to including no large companies at all. Therefore, the researcher believes that a sample with a more accurate representation of the Greek economy should also include large companies. The fact that 83.33% of companies in the sample is very close to the percentage of employment for which SMEs accounted for in 2020 (83%), is an indication that the sample is a good representation of the companies in the Greek economy. However, this study's findings indicate that the impact of company size is actually not significant in this study, since it was found statistically significant only in model 3 that examines paradox mindset as a moderator of the strategic decision speed – organizational ambidexterity relationship with a regression coefficient of 1.837E-05; therefore, the company size effect in this relationship is in reality minimal.

Table 20 presents the age of the companies in the sample, which was calculated by subtracting the year in which they were founded as inserted by respondents in the relevant field, from the current year, i.e. 2020 or 2021 respectively (depending on when the survey was filled in).

Table 20: Company Age

Company Age (Years)	Number	%
<10	36	25
(10, 20]	29	20.14
(20, 30]	23	15.97
(30, 40]	13	9.03
(40, 50]	19	13.19
(50, 60]	10	6.94
>60	14	9.72
Total	144	100

Data concerning the age of Greek companies are not easily available in general. For example, the number of young companies and startups is not easy to estimate and there are different numbers reported by different organizations (Source: [Enterprise Greece](#) - Report on the Greek startup scene by the Greek government). Nevertheless, it is important that both younger companies and established companies are represented in the sample. If younger companies, with less than ten years since having been founded, were excluded from the sample, this would entail overlooking the significant difficulties that these companies face compared to older, established firms during a crisis. Indeed, a crisis has disproportionately more negative impact on younger than on older firms and negatively affects their growth (Bartz & Winkler, 2016) and their access investments funding (Isatayeva et al., 2019) during the crisis. Hence, it is important to include both younger and older companies and a good representation of the Greek business environment would include companies with different ages, as is the case in this study.

Table 21 presents the industry sector in which the company operates, as selected by the respondent from the drop-down menu available on Qualtrics. A variety of industry sectors is represented in this study's sample. Overall, the Greek economy is a service economy. In 2020 when the research was launched, the service sector accounted for 68.56% and the production sector for 15% of the

national GDP (Source: [Statista](#)). As is presented in Table 21, the percentage of service companies in the sample is 65.97% and the percentage of production companies is 17.36%. These percentages are very close to the percentages in the whole population of Greek companies, which indicates that the industry sectors of companies in Greece in 2020 are fairly represented in this study's sample.

Table 21: Industry Sector

Industry sector	Services	Number	Percentage
Forestry, fisheries, agriculture, agriculture	No	1	0.69
Real estate / real estate management	Yes	2	1.39
Mining / Ores	No	1	0.69
Professional, scientific or technical services	Yes	23	15.97
Utilities	No	1	0.69
Construction company	No	5	3.47
Production / processing	No	25	17.36
Educational services	Yes	13	9.03
Wholesale	No	8	5.56
Retail	No	8	5.56
Health / social protection services	Yes	11	7.64
Arts / entertainment	Yes	6	4.17
Transportation, storage & logistics	Yes	3	2.08
Tourism / Catering	Yes	9	6.25
Telecommunications / Informatics	Yes	14	9.72
Insurance / Financial Services	Yes	11	7.64
Management of companies/group of	Yes	3	2.08
Total		144	100

It is important to mention that the Shipping Industry, one of the most important industries in Greece, has been excluded from this study. This is due to the fact that the Shipping Industry does not necessarily follow the rest of the economy. Indeed, different types of crises may affect and have affected the Shipping Industry, which have not necessarily affected the rest of the economic sectors. For example, in the past the Greek Shipping industry has been negatively affected by

competition from countries with lower labor costs (Source: [European Foundation for the Improvement of Living and Working Conditions](#)), by collision risks between ships and whales (Frantzis et al., 2019) or by environmental regulation related to the sea water (Sideri et al., 2021), which did not affect other industries in the Greek economy. In general, the shipping industry experiences crises that other industries do not experience and vice-versa. This is why shipping was excluded from the sample.

Last but not least, Table 22 presents the number of family companies in the sample. Data for this question were collected with respondents choosing between Yes or No concerning whether this is a family company. About half of the companies in the sample were family companies. This is further discussed in the next section, in combination with the questions of ownership and founding the company.

Table 22: Family Companies in the Sample

Family company	Number	%
Yes	68	47.22
No	76	52.78
Total	144	100

Overall, the sample is an accurate representation of the companies operating in Greece when the data for this research was collected, which is an important assumption of positivism (Gill & Johnson, 2010). The next section presents individual demographic data of respondents.

6.1.2 Decision Makers' Demographics

Tables 22 to 29 present information on the profile of the decision makers who responded to the research survey. All respondents were at the top of the hierarchy in their organizations. Among them, about one out of four were women (23.61%) as indicated in Table 22. It is worth mentioning

that although the options in the drop-down menu for this question were not binary, i.e. there was the “Other” option for gender, no respondent selected this option. This does not necessarily mean that the respondents identify themselves solely as men or women, though. Binary results in this question may be related to the fact that discrimination in Greece on the basis of sexual orientation is quite widespread (Papadaki & Papadaki, 2011). Gender has been examined and used as a control variable in this study.

Table 23: Respondents’ Gender

Gender	Number	%
Woman	34	23.61
Man	110	76.39
Total	144	100

Table 24 presents the educational level of top executives in the study’s sample, as they selected it from the relevant drop-down menu. As the table indicates, there were no participants who reported that their higher education degree was lower than high school. The majority of participants have obtained a Master’s degree (53.47%). The research participants who hold at least a University degree correspond to 90.97%, which means that more than nine out of ten top executives in the sample have either a University or a higher degree (Master’s, PhD, post-doc). This indicates that top executives in the sample are highly educated, even though the majority of companies are SMEs.

Table 24: Educational Level of Respondents

Educational level	Number	%
Lower than High School Degree	0	0
High School Degree	6	4.17
Some university lessons, but no university degree	2	1.39
Post-secondary 2-year degree	5	3.47
University Degree	49	34.03
Master's Degree	77	53.47
PhD/Post-doctorate Degree	5	3.47
Total	144	100

Table 25 presents the educational background of the research participants. The most popular educational areas for top executives in the sample is Business Administration (39.58%) and STEM (31.94%). These two areas combined account for more than 70% of respondents, which means that more than seven out of ten respondents in the samples have studied business administration or STEM. In addition, there is no one in this study's sample with a lower than high school education degree.

Table 25: Respondents' Educational Background

Educational background	Number	%
Engineering / Informatics / Sciences	46	31.94
Business Administration	57	39.58
Social sciences	8	5.56
Art / Humanities	12	8.33
Medicine or life sciences	7	4.86
Accounting / finance	14	9.72
Total	144	100

Table 26 presents the experience of survey respondents in years. Respondents filled in the relevant field with the number of years that corresponded to their experience. As is indicated by the Table,

the vast majority of respondents have more than 10 years of work experience (91.67%). Hence, more than nine out of ten executives in the sample have at least a decade of work experience.

Table 26: Respondents' Years of Experience

Experience (Years)	Number	%
(5,10]	12	8.33
(10,20]	47	32.64
(20,30]	64	44.44
(30, 40]	20	13.89
>40	1	0.69
Total	144	100

Table 27 presents whether the survey participants have experience abroad. Data for this question were gathered with participants selecting Yes or No concerning whether they have in the past worked in another country. As the table indicates, about 40% of the top executives who filled in the survey have work in other countries as well.

Table 27: Experience Abroad

Experience abroad	Number	%
Yes	58	40.28
No	86	59.72
Total	144	100

Table 28 presents whether the survey participants have worked in a multinational company (MNC). Data for this question were gathered with participants selecting Yes or No concerning whether they have ever worked in a MNC. AS the table indicates, more than half of the respondents have experience in a multinational company.

Table 28: Experience in a Multinational Company

Experience in a MNC	Number	%
Yes	79	54.86
No	65	45.14
Total	144	100

Tables 29 and 30 present whether the respondent is the company owner and whether he/she, or a member of their family, has founded or co-founded the company. The percentage of company founders (65.97%) is higher than the percentage of company owners (60.42%), which indicates that there are cases where participants in the sample have founded the company but do not own it anymore. Moreover, according to Table 23, 47.22% of the companies in the sample are family companies. This indicates that about 19% of the companies in the sample (the difference between 65.97% - 47.22% = 18.75%) were founded by the respondent, but are not family companies. Similarly, slightly more than 13% of the companies in the sample (60.42% - 47.22% = 13.2%) are owned by the respondent but are not family companies. These numbers indicate that Greek entrepreneurs are not always inheriting companies from their families; hence, it is interesting to test whether CEO ownership makes a difference. A relevant finding is discussed in section 6.2.4.

Table 29: CEO Ownership

Owner	Number	%
Yes	87	60.42
No	57	39.58
Total	144	100

Table 30: Company Founders/Co-founders

Founder	Number	%
Yes	95	65.97
No	49	34.03
Total	144	100

In general, the analysis of the decision makers' demographic data indicates that the sample is comprised of highly educated and highly experienced executives, a significant percentage of whom have worked in another country and in a multinational company in the past.

6.2 Descriptive Statistics, Correlations and Multicollinearity Test

Descriptive statistics or descriptive analysis of data is used to provide summaries or overviews of quantitative data, in a way that facilitates the identification of patterns and relationships that are not easily traceable in raw data (Pallant, 2010). Descriptive statistics enable a preliminary understanding of the maximum and minimum values of data, their average (mean), and the degree of variation between different observations (standard deviation). Apart from this basic statistical information, descriptive analysis also includes examining the correlations between the variables measured. If the correlation between two predictor variables is above 0.7, this means that these variables are in essence measuring the same phenomenon and the question of whether they should be used separately arises. When this occurs, there is multicollinearity, which means that the set of quantitative data examined is not reliable (Kumar, 1975).

A common practice in survey projects when examining moderation effects and testing for multicollinearity is to mean-center the variables examined (Irwin & McClelland, 2001). This process entails creating new variables from the raw (observed) data by subtracting the mean value from each observation. Mean-centering the variables facilitates the clarification of the regression coefficients and does not affect the model's overall R^2 , which represents how much of the dependent's variable variance is explained by the model (Iacobucci et al., 2017). Therefore, the numerical variables in this study were mean-centered (Aiken & West, 1991).

As a first step for mean-centering the data set variables, their means were computed. Then, these means (indicated in Table 31) were used to compute at SPSS the centered variables for the numerical variables in the research model. Table 31 presents the main statistical information of the observed variables, including their mean, whereas Table 32 presents the descriptive statistics and correlation coefficients for all variable in the model, where the numerical variable have been centered. Both tables include all the variables that have been used in the model, excluding the demographic variables that were not used as control variables, but were included in the questionnaire based on the Hierarchical Iterative Control (HIC) Approach (please see section 4.8). As already mentioned, categorical variables were not mean centered.

As table 31 indicates, the distance between the minimum and maximum values of company size is quite large, a fact that is also reflected in the variable's standard deviation. However, company size has been used as a control variable and has not altered results. Moreover, as it is explained in the results section, the effect of company size is minimal with a regression coefficient that is almost zero (Please see section 6.3).

Table 31: Descriptive Statistics of Observed Variables

Variable	Min	Maximum	Mean	St. deviation
Organizational ambidexterity	1.92	7.00	5.49	0.90
Strategic speed	1.00	7.00	4.89	1.41
Relative performance	1.71	7.00	4.93	1.10
Paradox mindset	1.67	6.78	5.26	0.86
Optimism	2.00	6.00	4.86	0.90
Educational level	2.00	7.00	5.44	1.03
Environmental dynamism	2.17	6.83	4.22	0.92
Company size	2.00	61000.00	928.72	5331.45
Social desirability	3.00	7.00	5.45	0.83
Experience (years)	5.00	43.00	23.00	8.45
Gender	0.00	1.00	0.24	0.43
Family Company	0.00	1.00	0.47	0.50
CEO Ownership	0.00	1.00	0.60	0.49
Marker Variable	1.00	7.00	4.86	1.581

Table 32 presents the descriptive statistics and the correlations coefficients for all variables in the research model, where the numerical variables are now centered. From now on, whenever a reference is made to a numerical independent variable in the research model, it will be implied that the reference concerns the centered variable. As is indicated in Table 32, correlation coefficients for all variables are well below the threshold of 0.7. More specifically, the maximum bivariate correlation is 0.414, between relative performance and organizational ambidexterity, which are hypothesized to be positively associated, so a correlation between them is expected. Still, the value of the Pearson correlation between these two variables was significantly still well below the 0.7 threshold.

Further, the marker variable (“I daydream and fantasize, with some regularity, about things that might happen to me.”) does not correlate with any variable in the model. As already mentioned, this item is part of the Interpersonal Reactivity Index (Davis, 1980) that is used to measure

empathy. It was selected as an item that is not relevant to the variables in the research model. Indeed, the marker variable item only correlates with social desirability with a Pearson correlation value of 0.166, significant at the 0.01 level. Correlations between items of the Interpersonal Reactivity Index and social desirability items have been reported in previous work (Braun et al, 2015) and do not affect the validity of results. Specifically for this dissertation, the item used for the marker variable only correlates with social desirability and this item is part of a scale that measures empathy, which is not examined in this study. Hence, the marker variable item is indeed not related (as it does not correlate) with variables in this study, indicating that the sample does not suffer from common method variance (Lindell & Whitney, 2001).

Table 32: Descriptive Statistics and Correlation Matrix

	Mean	S.D.	CR	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
(1) Organizational ambidexterity	5.489	0.909	0.924	0.712													
(2) Strategic decision speed	-0.003	1.41	0.926	.353**	0.898												
(3) Relative performance	4.93	1.10	0.941	.414**	0.151	0.833											
(4) Paradox mindset	0.004	0.94	0.881	.231**	0.003	0.154	0.718										
(5) Optimism	0.001	0.90	0.810	.377**	.216**	.233**	0.086	0.825									
(6) Educational level dummy	0.958	0.20	n/a	0.007	-0.107	0.099	.174*	-0.052	n/a								
(7) Environmental dynamism	0.000	0.92	0.865	0.042	0.139	-0.126	-0.091	-0.140	0.005	0.721							
(8) Company size	928.72	5331.45	n/a	0.013	-.177*	-0.047	0.096	0.086	0.036	0.052	n/a						
(9) Social desirability	0.00	0.834	n/a	.247**	0.129	0.126	0.102	.357**	-0.065	0.023	0.002	n/a					
(10) Experience (years)	0.0003	8.21	n/a	0.053	0.094	-0.022	-0.095	0.114	-.0178*	0.123	-0.031	-0.006	n/a				
(11) Gender	0.24	0.426	n/a	-0.111	-0.044	-0.049	0.065	0.022	-0.048	-0.092	0.162	.184*	-0.043	n/a			
(12) Family company	0.47	0.501	n/a	-0.141	-0.072	-0.057	-0.113	-0.063	-0.012	-0.116	-0.132	0.003	-0.102	-0.002	n/a		
(13) CEO Ownership	0.60	0.491	n/a	0.152	.180*	-0.162	-0.066	0.065	-0.027	-0.027	-.188*	0.080	-0.064	-0.085	.339**	n/a	
(14) Marker variable	0.001	1.58	n/a	0.084	0.050	-0.081	0.144	0.036	0.026	-0.007	0.083	.166*	-0.146	0.080	0.083	0.010	n/a

Note: * Correlation is significant at the 0.05 level (2-tailed). **Correlation is significant at the 0.01 level (2-tailed). The diagonal in bold indicates the square root of the AVE values.

In addition, the Variance Inflation Factors (VIF) statistics were computed as another test for multicollinearity. All VIF values were below 2 (maximum VIF is 1.198), well below the cutoff value of 10 (Byrne, 2013; Neter et al., 1985). Thus, our sample does not suffer from multicollinearity.

6.3 Common Method Bias

Common method bias, which may occur in quantitative research when all variables (dependent, independent, mediating, and moderating) are collected using the same method, for example a survey, and at the same time (Jordan & Troth, 2020; Podsakoff et al., 2012). This study, although designed to include two waves, was based on only one wave of data collection. Hence, it needs to be examined in terms of common method bias. The Harman single factor test was conducted, and the maximum value of variance explained by a single factor is 11.3%, which is significantly below the 50% threshold of a variance explained by a single factor usually used as a cutoff point. This in combination with the facts that a) the maximum correlation between variables in this study is 0.464, which is well below the threshold of 0.7, and b) the marker variable does not significantly correlate with any variable in the research model, suggest that the study does not suffer from common method bias.

6.4 Construct Reliability

In order to examine the reliability of the constructs used to measure this study's variables, Cronbach's alpha coefficient was used (Cronbach, 1970). This method evaluates the internal consistency reliability of an instrument, in other words how reliable are the specific items included in a variable for measuring this variable, based on a single measurement occasion. When the Cronbach's alpha value is greater than 0.8, then the instrument is considered to be reliable (De Vaus, 2002), whereas levels greater than 0.7 are considered reliable when the

number of items in the variable is less than 10 (Nunnally, 1978). More recent studies suggest that Cronbach alpha values above 0.6 are acceptable (Wim et al., 2008).

Reliability analysis revealed that if items 6 and 8 from the Paradox Mindset (Miron-Spektor et al., 2018) scale were removed, the scale's reliability would improve (Cronbach Alpha with 7 items was 0.851 versus 0.833 of the original 9-item scale). Hence, although the survey measurement for Paradox Mindset (Miron-Spektor et al., 2018) included all nine items of the original scale, items 6: I often experience myself as simultaneously embracing conflicting demands, and 8: I feel uplifted when I realize that two opposites can be true, of the scale were removed. Specifically concerning item 8, the decision to remove it was also supported by feedback in the cognitive interviewing phase by the pilot phase respondents. Similarly, the reliability of the Environmental Dynamism construct would improve if items 2 and 3 were removed (Cronbach Alpha 0.680 versus 0.674); these items corresponded to the second and third items from the Market Turbulence scale (Wilden et al., 2015). Hence, these items were removed according to item purification processes (El Hajjar, 2018; Nunnally, 1978). Table 33 demonstrates that environmental dynamism is the only variable measured in this study with a Cronbach's alpha value lower than 0.7 (but still quite close to it). In previous research, environmental variables have been reported with similar or even lower Cronbach values. For example, e.g. Ang & Cummings (1997) reported a Cronbach value of 0.62 for technological uncertainty; Mitchell et al. (2011) reported a Cronbach value of 0.65 for environmental hostility; and Singh (1986) reported a Cronbach value of 0.58 for environmental turbulence and 0.56 for competitive pressure. Specifically when environmental variables are relatively broad, in other words when they include different dimensions, the acceptable range for the Cronbach alpha value lies between 0.55 and 0.70 (Van de Ven & Ferry, 1980). Therefore, since environmental dynamism includes uncertainty and turbulence as dimensions as already

explained, its Cronbach value of 0.68 is within the acceptable range. Overall, the internal consistency reliability requirements are satisfied by the variables measured in this study.

Table 33: Internal Reliability

Variable	Items	Cronbach's alpha	CR	AVE
Ambidexterity	12	0.921	0.924	0.507
Strategic speed	3	0.920	0.927	0.807
Relative performance	7	0.941	0.941	0.694
Paradox mindset (7 items)	7	0.851	0.881	0.516
Optimism	2	0.741	0.810	0.681
Environmental dynamism (6 items)	6	0.680	0.865	0.521

Furthermore, composite reliability (CR) values were calculated for each construct measured and are included in Table 33 along with the respective average variance extracted (AVE) values. Given that all AVE values are above 0.5 and all CR values are above 0.8, no low-loading items were found that needed to be removed and construct reliability is achieved (Fornell & Larker, 1981).

6.5 Construct Validity and Factor Analysis

Factor analysis is a statistical method applied to quantitative data, in order to test the validity of the instrument used. There are two types of factor analysis (Russell, 2002): Exploratory Factor Analysis (EFA), in which no assumptions are made concerning the relationships among factors (Fabrigar & Wegener, 2012) and with the purpose of decreasing the number of items in a research model, and Confirmatory Factor Analysis (CFA), which aims to evaluate “how well a hypothesized factor structure fits the observed data” (Russell, 2002). EFA is used when new scales, which have not been tested and validated yet, are included in a survey questionnaire, whereas CFA is used when researchers already know how many items are included in the measurement constructs and which of them load on the different factors that have been

hypothesized. In this study, all scales included in the questionnaire were used and tested in previous studies; therefore, the appropriate method of factor analysis was CFA.

In order to conduct CFA on a data set, there is a minimum requirement concerning the sample size, since very small sample sizes are considered problematic for factor analysis; at least 100 cases are required (Boomsma, 1982). Previous research has examined the effect of sample size and number of parameters on the results of CFA (Jackson, 2001), and the conclusion was that it is indeed sample size that matters and not the number of variables measured. In addition, when there are smaller sampler sizes, the most important index in order to evaluate the CFA results is CFI, as it is not affected by sample size (Russell, 2002). Furthermore, Mundfrom et al. (2005) suggest that when the ratio of the number of items divided by the number of factors is 5, then the required sample size ranges between 130 and 170, whereas if the aforementioned ratio is 6, then the required sample size ranges between 110 and 140. In this study, the respective ratio is 5.28, which is between 5 and 6, so the number of cases (144) lies within the acceptable range. Therefore, different minimum sample size requirements for conducting a CFA are satisfied.

Confirmatory Factor Analysis was conducted on AMOS and multiple indices were used in order to evaluate the validity of the construct and the overall model fit (Hu & Bentler, 1998; Byrne, 2013). More specifically, the following indices and respective criteria are used (Hu & Bentler, 1998):

- Comparative Fit Index (CFI) with a cutoff value of 0.9 (adequate fit if $CFI > 0.9$)
- Tucker-Lewis Index (TLI) with a cutoff value of 0.9 (adequate fit if $TLI > 0.9$)
- Standardized Root Mean Residual with a cutoff value of 0.10 (adequate fit if $SRMR < 0.10$)

- Root Mean Square Error of Approximation (RMSEA) with a cutoff value of 0.08 (adequate fit if RMSEA is <0.08)

Table 34 presents the model fit results:

Table 34: Confirmatory Factor Analysis – Model Fit Results

Model Fit Index	Value	Criterion
CFI	0.907	> 0.90
TLI	0.896	> 0.90
SRMR	0.0887	< 0.10
RMSEA	0.059	< 0.08

As Table 34 indicates, there is a good fit between the observed data and the hypothesized model, with only the TLI being slightly below 0.9, but very close to it. In addition, discriminant validity was examined by comparing the square roots of AVE in the diagonal in Table 32 with the corresponding row and column correlation values (off-diagonal) for each variable measured, according to the Fornel & Larcker (1971) criterion. The highest correlation value was 0.414 and the lowest square root of AVE value was 0.712, so all square roots of AVE were significantly higher than the respective correlations and the Fornell & Larcker (1981) criterion is satisfied. Therefore, acceptable construct validity is achieved and there are no confounds between the main variable constructs that would indicate insufficient discriminant validity (Farrell, 2010).

6.6 Chapter Summary

This chapter included a presentation of sample demographics, descriptive statistics and bivariate correlations, along with an analysis of construct validity and reliability. The analysis of the demographics presented indicates that the sample is a satisfactory representation of the Greek market. Furthermore, the descriptive statistics, construct reliability and validity, and

confirmatory factor analysis presented, demonstrate that the model fit is good and the sample does not suffer from multicollinearity or common method bias. The next Chapter presents in detail the regression results for the different model tests, in order to examine whether the hypotheses formulated are supported or not.

7. Results

This chapter presents the findings of this study through presenting the results of regressions and other methods used for testing the various hypotheses. A synthesis of results is presented in section 6.3, in which the effects of the control variables, including environmental variables and social desirability bias, are also discussed.

As already stated, the aim of this research is to investigate the importance of organizational ambidexterity under crisis conditions, and to examine the factors affecting the decision to pursue ambidexterity under crisis. Based on the literature review, this entails examining the direct relationship between strategic decision speed and organizational ambidexterity (Hypothesis 1), and the direct relationship between organizational ambidexterity and performance (Hypothesis 6). Moreover, the established relationship between strategic decision speed and organizational ambidexterity is further investigated in terms of moderating factors. Three moderators related to the CEOs' cognition were examined, namely paradox mindset (Hypothesis 2), optimism (Hypothesis 3) and educational level (Hypothesis 4), while environmental dynamism was also examined as a moderator (Hypothesis 5). Multiple moderated hierarchical regression (Baron & Kenny, 1986; Cramer, 2003; Schriesheim, 1995) was used, with interaction effects tested first individually and then simultaneously (all four interaction effects together). Table 35 presents all the hierarchical linear regression results, both for the two direct effects and the four moderation effects. For Models 1 to 5 the dependent variable is organizational ambidexterity, whereas for Model 6 the dependent variable is organizational performance. Models 1 to 5 present the results for Hypothesis 1 to 5, whereas Model 6 presents the regression results of strategic decision speed on organizational ambidexterity when all four moderators are inserted in the regression. Model 7 presents the regression results concerning Hypothesis 6.

Table 35: Results of Hierarchical Linear Regression Analyses

Variable	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7
<i>Company Size</i>	7.738E-06	1.316E-05	1.204E-05	1.010E-05	3.959E-06	1.428E-05	-2.063E-
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
<i>Social Desirability</i>	0.131	0.136	0.136	0.189*	0.167↑	0.217*	0.074
	(0.087)	(0.084)	(0.084)	(0.090)	(0.086)	(0.084)	(0.117)
<i>Years of Experience</i>	0.001	0.002	0.000	0.001	0.003	0.001	-0.004
	(0.008)	(0.008)	(0.008)	(0.008)	(0.008)	(0.008)	(0.010)
<i>Gender</i>	-0.282↑	-0.318*	-0.320*	-0.318*	-0.337*	-0.415**	-0.161
	(0.161)	(0.156)	(0.156)	(0.160)	(0.158)	(0.148)	(0.208)
<i>Family Company</i>	-0.218	-0.173↑	-0.195	-0.222	-0.174	-0.134	0.217
	(0.143)	(0.139)	(0.138)	(0.141)	(0.141)	(0.132)	(0.180)
<i>CEO Ownership</i>	0.250↑	0.264↑	0.236	0.281↑	0.229	0.258*	-0.669***
	(0.148)	(0.142)	(0.142)	(0.146)	(0.144)	(0.135)	(0.186)
<i>Organiz. Ambidexterity</i>							0.423***
							(0.120)
<i>Strategic Decision Speed</i>	0.190**	0.161***	0.147**	-0.542↑	0.141**	-0.457	0.147
	(0.072)	(0.049)	(0.049)	(0.320)	(0.050)	(0.307)	(0.421)
<i>Paradox Mindset</i>	0.252**	0.188**	0.163*	0.147*	0.205**	0.141**	0.048
	(0.083)	(0.070)	(0.070)	(0.074)	(0.071)	(0.069)	(0.096)
<i>Optimism</i>	0.074**	0.224**	0.293***	0.240**	0.250**	0.256**	0.131
	(0.340)	(0.080)	(0.081)	(0.082)	(0.081)	(0.077)	(0.109)
<i>Educational Level</i>	0.031	-0.175	0.096	-0.391	0.017	-0.515	0.559
	(0.076)	(0.336)	(0.328)	(0.395)	(0.332)	(0.365)	(0.501)
<i>Environmental Dynamism</i>	0.190	0.019	0.040	0.037	0.060	0.059	-0.121
	(0.072)	(0.073)	(0.073)	(0.075)	(0.074)	(0.070)	(0.095)
<i>Str.D.Speed X Parad.Mindset</i>		0.140***				0.097**	-0.006
		(0.042)				(0.041)	(0.057)
<i>Str.D.Speed X Optimism</i>			0.166***			0.146**	0.062
			(0.049)			(0.048)	(0.067)
<i>Str.D.Speed X Educ.Level</i>				0.717*		0.603↑	-0.116
				(0.323)		(0.309)	(0.426)
<i>Str.D.Speed X Env.</i>					-0.142**	-0.113*	-0.152**
					(0.050)	(0.047)	(0.066)
Constant	5.430***	5.640***	5.365***	5.885***	5.517***	5.972***	2.438**
	(0.351)	(0.344)	(0.339)	(0.402)	(0.344)	(0.372)	(0.879)
R ²	0.312	0.366	0.367	0.337	0.351	0.450	0.315
ΔR ²	0.052**	0.054***	0.055***	0.025*	0.039**	0.024*	0.067***

Notes: ↑p<0.10, *p < 0.05; **p < 0.01, ***p<0.001. Parentheses indicate error values. DV is performance in Model 7, and organizational ambidexterity in all other models. Model 2 includes the interaction term of Strategic Decision Speed and Paradox Mindset; Model 3 the interaction term of Strategic Decision Speed and Optimism; Model 4 the interaction term of Strategic Decision Speed and Educational Level; Model 5 the interaction term of Strategic Decision Speed and Environmental Uncertainty; Model 6 includes all interaction terms.

Results concerning both direct relationships as well as moderation effects are discussed as follows.

7.1 Direct Relationship between Strategic Decision Speed and Organizational Ambidexterity

As already mentioned, two direct relationships are examined in this study: the relationship between strategic decision speed and organizational ambidexterity, and the relationship between organizational ambidexterity and organizational performance. Both relationships are examined under the crisis conditions created by the COVID-19 pandemic.

The hierarchical linear regression results for the relationship between strategic decision speed and organizational ambidexterity under crisis are presented in Model 1 of Table 35 above. As indicated in Model 1, the relationship between strategic decision speed and organizational ambidexterity is positive and significant ($p=0.001933$). Therefore Hypothesis 1 is supported, and there is a positive significant relationship between strategic decision speed and organizational ambidexterity, with data being collected under crisis. Optimism and paradox mindset also have significant direct effects on organizational ambidexterity. In addition, the R^2 , which represents the percentage of variance explained by the model, is 0.312. This means that if only strategic decision speed and the control variables are considered, 31.2% of the variance of organizational ambidexterity is explained through this model, while controlling for company size, social desirability, years of experience, gender, whether the company is a family company or not, and ownership of the company by the respondent. Hence, slightly less than one third of the variance of organizational ambidexterity is explained by this model. Examining moderating factors is expected to explain a part of the remaining variance. Moderating effects of this relationship are presented in the following section, which presents the multiple moderated

hierarchical regression results concerning Hypotheses 2, 3, 4, and 5 (examining the moderating effects of CEOs' paradox mindset, optimism educational level, and environmental dynamism respectively on the strategic decision speed – organizational ambidexterity relationship).

7.2 Moderators of the Strategic Decision Speed – Organizational Ambidexterity

Relationship

In order to examine potential moderators of the strategic decision speed – organizational ambidexterity relationship, the hypotheses 2 to 5 were tested using multiple moderated hierarchical regression. Multiple moderated hierarchical regression is widely used in strategic management research when examining potential moderating effects (Aguinis et al., 2017). Different regression models were run, where the dependent variable was organizational ambidexterity and the independent variable was strategic decision speed. Four potential moderators were considered: three were at the decision maker's (individual) level, namely paradox mindset, optimism and educational level, and one was at the environmental level, i.e. environmental dynamism based on the CEOs' perceptions. The moderators were inserted in the regression model in blocks. The respective results are discussed as follows.

7.2.1 The Moderating Effect of Paradox Mindset on the Strategic Decision Speed – Organizational Ambidexterity Relationship

Hypothesis 2 suggests that paradox mindset acts as a moderator of the relationship between strategic decision speed and organizational ambidexterity under crisis. According to Hypothesis 2, the positive relationship between strategic decision speed and organizational ambidexterity becomes stronger when the paradox mindset of decision makers is high. The regression results for this moderation effect are presented in Table 35 (Model 2). As Model 2 indicates, there is a strengthening moderating effect of paradox mindset on the relationship between strategic

decision speed and organizational ambidexterity. Strengthening effects occur when the signs of the coefficients of predictor and the moderator are both positive or both negative (Gardner et al., 2017). If, in addition, the sign of the dependent variable coefficient is also the same as the other two coefficient signs (of the predictor and the moderator), then the moderating effect is accentuating and the moderator acts as a catalyst, which strengthens the relationship between the predictor and dependent variable. As Model 2 indicates, paradox mindset acts as a catalyst on the strategic decision speed – organizational ambidexterity relationship with the interaction effect being significant at the 0.001 level; it also has a significant direct effect on ambidexterity, as does optimism, with both effects at the 0.01 level (p equals 0.008 and 0.006 respectively). The strengthening effect of paradox mindset on the strategic decision speed – organizational ambidexterity relationship is accentuating. Therefore, the relationship between strategic decision speed and organizational ambidexterity is stronger at higher levels of paradox mindset than at lower levels of paradox mindset, in support of Hypothesis 2. When paradox mindset increases by 1 unit, the effect of strategic decision speed on organizational ambidexterity becomes stronger by 14%. Figure 8 presents the moderation effect of paradox mindset on the strategic decision speed – organizational ambidexterity relationship:

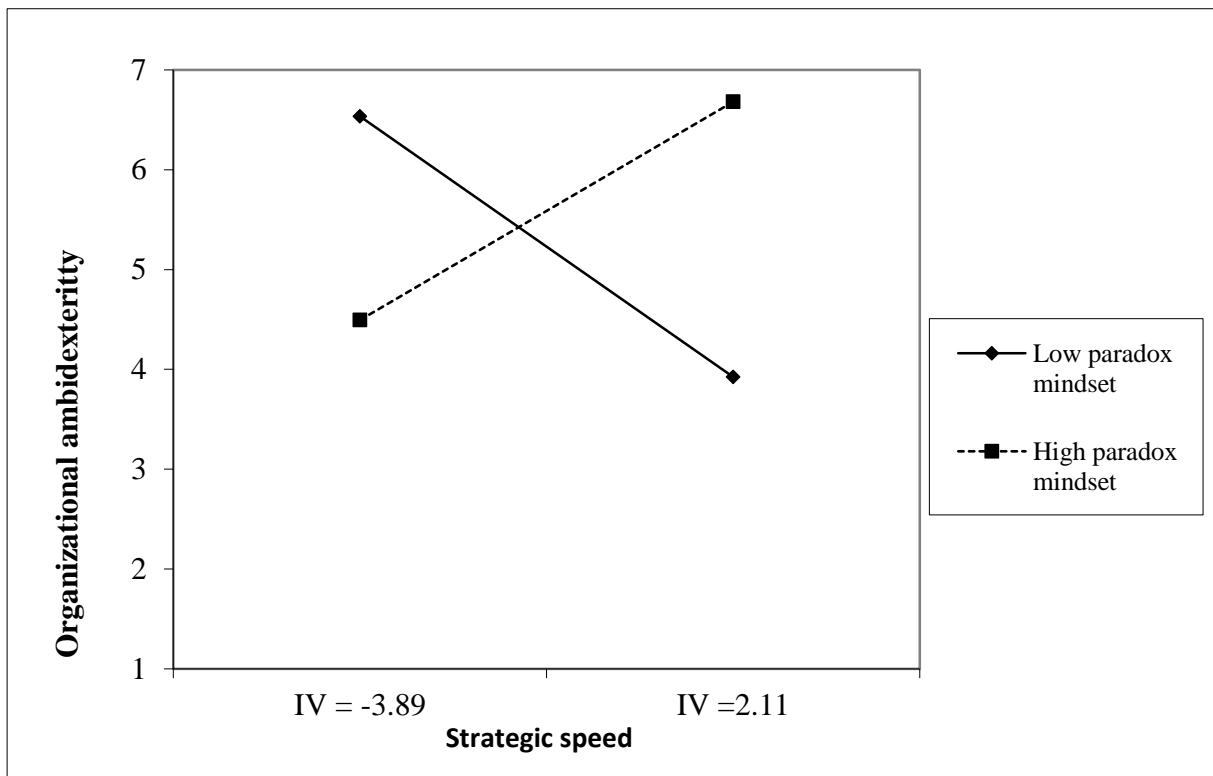


Figure 8 – Accentuating and Reversing Interaction Effect of Paradox Mindset and Strategic Decision Speed on Organizational Ambidexterity

Strengthening moderation effects may be disordinal, i.e. the graph resembles to an X and there is a crossing point within the observed range of data (Gardner et al., 2017). If the gradient is significant both at low and at high levels of the moderator, then the effect is called reversing (Gardner et al., 2017) and indicates a relatively strong effect of the moderation on the relationship examined. Results indicate that the strengthening, accentuating moderation effect of paradox mindset on the relationship between strategic decision speed and organizational ambidexterity is indeed disordinal (Gardner et al., 2017), as shown in Figure 8, and reversing as indicated by slope analysis: the slope's value at lower levels of paradox mindset is negative (-0.435) with a p-value of 0.019, whereas at higher levels of paradox mindset it is positive (0.364) with a p-value of 0.000.

In disordinal effects, the effect of the moderating variable on the examined relationship is relatively strong (Cohen et al., 2003) and the crossing point indicates the value of the predictor under which the dependent variable does not vary as a function of the moderator (Gardner et al., 2017). The crossing point is $X_1 = -0.188/0.140 = -1.343$, which means that when (the centered variable of) strategic decision speed is -1.343, paradox mindset makes no difference on the value of organizational ambidexterity. This value is below the mean of strategic decision speed (-0.003), which indicates that those with a high paradox mindset achieve superior levels of organizational ambidexterity compared to those with a low paradox mindset starting at paces of decision making considerably lower than the mean, and the difference between the levels of ambidexterity achieved is greater as strategic decision speed increases. Overall, slope analysis indicates that the moderation effect of paradox mindset on the strategic decision speed – organizational ambidexterity relationship is significant and relatively strong, as the slope is negative for low levels of paradox mindset and becomes positive for higher levels of paradox mindset.

7.2.2 The Moderating Effect of Optimism on the Strategic Decision Speed – Organizational Ambidexterity Relationship

Hypothesis 3 suggests that under crisis, leaders' optimism acts as a moderator of the relationship between strategic decision speed and organizational ambidexterity, such that strategic decision speed has a stronger impact on ambidexterity when leaders are more optimistic. Model 3 on Table 35 presents the regression results for this moderation effect. As the table indicates, there is a significant strengthening, accentuating (Gardner et al., 2017) moderation effect of optimism on the strategic decision speed – organizational ambidexterity relationship, since all regression coefficients for the predictor, moderator and interaction variable are positive. If optimism increases by one unit, the aforementioned relationship

becomes stronger (more positive) by 16.6%. Moreover, slope analysis indicates that the gradient of the slope is negative (-0.328) and significant ($p=0.034$) at low levels of optimism, whereas it becomes positive (0.336) and significant ($p=0.000$) at high levels of optimism, indicating a reversing effect. Therefore, Hypothesis 3 is supported and the relationship between strategic decision speed and organizational ambidexterity becomes stronger at higher levels of CEOs' optimism. Table 35 also demonstrates the significant direct effect of strategic decision speed, optimism and paradox mindset on organizational ambidexterity when examining optimism as a moderator.

Figure 9 presents the moderation effect of optimism on the strategic decision speed – organizational ambidexterity relationship. As already mentioned, optimism's moderation effect is strengthening, accentuating and reversing; it is also disordinal with a crossing point within the observed range of data (Gardner et al., 2017). The above indicate a relatively strong moderation effect. In this case, the crossing point is $X_2 = -0.293/0.166 = -1.765$, so when strategic decision speed is equal to -1.765, optimism makes no difference on the value of organizational ambidexterity, but for values of strategic decision speed greater than -1.765, when the leaders are optimistic the company achieves higher organizational ambidexterity. This value of strategic decision speed is even lower than the respective crossing value of the paradox mindset moderation, indicating that being optimistic makes a difference for organizational ambidexterity starting at lower values of strategic decision speed than paradox mindset does. Overall, moderation analysis and slope analysis show that the moderation effect of optimism on the strategic decision speed – organizational ambidexterity relationship is significant and relatively strong, with optimism acting as a catalyst on the relationship examined.

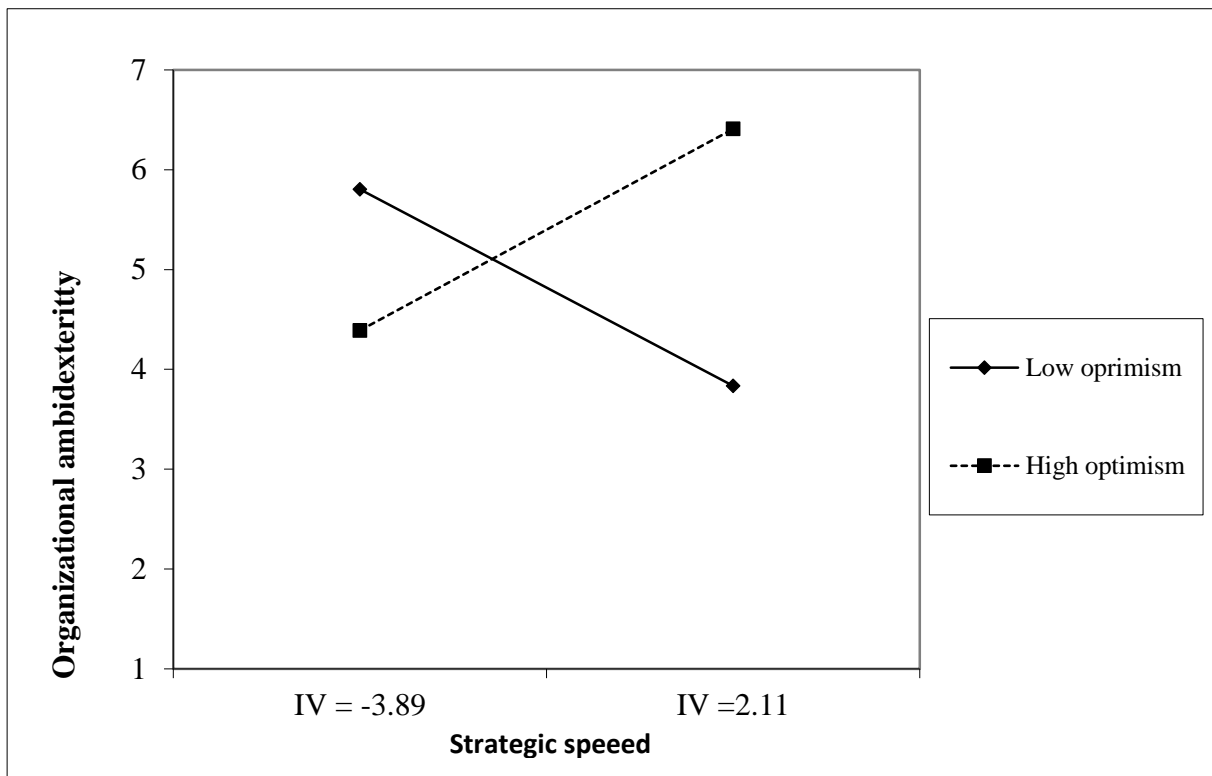


Figure 9 – Accentuating and Reversing Interaction Effect of Optimism and Strategic Decision Speed on Organizational Ambidexterity

7.2.3 The Moderating Effect of Educational Level on the Strategic Decision Speed – Organizational Ambidexterity Relationship

Hypothesis 4 suggests that, under crisis, CEOs’ educational level moderates the relationship between strategic decision speed and organizational ambidexterity, such that the relationship is stronger for those with a higher educational level. Educational level is a non-binary categorical variable with seven categories, which is ordinal, i.e. there is clear order between the different categories (lower values represent lower levels of education). In this study’s data set, there are unequal sample sizes across educational level categories (34.03% of this study’s respondents hold a university degree and 53.47% hold a master's degree, so the remaining categories are below 10%). This can be problematic, as in such cases the moderation effect can be

underestimated (Alexander & DeShon, 1994; Aguinis et al., 2001). Even if the moderation effect is underestimated in this study, it still is a significant moderation effect (please see below), which could be even stronger. Taking into consideration that researchers have usually no control on the representation of different categorical variables categories in the sample (Aguinis et al., 2001), and that CEOs are in majority well educated, as has been also been the case in previous studies (e.g. Souitaris et al., 2010), the distribution of respondents in the different categories of educational level is not problematic.

In order to test the moderation effect of educational level on the relationship between strategic decision speed and organizational ambidexterity, a binary dummy variable was created for educational level as is required for categorical variables (Dawson, 2014). In the study's sample, no respondent had an educational level lower than high school (i.e. the value of 1 was not observed in the data set). For the creation of the dummy variable, the value of 0 was assigned to those having obtained up to a high school degree (representing the lowest educational level category observed in the sample corresponding to the value of 2) and the value of 1 was assigned to those having attended some form of higher education (representing the remaining five categories of educational level, corresponding to the values 3 to 7), according to relevant methodological suggestions (Dawson, 2014).

For the creation of the dummy variable, the value of 0 was assigned to those having obtained up to a high school degree (representing one educational level category) and the value of 1 was assigned to those having attended some form of higher education (representing the remaining six categories of educational level observed in the sample), according to methodological suggestions when testing categorical variables for moderation (Dawson, 2014). Then, multiple moderated hierarchical regression was used – similarly to the examination of the moderation

effects of paradox mindset and optimism. In all following moderation analyses where educational level is included, regressions are run with the educational level dummy variable (not the initial variable with seven categories). An alternative approach for testing moderation effects of categorical variables with more than one category is to conduct an analysis of covariance (Dawson, 2014). Analysis of covariance or ANCOVA is a method introduced by Fisher (1932). This method was also used, in order to better interpret the multiple moderated hierarchical regression results. Model 4 in Table 35 indicates the moderation results of educational level on the strategic decision speed – organizational ambidexterity relationship, while Table 36 presents the ANCOVA results.

As Table 35 indicates, the regression coefficients of educational level (-0.391) and strategic decision speed (-0.542) are negative, whereas the coefficient of the interaction term (Strategic Decision Speed X Educational level) is positive (0.717). This means that the interaction effect of educational level and strategic decision speed on organizational ambidexterity is not strengthening, but weakening, since the sign of the predictor coefficient (strategic decision speed's coefficient) is negative and the sign of the interaction term (*Speed X Educational level*) is positive. This weakening effect is significant at lower levels of education and is neutralized at higher levels of education. Further, when the moderator and the predictor coefficients have the same sign, the moderating effect is substitutive (Gardner et al., 2017). A substituting effect suggests that although the predictor and moderator have similar effects on the dependent variable (i.e. organizational ambidexterity), neither of them adds further value than the other and one can, thus, substitute the other. When an interaction effect is substituting, the conditional predictor-dependent variable relationship is significant in the lower range of the moderator (Gardner et al., 2017). Therefore, examining the effect of those with lower levels of education reaching strategic decisions quickly is crucial.

In order to further investigate the moderation effect of educational level on the relationship between strategic decision speed and organizational ambidexterity, ANCOVA analysis was run. ANCOVA allows the examination of the covariance between the different levels of the categorical moderator variable and the independent variable, through investigating the interaction effect between each level of the categorical moderator (in this case educational level) and the predictor (in this case strategic decision speed). The analysis of covariance produced some very interesting results. The ANCOVA parameter estimates are presented in Table 36 (as already mentioned, no one in this study's sample has a lower than high school education degree, which means that the first category of the moderator variable, which corresponds to education below the high school level, does not appear in the ANCOVA results table):

Table 36: ANCOVA Parameter Estimates

Parameter	Estimate	Sig.	Observed Power ^b
<i>Intercept</i>	6.012***	0.000	1.000
	0.534		
<i>Educational Level =2</i>	-0.323	0.637	0.076
	0.682		
<i>Educational Level =3</i>	-0.651	0.670	0.071
	1.523		
<i>Educational Level =4</i>	-0.222	0.742	0.062
	0.673		
<i>Educational Level =5</i>	-0.514	0.350	0.153
	0.548		
<i>Educational Level =6</i>	-0.541	0.321	0.167
	0.543		
<i>Educational Level =7</i>	0 ^a		
<i>Strategic Decision Speed</i>	0.601**	0.017	0.672
	0.248		
<i>[Educational Level=2] X Strategic Decision Speed</i>	-0.921**	0.026	0.607
	0.410		
<i>[Educational Level=3] X Strategic Decision Speed</i>	-0.851	0.495	0.104
	1.245		
<i>[Educational Level=4] X Strategic Decision Speed</i>	-0.288	0.435	0.122
	0.368		
<i>[Educational Level=5] X Strategic Decision Speed</i>	-0.394	0.138	0.317
	0.264		
<i>[Educational Level=6] X Strategic Decision Speed</i>	-0.367	0.158	0.292
	0.258		
<i>[Educational Level=7] X Strategic Decision Speed</i>	0 ^a		

Notes: 1) $\uparrow p < 0.10$, * $p < 0.05$; ** $p < 0.01$, *** $p < 0.001$. Parentheses indicate error values.

2) a. This parameter is set to zero because it is redundant. b. Computed using alpha = 0.05.

As Table 36 indicates, the only significant interaction between the different categories of educational level and strategic decision speed was found at the lowest educational level (CEOs with a high school degree) and this interaction effect was significantly negative ($b = -0.921$, $p = 0.026$). This finding is in accordance with the fact that significance in substituting effects lies at the lower levels of the moderator as suggested by Gardner et al. (2017), and indicates that

when CEOs have an educational level of 2, i.e. their highest level of education is a high school degree, then reaching decisions quickly harms organizational ambidexterity. Put differently, it takes CEOs with (at least) some kind of tertiary education in order for strategic decision speed to be associated with organizational ambidexterity, whereas at educational level lower than high school, the effect of reaching strategic decisions quickly on organizational ambidexterity is negative.

The moderation effect of educational level on the strategic decision speed – organizational ambidexterity relationship may, hence, be interpreted as follows: educational level moderates the aforementioned relationship such that the negative effect of strategic decision speed on organizational ambidexterity observed at lower levels of education is neutralized at higher levels of education, in accordance with Howell et al.'s (1986) interpretation of substituting moderation effects. Therefore, at higher levels of education the strategic decision speed – organizational ambidexterity relationship is positive, whereas at lower levels it is negative. This is also demonstrated in Figure 10, which presents one more disordinal interaction effect. The slopes of the lines for low educational level (negative slope) and for high educational level (positive slope) intercept within the observed range of data. As Figure 10 indicates, the effect of strategic decision speed on organizational ambidexterity is negative for low levels of education, whereas the effect is positive for high levels of education. The effects at lower and higher levels of education are significant, indicating a reversing effect (Gardner et al., 2017). Slope analysis indicates that the gradient of the slope at low levels of education is -0.542 with a p-value of 0.093, whereas at high levels of education the gradient is 0.174 with a p-value of 0.01, illustrating how the significant negative effect at lower levels of education turns to a significant positive effect at higher levels of education.

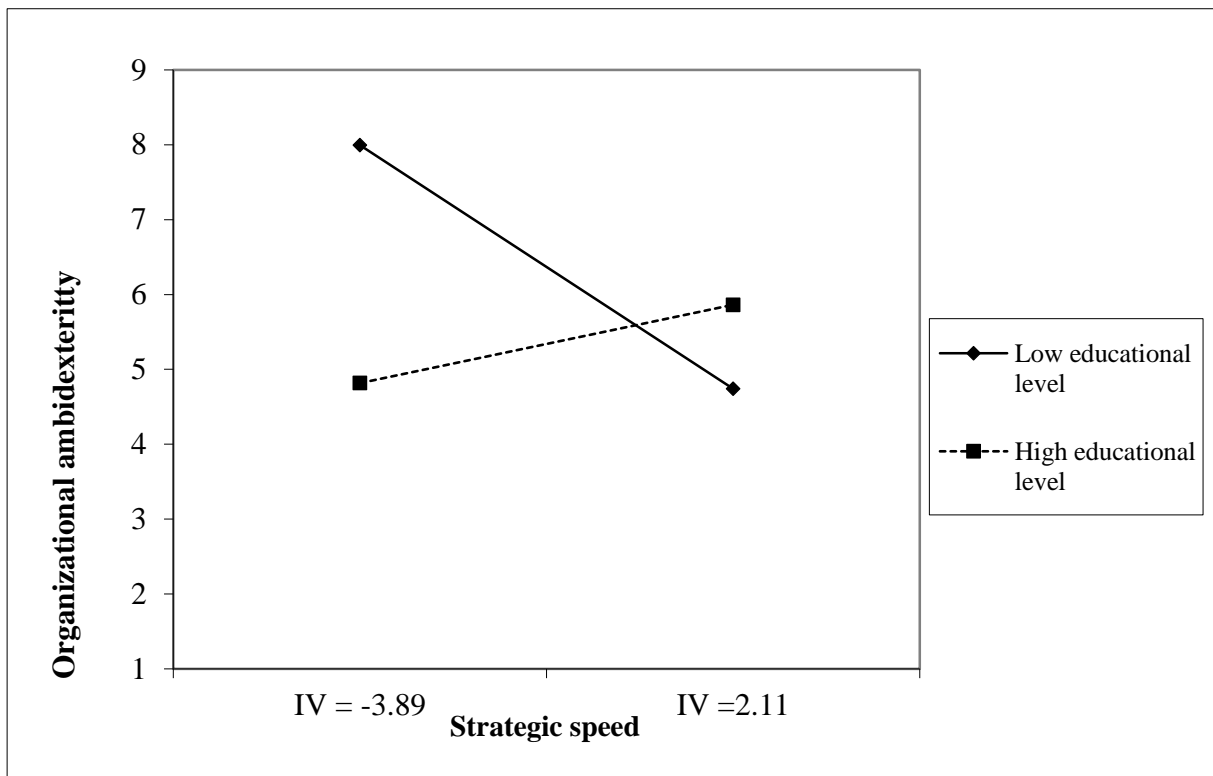


Figure 10 – Substituting Interaction Effect of Educational Level and Strategic Decision Speed on Organizational Ambidexterity

Based on the substituting interaction effect of educational level and strategic decision speed, Hypothesis 4 is partially confirmed, as educational level acts as a moderator on the strategic decision speed – organizational ambidexterity relationship, but based on the hypothesized moderation the effect should be strengthening, and the moderating effect found is not a strengthening effect. The crossing point for this moderation effect is $X_3 = 0.545$, indicating that at levels of strategic decision speed higher than 0.545, deciding quickly leads to ambidexterity. Hence, the substituting interaction effect of educational level and strategic decision speed on organizational ambidexterity is significant and constitutes an important finding, which suggests that leaders with low levels of education that decide fast under crisis are not able to lead their companies to be ambidextrous. In other words, high levels of decision makers' education are

needed in order for organizations to achieve ambidexterity when decisions are reached fast under crisis.

7.2.4 The Moderating Effect of Environmental Dynamism on the Strategic Decision Speed – Organizational Ambidexterity Relationship

Hypothesis 5 suggests that, under crisis, the higher the (perceived) dynamism of the environment, the weaker the effect of strategic decision speed on organizational ambidexterity. In other words, when decision makers interpret the environment as highly unpredictable and rapidly changing, they will be hesitant to pursue both exploration and exploitation opportunities when they reach decisions quickly. This could be related to March's (1991) suggestion that exploitation opportunities are perceived as less risky and uncertain compared to exploration opportunities or to freezing the implementation of strategic decisions and adopting a wait and see attitude, due to the high degree of unpredictability and change in the environment (Bingham & Eisenhardt, 2008). This is in line with the view that often decisions fail due to poor implementation (Tawse & Tabesh, 2021).

Model 5 in Table 35 presents the respective moderated regression results. As the table indicates, there is a negative moderation effect of environmental dynamism on the relationship between strategic decision speed and organizational ambidexterity, significant at the 0.01 level ($p=0.006$). This effect is weakening, as the predictor's and the interaction term's coefficients (0.141 and -0.142 respectively) have opposite signs; the effect is also substituting, as in the case of educational level, since the predictor's and the moderator's coefficients have opposite signs (Gardner et al., 2017). Hence, dynamism moderates the relationship between strategic decision speed and organizational ambidexterity such that the relationship becomes weaker as dynamism increases. Figure 11 illustrates this substituting moderation effect.

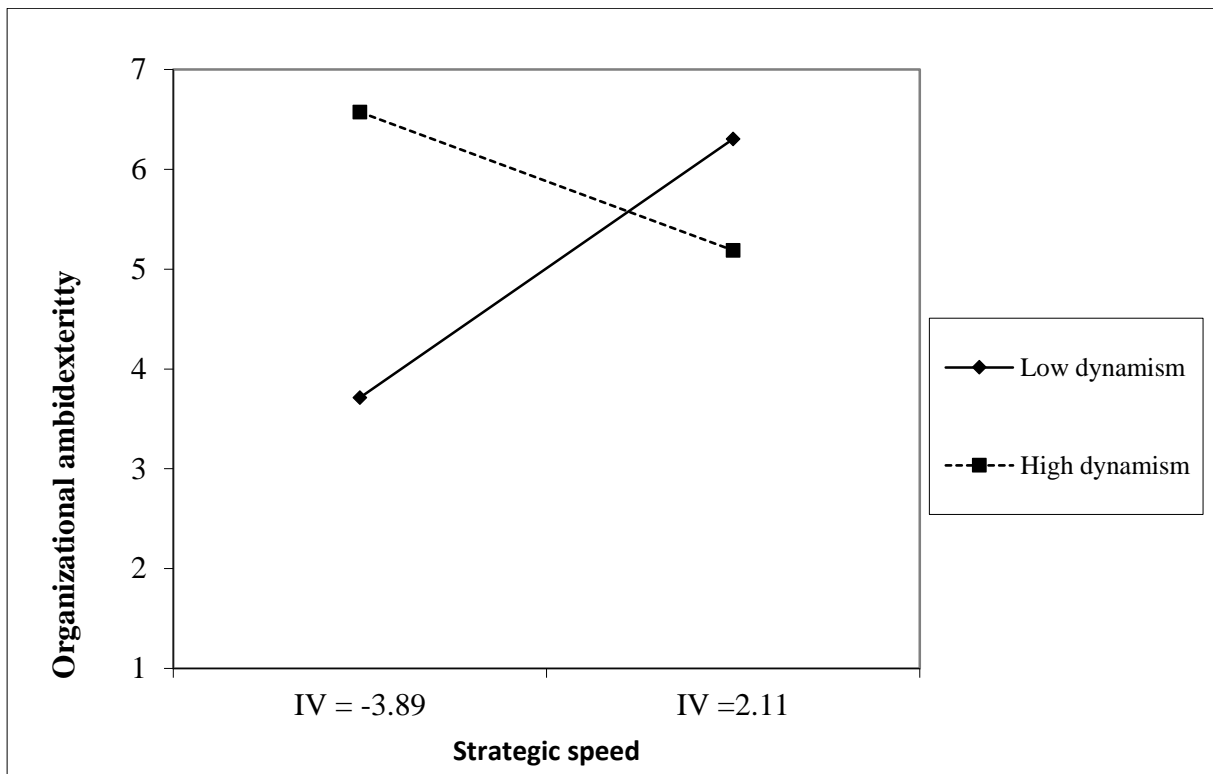


Figure 11 –Substituting Interaction Effect of Environmental Dynamism and Strategic Decision Speed on Organizational Ambidexterity

Although the substitution effect is disordinal, it is not reversing: slope analysis indicates that the gradient at low levels of dynamism is 0.432 with a p-value of 0.000, but at high levels the gradient, although negative (-0.231), is not significant (p=0.119). Therefore, the moderating effect of environmental dynamism is substitutive and disordinal, with the crossing point being $X_4 = -(0.060/-0.142) = 0.423$. Therefore, when strategic decision speed is 0.423, perceived environmental dynamism makes no difference. For paces of strategic decision making higher than 0.423, i.e. considerably higher than both the average pace of decision making (-0.034) and the mid-point of strategic decision speed (-0.089), those who perceive the environment as more dynamic achieve lower levels of ambidexterity. So, hypothesis 5 is supported; the more

dynamic the environment while reaching strategic decisions quickly, the less ambidextrous the organization. In the next section, all four moderating effects are examined simultaneously.

7.2.5 The Simultaneous Moderating Effects of all Four Moderators

Model 6 in Table 35 presents the regression results with all four moderators inserted in the model simultaneously. As Model 6 indicates, all four moderators are significant when inserted in the model simultaneously. The model's R-square value is 0.450, which indicates that 45%, i.e. slightly less than half, of the variance of organizational ambidexterity is explained by this model. Optimism ($p=0.03$), paradox mindset ($p=0.019$) and environmental dynamism ($p=0.019$) have more significant interaction effects than educational level ($p=0.053$). However, the coefficient of educational level (0.603) has the highest absolute value, followed by the coefficient of optimism (0.146), dynamism (-0.113) and paradox mindset (0.097). The lower coefficients of optimism and paradox mindset may be explained by the fact that they both have significant direct effects on ambidexterity: optimism's regression coefficient is 0.256 with a p-value close to 0.001 ($p=0.001123$), whereas paradox mindset's coefficient is 0.141 with a p-value of 0.044. Thus, paradox mindset and optimism have a direct effect on organizational ambidexterity and a moderating effect on the strategic decision speed – organizational ambidexterity relationship.

In addition, among the control variables used in the model, social desirability (coefficient=0.217, $p=0.011$) and ownership of the company by the respondent (coefficient=0.258, $p=0.058$) have a positive significant effect at the 0.05 level, whereas gender has a negative effect significant at the 0.01 level (coefficient=-0.415, $p=0.006$). So, social desirability accounts for some of the variance of organizational ambidexterity and there is a positive effect on organizational ambidexterity when companies are run by their owners

compared to companies where the person at the top of the hierarchy is not the owner. Last but not least, companies that are run by men achieve higher ambidexterity than companies that are run by women (the gender variable was assigned the value of 1 for women and 0 for men).

Overall, the regression results of all moderation models examined suggest that there is a significant relationship between strategic decision speed and organizational ambidexterity, and indicate how this relationship becomes stronger or weaker depending on the levels of optimism, paradox mindset, educational level and perceived environmental dynamism of CEOs. The main goal of CEOs is to enhance firm performance and the direct relationship between organizational ambidexterity and performance is discussed as follows.

7.3 Organizational Ambidexterity – Performance Relationship

In order to test the relationship between organizational ambidexterity and performance, a regression was run, which included all control variables, all four moderators and their interaction terms with strategic decision speed, and organizational ambidexterity as independent variables, and relative organizational performance as the dependent variable (Model 7). As Model 7 indicates, there is a strong positive relationship between organizational ambidexterity and performance (coefficient=0.423) significant at the 0.001 level ($p=0.000610$). 31.5% (almost one third) of the variance of organizational performance is explained by this model and the change in R-square is 0.067. Therefore, Hypothesis 6 is supported, which means that when companies are ambidextrous under crisis, they achieve superior performance.

Among the control variables, the only one with a significant effect on organizational performance is ownership of the company by the CEO (coefficient =-0.669, $p=0.000475$), suggesting that companies achieve better performance under crisis when they are not owned by

their CEOs. This suggests that companies are better off, when they operate in a crisis environment, if the top decision maker is not the company owner. Another important finding is that there is no direct effect of strategic decision speed on organizational performance under crisis; however there is a significant negative interaction effect of strategic decision speed and perceived environmental dynamism on performance (coefficient=-0.152, p=0.023). Hence, when reaching strategic decisions quickly, CEOs who perceive the environment as more dynamic achieve lower performance than those who perceive the environment as less dynamic. On the other hand, strategic decision speed is positively associated with organizational ambidexterity as indicated in Model 1, and ambidexterity is positively associated with firm performance as indicated by Model 7. This finding suggests that organizational ambidexterity mediates the relationship between strategic decision speed and performance under crisis. Mediation analysis for the strategic decision speed → organizational ambidexterity → firm performance relationship is presented in the next section.

7.4 Mediation Analysis

In order to validate the hierarchical regression findings that suggest that ambidexterity mediates the relationship between strategic decision speed and firm performance, mediation analysis was conducted. Mediation analysis is the method used when trying to investigate whether an independent variable (X) affects a dependent variable (Y) directly or whether this relationship passes through a third variable, the mediator (M) (Hayes, 2013). Simple mediation examines the mediation without the presence of moderators, whereas moderated mediation examines the mediation under the presence of moderators. Mediation analysis was run using the PROCESS macro on SPSS, both using the simple model without moderators, as well as using moderated mediation for each of the four moderators.

7.4.1 Simple Mediation Model

In the simple mediation model, the relationship between strategic decision speed and firm performance mediated by organizational ambidexterity is tested. Figure 12 demonstrates the two different paths from strategic decision speed to firm performance under the simple mediation model:

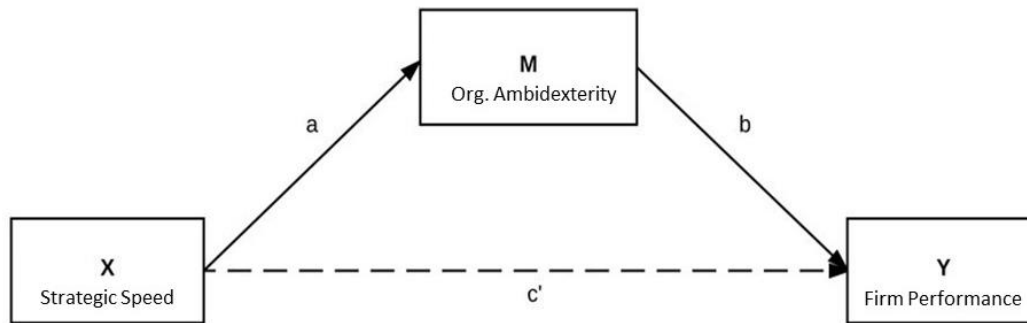


Figure 12 – Simple Mediation Model

Table 37 presents the mediation analysis results:

Table 37: Simple Mediation Analysis Results

<u>Direct effect of X on Y</u>						
Effect	se	t	p	LLCI	ULCI	c'_cs
0.0274	0.0645	0.4243	0.6720	-0.1002	0.1550	0.0351
<u>Indirect effect(s) of X on Y:</u>						
	Effect	BootSE	BootLLCI	BootULCI		
Ambidexterity	0.1050	0.0360	0.0402	0.1823		
<u>Completely standardized indirect effect(s) of X on Y:</u>						
	Effect	BootSE	BootLLCI	BootULCI		
Ambidexterity	0.1345	0.0481	0.0494	0.2369		

Note: Level of confidence for all confidence intervals in output: 95%

As the table indicates, the direct effect of strategic decision speed on firm performance is insignificant, whereas the 95% confidence intervals for the indirect effect do not include zero; therefore, the indirect effect is statistically significant at the 5% level. The standardized measure of the absolute indirect effect size is 0.1345. The mediation analysis results suggest a full

mediation of the relationship between strategic decision speed and firm performance by organizational ambidexterity under crisis. Consequently, as results indicate, strategic decision speed is not associated with firm performance directly, but the strategic decision speed – organizational performance relationship is mediated by organizational ambidexterity. This is a significant contribution of this study in the field of strategic management and strategic decision making, as it sheds light on the mixed findings of previous research: reaching decisions fast does not lead to superior performance, but enhances organizational ambidexterity. Then, organizational ambidexterity leads to superior performance.

7.4.2 Moderated Mediation with Paradox Mindset as the Moderator

The first moderated mediation examined is the one where paradox mindset is included as a moderator of the mediation relationship, whereas all other moderators (i.e. optimism, educational level and environmental dynamism) and interaction effects are included in the model as control variables. Figure 13 demonstrates the two different paths from strategic decision speed to firm performance under this moderated mediation model:

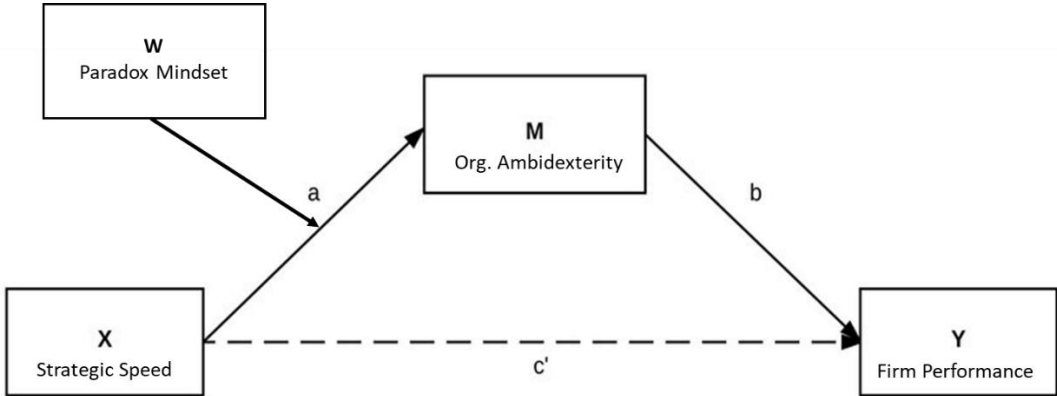


Figure 13 – Moderated Mediation (Paradox Mindset)

Table 38 presents the moderated mediation analysis results:

Table 38: Moderated Mediation Analysis Results – Paradox Mindset

OUTCOME VARIABLE: Ambidexterity

Model Summary

R	R-sq	MSE	F	df1	df2	p
0.6709	0.4502	0.5075	6.9864	15.0000	128.0000	0.0000

Test(s) of highest order unconditional interaction(s):

	R ² -chng	F	df1	df2	p
X*W	0.0241	5.6055	1.0000	128.0000	0.0194

Conditional effects of the focal predictor at values of the moderator(s):

Par.Mindset	Effect	se	t	p	LLCI	ULCI
-0.9457	-0.5486	0.2988	-1.8358	0.0687	-1.1399	0.0427
0.1686	-0.4401	0.3084	-1.4271	0.1560	-1.0504	0.1701
0.8829	-0.3706	0.3179	-1.1658	0.2459	-0.9996	0.2584

Notes: 1. Level of confidence for all confidence intervals in output: 95%

2. W values in conditional tables are the 16th, 50th, and 84th percentiles.

OUTCOME VARIABLE: Performance

Model Summary

R	R-sq	MSE	F	df1	df2	p
0.5603	0.3139	0.9274	4.2153	14.0000	129.0000	0.0000

Direct effect of X on Y

Effect	se	t	p	LLCI	ULCI
0.1094	0.3971	0.2756	0.7833	-0.6763	0.8952

As the table indicates, the confidence interval at the 95% confidence level for the interaction term does not include 0, so paradox mindset moderates the mediation. Further, the conditional effects of strategic decision speed at different levels of paradox mindset, and more specifically at the 16th, 50th, and 84th percentiles, indicate that strategic decision speed is not significant at levels of optimism between the 16th and 86th percentile. As already mentioned, slope analysis for the paradox mindset moderation has indicated that the slope's value at lower levels of paradox mindset is negative (-0.435) with a p-value of 0.019, whereas at higher levels of paradox mindset it is positive (0.364) with a p-value of 0.000; obviously strategic decision speed is significant at levels lower than the 16th percentile, and higher than the 84th percentile of paradox mindset. Overall, paradox mindset is found to moderate the mediation. Furthermore, the moderated mediation analysis confirms that there is no direct effect of strategic decision speed on firm performance.

7.4.3 Moderated Mediation with Optimism as the Moderator

The second moderated mediation examined is the one where optimism is included as a moderator, whereas all other moderators (i.e. paradox mindset, educational level and environmental dynamism) and interaction effects are included as control variables. Figure 14 demonstrates the two different paths from strategic decision speed to firm performance under this moderated mediation model:

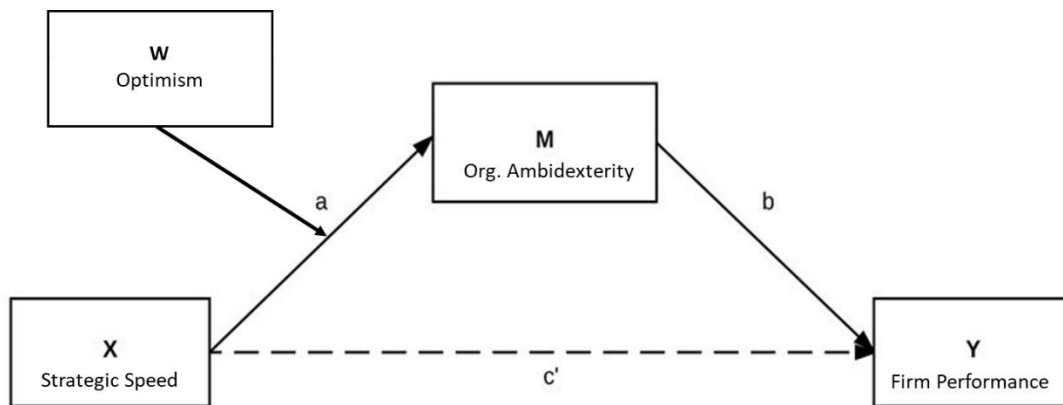


Figure 14 – Moderated Mediation (Optimism)

Table 39 presents the respective moderated mediation analysis results.

Table 39: Moderated Mediation Analysis Results – Optimism

OUTCOME VARIABLE: Ambidexterity

Model Summary

R	R-sq	MSE	F	df1	df2	p
0.6709	0.4502	0.5075	6.9864	15.0000	128.0000	0.0000

Test(s) of highest order unconditional interaction(s):

	R ² -chng	F	df1	df2	p
X*W	0.0407	9.4634	1.0000	128.0000	0.0026

Conditional effects of the focal predictor at values of the moderator(s):

Optimism	Effect	se	t	p	LLCI	ULCI
-0.08600	-0.5822	0.3142	-1.8532	0.0662	-1.2039	0.0394
0.01400	-0.4361	0.3058	-1.4260	0.1563	-1.0411	0.1690
1.1400	-0.2899	0.3047	-0.9515	0.3431	-0.8927	0.3129

Notes: 1. Level of confidence for all confidence intervals in output: 95%
 2. W values in conditional tables are the 16th, 50th, and 84th percentiles.

OUTCOME VARIABLE: Performance

Model Summary

R	R-sq	MSE	F	df1	df2	p
0.5523	0.3051	0.9393	4.0453	14.0000	129.0000	0.0000

Direct effect of X on Y

Effect	se	t	p	LLCI	ULCI
0.2118	0.4157	0.5095	0.6113	-0.6107	1.0343

As shown in the table, the confidence interval at the 95% level for the interaction term of speed and optimism does not include zero, which means that optimism moderates the mediation. Again, the conditional effects of strategic decision speed at different levels of optimism indicate that, strategic decision speed is not significant at the 0.05 level when optimism is between the 16th and the 84th percentile. However, as slope analysis indicated speed is significant at lower levels and higher levels of optimism that obviously fall outside this range (i.e. below the 16th and above the 84th percentile). As slope analysis indicated, the gradient of the slope of the strategic decision speed – organizational ambidexterity relationship is negative (-0.328) and significant (p=0.034) at low levels of optimism (obviously lower than the 16th percentile), whereas it is positive (0.336) and significant (p=0.000) at high levels of optimism (obviously higher than the 84th percentile), indicating a reversing effect. Again, there is no direct effect of strategic decision speed on firm performance. Overall, optimism is found to moderate the mediation.

7.4.4 Moderated Mediation with Educational Level as the Moderator

The third moderated mediation examined is the one where educational level is included as a moderator, whereas all other moderators (i.e. paradox mindset, optimism and environmental dynamism) and interaction effects are included as control variables. Figure 15 demonstrates the two different paths from strategic decision speed to firm performance under this moderated mediation model:

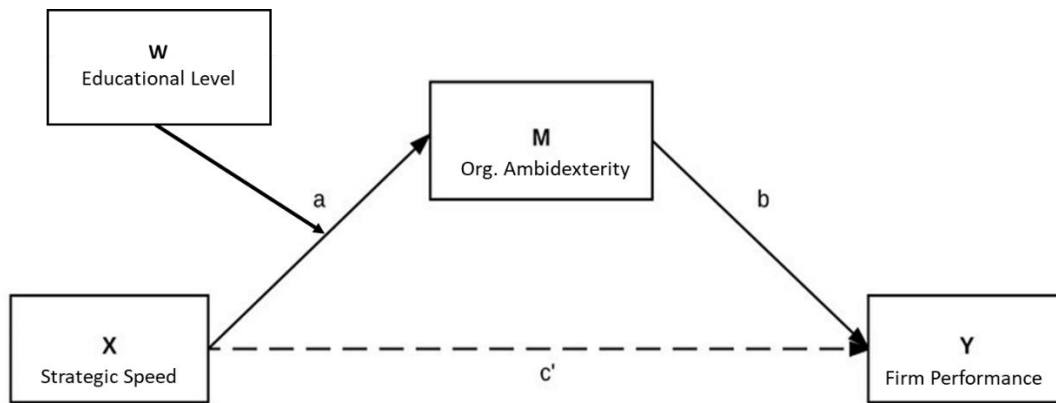


Figure 15 – Moderated Mediation (Educational Level)

Table 40 presents the respective moderated mediation results:

Table 40: Moderated Mediation Analysis Results – Educational Level

OUTCOME VARIABLE: Ambidexterity

Model Summary

R	R-sq	MSE	F	df1	df2	p
0.6709	0.4502	0.5075	6.9864	15.0000	128.0000	0.0000

Test(s) of highest order unconditional interaction(s):

	R ² -chnge	F	df1	df2	p
X*W	0.0164	3.8126	1.0000	128.0000	0.0531

Conditional effects of the focal predictor at values of the moderator(s):

Educ. Level	Effect	se	t	p	LLCI	ULCI
0.0000	-0.4565	0.3065	-1.4893	0.1389	-1.0631	0.1500
1.0000	0.1461	0.0468	3.1199	0.0022	0.0534	0.2387

OUTCOME VARIABLE: Performance

Model Summary

R	R-sq	MSE	F	df1	df2	p
0.5550	0.3081	0.9353	4.1023	14.0000	129.0000	0.0000

Direct effect of X on Y

Effect	se	t	p	LLCI	ULCI
0.0279	0.0649	0.4297	0.6681	-0.1006	0.1563

As the table indicates, the interaction effect of strategic decision speed and educational level is significant at the 0.10 level, but slightly above the 0.05 level ($p=0.0531$). Furthermore, the effect of strategic decision speed on organizational ambidexterity is positive and significant only at high levels of education (i.e. for CEOs with at least a university degree), whereas there is no

direct relationship between strategic decision speed and firm performance. Overall, educational level is found to moderate the mediation.

7.4.4 Moderated Mediation with Environmental Dynamism as the Moderator

The fourth moderated mediation examined is the one where environmental dynamism is included as a moderator, whereas all other moderators (i.e. paradox mindset, optimism, and educational level) and interaction effects are included as control variables. Figure 16 demonstrates the two different paths from strategic decision speed to firm performance under this moderated mediation model:

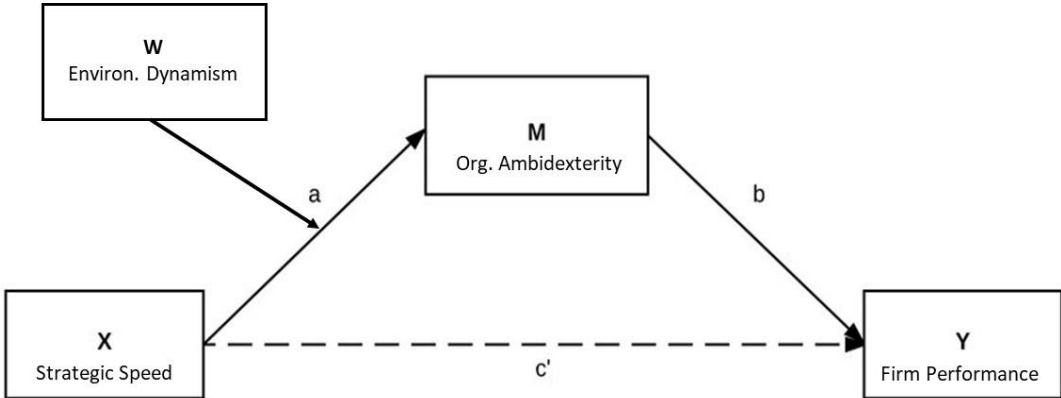


Figure 16 – Moderated Mediation (Environmental Dynamism)

Table 41 presents the respective moderated mediation results:

Table 41: Moderated Mediation Analysis Results - Environmental Dynamism

OUTCOME VARIABLE: Ambidexterity

Model Summary

R	R-sq	MSE	F	df1	df2	p
0.6709	0.4502	0.5075	6.9864	15.0000	128.0000	0.0000

Test(s) of highest order unconditional interaction(s):

	R ² -chng	F	df1	df2	p
X*W	0.0242	5.6415	1.0000	128.0000	0.0190

Conditional effects of the focal predictor at values of the moderator(s):

Env.Dynamism	Effect	se	t	p	LLCI	ULCI
-0.8820	-0.3572	0.3087	-1.1572	0.2493	-0.9680	0.2536
-0.0486	-0.4511	0.3065	-1.4716	0.1436	-1.0575	0.1554
0.9514	-0.5637	0.3106	-1.8148	0.0719	-1.1783	0.0509

Notes: 1. Level of confidence for all confidence intervals in output: 95%

2. W values in conditional tables are the 16th, 50th, and 84th percentiles.

OUTCOME VARIABLE: Performance

Model Summary

R	R-sq	MSE	F	df1	df2	p
0.5218	0.2723	0.9836	3.4484	14.0000	129.0000	0.0001

Direct effect of X on Y

Effect	se	t	p	LLCI	ULCI
0.1277	0.4284	0.2980	0.7662	-0.7199	0.9752

As the table indicates, the interaction effect of strategic decision speed and environmental dynamism is significant at the 0.05 level, but only slightly above the 0.01 level ($p=0.019$). Furthermore, the effect of strategic decision speed on organizational ambidexterity is not significant for values of environmental dynamism between the 16th and 84th percentile; however, slope analysis has indicated that strategic decision speed is significant for organizational ambidexterity at lower levels of environmental dynamism, obviously lower than the 16th percentile. Again, there is no direct relationship between strategic decision speed and firm performance. Overall, environmental dynamism is found to negatively moderate the mediation.

7.5 Post-hoc Analysis

Post-hoc analyses are additional statistical analyses used after the data have been collected and analyzed, in order to refine the theoretical implications of a piece of research work (Klockars & Hancock, 1998; Leung, 2011). In this study, the impact of perceived environmental dynamism was further investigated based on a post-hoc analysis, in order to better refine the

theoretical implications concerning the effect of environmental dynamism. The additional statistical analyses conducted examined perceived environmental dynamism as an independent variable, and how it affects the speed of decision making and ambidexterity as dependent variables; i.e. two direct relationships were examined, the one between environmental dynamism and strategic speed (Model 8) and the one between environmental dynamism and organizational ambidexterity (Model 9). Further, in order to examine whether there is a significance impact of strategic decision speed on firm performance, on more direct relationship was investigated, between strategic decision speed and performance. This relationship was examined both including the control variables and no moderators (Model 10), as well as including all control variables and moderators (but no interaction effects – Model 11).

Acknowledging that presenting new hypotheses developed after the data were collected as developed a priori is an unethical process (Leung, 2011), it is clearly stated that these hypotheses were not formed a priori, yet the researcher views them as ways of getting additional insights on the relationships between the different variables examined. Thus, complementary regression analyses were run and the respective regressions results are presented in Table 42.

Firstly, the impact of perceived environmental dynamism on strategic decision speed was examined (Model 8) and was found significant at the 5% level (coefficient=0.259, $p=0.044$). This indicates that the higher the perceived dynamism, the faster the decision-making process in organizations. On the contrary, the impact of environmental dynamism on ambidexterity (Model 9) was insignificant; so dynamism on its own does not affect ambidexterity. These findings indicate that when CEOs perceive the environment as more dynamic, they tend to reach strategic decisions quicker, but solely this perception about the environment does not make companies ambidextrous. On the other hand, the moderation and mediated moderation analyses

have indicated that the higher the perceived environmental dynamism, the weaker the relationship between strategic decision speed and ambidexterity. This sheds a light on what happens when fast strategic decisions are reached under high environmental dynamism and is in line with the view that exploration opportunities may be perceived as riskier (March, 1991). In addition, the

Concerning the effect of strategic decision speed on firm performance, this was found insignificant in both models (10 and 11), i.e. irrespective of whether moderators were included in the regression or not. This finding is in agreement with the regression results presented in Table 35 as well as with the mediated moderation results. This is a noteworthy finding concerning the impact of strategic decision speed under a dynamic crisis. So, organizational ambidexterity is a missing link between strategic decision speed and performance in dynamic environments, and whether this stands in more stable environments remains to be examined. The fact that no significant direct relationship was found between strategic decision speed and firm performance underlines the importance of this work in the area of strategic management and strategic decision making. Further, this makes the other hypotheses even more important; reaching strategic decisions quickly under a dynamic crisis is not beneficial for firm performance, but it enables companies to be ambidextrous, a driving factor of performance. Hence, organizational leaders need to be well optimistic, well-educated and paradoxical thinkers in order to enhance the strength of the relationship between strategic decision speed and ambidexterity.

Concerning the role of perceived environmental dynamism, the findings of the post-hoc analysis combined with the results of the moderation and mediated moderation analyses suggest that although companies are deciding faster under high dynamism, in reality they are freezing

their strategic activities and are remaining still; that is, although they are trying to move fast, they end up not taking action when leaders perceive the environment as highly dynamic. This is a very interesting finding about the effect of environmental dynamism on strategic decision making.

Table 42: Post-hoc Analysis Results

Variable	Model 8	Model 9	Model 10	Model 11
<i>Company Size</i>	-4.941E-05*	7.738E-06	-9.621E-06	-1.432E-05
	(0.000)	(0.000)	(0.000)	(0.000)
<i>Social Desirability</i>	0.043	0.131	0.182	0.098
	(0.149)	(0.087)	(0.112)	(0.117)
<i>Years of Experience</i>	0.005	0.001	-0.007	-0.004
	(0.014)	(0.008)	(0.011)	(0.011)
<i>Gender</i>	0.006	-0.282↑	-0.211	-0.214
	(0.276)	(0.161)	(0.220)	(0.216)
<i>Family Company</i>	-0.331	-0.218	0.046	0.070
	(0.244)	(0.143)	(0.196)	(0.192)
<i>CEO Ownership Respondent</i>	0.505*	0.250↑	-0.518*	-0.531**
	(0.250)	(0.148)	(0.204)	(0.198)
<i>Organiz. Ambidexterity</i>				
<i>Strategic Decision Speed</i>		0.160**	0.132	
		(0.051)	(0.067)	
<i>Paradox Mindset</i>	0.047	0.190**		0.116
	(0.124)	(0.072)		(0.097)
<i>Optimism</i>	0.341*	0.252**		0.222*
	(0.139)	(0.083)		(0.111)
<i>Educational Level</i>	-0.600	0.074		0.556
	(0.581)	(0.340)		(0.457)
<i>Environmental Dynamism</i>	0.259*	0.031		-0.142
	(0.128)	(0.076)		(0.102)
<i>Str.D.Speed X Env. Dynamism</i>				0.126
				(0.068)
Constant	0.467	5.430***	5,28***	4.748***
	(0.600)	(0.351)	(0.168)	(0.471)
R ²	0.398	0.559	0.294	0.401
ΔR ²	0.159*	0.312	0.087	0.161

Notes: ↑p<0.10, *p < 0.05; **p < 0.01, ***p<0.001. Parentheses indicate error values. DV is Strategic Decision Speed in Model 8; DV is Organizational Ambidexterity in Model 9; DV is Relative Firm Performance in Models 10 and 11.

The following section briefly presents contemporaneous data concerning the responses of Greek companies to the pandemic in the same time period that this research was conducted. The researcher views these data as a complementary source of insights, concerning what was happening in the Greek business environment at the time.

7.6 Contemporaneous Data

This study has considered contemporaneous data from three sources concerning the responses of Greek companies during the pandemic: firstly, the opening remarks of Dr. Yannis Stournaras, Governor of the Bank of Greece, Member of the Board of Governors of the International Monetary Fund, and former Minister of Finance of Greece, during the joint seminar of the Bank of Greece and the European Investment Bank, organized in March 2022; secondly, a report by PWC (PriceWaterhouseCoopers) Greece titled “The response of the Greek companies to the pandemic” issued in 2020; and thirdly, a report by Piraeus Bank, one of the largest banks of Greece, titled “Tracking Greek corporate balance – sheets in and out of the pandemic” issued in August 2020. The survey data for this study were collected between October 2020 and March 2021 with participants being asked to provide answers on their company’s strategy and performance in the past six months. The time period covered in the aforementioned three reports was more or less the same time period reflected in the survey participants’ responses. All three historical data sources included valuable information about how Greek companies responded to the pandemic, and more specifically about the strategic decisions that they reached. The data are presented in detail in the Appendix.

The three reports share some important similarities: in general, the responses of companies to the pandemic, during the time period that this study was conducted, mainly focused on exploitation opportunities (as demonstrated by the decrease in operating costs). Exploration

opportunities were pursued by fewer companies, although those companies that also pursued exploration opportunities were superior performers. These findings are in line with March's (1991) position that exploration opportunities are perceived as risky and uncertain, whereas exploration opportunities seem a safer choice under uncertainty. The decrease in investments indicates that, indeed, the pandemic crisis led to avoidance behaviors, with companies particularly avoiding explorative opportunities (Hirsh et al., 2012; March, 1991; McMullen & Shepherd, 2006). Therefore, the increased dynamism of the environment harmed organizational ambidexterity of companies in Greece, in general. However, there were companies that were able to be ambidextrous by pursuing both exploitation and exploration opportunities. To sum up, based on these supporting data that are publicly available, the responses of the Greek companies to the pandemic indicate a general trend to focus on exploitation; of course, there was some variation in the responses and the organizations that were ambidextrous achieved superior performance. Hence, on average, there was a hesitance of Greek companies to invest during the first year of the pandemic crisis, indicating that the implementation of decisions about exploration opportunities was possibly delayed or cancelled. Although this can only be interpreted as a trend and there are no specific data about the companies included in the study sample, it is in accordance with moderation analysis and post-hoc analysis findings that suggest that the link between deciding fast and ambidexterity is weaker when environmental dynamism is perceived as very high.

7.7 Synthesis of Results

As Table 35 indicates, there is a significant positive relationship between strategic decision speed and organizational ambidexterity in Models 1 (model testing the direct relationship between strategic decision speed and ambidexterity), 3 (model testing paradox mindset as a moderator), 4 (model testing optimism as a moderator), and 6 (model testing environmental

dynamism as a moderator), whereas this relationship becomes negative when educational level is examined as a moderator on its own, and becomes insignificant when all four moderators are examined. The fact that the effect of strategic decision speed changes when educational level is examined as a moderator is explained by the nature of the moderation, which is substitutive, i.e. educational level may substitute strategic decision speed, and thus the two are interchangeable and educational level takes away the effect of strategic decision speed when it is entered in the model. Furthermore, there is a positive significant effect of organizational ambidexterity on firm performance and no effect of strategic decision speed on firm performance as indicated in Model 2. There is also a significant negative effect of the interaction between strategic decision speed and perceived environmental dynamism on performance, indicating again that the more dynamic the environment when deciding fast, the poorer the performance of the firm. Therefore, reaching decisions quickly does not lead to superior performance directly; rather, achieving organizational ambidexterity mediates the strategic decision speed – firm performance relationship. This is a remarkable finding that sheds light on previous contradicting results concerning the effect of strategic decision speed on firm performance. Last but not least, paradox mindset, optimism, educational level and environmental dynamism have significant moderating effects on the strategic decision speed – organizational ambidexterity relationship; the first two effects are accentuating and reversing, whereas the third and the fourth ones are substituting. Therefore, adopting a paradox mindset and being optimistic strengthen the aforementioned relationship, whereas it takes educated CEOs in order for strategic decision speed to be associated with ambidexterity. Further, at high levels of perceived environmental dynamism, the strategic decision speed – organizational ambidexterity relationship becomes negative. This was confirmed by insights from the qualitative data collected during the pilot phase and was also supported by contemporaneous data available about the responses of Greek companies during the first year of the pandemic.

Overall, this study's findings support Hypotheses 1, 2, 3, 4, and 6, but do not fully support Hypothesis 5, as it suggests a strengthening moderation of educational level on the strategic decision speed – organizational ambidexterity relationship. A moderating effect of educational level on the aforementioned relationship was found, but it was a substitutive one, indicating that at low levels of education, strategic decision speed is associated with lower levels of organizational ambidexterity.

This study also reveals some interesting results concerning the role of the control variables. Years of experience are insignificant in all models in Table 35, whereas company size is only significant when educational level is tested as a moderator, probably because decision makers in smaller firms may have lower levels of education compared to those in larger firms. Moreover, gender has a negative significant effect in models 3 – 7, indicating that among CEOs who reach strategic decisions quickly, male CEOs achieve higher levels of organizational ambidexterity than female CEOs do. This finding is in line with previous work that suggests that women are less ambidextrous strategists than men when facing family interference with work (Yu et al, 2018), and Greece is a highly masculine society viewing women as responsible for taking care of the family and the household (Hofstede, 1980). Thus, women in Greece are probably experiencing family interference with work, which could explain why they are less ambidextrous strategists than men. Further, women face gender discrimination concerning the access to resources (Xie and Lv, 2016), making it harder for them to acquire resources that will enable them to pursue different types of opportunities and, hence, to be ambidextrous. However, as findings indicate, gender does not affect organizational performance. So, although being less ambidextrous than their male peers, there is no effect of CEO gender on firm performance.

Another interesting finding concerning the control variables is the positive effect of CEO ownership on organizational ambidexterity and its negative effect on performance. Hence, owners who are CEOs are not able to benefit from ambidexterity, as Table 35 indicates based on the negative effect of CEO ownership on organizational performance. This is an interesting finding compared to previous findings concerning CEO ownership, which was reported to lead to superior performance (Mueller & Spitz-Oener, 2006). On the other hand, CEO ownership has a significant positive effect on strategic decision speed (Table 42), i.e. CEOs who own the company are faster decision makers; this is expected, as they often do not need to obtain a consensus concerning strategic decisions, and is in line with previous research findings concerning owners of Greek companies using less rational approaches to decision making (Papadakis et al., 1998). Hence, a possible explanation for the negative relationship between CEO ownership and performance under crisis could be that the negative effect on performance is due to reaching strategic decisions faster than CEOs who are non-owners, since there is a negative interaction effect of strategic decision speed and environmental dynamism on performance. It is noteworthy, the effect of CEO ownership is insignificant for achieving ambidexterity in model 4 that examines optimism as a moderator, indicating that CEO ownership does not make a difference for ambidexterity when the CEO is optimistic.

Table 35 also indicates that social desirability has an effect in models 4 and 5 (significant at the 0.05 and the 0.10 levels respectively), which examine the moderating effects of educational level and perceived environmental dynamism, and model 6 (significant at the 0.05 level), which examines all moderators simultaneously. Hence, the respondents in this research appear to have replied, at least up to a certain extent, in a socially desirable way, which is very common in survey research. Individuals often tend to respond to survey questions in ways that will make them viewed more favorably in terms of socially acceptable behaviors (Steenkamp et al., 2010).

Although social desirability bias may threaten the validity of research findings (Kwak et al., 2021), it has been controlled for in this study, in line with the view that including social desirability as a control variable improves the research results accuracy (Larson, 2019). Therefore, it is important that the two direct relationships and four moderation effects examined in this study are all still significant when social desirability is used as a control variable. Further, in line with the view that social desirability bias is not problematic when its correlation with other variables is small, even though it is significant (Antonetti & Maklan, 2016; Polonsky et al., 2014), no respondents were excluded from the data set. Indeed, social desirability correlates with gender (correlation coefficient is 0.184), with organizational ambidexterity (correlation coefficient is 0.247) and with optimism (correlation coefficient is 0.357). The correlation with gender indicates that women in the sample tend to provide more socially desirable answers, but women constitute only 23.61% of the sample. Further, the highest correlation is observed between social desirability and optimism, which is expected. Nevertheless, all three correlations are considerably lower than the suggested threshold in the literature of 0.7 (Dormann et al. 2013). Overall, the effect of social desirability bias in this study is not viewed as problematic.

7.8 Chapter Summary

This chapter presented the results in terms of the hypotheses formulated. Findings support Hypothesis 1, i.e. there is a positive significant relationship between strategic decision speed and organizational ambidexterity under crisis. Hypothesis 2 is also supported, which means that, under crisis, companies that are ambidextrous achieve superior performance. In addition, all moderators hypothesized have been found to moderate the strategic decision speed – organizational ambidexterity relationship. However, hypothesis 5 is not fully supported, as a strengthening moderation was hypothesized, but a mitigating moderation was found. Overall, results indicate that deciding quickly under crisis leads to achieving ambidexterity and is

beneficial for organizations that are ambidextrous, since there is no direct relationship between strategic decision speed and performance. Moreover, being optimistic under crisis pays off, as does possessing a paradox mindset and having higher levels of education. Last but not least, when the environment is perceived as highly unpredictable and rapidly changing, decision makers who decide fast achieve lower levels of ambidexterity for their organizations. The aforementioned results are further discussed in the following section.

8. Discussion

This chapter further discusses the findings identified in Chapter 7 and how they fit with previous literature findings. The major contributions of this study, related to theory and managerial implications, are also presented.

The aim of this research was to examine strategic management under crisis, based on the opportunity logic of strategy (Bingham & Eisenhardt, 2008), according to which organizations achieve and sustain a competitive advantage through identifying and seizing opportunities for creating profits earlier, faster, and more successfully than competitors. Since profits can be created both by decreasing costs (through improving efficiency, i.e. exploiting) and by increasing revenues (through entering or expanding to new markets, introducing new products and services, i.e. exploration), the opportunity logic is associated with identifying and seizing opportunities for both exploration and exploitation. Hence, the opportunity logic is relevant in most environments and specifically in crisis environments, which are unpredictable and volatile. Moreover, a central aspect of strategic management under the opportunity logic is related to finding and taking advantage of exploration and exploitation opportunities, in other words with organizational ambidexterity, rendering organizational ambidexterity a key strategic decision (Døjbak Håkonsson et al., 2016; Gupta et al., 2006; Kortmann, 2015). The ambidexterity decision is interrelated with multiple other decisions about exploration and exploitation opportunities, like which exploration and exploitation opportunities to pursue or how knowledge about opportunities is shared in the organization (e.g. Mom et al., 2007). Furthermore, similar to organizational ambidexterity, strategic decision speed (Eisenhardt, 1989) is also central under the opportunity logic of strategy, as it enables identifying and seizing opportunities early and quickly, including opportunities for exploration and exploitation. Thus,

based on the opportunity logic of strategy, a relationship between strategic decision speed and organizational ambidexterity was hypothesized and confirmed in this study.

Till now, the alignment of strategic decision speed to the pace of external change (Clark and Maggitti, 2012; Shepherd et al., 2021) had been recognized as a factor related to firm performance, but not to organizational ambidexterity. The findings concerning the strategic decision speed – firm performance relationship were mixed and confusing, with positive relationships (e.g. Baum & Wally, 2003), negative relationships (e.g. Perlow et al., 2002) and no relationship (e.g. Forbes, 2001) having been reported. This study provides insights concerning how strategic decision speed is related with firm performance, indicating that in reality there is no direct relationship (a finding that helps explain previous confusing findings). Rather, strategic decision speed is positively related with organizational ambidexterity, which in turn is related with firm performance. This is an important findings concerning different aspects of strategic management and their interaction, which adds to the discussion on the third key debates presented earlier.

In addition, drawing on strategic choice theory (Child, 1972 & 1997) and upper echelons theory (Hambrick & Mason, 1984; Hambrick, 2007), this dissertation suggests that the decisions that CEOs reach under crisis make a difference; firstly, because the decision of pursuing ambidexterity has a significant effect on firm performance, and, secondly, because their cognitive abilities affect a key aspect of firm strategy: organizational ambidexterity. These findings contribute to the discussion on the first key debate presented earlier, that has to do with the level of influence that managers have over organizational outcomes. Based on this study's findings, it can be supported that CEOs have an increased level of influence on organizational

outcomes, and therefore the assumptions of choice theory (Child, 1972 & 1997) and upper echelons theory (Hambrick & Mason, 1984; Hambrick, 2007) are validated in this study.

Moreover, this study examined organizational ambidexterity (He & Wong, 2004) as part of the strategic decision-making framework (Elbanna et al., 2020) for the first time and identified the interplay between different dimensions of the strategic decision-making context (Elbanna et al., 2020) and ambidexterity. These findings add to the discussion of the second key debate presented above, examining the interplay between environmental impact and managerial actions, while incorporating organizational characteristics as contextual factors of the decision-making process as well. This study has borrowed concepts from the strategic decision-making field and has applied them in another important field of strategic management research, i.e. organizational ambidexterity. Therefore, this research adopted an integrated multilevel approach of strategic management, identifying how these multiple levels interact.

Last but not least, this study has examined the outcomes of organizational ambidexterity under the global pandemic crisis, which may be characterized as a fractal crisis (Topper & Lagadec, 2013), adding to the discussion on the fourth debate presented above. Organizational ambidexterity has to do with identifying and seizing opportunities for exploration and exploitation. Indeed, findings indicate that was beneficial for companies to pursue both types of opportunities in the context of the global pandemic crisis, in accordance with Du & Chen's (2018) suggestions about its positive outcomes in VUCA environments. However, the more dynamic the environment (based on the CEOs' perceptions), the more difficult it proved to turn fast strategic decisions into ambidextrous ones. Hence, there seems to be a difficulty for companies to be ambidextrous under increased uncertainty and turbulence of the environment.

Taking a closer look at this study's findings, there are some additional theoretical implications worth discussing. Firstly, the focus on cognition-related characteristics of organizational decision makers is in line with the suggestion that cognition significantly affects strategic decision making under crisis (Maitlis & Sonenshein, 2010; Weick, 1993; Weick, 1998). Thus, it is important that the three cognition-related characteristics of CEOs that have been examined as moderating factors of the relationship between strategic decision speed and organizational ambidexterity have been validated as moderators: paradox mindset (Miron-Spektor et al., 2018), optimism (Tiger, 1979) and educational level. Specifically, paradox mindset was chosen as a way of thinking that enables leaders to deal with the paradoxical tensions created by the pandemic (Carmeli et al., 2021); optimism as a cognitive skill that affects strategic decisions (Langabeer & DelliFraine, 2011); and educational level as a proxy of individuals' cognition (Hambrick & Mason, 1984). The fact that all three cognitive characteristics examined have been found to moderate the relationship between strategic decision speed and organizational ambidexterity indicates that the assumption that cognition is crucial under crisis (e.g. Weick, 1998) is valid.

Secondly, previous research suggests that perceptions about the environment affect strategic decision making more than the actual conditions in the environment (Child, 1972; Duncan, 1972; Hambrick & Snow, 1977; Miller, 1988; Weick, 1969). Perceived environmental dynamism was examined as a moderator of the strategic decision speed – organizational ambidexterity relationship and it was found that the more the perceived environmental dynamism, the weaker the relationship between deciding quickly and being ambidextrous. Therefore, although all CEOs were exposed to the same crisis, the global pandemic, in the same country, Greece, and responses were collected in the same time period, it seems that their perceptions about the environment varied and indeed affected their strategic decisions.

Although it cannot be said that their perceptions affected strategic decision making more than the actual conditions of the environment as previous research suggests (e.g. Miller, 1988), it can be supported that environmental perceptions of decision makers do make a difference.

Thirdly, all four moderators examined can be associated with identifying and seizing opportunities: a paradox mindset enables a decision maker to perceive, consider and choose to pursue opportunities that may seem contradicting; optimism facilitates the process of understanding the potential positive outcomes of opportunities that may require more time or effort; higher levels of education permit viewing a situation holistically, without neglecting aspects that may be related to less obvious opportunities or to managing the complex task of pursuing multiple different opportunities; and perceived environmental dynamism affects how a CEO evaluates opportunities related to the risks and threats that the environment entails. All hypothesized moderators were confirmed, although the nature of moderation for educational level (substitutive) was different from the one hypothesized (accentuating), showing that the opportunity logic of strategy relates to individual characteristics and perceptions of decision makers.

One final important theoretical implication based on this study's findings is that the opportunity logic is important under crisis. Adding to the discussion on different strategy logics presented in the Furr & Eisenhardt (2021) paper, this study expands the relevance of the opportunity logic of strategy to crisis environments. Previous work has suggested that the opportunity logic is relevant in dynamic environments (Bingham & Eisenhardt, 2008; Furr & Eisenhardt, 2021). The study's findings indicate that being able to identify and seize opportunities faster than competitors under crisis is related with organizational ambidexterity, which in turn is associated with superior performance. Hence, organizational leaders under crisis may achieve a

competitive advantage for their companies through an ambidextrous strategy, balancing the pursuit of exploitation and exploration opportunities under crisis in a timely manner. Furthermore, this study indicates that strategizing by *thinking* as described in the strategy creation view (Furr & Eisenhardt, 2021) is extremely important under crisis, since it is the thinking component that guides the other two components of strategizing, i.e. *doing* and *shaping*. Although this study was not designed in order to test the elements of the strategy creation view under crisis, findings indicate that under the dynamic conditions of a fractal crisis, *doing* is often postponed and *shaping* is very difficult. Still, cognition and perceptions that guide the *thinking* element of the strategy creation view are crucial and, based on the qualitative insights from the cognitive interviewing phase, some part of the planned *doing* occurs. More work on strategizing under crisis is essential in order to examine the interplay between *thinking*, *doing*, and *shaping* during crisis under the opportunity logic of strategy. Hopefully, this study has contributed to the very interesting discussion about strategizing under crisis through adding important findings to existing work. These findings are discussed in more detail as follows.

8.1 Discussion on Direct Relationships

The two direct relationships examined in this study were the relationship between strategic decision speed and organizational ambidexterity, and the relationship between organizational ambidexterity and firm performance. Both relationships were found to be positive and significant, whereas the direct relationship between strategic decision speed and firm performance was not significant, indicating that deciding fast is not enough for achieving superior performance, even in dynamic environments.

Strategic management researchers have identified the question of how strategic decision speed leads to superior performance as an interesting question with no clear answer for decades

(Eisenhardt, 1989; Shepherd et al., 2021). Indeed, previous research has reported mixed findings about the relationship between deciding fast and firm performance specifically in dynamic environments. In different pieces of work in dynamic environments, the effect of strategic decision speed on firm performance has been found to be positive (e.g. Baum & Wally, 2003), negative (e.g. Perlow et al., 2002) or insignificant (e.g. Forbes, 2001). In addition, in stable environments, empirical research has suggested that the relationship between strategic decision speed and firm performance is negative (Chen & Hambrick, 1995) and this has been the assumption in the discussion about strategic decision speed in stable environments in previous research. This study's findings suggest that under crisis, there is no direct link between speed and performance, but the route from strategic decision speed to performance passes through ambidexterity. Hence, ambidexterity may be a possible explanation for contradictory previous results and this may become an avenue of future research, where strategic decision speed and organizational ambidexterity are simultaneously examined.

So, speed is not directly associated with firm performance in a crisis environment. Rather, the process of achieving superior performance under crisis is a two-stage process: firstly, organizations need to decide fast in order to be ambidextrous, and secondly they need to be ambidextrous in order to perform well. Organizational ambidexterity has been repeatedly linked with enhanced performance in previous work in dynamic environments (e.g. Du & Chen, 2018; Heracleous et al., 2017; Junni et al., 2013), as well as in financial crisis environments (Dolz et al., 2019; Shmitt et al., 2010). In accordance with recent findings during the pandemic (Jang & Lee, 2022), this study confirms the positive relationship between organizational ambidexterity and firm performance in a fractal crisis environment, where the crisis is intense, long-lasting and includes smaller nested crises (Topper & Lagadec, 2013). Hence, this study validates that being ambidextrous at the firm level pays off during fractal crises, in line with the suggestion

that companies are able to eliminate the threats for firm survival and pursue opportunities that enhance their long-term performance when they are ambidextrous under challenging conditions (Hill & Birkinshaw, 2014; Schmitt et al., 2010). Thus, organizational ambidexterity is a key strategic decision under a fractal crisis.

Overall, both direct relationships hypothesized in this study have been confirmed. The following section discusses the four hypotheses concerning the moderating variables (paradox mindset, optimism educational level, and environmental dynamism) of the strategic decision speed – organizational ambidexterity relationship.

8.2 Discussion on Moderators

This study examined the role of four variables as moderators: paradox mindset, optimism, educational level and environmental dynamism. The first three moderators considered are related to CEOs' cognition, whereas the fourth is related to the environment. All four variables were found to moderate the strategic decision speed – organizational ambidexterity relationship, although a different type of relationship was found for educational level (substituting) from the one hypothesized (strengthening and accentuating).

8.2.1 Leaders' Cognition

Findings concerning the importance of leaders' cognition under crisis confirm the findings and suggestions of previous work (Maitlis & Sonenshein, 2010; Weick, 1993). Indeed, this dissertation confirms that how CEOs perceive and make sense of a crisis situation matters, and specifically highlights the importance of their cognitive skillset, and of how they use (and choose to use) their cognitive skills.

Adopting a paradox mindset – a cognitive skill related to the cognitive ability to think paradoxically – is beneficial for decision makers who reach strategic decisions quickly under crisis, because it enables them to consider and pursue paradoxical opportunities for exploration and exploitation. The moderating effect of paradox mindset on the relationship between strategic decision speed and organizational ambidexterity was found to be positive, accentuating and reversing, indicating a relatively strong moderation effect (Gardner et al., 2017). Thus, CEOs who decide fast and are characterized by high levels of paradox mindset help achieve significantly higher levels of ambidexterity for their organizations. Paradox mindset not only enhanced the effect of strategic decision speed on organizational ambidexterity, but also reverses the negative effect at lower levels of paradox mindset into a positive one at higher levels; in other words, CEOs with low levels of paradox mindset are harming organizational ambidexterity when deciding fast about strategy, whereas those with a high level are enhancing it. With the advantages of paradoxical thinking having been recognized in the past decade on various aspects of the personal and professional lives of individuals (Miron-Spektor et al., 2018; Smith & Lewis, 2011), this study suggests that a paradox mindset is beneficial for companies at the firm level, through its impact on strategic decision making and strategizing.

Moreover, an even stronger positive, accentuating and reversing moderating effect on the relationship between strategic decision speed and organizational ambidexterity was found for optimism. In accordance with previous literature that suggests that remaining optimistic in difficult situations is beneficial (Carver et al., 2002), the findings suggest that the more optimistic the CEOs, the stronger the relationship between deciding fast about strategy and organizational ambidexterity. Low levels of optimism entail expecting negative outcomes (Seligman, 1991); so, when the environment is unpredictable and changing and there is the rush

to reach decisions quickly, pessimistic CEOs cannot achieve ambidexterity, because they tend to focus on safer opportunities related to exploitation. Therefore, this study suggests that being optimistic as an organizational leader under crisis pays off.

Furthermore, the moderating role of educational level on the strategic decision speed – organizational ambidexterity relationship was confirmed and it was substituting. This means that high levels of education are required in order for those who decide fast to be able achieve organizational ambidexterity; otherwise, reaching decisions quickly leads to lower ambidexterity levels. This finding is in line with previous research that suggests that highly educated CEOs are more able to solve complex problems (Goll et al., 2007) and to be engaged in multiple different activities (Papadakis et al., 1998). It seems that CEOs with lower levels of education lack the ability to deal with multiple sources of information about exploration and exploitation opportunities and find it more difficult to be involved in multiple and very different activities that relate to pursuing both. Therefore, deciding fast concerning strategic options without being adequately educated (i.e. without at least a university degree) harms organizational ambidexterity.

The above three cognition-related characteristics of CEOs have been found to significantly affect the relationship between strategic decision speed and organizational ambidexterity. These characteristics are all at the individual level and they affect a relationship at the firm level, incorporating the microfoundations perspective. The impact of perceived environmental uncertainty, discussed as follows, is an environmental-level dimension based on individual perceptions, and the study examines how it affects the firm-level relationship between strategic decision speed and organizational ambidexterity, incorporating a multi-level integrated approach to strategic management.

8.2.2 Perceived Environmental Uncertainty: the Strategic Decision Speed – Organizational Ambidexterity Relationship in Different Perceived Contexts

The moderating effect of perceived environmental dynamism has been found to be substituting based on the categorization by Gardner et al. (2017). This means that when CEOs perceive the environment as more dynamic, they tend to be less ambidextrous when reaching strategic decisions fast. In other words, the relationship between strategic decision speed and ambidexterity becomes weaker at higher levels of environmental dynamism. This finding is in line with the stream of research that views increased uncertainty as a cause of avoidance behaviors that limit the pursuit of opportunities in general, with a trend to particularly avoid explorative opportunities (Hirsh et al., 2012; March, 1991; McMullen & Shepherd, 2006). Therefore, it seems that although COEs are reaching decisions fast in order to follow the pace of change in the environment, in reality their companies are either becoming strategically unbalanced, mainly focusing on exploitation opportunities, or strategically inactive, tending to not pursue any opportunities (neither exploitation, nor exploration opportunities).

Furthermore, slope analysis showed the gradient of the strategic decision speed – organizational relationship line is positive and significant at low levels of dynamism, whereas it is negative but not significant at high levels of dynamism. This indicates potentially a significant positive relationship between strategic decision speed and ambidexterity in stable environments, which is an interesting avenue for future research. It is noteworthy that the coefficient of strategic decision speed in Model 5 is positive, indicating that the strategic decision speed – organizational ambidexterity relationship is positive and significant even when accounting for environmental dynamism. That is, under crisis, deciding quickly is positively and significantly

related with organizational ambidexterity; however, the higher the perceived environmental dynamism, the weaker this relationship becomes.

To sum up, under crisis, reaching fast decisions is positively related with organizational ambidexterity. Different perceptions about environmental dynamism provide significant insights concerning the strategic decision speed – organizational ambidexterity relationship, which becomes weaker as the levels of dynamism increase. This suggests that the more dynamic the environment is perceived by CEOs, the less ambidextrous their companies become when they are reaching strategic decisions quickly. This can be explained by their tendency to pursue less opportunities and/or focus on those opportunities that entail less uncertainty. Thus, higher levels of environmental uncertainty weaken the relationship between deciding fast and being ambidextrous, because leaders select either to pursue safer opportunities related to exploitation or to freeze the implementation of strategic decisions concerning pursuing opportunities all together, until the environment becomes less uncertain and more stable. This is in accordance with crisis literature suggestions that organizations become more concerned with tactical strategic issues when the crisis occurs in an environment that is already complex (Smart & Vertinsky, 1984), leaving the pursuit of opportunities with a long-term focus for a time when the environment is less dynamic. Indeed, Greece was a very complex environment prior to the beginning of the global pandemic, so this study's findings are in line with Smart & Vertinsky's (1984) suggestions. Further, a focus on exploitation was also supported by the analysis of contemporaneous data included in reports concerning the responses of Greek companies to the pandemic during the time period that this study was conducted. These reports indicate that Greek companies were focusing on survival and tactics (i.e. on exploitation) rather than on investments and growing (i.e. exploration).

Overall, the moderation analysis findings empirically validate the importance of cognitive skills and individual perceptions in strategic management under crisis. Companies are better off when led by individuals who are paradoxical thinkers, optimistic and highly educated. Furthermore, the relationship between strategic decision speed and organizational ambidexterity becomes weaker when the environment is perceived as more dynamic. These empirical findings entail important theoretical contributions and managerial implications discussed as follows.

8.3 Research Contributions

This project is bridging the macro, meso and the micro levels while examining strategic management in organizations, under the crisis conditions of the COVID-19 pandemic. Through identifying factors that affect strategic decision making at different levels, this study enables a holistic view of strategic management under crisis and enables a multilevel approach. Theoretical contributions and managerial implications of this project are presented below.

8.3.1 Theoretical Contribution

Before presenting the theoretical contribution of this study, it is essential to define what theory is. Although there are various definitions of theory and in the past there appeared to be no clear consensus on a single definition of what theory is (Sutton & Staw, 1995), the researcher finds the definition provided by Gioia & Pitre (1990) very helpful: theory is “any coherent description or explanation of observed or experienced phenomena” (Gioia & Pitre, 1990, p. 587). Although this is a rather broad definition, Gioia & Pitre examine how this definition is relevant to different research paradigms and conceptualize theory as an illustration of how a set of concepts, and the relationships between them, explain the occurrence of a phenomenon. Therefore, this study defines a set of concepts (organizational ambidexterity, strategic decision speed, organizational performance at the meso level; paradox mindset, optimism, and educational level at the micro

level; and environmental dynamism at the macro level) and explains how they interrelate, illustrating how strategic management occurs under crisis.

This study's findings entail important theoretical contributions to the strategic management literature in general, and particularly to the organizational ambidexterity, strategic decision speed and crisis management literatures. The relationship between organizational ambidexterity and strategic decision speed has not been examined so far, empirically or theoretically. This work considers organizational ambidexterity as a crucial strategic decision, involving and related to multiple other strategic decisions. These strategic decisions concern opportunities about exploration and exploitation that need to be implemented in order for organizational ambidexterity to occur, in accordance with Døjbak Håkonsson et al. (2016). Organizational ambidexterity is, hence, embedded in the strategic decision-making process.

Incorporating organizational ambidexterity in the strategic decision-making framework is important, since it suggests that organizational ambidexterity needs to be viewed as part of the overall strategic decision-making process within organizations, instead of considering it in isolation. Further, the interplay between different dimensions of strategic decision making and organizational ambidexterity can now be examined, making it possible to better understand the underlying mechanisms of ambidexterity. Consequently, this work contributes to the advancement of strategic management literature in general, suggesting that it is essential that the process of strategic decision making and organizational ambidexterity should not be considered separately, but should be integrated in the strategic decision-making framework (Elbanna et al., 2020).

Furthermore, this study's findings suggest that strategic decision speed and organizational ambidexterity are positively related. Delaying strategic decisions impedes ambidexterity, as opportunities to explore and exploit are missed. Reaching decisions slowly leads to pursuing opportunities that are unavailable or irrelevant, due to the high pace of environmental change in dynamic and crisis environments, whereas in stable environments slow decision making would leave room for competitors to seize opportunities first and make them unavailable. This study, hence, contributes to the organizational ambidexterity literature by adding strategic decision speed to organizational ambidexterity's firm-level antecedents. Companies that are interested in achieving organizational ambidexterity need to be aware and cautious of their speed of decision making. Adding strategic decision speed to the antecedents of ambidexterity is an important contribution, since it entails that strategic decision speed antecedents (which have not yet been associated with ambidexterity) may have a significant impact on organizational ambidexterity, with speed acting as a mediator on relationships between its antecedents and ambidexterity. Similarly, strategic decision speed outcomes, like for example innovation performance, may act as mediators of the strategic decision speed – organizational ambidexterity relationship.

At the same time, this work adds organizational ambidexterity to the strategic decision speed outcomes under crisis, contributing to the strategic decision speed and strategic decision making literatures. Findings indicate that strategic decision speed is not related with superior performance under crisis, but with organizational ambidexterity, which in turn leads to superior performance. So, organizational ambidexterity is a missing link between strategic decision speed and performance. Previous work has recognized the need to shed light on conflicting findings concerning the relationships between strategic decision speed and firm performance (e.g. Shepherd et al., 2020). Hence, this study sheds light concerning the consequences of

strategic decision speed: achieving superior performance is not related with strategic decision speed under crisis; rather, deciding fast under crisis enables companies to be ambidextrous.

As already mentioned, this study's findings suggest that the role of CEO cognition and perceptions is central in strategizing under crisis. More specifically, companies under crisis are better led by optimistic, paradoxical, and highly educated CEOs. Among these three cognition-related characteristics, the most controversial in the literature concerning its outcomes is optimism; previous research suggests that too much optimism is not beneficial for organizations (Snyder & Rand, 2003; Hmieleski & Baron, 2009). This study provides support that optimism is beneficial for organizational leaders strategizing under crisis, with no indication that optimism is not beneficial above a certain point. On the contrary, the higher the optimism, the stronger its combined effect with strategic decision speed on organizational ambidexterity; and since ambidexterity is strongly related with firm performance under crisis, optimistic CEOs are enabling their organizations to perform better. Further, the fact that a positive psychological state-like capacity (optimism) and a mindset (paradox mindset) are beneficial for decision makers under crisis, contributes to the positive organizational behaviour, mindsets, and paradox literatures. These findings add to the discussion about the role of cognition of organizational leaders in strategic management in general (e.g. Miller et al., 1998; Venugopal et al., 2018; Wilms et al., 2019) and under crisis in particular (e.g. Andreou et al., 2017; Billings et al., 1980; Weick, 1998), indicating that a combination of cognitive abilities is essential in order for organizational leaders to be able to face the challenges of a crisis environment.

Last but not least, this study contributes to the crisis literature and adds to the discussion about successful strategies under crisis, through examining the role of organizational ambidexterity during crisis. The work's findings support the beneficial outcomes of organizational ambidexterity under the conditions of a fractal crisis. Previous research has identified the positive impact of ambidexterity on firm survival (Raisch et al., 2009) and on performance when the environment is dynamic or highly uncertain (Du & Chen, 2018; Heracleous et al., 2017; Junni et al., 2013). However, the magnitude and duration of the pandemic crisis has created unprecedented conditions and this study has tested the role of ambidexterity during this fractal crisis (Topper & Lagadec, 2013), i.e. a long crisis within which shorter nested crises occurred. Organizational ambidexterity is, therefore, a crucial part of strategic management under crisis.

The aforementioned theoretical contributions also entail substantial managerial implications, which are discussed in the next section.

8.3.2 Managerial Implications

This study's findings offer insights for strategic management under crisis. First of all, strategic decision making should not be delayed under crisis. Eisenhardt's (1989) seminal study on strategic decision speed identified big variations in the time required to make strategic decisions, ranging from four months to over a year. Such time frames for strategic decision making, even at the lower end of the range, could be detrimental for an organization operating in a crisis environment, where change is rapid. Organizational leaders need to adjust the pace of making decisions to the pace of change of the external environment (Clark and Maggitti, 2012). When decision-making time is counted in several months, the possibility for misreading the situation significantly increases (Mason and Mitroff, 1981), as the topics that decisions

concern at a specific point in time may no longer be relevant after a few months. In this way, opportunities are overlooked and missed. In the specific case of the global COVID-19 pandemic, time periods of less than four months were characterized by numerous, important changes in the environment. Companies that have not decided quickly on strategic issues have probably lost exploration and exploitation opportunities, which have been seized by competitors. Thus, delaying decisions is not the best strategy under crisis; organizational leaders should be cautious about decision-making times and keep track of them.

A possible way of keeping track of the time needed for strategic decision making is to identify the key meetings during which strategic decisions are made and report the timeframes for those meetings; then, individuals in decision-making teams need to evaluate whether this time needs to be shortened during the crisis. In addition, attention needs to be devoted on how fast information is being acquired. In case the access to information is slow, possibly there is the need to change metrics and focus on metrics that can be obtained faster; or maybe there is the need for changing processes related to gathering information, assigning it to different people, and taking advantage of networks. Finally, as the dramatic and unexpected change caused by the pandemic demonstrated, companies need to be prepared to invoke crisis plans, and change plans as well if needed, at any moment. The horizon for strategic plans under a crisis needs to be both short-term and long-term, however sticking with decisions that are not beneficial for the company as the environment is changing may not be beneficial. Hence, companies need to be flexible and able to change plans related to pursuing strategic opportunities at the shortest notice. To sum up, organizations need to be monitoring the processes of strategic decision making under crisis, and to consider and discuss changes that will enable them to respond to the changing conditions faster and more effectively.

On the other hand, decision makers are human beings, who may be stressed, afraid, worried or even panic under crisis, which could delay decision making. This is where decision makers' cognition and way of thinking makes a big difference under crisis. Being optimistic and using paradoxical thinking are beneficial for organizational leaders when the environment is volatile and hostile. When leaders make decisions quickly under crisis, those who are optimistic and possess a high paradox mindset are able to pursue opportunities for both exploration and exploitation and achieve higher levels of organizational ambidexterity. Organizational ambidexterity is, in turn, associated with better performance against competitors. In addition, lower levels of education are associated with lower levels of organizational ambidexterity for those leaders who are reaching decisions quickly. Hence, only leaders with higher level of education are able to recognize both types of opportunities, i.e. exploitative and explorative ones, when deciding fast. These findings are important, as they not only confirm the importance of organizational leaders' education and skills, but they also underline the need for lifelong, soft skills training in organizations. Being optimistic is not necessarily genetic and static, but is nowadays viewed as a state-like capacity (Luthans & Youssef, 2004). This means that individuals can choose and learn how to be optimistic. Similarly, a paradox mindset – although considered as having a neurological basis (Hannah et al., 2013) – is not static. On the contrary, it is enhanced while aging (Lomranz & Benyamini, 2016), and can be cultivated through training and interventions (Lüscher & Lewis, 2008). Although this study did not test the effects of an intervention concerning CEOs' cognitive skills, this study suggests that organizations may benefit from training top executives on ways of thinking and mindsets, or that they should look for other ways to help top executives develop these cognitive abilities in case training interventions are not effective. This also means that training providers have to create new training proposals that will cover these new needs for training executives, at the board of directors' level, on paradox mindset and optimism.

Last but not least, this study's findings suggest that it is worthwhile for companies to continue investing under crisis and pursue ambidextrous opportunities. Often under crisis, organizational leaders tend to engage in defensive strategies like cutting costs, optimizing production times, or improving service quality. Although these are beneficial practices, companies are better off when they also try to grow and expand under crisis. Hence, decision makers need to overcome the natural tendency to adopt defensive strategies and focus only on exploitation, the beneficial outcomes of which are easier to perceive (March, 1991), and also pursue exploration opportunities. Organizational leaders need to realize that the beneficial effects of exploitation may be visible in the short term, but the company will be in an inferior position in the long term if exploration is neglected. Thus, ambidextrous opportunities should be consciously sought and ways of seizing them should be discussed in strategy meetings. This does not mean that all opportunities identified should be pursued, but that there should be a conscious effort to identify both types of opportunities. Then, top management teams should evaluate each opportunity according to the company's goals and environmental conditions. Good managerial practice under crisis or in dynamic environments would, consequently, entail that ambidextrous opportunities are discussed in strategy meetings, and, at the (next) stage of strategy implementation, a relatively balanced number of exploration and exploitation opportunities is pursued.

8.3.3 Summary of Contributions

Corley & Gioia (2011) introduced a way of summarizing the contributions of a research study based on two criteria: research utility and research originality. Research utility has to do with the degree of usefulness of the contribution in terms of science and practicality. Research originality includes two categories of contributions: revelatory and incremental, based on

whether these contributions create something new or add on existing findings. The result of this categorization is a 2X2 matrix, presented for this study in Figure 17 below. As the matrix indicates, this study includes contributions to all four categories in the 2X2 matrix, with at least three items in each category.

Originality	Revelatory	<ul style="list-style-type: none"> 1) Deciding fast under crisis enables the pursue of both growth/expansion (exploration) and optimization/cost-reduction (exploitation) opportunities 2) Deciding fast under crisis does not necessarily lead to superior performance 3) Remaining optimistic even under extreme crisis conditions is important 4) Pursuing both exploration and exploitation opportunities pays off during a fractal crisis 	<ul style="list-style-type: none"> 1) Positive relationship between strategic speed and organizational ambidexterity 2) CEOs' paradox mindset and optimism strengthen the strategic speed – organizational ambidexterity relationship 3) High level of education are required in order for the with strategic speed – ambidexterity relationship to be positive 4) Environmental dynamism weakens the aforementioned relationship
	Incremental	<ul style="list-style-type: none"> 1) Effective strategic management under crisis entails deciding fast, as long as ambidexterity is achieved 2) Top executives need to be trained on how to adopt a positive attitude and how to think paradoxical through training/interventions 3) Growth and optimization opportunities should be identified and pursued under crisis 	<ul style="list-style-type: none"> 1) Incorporating organizational ambidexterity in the strategic decision-making framework 2) Organizational ambidexterity is beneficial under a fractal crisis 3) Strategic speed is not directly related to organizational performance 4) Cognition of decision makers is crucial under crisis
		Practically useful	Scientifically useful
Utility			

Figure 17 – Research Contributions Summary

Among the contributions presented in Figure 17, the contribution related with point 2 in the revelatory and practically useful category, i.e. that deciding fast under crisis is not necessarily related to superior firm performance, is extremely important. Deciding fast is not associated with enhanced firm performance under crisis. Rather, companies need to decide fast in order to achieve organizational ambidexterity, which leads to superior performance. Therefore, solely deciding fast does not lead to enhanced firm performance under crisis and it is not just the process of reaching decisions that makes a difference; the nature of decisions being made and, more specifically, the type of opportunities being pursued under crisis is crucial. Hence, attention needs to be paid to both the process of deciding about opportunities, which should not

be delayed, and the nature of opportunities pursued, which should include both exploitation and exploration opportunities.

Furthermore, the role of cognition and perceptions of decision makers concerning strategic management under crisis is confirmed in this study, in accordance with suggestions of previous work (e.g. Andreou et al., 2017; Weick, 1998). This entails implications about executive training that may substantially facilitate the work of organizational leaders under crisis. There is a need for shifting the focus of training from technical and subject-specific skills to soft skills and mindsets. This study indicates that it is important that CEOs are able to adopt an optimistic view and to employ paradoxical thinking when coping with a crisis. Both these cognitive skills are not stable and genetic, but can be learnt and developed (Luthans & Youssef, 2004; Miron-Spektor et al., 2018). Thus, organizations should plan their training and development activities accordingly, making sure that executives understand that their way of thinking is crucial for the organization and providing them with the skills that will facilitate their work.

Overall, this work has produced important findings both concerning the advancement of theory and related to managerial implications. These findings will hopefully serve as useful guidelines for organizational leaders and will open up new horizons for future research.

8.4. Chapter Summary

This chapter further discussed the findings identified in Chapter 7, along with the major contributions of this study. One key contribution of this dissertation is the identification of a positive relationship between strategic decision speed and organizational ambidexterity under crisis. This relationship has not been examined so far and it suggests that the missing link between deciding fast and achieving superior performance is being ambidextrous;

organizational ambidexterity is a necessary mediating condition for turning fast strategic decisions to superior performance. Findings indicate that rapid decision making is not related to superior performance under crisis, as there is no direct relationship between the two. Therefore, this study sheds light on previous mixed and confusing findings concerning the outcomes of strategic decision speed.

Furthermore, this study examines organizational ambidexterity as part of the strategic decision making in organizations, both in terms of strategy context (what strategic decisions are made about exploration and exploitation opportunities), as well as strategy process (how fast these decisions are reached and what affects the decision-making process). Based on the opportunity logic of strategy (Bingham & Eisenhardt, 2008) that advocates that companies achieve a competitive advantage when they identify and seize opportunities faster than competitors, and drawing on strategic choice theory (Child 1972 & 1997) and upper echelons theory (Hambrick & Mason, 1984; Hambrick, 2008), this dissertation suggests that successful strategic management under crisis entails deciding fast in order to not miss opportunities for both exploration and exploitation. Indeed, a significant positive relationship between strategic decision speed and organizational ambidexterity was identified under the global pandemic fractal crisis, suggesting that organizations need to decide fast in order to be ambidextrous. Therefore, this work supports the idea that the opportunity logic is relevant under dynamic environments (Furr & Eisenhardt, 2021) and expands this relevance to crisis environments, as deciding fast leads to organizational ambidexterity, which in turn leads to enhanced performance.

In addition, CEOs' optimism and paradox mindset were found to positively moderate (strengthen) the aforementioned relationship under crisis. This indicates that adopting a positive

attitude and using paradoxical thinking are key cognitive abilities of organizational decision makers, specifically under crisis conditions. Furthermore, CEOs' educational level was found to have a substituting interaction effect with strategic decision speed on organizational ambidexterity, indicating that higher levels of education are required in order for fast decision making to lead to organizational ambidexterity when the environment is turbulent, hostile, and unpredictable. Furthermore, environmental dynamism negatively moderates the strategic decision speed – organizational ambidexterity relationship; therefore, the higher the perceived dynamism, the weaker the relationship between strategic decision speed and organizational ambidexterity. The four moderating effects examined in this research are in line with a multilevel integrated approach, which bridges the micro, meso and macro level.

Last but not least, ambidextrous companies were found to perform significantly better under the global pandemic crisis compared to their rivals, illustrating that organizational ambidexterity is beneficial for organizations under a fractal crisis. This important finding builds on previous work concerning the beneficial role of ambidexterity under (smaller and/or shorter) crisis, by extending the advantages of being ambidextrous to conditions of a fractal crisis. The COVID-19 pandemic has disrupted the business environment throughout the world very unexpectedly, with major changes occurring very rapidly but affecting the environment for longer periods of time, within which numerous smaller crises were nested. An important contribution of this study is that it proves that there is no direct relationship between reaching strategic decisions quickly and firm performance; instead, strategic decision speed leads to organizational ambidexterity, which in turn leads to superior performance under crisis. Therefore, an answer is provided to why reaching decisions quickly in dynamic environments is beneficial for organizations, establishing a mediator relationship by ambidexterity, another

element of strategy, between strategic decision speed and organizational performance for the first time.

Although the relationship between strategic decision speed and ambidexterity was proven in a dynamic environment, it may well be valid under less turbulent and unpredictable environments where the opportunity logic still applies and where companies achieve a competitive advantage by pursuing opportunities for exploration and exploitation faster and earlier than competitors. In other words, in stable environments as well, reaching strategic decisions slowly leaves room for competitors to seize opportunities and these opportunities are missed by those firms responding slowly. The difference with dynamic environments is that in dynamic environments, there are two possible reasons for slow decision makers' failure to achieve a competitive advantage: firstly because the environment changes, so the opportunity may be irrelevant at a later stage, and secondly because competitors act and the opportunity may be unavailable at a later stage. In less dynamic environments, the first reason of missing to achieve a competitive advantage is less relevant, since the environment is stable and the opportunity will still be relevant later, when the decision is made. But the second reason still stands; allowing competitors to seize opportunities and remaining inactive will eventually lead to losing market share. Hence, ambidexterity will not be achieved, and performance will eventually start declining when strategic decisions are delayed even in stable environments.

In addition, four moderators of the relationship between strategic decision speed and performance have been identified: paradox mindset, optimism, and educational level, related to CEOs' cognitive skills, and environmental dynamism as perceived by the CEOs, related to the environment. CEOs who are paradoxical thinkers and optimistic are more able to achieve ambidexterity for their companies when reaching fast decisions, whereas only CEOs with high

levels of education are able to achieve ambidexterity when deciding quickly. On the other hand, the higher the perceived environmental dynamism, the weaker the relationship between strategic decision speed and ambidexterity. There are also some interesting findings concerning control variables like the fact that CEO ownership has a positive effect on ambidexterity, but a negative effect on performance.

The following Chapter presents the limitations of this study and suggestions for future research stemming from these limitations, but also more generally, in an effort to consider ways to further advance the relevant literature.

9. Conclusion

This Chapter presents this study's limitations in terms of the nature of methods and context. Ways of addressing these limitations are presented as recommendation for future research, along with more general ideas stemming from results.

9.1 Research Limitations

Although this study has been carefully planned and organizational leaders were consulted at the early stages of planning, it still entails limitations that also present opportunities for future work. Among the limitations of this research is the relatively low sample size (144), which is related with various factors. Firstly, the timing of data collection during a global pandemic that has significantly disrupted the business environment. Moreover, the fact that CEOs are part of the organizational elite, which makes very willing to help other elite members (McDonald & Westphal, 2011), but maybe less willing to interact with those that do not belong in the elite, like researchers. In addition, CEOs are very busy and tend to avoid survey research (Bernard & Westphal, 2006). Taking the above into account, the design of the survey for this study included all the features that have been proven beneficial in terms of increasing the probabilities of a CEO filling in a survey (Bernard & Westphal, 2006), in terms of length (limited number of items), endorsement from another elite member through the use of snowballing and incentives (report with findings). Hence, one would expect that the total number of respondents would be higher given that all these features were incorporated in survey design, as well as given the time and effort put into recruiting participants. However, the 144 responses collected, neither an extremely high number of responses but nor an extremely low, have provided important and useful insights concerning the role of CEOs in strategizing under crisis.

A second limitation is that, while initially it was planned to collect two measurements of performance at two different time points, the disruption caused by the pandemic created a low response rate for the study's second wave (29.86%) and consequently the second wave was not used. Thus, the second measurement of organizational performance was not included in the research analysis, and this dependent variable's measurement relied on measurement at a time point when all independent variables were measured as well, which could lead to common method bias (Jordan & Troth, 2020; Podsakoff et al., 2012). Further, there was one collection point concerning the strategic decision speed – organizational ambidexterity relationship. The limitations related to the relatively small sample size and the study being cross-sectional create further limitations concerning how the data was analyzed; a larger sample size (of at least 200 data points) would have allowed a more advanced statistical analysis, using structural equation modelling to test the conceptual model, which could provide more insight into the relationships examined. However, the uniqueness of the environment of Greece offered important insights concerning strategic management under crisis and collecting 144 responses from CEOs during the pandemic is an important achievement, specifically considering that academic research was severely affected and hampered particularly in the first year of the pandemic (Fernandes, 2020; Mobaraka et al., 2022). It is also important that, as already explained, the sample does not suffer from common method bias.

Another limitation of this study is connected to the use of single respondent, self-reported data. Podsakoff et al. (2003) argue that this may create bias in organizational research, specifically when the items measured are related to psychological characteristics, and can lead to common method variance. Although the sample does not suffer from common method variance, social desirability bias was found to be significant in some of the regression models. Still, social desirability bias is not problematic in this study, since its correlation with other variables was

small, below 0.36 in all cases (Antonetti & Maklan, 2016; Polonsky et al., 2014). A move away from self-reported, single-respondent data would require a different research design and would further add to the difficulties of collecting data during a global pandemic. In addition, using self-reported data in management research is still considered an important and valid tool for examining relationships between variables. A solution related to potential common method variance issues in self-reported data research has been suggested by Podsakoff et al. (2003) and has to do with using measures that have already been validated in previous studies. This study has exclusively used such measures. Furthermore, survey data were complemented by qualitative insights from the cognitive interviewing phase and by an examination of publicly available data that were extremely relevant with this study concerning the response of Greek companies to the pandemic. Thus, what the single respondent survey data was indicating has been cross-checked through using other data.

A fourth limitation is related to snowballing, although snowballing is the method that in essence allowed and enabled data collection in this study. Snowballing is considered as an unorthodox approach of sampling (Dodd & Patra, 2002), because it does not allow the researcher(s) to select companies in a systematic way. Nevertheless, the outcome of snowballing in this study was a sample of 144 companies from various industries, which overall constitute a fair representation of the Greek business environment as discussed in section 6.1.1. Still, a systematic selection of companies from specific sectors or with specific characteristics in terms of size, age, etc., could possibly shed light on differences in strategic decision-making processes across companies with these different characteristics. Such conclusions cannot be drawn from this work.

Acknowledging the limitations above, the next section presents future research directions aiming to build on and expand this study's findings.

9.2 Future Research Directions

The newly established, in this study, relationship between organizational ambidexterity and strategic decision speed may produce interesting new theoretical and managerial insights in the future. Hence, this interesting new link between two important strategic management can now be further explored, opening up multiple possible directions for future research.

Building on this work, future research could further explore the relationship between strategic decision speed and organizational ambidexterity, by considering various decision-specific, individual, team, organizational and external to the organization factors as moderators and/or mediators. The fact that this work positions organizational ambidexterity within the strategic decision-making framework creates multiple options for examining different interactions between the framework's dimensions and organizational ambidexterity. Be they decision characteristics, psychological characteristics, demographics, top management team characteristics, firm-specific features, or factors related to partnerships, the local environment, the market or the global environment, this direction is fascinating. The more factors that future research examines, the better the understanding of the interplay between the two central strategic management aspects considered in this study and the process of strategizing in general.

In addition, interesting findings concerning the control variables used in this study could be further explored in the future. For example, CEOs who are also the company owners appear to achieve better results concerning organizational ambidexterity, but do not achieve superior performance. In other words, company owners are not able to benefit from ambidexterity and the link between ambidexterity and performance is somehow broken for them, at least under crisis. This could potentially be further examined by future research that focuses on CEO

ownership or on family companies, investigating possible factors that mediate between ambidexterity and performance for these companies in dynamic and non-dynamic environments. For example, recent work by Borini et al. (2022) suggests that ambidexterity leads to knowledge creation about new products, operations/production, marketing, or environmental management practices. Could it be that owners who are CEOs fail to enable knowledge sharing and this harms firm performance? Such questions can be formed, shedding light on the role of CEO ownership on firm strategy and performance. Similarly, the role of gender can further be examined while strategizing: are women CEOs less ambidextrous because they have limited access to resources as the literature suggests? Exploring other factors that may possibly affect the ambidexterity of women CEOs, like psychological factors, could also provide interesting insights.

Moreover, additional insights could be provided by longitudinal studies on strategic decision speed, ambidexterity and performance with multiple time points. A longitudinal study design could provide significant insights on how different elements of strategy (strategic decision speed and organizational ambidexterity) and organizational outcomes (performance or other outcomes) interact over time. Previous work suggests that past performance is related with how well a decision is implemented (Elbanna et al., 2014). Future research could examine the impact of past performance on strategizing; interesting questions like whether companies that pursued ambidexterity and achieved superior performance in the past choose to pursue ambidexterity in the future, or whether those that reached decisions quickly in the past continue to do so and what the respective outcomes are, could then be examined.

Furthermore, replication studies could be very useful, i.e. studies that examine the same variables in different contexts. It would be interesting to examine whether the relationships

identified are valid under different environmental conditions. For example, crises of different duration and volume would be ideal research contexts in order to be able to compare the effect of different crises; similarly, examining these relationships in more stable environments would provide valuable insights about strategizing in different contexts. In other words, future work could assess the robustness of the relationships included in this study's model in different variations of hostility, turbulence and munificence of the environment.

To sum up, future work can examine multiple factors as antecedents, outcomes, moderators and/or mediators of the variables included in this study, across different levels (individual, team, organizational, inter-organizational, external environment) and in different contexts. Using this study as the starting point, the relationship between strategic decision speed and ambidexterity can be examined under different angles and provide a better understanding of what organizations need to do in order to thrive under different conditions.

The following section presents some closing remarks while reflecting on the process of doing doctoral research.

9.3 Closing Remarks

This doctoral research began in 2018, prior to the pandemic with a part-time mode of study, and was completed in the fall of 2022, having switched to a full-time mode about one and a half years previous to completion. The challenges faced in these four and a half years in total were diverse and often unexpected, but have helped me gain significant knowledge and skills.

First of all, there were numerous decisions that needed to be reached along the way, related to the research design and implementation. I am proud that I can claim ownership for these

decisions, including basic choices like the decision to pursue a PhD, to pursue it at the specific university, or to choose this topic in which I am interested; but also crucial decisions like choosing Greece for a research context, selecting CEOs as the research participants, selecting the variables included in the study, choosing snowballing as the research recruitment process, deciding when data collection should stop, opting for the specific methodology, etc. Having said this, I am very grateful to my supervisors for their advice throughout this journey, part of which was also that I needed to reach my own decisions, because this is my PhD. So, I can proudly say now that this is my PhD! And the process of doing a PhD has turned me into a better decision maker, more able to consider different aspects of an issue and their consequences, as well as my own emotions, values and views.

Secondly, my main motivation for doing a PhD was the idea of creating new knowledge. As an active member of society, I value collective knowledge and have significantly benefited – and keep benefiting – from knowledge created by others. Building on existing knowledge created by members of the academic research community, I have contributed by adding new insights on the process of strategizing. I firmly believe that my dissertation makes an original contribution to knowledge in the area of strategic management, through connecting two aspects of strategy that had not been associated so far and examining the factors that affect their relationship. Hence, I am satisfied that doing a PhD has indeed led to contributing to knowledge and I am happy with this outcome.

Last but not least, I am satisfied that my work is of publishable standard, as proven by my PhD's original contribution to knowledge and the fact that I have received positive feedback after having presented this work, while it was still in progress, at academic conferences and paper development workshops. It is important that the feedback received from senior academics and editors in academic journals was very encouraging, indicating that this is a promising piece of

work that they would consider for publication. Again, I am extremely grateful to my supervisors for their constructive feedback along the way, as well as to the University of Sheffield various activities related to the development of doctoral researchers, as both have helped me develop a thorough understanding of the publication process and the quality required for publishable academic work.

Looking back on this journey, I feel satisfied and excited. I value hard work and persistence, and have become more resilient. Just like strategic choice theory suggests, I believe that my choices were important and I am pleased with their outcomes. I view pursuing a PhD as an amazing learning and development process, while reaching the milestone of completing as an important achievement. I am confident that I will continue to be curious, to ask questions and to learn, building on the knowledge and skills acquired through my PhD.

9.4 Chapter Summary

This Chapter discusses how this study's findings fit into existing work, the study's limitations, and suggests further research directions. The study's findings were discussed in the context of four key debates in the field of strategic management that were presented earlier. Further, the theoretical and managerial implications of the newly established relationship between strategic decision speed and organizational ambidexterity have been discussed. Limitations concerning sample size and methodological issues are presented, while acknowledging the challenges of conducting research with CEOs. Next, suggestions about different research designs that would provide important insights on the relationships between the variables tested in this study are presented, including further examining some interesting findings about control variables. At the end of the Chapter, the researcher presents some closing remarks and a personal reflection on the PhD journey.

The researcher believes that this study opens up a number of avenues for further research and hopes that this work will serve as the starting point for interesting future work. Overall, this project simultaneously examines factors at different levels that affect strategic decision-making, including the individual, firm-level and the environment, recommending an integrated multi-level approach. With different crises increasingly becoming part of the global reality recently, the need to take this integrative approach on strategic management is now higher than ever.

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Appendix

1. Comprehensive Table of Ambidexterity Conceptualization, Implementation and Findings

Authors	Ambidexterity concept/definition	Suggestions/ Findings	Ambidexterity implementation ²	Methodology/ empirical setting
Duncan (1976)	First introduction of organizational explorative and exploitative activities.	Organizations use dual structures when facing contradictions, by using cyclicity regarding exploration and exploitation	Sequential ambidexterity	Case studies
Tushman & O'Reilly (1996)	In order for organizations to be able to achieve long-term success, they have to be ambidextrous.	Different, separate business units focus on alignment and others on adaptation.	Structural ambidexterity	Case studies research in the semi-conductor sector
Adler et al. (1999)	Pursuing efficiency and flexibility entails trade-offs that can be more easily overcome by ambidextrous organizations.	Efficiency & flexibility were enabled by applying 4 organizational mechanisms (meta-routines, job enrichment, role switching, partitioning the company's structure). Leadership, learning and trust were crucial during the transition.	Contextual ambidexterity/ paradox approach (moving from <i>either/or</i> to <i>both/and</i> approach)	Case study of the TOYOTA Production System/ Qualitative research (interviews)
Gibson & Birkinshaw (2004)	Business units are able to simultaneously align and adapt, through contextual ambidexterity.	There is no trade-off between adaptability & alignment. In successful business units, such capabilities were	Contextual ambidexterity/ paradox approach.	Combination of qualitative and quantitative data; survey with 4,195 respondents from 41 business units

² *Ambidexterity implementation* is either mentioned in the paper as ambidexterity approach or judged by the researcher, based on the organizational ambidexterity literature so far. For example, paradox theory is posterior to the work by Adler et al. (1999), but their approach is related to the paradox approach, even if they did not know it/mention it at the time.

		concurrently developed using simpler organizational structures and less formality.		
He & Wong (2004)	The concurrent pursuit of exploratory & exploitative strategies (new product development/new markets entry) and innovative strategies (improving current status through technological innovation)	An imbalance between exploratory strategies and exploitative ones concerning innovation, has a negative effect on sales growth rate. Organizations with low levels of exploration or exploitation should not be viewed as ambidextrous.	Continuous balance of exploration/ exploitation through time.	CEOs survey on 206 manufacturing firms
Smith & Tushman (2005)	Ambidextrous organizations have differentiated, separate business units assigned with exploration and exploitation	Top management teams develop cognitive capabilities that help them balance contradicting demands: short-term efficiency (exploiting) versus long-term innovation (exploring)	Structural ambidexterity for the organization with separated units, but contextual approach for top management executives (both/and approach).	Theoretical model based on literature review
Lubatkin et al. (2006)	The aptitude of organizations to simultaneously exploit present competencies and explore novel competencies. This combination leads to organizational learning.	TMT behavioral integration is critical to attaining ambidexterity in SMEs. The simultaneous focus on both exploration and exploitation positively affects performance.	Contextual ambidexterity/ paradox approach; inseparable nature of exploration and exploitation as facets of organizational learning.	Survey in 139 SMEs, both CEOs and team members

		Ambidexterity is possible at the business unit level.		
Lavie & Rosenkopf (2006)	The concept of ambidexterity is expanded to strategic alliances formation. Firms tend to balance their exploratory and exploitative activities over time and across domains, when forming strategic alliances.	Organizations intensively involved in R&D alliances that generate knowledge, shift to marketing/production partnerships that leverage knowledge. A focus on exploration in a specific domain is balanced by a shift in focus on exploitation on another.	Structural ambidexterity in partnerships, but paradox approach is used over time (sequential implementation) and across domains.	Pooled time series analysis of alliances formed by U.S. software firms
Lin et al. (2007)	A firm's alliance behaviour is viewed as a form of exploration and exploitation. Exploitative alliances aim to enhance existing capabilities, whereas exploratory alliances aim to discover new opportunities and to develop new capabilities.	Firm size matters: Larger firms benefit from ambidextrous strategic alliances, whereas smaller ones benefit more when an alliance is either exploratory or exploitative.	There is no single implementation of ambidexterity; the approach needs to take into account the various external environments and organizational characteristics.	Analysis of empirical data from 5 U.S. industries spanning 8 years, and expansion of theoretical insights to the network level by building a computer simulation model.
Mom et al. (2007)	The ability to both explore, so as to be prepared for the future, as well as exploit and meet current demands.	Top-down knowledge positively relates to exploitation activities; bottom-up and horizontal knowledge positively relate to exploration activities.	Individual ambidexterity. Contextual implementation concerning units (both exploit and explore), but structural concerning individuals (production managers focus on exploitation, product market	Survey of managers in an international electronics firm (104 responses)

			managers on exploration).	
O'Reilly & Tushman (2008)	A capability and it refers to the managers' ability to adapt to changing demands.	The role of the leadership team is critical; cognitive and behavioral flexibility are needed. No trade-off between efficiency and innovation. Senior teams must be flexible in order to enhance exploration and exploitation.	Structural ambidexterity for units; paradox approach at the organizational and individual level.	Theoretical paper based on literature review
Wang & Li (2008)	There is an optimal degree of exploration and exploitation. Exploring and exploiting beyond the optimal level should not be considered as ambidexterity.	Overexploration and overexploitation are harmful for organizational performance. However, overexploration's harmful effect on performance is lower when there is increased environmental dynamism.	Contextual ambidexterity/ paradox approach	Data drawn from S&P's Compustat, U.S. patent data, and the U.S. Census of Manufacturers to construct a model (using patent citations data to construct the proxies for firm search behavior and to derive measures of search deviation)
Judge & Blocker (2008)	Ambidexterity has to do with exploring new markets and exploiting existing ones.	Organizational capacity for change is an antecedent to strategic ambidexterity, moderated by environmental uncertainty and	Paradox approach: authors propose to not view ambidexterity as a dilemma (<i>either/or</i> approach), and introduce strategic ambidexterity (<i>both/and</i> approach).	Theoretical paper based on literature review

		organizational slack (ability to adapt to dramatic external environment shifts).		
Andriopoulos & Lewis (2009)	Ambidextrous firms exploit existing products and this leads to incremental innovation; and explore new opportunities and this leads to radical innovation.	Managing paradoxes and making ambidextrous decisions is a responsibility that is shared across units and levels in an organization, and is not the responsibility solely of top management.	Paradox approach: innovation paradoxes: strategic intent (profit-breakthroughs), customer orientation (tight-loose coupling), and personal drivers (discipline-passion).	Data collection over 4 years: (1) semi-structured interviews, (2) archival data, (3) observation.
Cao et al. (2009)	Ambidexterity has two dimensions: the balance dimension (BD), which has to do with maintaining a balance between exploration and exploitation, and the combined dimension of ambidexterity (CD), which has to do with the combined magnitude of exploration and exploitation.	When resources are limited (small firms or scarce-operating environments), firms are better off when they manage trade-offs between exploration and exploitation; when resources are available, it is best to pursue both exploration and exploitation.	Approach depends on resources availability.	Survey on 122 firms (CEOs and CTOs) in three high-tech parks in China
Rothaermel & Alexandre (2009)	Ambidexterity is the ability of organizations to concurrently balance diverse undertakings in the context of a trade-off	Increased levels of absorptive capacity (the ability to incorporate new information in commercial action) enable companies to fully enjoy the positive results of ambidexterity in sourcing technology	Paradox approach: a firm's ability to combine trade-offs enhances performance.	Combination of survey (143 top management executives) and publicly available data

Carmeli & Halevi (2009)	Ambidextrous firms are able to exploit existing competencies and explore new opportunities, simultaneously.	TMTs apply behavioral integration to put organizational ambidexterity into action.	Contextual ambidexterity/ paradox approach	Theoretical paper based on literature review
Jansen et al. (2009b)	Organizational ambidexterity has to do with routines and processes; such routines and processes integrate contradictory efforts of separated exploratory and exploitative units.	Structural differentiation is important for achieving ambidexterity, but it is not enough. Integration mechanisms like senior team social integration and cross-functional interfaces are critical, whereas senior team contingency rewards do not contribute to the achievement of ambidexterity.	A combination of structural approach with paradox theory concerning the integration of contradictory efforts at the organizational level.	Survey on multiple respondents from a large European financial services firm (89 executive directors and 305 senior team members)
Markides & Oyon (2010)	An ambidextrous organization is an organization that can compete with dual business models in the same industry	There are no right and wrong answers concerning separate or integrated business models; answers are company-specific and the decision may concern the separation of activities, not business units.	Company-specific approach to ambidexterity, either structural or paradox approach, but creating the appropriate context in terms of culture, incentives, structures and people is the key.	Case studies based on publicly available data
Turner et al. (2013)	Using and refining existing knowledge, as well as creating new knowledge.	Ambidexterity involves all levels (organization, group, and individual). It is enabled by	Paradox approach	Theoretical paper (systematic literature review)

		intellectual capital resources (organizational, social, and human capital).		
Patel et al. (2013)	The ability to efficiently exploit present market opportunities & innovate for future market challenges.	It is specific HR practices that put into action a high performance work system, which in turn enhances resource flexibility that leads to ambidexterity.	<i>Both/and</i> approach. Link between HR practices and ambidexterity.	Survey on SMEs CEOs (215 respondents)
Junni et al. (2013)	The capability of a firm to pursue both explorative and exploitative innovation (definition by O'Reilly & Tushman, 2004).	Exploration and exploitation were separately tested and the overall effects of both on performance were positive and significant. Organizational ambidexterity has a positive effect on performance under conditions of uncertainty. The effect of ambidexterity on performance is stronger for technology and service firms than for manufacturing firms.	<i>Both/and</i> approach: high levels of exploitation and exploration are highly desirable, but they can be costly and difficult to achieve, requiring specific organizational structures and mindsets.	Meta-analysis
Kammerlander et al. (2014)	An organization concurrent pursuit of exploration and exploitation.	In SMEs, CEOs with high promotion focus engage in more exploration and exploitation activities than those with high	Leadership-based contextual ambidexterity is better for SMEs (paradox approach).	153 survey responses of CEOs of Swiss SMEs

		prevention focus (research based on regulatory focus theory (Higgins, 1997)). The CEO's promotion focus has a stronger effect when the environment is more competitive.		
Hill & Birkinshaw (2014)	The ability to leverage existing resources and create new combinations in order to face future demands.	Organizational ambidexterity is positively related to the growth of a corporate venture (CV) business unit. CV units last longer when they create new capabilities, while at the same time they take advantage of existing strengths.	Paradox, <i>both/and</i> approach to the corporate venture business units level.	Phase 1: 50 persons interviewed in 40 CV units across 8 countries Phase 2: survey of 95 managers of CV units Phase 3: Follow-up phone calls
Mudambi & Swift (2014)	Ambidextrous firms practice both R&D-based exploration and exploitation.	Important changes in R&D spending in a short time-period, whether increases or decreases, indicate leaps between exploration and exploitation, and they have a positive effect on firm performance, given they are timed correctly. And the correct timing is signaled by whether the company's short-terms earnings are	Sequential ambidexterity (shifting between exploration and exploitation).	Data on a sample of publicly traded U.S. manufacturing firms, publicly available (Compustat) Annual North America databases (S&P, 2009).

		lower than the industry.		
Ou et al. (2015)	Ambidextrous strategic orientation has to do with concurrent orientation strategic activities towards exploration and exploitation.	CEOs' humility indirectly enhances the engagement of ambidextrous strategies and contributes to firm performance, through TMT integration and pay equality	Paradox approach (recognize and accept paradoxical tensions).	Survey & archival data collected at multiple time points from 105 small-to-medium-sized firms in the computer software and hardware industry in the USA.
Papachroni et al. (2015)	Exploration and exploitation are not necessarily contrasting activities, but they are connected and complementary.	Using the paradox lens to view ambidexterity shifts research towards a combination of the paradoxical poles, and of how they interact over time.	Paradox approach-proposal for a shift in research on organizational ambidexterity.	Theoretical paper based on a literature review
Ogrean (2016)	Ambidexterity refers to how an organization does the job today while keeping in mind of the job it will do tomorrow.	Ambidexterity is the key to managing strategic organizational paradoxes, which are increasing in complexity due to the more diverse and more dynamic internal and external firms' environments.	Paradox approach.	Theoretical paper (literature review)
Swift (2016)	Ambidexterity has to do with R&D-based exploration and exploitation.	Big and fast R&D changes in expenditure (i.e. shifting from exploration to exploitation and vice-versa) are linked with higher probabilities	Sequential ambidexterity.	Analysis on data publicly available at the Compustat Annual North America database (Standard S&P, 2012)

		of firm mortality. Firms that have achieved superior learning and don't reduce R&D spending are more likely to survive during these swifts.		
Ajayi et al. (2017)	The dual focus on exploration and exploitation activities.	In SMEs, an organizational context with less centralization, more shared knowledge and responsibility, and focused on rapid reconfiguration to suit new circumstances, enhances employees' engagement, which leads to ambidexterity; and this increases the chances of firm survival.	Paradox approach- individual level as the unit of analysis.	Survey in 72 companies (398 shop-floor employees) in the Nigerian SMEs manufacturing and services industry
García-Granero et al. (2018)	Ambidexterity is the capability of a firm to concurrently pursue exploration and exploitation (Gibson & Birkinshaw, 2004).	Shared responsibility does not always lead to ambidexterity, unless TMT diversity is mainly based on age. When team members have diverse functional backgrounds, it is better that final decisions are made by the CEO. Thus, a top-down decision making initiative is more effective when	Paradox approach paradoxical tensions of ambidexterity.	Survey on CEOs of Spanish firms from the primary and secondary sectors and high-tech firms from the tertiary sector (617 questionnaires)

		TMTs are functionally diverse.		
Venugopal et al. (2018)	Ambidexterity is the capability of a firm to concurrently pursue exploration and exploitation (Gibson & Birkinshaw, 2004).	In SMEs, TMT behavioral integration facilitates org. ambidexterity; but once the exploration and exploitation decisions have been made, top management does not need to be involved in order to achieve organizational ambidexterity.	Paradox approach: recognizing the importance of managing paradoxical innovation strategies to sustain long-term performance.	78 hi-tech SMEs (IT, biotech & electronics). Multiple responses from each firm (473 usable surveys - 240 TMT members and 233 managerial executives).
Hughes (2018)	Ambidexterity is the capability of a firm to concurrently pursue exploration and exploitation (Gibson & Birkinshaw, 2004).	Linking marketing and org. ambidexterity. (E.g. How could marketing be organized in order to facilitate organizational ambidexterity?)	Paradox approach.	Theoretical paper (literature review)
Venugopal et al. (2020)	Combining and/or balancing innovations that are simultaneously explorative and exploitative	Behavioral integration processes mostly enhance a firm's combined ambidexterity, although they also enhance balanced ambidexterity.	Paradox approach.	Survey on 233 managers and 240 TMT members of Indian IT, Biotechnology, and Electronics SMEs
Katou et al. (2021)	Simultaneous pursuit of exploration and exploitation	The social intelligence of leaders has stronger positive impact on creativity through exploration activities, than productivity through exploitation activities.	Paradox approach.	Survey on 657 Greek employees of 99 private firms

2. Emails Sent for Participation to the Survey's First Wave

2.1 Initial email communication about first wave

Dear Dr./Mr./Mrs. _____,

Following our communication earlier today, I am sending you some more information on the research project titled “Leaders’ mindsets and strategic management during the COVID-19 pandemic”.

The research aims to understand how business leaders in Greece perceive the business environment during the pandemic, as well as how their way of thinking influences strategy. It is aimed at top executives who are responsible for making strategic decisions. The research is conducted online and completing the research questionnaire takes about 10 minutes. All answers are anonymous and confidential. After the completion of the research, we will send you the research results as a token of our appreciation for your contribution.

If you agree to participate, please click on the link below in order to access the online questionnaire:

[Qualtrics link for survey's first wave]

Please note that you may find more information on this research project at the attached file (Research_Info.doc).

In case you think that someone in a similar top executive position (as you would) be interested in answering the research survey, I would be grateful if you could forward them the research information or if you could forward me their contact information, so that I can inform them on this research project. The only restriction is that the company this person leads is a private (not a public sector) company.

I am at your disposal for any further clarifications.

Thank you in advance for your time.

Yours sincerely,

Maria Skordia

Doctoral Researcher, University of Sheffield, UK

2.1 Follow-up email communication about first wave

Dear Dr./Mr./Mrs. _____,

This is a kind reminder following our communication about two weeks ago concerning your potential participation to the research project titled “Leaders’ mindsets and strategic management during the COVID-19 pandemic”.

The research aims to understand how business leaders in Greece perceive the business environment during the pandemic, as well as how their way of thinking influences strategy. It is aimed at top executives who are responsible for making strategic decisions. The research is

conducted online and completing the research questionnaire takes about 10 minutes. All answers are anonymous and confidential. After the completion of the research, we will send you the research results as a token of our appreciation for your contribution.

If you agree to participate, please click on the link below in order to access the online questionnaire:

[Qualtrics link for survey's first wave]

Please note that you may find more information on this research project at the attached file (Research_Info.doc).

In case you think that someone in a similar top executive position (as you would) be interested in answering the research survey, I would be grateful if you could forward them the research information or if you could forward me their contact information, so that I can inform them on this research project. The only restriction is that the company this person leads is a private (not a public sector) company.

I am at your disposal for any further clarifications.

Thank you in advance for your time.

Yours sincerely,

Maria Skordia

Doctoral Researcher, University of Sheffield, UK

3. Emails Sent for Participation to the Survey's Second Wave

3.1 Initial email communication about second wave

Dear Dr./Mr./Mrs. _____,

We hope this message finds you well.

You are receiving this email because, a few months ago, you filled in a survey questionnaire for the research project titled “Leaders’ mindsets and strategic management during the COVID-19 pandemic”.

In order for the research to be completed and for the results to be sent to you as a token for our appreciation of your contribution, we are running a second wave of data collection and are kindly asking you to answer only one additional question regarding the performance of your company at the moment, compared to your competitors. The question you need to answer is the following:

Please consider how your company has performed compared to your main competitors in the last six months, choosing between 1 = Much worse than competitors, 2 = Worse than competitors, 3 = Somehow worse than competitors, 4 = The same as competitors, 5 = Somehow better than competitors, 6 = Better than competitors, and 7 = Much better than competitors.

1. Sales volume _____

2. Sales volume growth _____

3. Market share _____

4. Market share growth _____

5. Net profit _____

6. Profit margin _____

7. Return on equity _____

In order to answer to this question, please click on the following link and fill in the corresponding number (1 to 7) next to each performance indicator:

[Second wave link]

The survey results will be sent to you within the next few months. Thank you very much for your valuable contribution to this research.

Yours sincerely,

Maria Skordia

Doctoral Researcher, University of Sheffield, UK

3.2 Follow-up email communication about first wave

Dear Dr./Mr./Mrs. _____,

We hope this message finds you well.

This is a kind reminder following our communication about two weeks ago concerning your participation to the second wave of data collection for the research project titled “Leaders’ mindsets and strategic management during the COVID-19 pandemic”.

You are receiving this email because, a few months ago, you filled in a survey questionnaire for the research project titled “Leaders’ mindsets and strategic management during the COVID-19 pandemic”.

In order for the research to be completed and for the results to be sent to you as a token for our appreciation of your contribution, we are running a second wave of data collection and are kindly asking you to answer only one question regarding the performance of your company at the moment compared to your competitors. The question you need to answer is the following:

Please consider how your company has performed compared to your main competitors in the last six months, choosing between 1 = Much worse than competitors, 2 = Worse than competitors, 3 = Somehow worse than competitors, 4 = The same as competitors, 5 = Somehow better than competitors, 6 = Better than competitors, and 7 = Much better than competitors.

1. Sales volume _____
2. Sales volume growth _____
3. Market share _____
4. Market share growth _____
5. Net profit _____
6. Profit margin _____
7. Return on equity _____

In order to answer to this question, please click on the following link and fill in the corresponding number (1 to 7) next to each performance indicator:

[Second wave link]

The survey results will be sent to you within the next few months. Thank you very much for your valuable contribution to this research.

Yours sincerely,

Maria Skordia

Doctoral Researcher, University of Sheffield, UK

[4. Participant Information Sheet](#)

As already mentioned, participants were sent the Information Sheet as an attachment to the email that invited them to participate in the research, and the content of the Participant Information Sheet was also the landing page of the link leading to the survey. The Sheet's content was the following:

Thank you for reading this text. You are invited to take part in a study, which will be part of a wider research project. Before deciding whether you want to participate, it is important that you understand why the research is being done and what it will involve. Please take time to read the following information carefully and discuss it with others if you wish. Ask us if there is anything that is not clear or if you would like more information. Take time to decide whether or not you wish to take part.

1. What is the project's purpose?

This project seeks to understand the individual behaviors and perceptions of organizational leaders that influence strategic decisions.

2. Why have I been chosen?

You have been chosen to take part in this study because you are an organizational leader of a manufacturing company in Greece. Your experience and expertise are highly appreciated.

3. Do I have to take part?

It is up to you to decide whether or not to take part. If you do decide to take part you will need to give your consent at the bottom of this page. However, you can withdraw at any time and you do not have to give a reason.

4. What will happen to me if I take part? What do I have to do?

If you decide to take part, you will be asked to fill in an online questionnaire. This will require approximately 15 minutes of your time.

5. Will I be recorded, and how will the recorded media be used?

Your answers to the questionnaire will be recorded to the survey data files. Survey data will be analyzed by the Doctoral researcher, who will retain anonymity and confidentiality for all participants. All aspects of the Data Protection Act (1998) will be followed. No-one outside the project will be allowed access to the data.

6. What are the possible disadvantages and risks of taking part?

There are no disadvantages or risks for you of participating in this research project.

7. What are the possible benefits of taking part?

In case you are interested in research findings, they will be shared with you once the project is completed. Also, with your participation, you will also be contributing to the creation of new knowledge.

8. Will my taking part in this project be kept confidential?

All the information that we collect about you during the course of the research will be kept strictly confidential and will only be accessible to the researcher. You will not be identifiable in any reports or publications.

9. What is the legal basis for processing my personal data?

According to data protection legislation, we are required to inform you that the legal basis we are applying in order to process your personal data is that ‘processing is necessary for the performance of a task carried out in the public interest’ (Article 6(1)(e)). Further information can be found in the University’s Privacy Notice <https://www.sheffield.ac.uk/govern/data-protection/privacy/general>.

10. What will happen to the data collected, and the results of the research project?

The data will only be used by the researcher. Any personal data will be anonymised (removed). Results of the research will be publicly shared in research publications, academic conferences, etc. Data collected will be securely stored for 10 years after the survey completion, and will afterwards be destroyed.

11. Who is the Data Controller?

The University of Sheffield will act as the Data Controller for this study, and is responsible for looking after your information and using it properly.

5. Participant Consent Form

The next page, after clicking the Next button at the bottom of the Participant Information Sheet page, was the Participant Consent Form, which included the following text:

Before answering questions in this survey, we would like to ensure you have fully understood the research purpose and agree to participate in this research.

I (the participant) have read the project information provided or the project has been fully explained to me. I agree to participate in this activity, realizing that I may withdraw at any time without reason and there will be no adverse consequences if I choose to withdraw.

I have been given the opportunity to ask questions about the project.

I understand that taking part in the project will include filling in an online questionnaire.

I understand that all answers in the survey are treated as strictly confidential and will not be released by the investigator in any form that may identify me.

I have been advised as to what data is being collected, the purpose for collecting the data, and what will be done with the data upon completion of the research.

I understand my personal details (name, phone number, email address, etc.) will not be revealed to people outside the project and will be deleted after the project is completed.

I understand and agree that other authorized researchers will have access to this data only if they agree to preserve the confidentiality of the information as requested in this form.

I give permission for the anonymized and confidential data set that is created from my survey answers to be stored at the researcher's personal computer, so it can be used for future research and learning.

I agree that research data gathered for the study may be published provided any identifying information is not used.

For further information about this project, the lead researcher Maria Skordia (mskordia1@sheffield.ac.uk) should be contacted.

You are under no obligation to participate. Completion and return of the questionnaire by you implies consent.

Please select one:

Yes, I agree to participate

No, I do not want to participate

After clicking Yes, participants read the following message: We would like to thank you for taking part in this research project, which aims to examine how companies are coping with the current challenges of the business environment in Greece.

We are interested in strategic decisions and actions, as well as your personal perspective that may affect strategic decisions. Your experience and input are highly appreciated.

We appreciate you giving your time to answer this very important survey. We are interested in your opinion and your responses are confidential.

The questionnaire will take you about 15 minutes to complete. Please feel free to contact us (mskordia1@sheffield.ac.uk) for any clarifications.

6. Measures of Ambidexterity Considered

Organizational ambidexterity (Gibson & Birkinshaw, 2004)

Alignment: Please indicate the degree to which you agree with the following (0 = no agreement to 1 = complete agreement):

1. The management systems in this organization work coherently to support the overall objectives of this organization.
2. The management systems in this organization cause us to waste resources on unproductive activities. (R)
3. People in this organization often end up working at cross-purposes because our management systems give them conflicting objectives. (R)

Adaptability: Please indicate the degree to which you agree with the following (0 = no agreement to 1 = complete agreement):

1. The management systems in this organization encourage people to challenge outmoded traditions/practices/sacred cows.
2. The management systems in this organization are flexible enough to allow us to respond quickly to changes in our markets.
3. The management systems in this organization evolve rapidly in response to shifts in our business priorities.

Explorative and exploitative innovation strategy (He & Wong, 2004)

Objectives for undertaking innovation projects in the last 3 years (1 = not important to 5 = very important)

Explorative innovation strategy

Introduce new generation of products

Extend product range

Open up new markets

Enter new technology fields

Exploitative innovation strategy

Improve existing product quality

Improve production flexibility

Reduce production cost

Improve yield or reduce material consumption

Organizational ambidexterity (Auh & Menguc, 2005)

We asked respondents to indicate the extent to which their firms use the given learning methods on a five-point Likert scale (1 - much less than competitors; 5 - much more than competitors).

Exploitation

1. Modernization and automation of production processes
2. Efforts to achieve economies of scale
3. Capacity utilization

Exploration

1. Research and development expenditures for product development
2. Research and development expenditures for process innovation
3. Rate of product innovations
4. Innovations in marketing techniques

Organizational ambidexterity (Lubatkin et al., 2006)

In the following questions, please select the one that is closer to your company's strategy during the past 3 years, ranging from 1= strongly disagree to 5 = strongly agree.

Exploratory orientation:

During the past 3 years, the firm:

- (a) looks for novel technological ideas by thinking “outside the box,”
- (b) bases its success on its ability to explore new technologies,
- (c) creates products or services that are innovative to the firm,
- (d) looks for creative ways to satisfy its customers’ needs,
- (e) aggressively ventures into new market segments, and
- (f) actively targets new customer groups.

Exploitative orientation:

During the past 3 years, the firm:

- (a) commits to improve quality and lower cost,
- (b) continuously improves the reliability of its products and services,
- (c) increases the levels of automation in its operations,
- (d) constantly surveys existing customers’ satisfaction,
- (e) fine-tunes what it offers to keep its current customers satisfied, and
- (f) penetrates more deeply into its existing customer base.

Organizational ambidexterity (Mom et al., 2007)

Managers’ exploration activities

To what extent did you, last year, engage in work related activities that can be characterized as follows (1 = to a very small extent to 7 = to a very large extent):

1. Searching for new possibilities with respect to products/services, processes or markets
2. Evaluating diverse options with respect to products/services, processes or markets
3. Focusing on strong renewal of products/services or processes
4. Activities requiring quite some adaptability of you

5. Activities requiring you to learn new skills or knowledge

Managers' exploitation activities

To what extent did you, last year, engage in work related activities that can be characterized as follows (1 = to a very small extent to 7 = to a very large extent):

1. Activities of which a lot of experience has been accumulated by yourself
2. Activities which serve existing (internal) customers with existing services/products
3. Activities of which it is clear to you how to conduct them
4. Activities primarily focused on achieving short-term goals
5. Activities which you can properly conduct by using your present knowledge
6. Activities which clearly fit into existing company policy

Dimensions of organizational ambidexterity (Jansen et al., 2009)

1 = strongly disagree and 7 = strongly agree

Exploratory innovation

Our organization accepts demands that go beyond existing products and services

We invent new products and services

We experiment with new products and services in our local market

We commercialize products and services that are completely new to our organization

We frequently utilize new opportunities in new markets

Our organization regularly uses new distribution channels

We regularly search for and approach new clients in new markets

Exploitative innovation

We frequently refine the provision of existing products and services

We regularly implement small adaptations to existing products and services

We introduce improved, but existing products and services for our local market

We improve our provision's efficiency of products and services

We increase economies of scales in existing markets

Our organization expands services for existing clients

Lowering costs of internal processes is an important objective

Organizational ambidexterity (Cao et al., 2010)

Please indicate, on a 1–7 scale, the importance of the following objectives regarding product development to your company over the last three years (or since founding if your firm is less than three years old):

(1 = not at all important, 4 = moderately important, 7 = highly important)

- Introduce new generation of products
- Extend product range
- Open up new markets
- Enter new technology fields
- Improve existing product quality
- Improve production flexibility
- Reduce production cost
- Enhance existing markets

Org. Ambidexterity, leadership characteristics, structure (Chang & Hughes, 2012)

A: Leadership – (1) adaptability and (2) risk-taking tolerance

A01 We repeatedly tell employees that this firm's survival depends on its adapting to market trends

A02 We often tell employees to be sensitive to the activities of our competitors

A03 We keep telling people around here that they must gear up now to meet customers' future needs

A05 We like to take financial risks

A06 We encourage the development of innovative marketing strategies, knowing well that some will fail.

E: Innovation Ambidexterity - (1) Exploitative Innovation and (2) Explorative Innovation

E01 We improve our provision's efficiency of products and services.

E02 We increase economies of scales in existing markets

E03 Our company expands services for existing clients.

E04 Lowering costs of internal processes is an important objective.

E05 New-to-market products or services

E06 Transformation of new-to-market ideas into product lines

E07 New-to-product innovations first started in our firm

E08 Introduction of new generations of products

E09 New-to-market product innovations in Research and Development.

E10 Addition of new elements in current product range

E11 Opening up new markets for current products or services

E12 Improvement of our distribution channels in our current market

Organizational ambidexterity (Patel et al., 2013)

Exploration (1 = "strongly disagree", 5 = "strongly agree")

Looks for novel technological idea by thinking "outside the box"

Bases its success on its ability to explore new technologies

Creates products or services that are innovative to the firm

Looks for creative ways to satisfy its customers' needs

Aggressively ventures into new market segments

Actively targets new customers groups

Exploitation (1, “strongly disagree,” to 5, “strongly agree”)

Commits to improve quality and lower cost

Continuously improves the reliability of its products and services

Increases the levels of automation in its operations

Constantly surveys existing customers’ satisfaction

Fine-tunes what it offers to keep its current customers satisfied

Penetrates more deeply into its existing customer base

7. Measures of Strategic Decision Speed Considered: Scales in Quantitative or Mixed

Methods Studies

Strategic decision-making speed (Baum & Wally, 2003)

Three strategic decision scenarios ([R] indicates reverse scoring)

Strategic decisions are important decisions that involve commitment of significant resources and that impact long-term profitability and growth. Please read the three strategic decision scenarios and answer the questions that follow:

#1. Acquisition decision

Assume that your company is one of four important competitors in your market. You believe that the Mills company has 10% of the market, you have 30% and the third and fourth companies also have 30% each. The Mills company has grown rapidly because their product has a feature that is technologically superior. The Mills company typically charges 10% more than your company charges for similar products. Of the remaining competitors, your quality is best and your price is highest. Your sales have been stagnant. Apparently, the Mills product advantage is not protected legally, but your efforts to duplicate the product have been unsuccessful.

You have just learned that the CEO of the Mills company has been authorized to talk to you to propose that your company acquire the Mills company for an amount that is 40% of your company's net worth.

Assume: (1) that your company does not have a policy that prevents growth through acquisition, (2) that you have not collected detailed information about the Mills company, and (3) that the CEO of the Mills company is a cooperative negotiator who has a normal level of self-interest.

Circle the approximate # of days it would take your organization to decide whether or not to invest significant time in pursuit of a merger with the Mills Company:

2 5 10 20 30 60 90 120 150 180 more [R]

#2. New product introduction decision

Assume that your company has just discovered a new way to enhance the value of one of your products. Unfortunately, there is little available information about the likelihood of its acceptance in the market place. None of your competitors has a similar product. There is a rumor that the Jones company has uncovered a similar enhancement, but they may not be big enough to bring it to market quickly. If you proceed with a full commitment to develop and introduce this new product, you will probably invest an amount equal to 20% of your annual sales. Assume that you have sufficient research, prototype, and production resources to proceed with the new product introduction.

Circle the approximate # of days it would take you/your organization to decide whether or not to proceed with a commitment to develop and introduce this new product:

2 5 10 20 30 60 90 120 150 180 more [R]

#3. Technology adoption decision

Enterprise resource planning software (ERP) is designed to enhance the efficiency, effectiveness, and coordination of production, purchasing, shipping, inventory control, and cost accounting. Assume that a new version of ERP has just been released and you think it may help you manage your business; however, you know that it will affect every department and every employee. Business-as-usual will be interrupted. In fact, you have a peer who said that he would never go through it again because implementation required the interaction and retraining of almost every employee. You have discovered that the investment amounts to 1/3 of your expected profits for 2002, not counting the internal expenses of the interruption. The ERP vendor said they had talked to one of your competitors.

Circle the approximate # of days it would take you/your organization to decide whether or not to proceed with a full commitment to new ERP software:

2 5 10 20 30 60 90 120 150 180 more [R]

Strategic decision speed (Souitaris & Maestro, 2010)

We prefer and tend to take our time when making strategic decisions.

We generally believe in making quick strategic decisions.

Please tick the extent (1 being 'not at all' to 5 being 'to a great extent') on which your company places on: speed when planning or thinking about strategies.

Decision Speed (Chen & Chang, 2012)

In making decisions, our firm's speed is very fast.

Our firm is able to integrate ideas and make decisions speedily.

In the implementation of decision-making, our speed is very fast.

Our firm launches new products faster than competitors.

Our firm incorporates new technologies into products faster than competitors

TMT Decision Speed (Clark & Maggitti, 2012)

1. This TMT routinely makes important decisions in under three months.

2. Relative to rivals, it take this TMT too long to make important decisions (reverse coded).

3. Given our competitive environment, this TMT moves quickly to make key strategic decisions.

Strategic decision speed (Mwangi, 2012)

We generally believe in making quick strategic decisions

Our firm is able to integrate ideas and make decisions speedily

Our firm launches new products faster than competitors

We prefer and tend to take our time when making strategic decisions

In the implementation of decision-making, our speed is very fast

The firm incorporates new technologies into products faster than competitors

8. Organizational Performance Scales Considered

Performance (Spanos & Lioukas, 2001)

For the following questions, please select how your firm is performing compared with your main competitors in the past six months, from 1 = Much worse than competitors to 7 = Much better than competitors.

(1 = Much worse than competitors, 7 = Much better than competitors)

1. Sales volume

2. Growth in sales volume
3. Market share
4. Growth in market share
5. Net profits
6. Profit margin
7. Return on own capital

Business unit performance (Gibson & Birkinshaw, 2004)

Please reflect on performance over the last five years and indicate the degree to which you agreed with the following: (1 = Strongly disagree, 7 = Strongly agree)

1. This business unit is achieving its full potential
2. People at my level are satisfied with the level of business unit performance
3. This business unit does a good job of satisfying our customers
4. This business unit gives me the opportunity and encouragement to do the best work I am capable of

Organizational performance (Chang & Hughes, 2012)

1. Our company is achieving its full potential
2. People at all levels are satisfied with the level of business performance
3. Our company does a good job of satisfying our customers
4. This company gives me the opportunity and encouragement to do the best work I am capable of

Financial performance (Kafetzopoulos, 2021)

Please indicate your level of agreement with the following statements, based on how well you reflected the actual situation at your work site. (1 = strongly disagree, 7 = strongly agree).

Profitability is increased

Gross margin has improved

Profit levels have improved

Productivity has improved

Return on investment has improved

9. Measures of Paradoxical Thinking Considered

Ingram et al. (2016) Paradoxical Thinking Construct

(1 = Strongly disagree/Does not make sense, 5 = Strongly agree/Makes perfect sense)

1. It is possible to maintain and develop our core competencies, while simultaneously creating new innovations.
2. It is possible to embrace the traditions that made this firm successful, while simultaneously changing to meet the demands of our current market.
3. It is possible to emphasize efficiency and standardization of work processes, while simultaneously looking for new ways to do things and finding new opportunities.

Paradoxical Leader Behavior in People Management Scale (Zhang et al., 2015)

(1=strongly disagree to 6=strongly agree)

1. Treating subordinates uniformly while allowing individualization (UI)

- (a) Uses a fair approach to treat all subordinates uniformly, but also treats them as individuals.
- (b) Puts all subordinates on an equal footing, but considers their individual traits or personalities.

(c) Communicates with subordinates uniformly without discrimination, but varies his or her communication styles depending on their individual characteristics or needs.

(d) Manages subordinates uniformly, but considers their individualized needs.

(e) Assigns equal workloads, but considers individual strengths and capabilities to handle different tasks.

2. Combining self-centeredness with other-centeredness (SO)

(a) Shows a desire to lead, but allows others to share the leadership role.

(b) Likes to be the center of attention, but allows others to share the spotlight as well.

(c) Insists on getting respect, but also shows respect toward others.

(d) Has a high self-opinion, but shows awareness of personal imperfection and the value of other people.

(e) Is confident regarding personal ideas and beliefs, but acknowledges that he or she can learn from others.

3. Maintaining decision control while allowing autonomy (CA)

(a) Controls important work issues, but allows subordinates to handle details.

(b) Makes final decisions for subordinates, but allows subordinates to control specific work processes.

(c) Makes decisions about big issues, but delegates lesser issues to subordinates.

(d) Maintains overall control, but gives subordinates appropriate autonomy.

4. Enforcing work requirements while allowing flexibility (RF)

(a) Stresses conformity in task performance, but allows for exceptions.

(b) Clarifies work requirements, but does not micromanage work.

(c) Is highly demanding regarding work performance, but is not hypercritical.

(d) Has high requirements, but allows subordinates to make mistakes.

5. Maintaining both distance and closeness (DC)

- (a) Recognizes the distinction between supervisors and subordinates, but does not act superior in the leadership role.
- (b) Keeps distance from subordinates, but does not remain aloof.
- (c) Maintains position differences, but upholds subordinates' dignity.
- (d) Maintains distance from subordinates at work, but is also amiable toward them.

Paradoxical Leader Behavior in Long-term Corporate Development Scale (Zhang & Han, 2019)

(1=strongly disagree to 6=strongly agree)

1. Maintaining short-term efficiency and long-term development (S L)

- (1) Ensures the business's current efficiency while considering the need for future business development
- (2) Emphasizes both short-term business profitability and long-term continuity
- (3) Increases the effectiveness of current business models, but also introduces new models with future prospects
- (4) Ensures current profits of existing businesses, but also insists on exploring new businesses with potential long-term gains
- (5) Exploits current mature businesses, but also explores businesses with future growth potential

2. Conforming to and shaping collective forces in the environment (C S)

- (1) Abides by government policies, but also influences policy-making directions
- (2) Maintains market rules, but also pushes to create new rules
- (3) Respects industry rules, but also proactively promotes change and innovation in industry rules
- (4) Follows market forces, but also creates market forces

(5) Conforms to collective forces in the environment, but also is good at changing those forces

3. Maintaining stability and flexibility (S F)

(1) Emphasizes standardizing internal organizing, but also emphasizes flexibility of the organizational system

(2) Focuses on routinizing internal organizational management, but also dares to keep adjusting and optimizing it

(3) Formalizes internal organizing methods, but also enables flexible transition among the methods

(4) Emphasizes prudent organizational decision-making process, but also emphasizes adapting to changes quickly

(5) Stabilizes organizational structure, but also adjusts or rebuilds it based on firm development

4. Focus on shareholders and the stakeholder community (S S)

(1) Emphasizes resource competitiveness between shareholders and stakeholders (upstream, downstream, competitors, employees, government, and so on), but also emphasizes harmonious coexistence in the stakeholder community

(2) Regards the firm as an independent unit, but also as one part of the stakeholder community

(3) Takes a shareholder perspective, but also takes a stakeholder community perspective

(4) Manifests the opposite nature of shareholder interests and stakeholder interests, but also seeks alignment among them

(5) Seeks the firm's unique value, but also attends to its value increment to the stakeholder community

10. Measures of Environmental Impact Considered

Environmental Dynamism (Protogerou et al., 2012)

(1 = Strongly Disagree, 7 = Strongly Agree)

1. Products become outdated in this market very quickly.
2. The rate of change in technology is very high.
3. The intensity of innovation-based competition is very high.

Environmental dynamism (Jansen et al., 2006)

(1 = Strongly Disagree, 7 = Strongly Agree)

1. Environmental changes in our local market are intense.
2. Our clients regularly ask for new products and services.
3. In our local market, changes are taking place continuously.
4. In a year, nothing has changed in our market. (R)
5. In our market, the volumes of products and services to be delivered change fast and often.

Environmental turbulence (Volberda & Van Bruggen, 1997)

(1 = Strongly Disagree, 7 = Strongly Agree)

Dynamism: Intensity

1. Changes in our market are very intense.
2. Our customers regularly ask for complete new products/services.
3. Our market can be characterized by more of the same. (R)

Dynamism: Frequency

4. In our market, changes are taking place continuously.
5. Within a year, nothing will have changed in our market. (R)
6. Our supply of products/services changes continuously.
7. In our market, the volumes of products/services to be delivered change fast and often.

Complexity: Number of elements

8. In making decisions in our market, a lot of variables should be taken into consideration.
9. In our market, developments are taking place which stem from all kinds of directions.

Complexity: Relatedness of elements

10. In our market, everything is related to everything.
11. A decision in our market, influences a large number of factors.

Predictability: Availability of information

12. Nothing of what happens in our market will stay a secret for us.
13. Information we need about our market, we will always get.
14. It is hard in this market to base decisions on reliable information. (R)
15. We have sufficient insight and information about who are customers are.
16. Information about our market exists, but is not available. (R)

Predictability: Predictability of changes

17. There is a clear trend in the changes in our market.
18. Although a lot changes in our market, it will always be possible to discover a pattern in these changes.
19. The entrance and exit of competitors is foreseeable.

Perceived Environmental Uncertainty (Waldman et al., 2001)

(1 = Strongly Disagree, 5 = Strongly Agree)

How would you characterize the external environment within which your corporation functions? In rating your environment, where relevant, please consider not only the economic but also the social, political, and technological aspects of the environment.

1. Very dynamic, changing rapidly in technical, economic, and cultural dimensions.
2. Very risky, one false step can mean the firm's undoing.
3. Very rapidly expanding through the expansion of old markets and the emergence of new ones.
4. Very stressful, exhausting, hostile, hard to keep afloat.

Market Turbulence (Jaworski & Kohli, 1993)

(1 = Strongly disagree, 5 = Strongly agree)

1. In our kind of business, customers' product preferences change quite a bit over time.
2. Our customers tend to look for new product all the time.
3. Sometimes our customers are very price-sensitive, but on other occasions, price is relatively unimportant.*
4. We are witnessing demand for our products and services from customers who never bought them before.

5. New customers tend to have product-related needs that are different from those of our existing customers.
6. We cater to many of the same customers that we used to in the past

Market turbulence (Wilden & Gudergan, 2015)

(1 = Strongly disagree, 7 = Strongly agree)

1. In our kind of business, customers' product preferences change quite a bit over time.
2. We are witnessing demand for our products and services from customers who have never bought them before.
2. We cater to many of the same customers that we used to in the past.
4. It is very difficult to predict any changes in this marketplace.

11. Social Desirability Scales Considered

Balanced Inventory of Desirable Responding Scale (Paulhus, 1998)

Using the scale below as a guide, write a number beside each statement to indicate how much you agree with it: 1 = Not true, 4 = Somewhat true, 7 = Very true.

1. My first impressions of people usually turn out to be right.
2. It would be hard for me to break any of my bad habits.
3. I don't care to know what other people really think of me.
4. I have not always been honest with myself.
5. I always know why I like things.
6. When my emotions are aroused, it biases my thinking.
7. Once I've made up my mind other people can seldom change my opinion.
8. I am not a safe driver when I exceed the speed limit.
9. I am fully in control of my own fate.
10. It's hard for me to shut off a disturbing thought.

11. I never regret my decisions.
12. I sometimes lose out on things because I can't make up my mind soon enough.
13. The reason I vote is because my vote can make a difference.
14. My parents were not always fair when they punished me.
15. I am a completely rational person.
16. I rarely appreciate criticism.
17. I am very confident of my judgments.
18. I have sometimes doubted my ability as a lover.
19. It's all right with me if some people happen to dislike me.
20. I don't always know the reasons why I do the things I do.
21. I sometimes tell lies if I have to.
22. I never cover up my mistakes.
23. There have been occasions when I have taken advantage of someone.
24. I never swear.
25. I sometimes try to get even rather than forgive and forget.
26. I always obey laws, even if I'm unlikely to get caught.
27. I have said something bad about a friend behind his or her back.
28. When I hear people talking privately, I avoid listening.
29. I have received too much change from a salesperson without telling him or her.
30. I always declare everything at customs.
31. When I was young I sometimes stole things.
32. I have never dropped litter on the street.
33. I sometimes drive faster than the speed limit.

Crowne & Marlowe Social Desirability Scale (Crowne & Marlowe, 1960)

Listed below are a number of statements concerning personal attitudes and traits. Read each item and decide whether the statement is true or false as it pertains to you.

1. Before voting I thoroughly investigate the qualifications of all the candidates.
2. I never hesitate to go out of my way to help someone in trouble.
3. It is sometimes hard for me to go on with my work if I am not encouraged.
4. I have never intensely disliked anyone.
5. On occasion I have doubts about my ability to succeed in life.
6. I sometimes feel resentful when I don't get my own way.
7. I am always careful about my manner of dress.
8. My table manners at home are as good as when I eat out in a restaurant.
9. If I could get into a movie without paying and be sure I was not seen, I would probably do it.
10. On a few occasions, I have given up doing something because I thought too little of my ability.
11. I like to gossip at times.
12. There have been times when I felt like rebelling against people in authority even though I knew they were right.
13. No matter who I am talking to, I am always a good listener.
14. I can remember "playing sick" to get out of something.
15. There have been occasions when I took advantage of someone.
16. I'm always willing to admit it when I make a mistake.
17. I always try to practice what I preach.
18. I don't find it particularly difficult to get along with loud-mouthed, obnoxious people.
19. I sometimes try to get even, rather than forgive and forget.
20. When I don't know something I don't at all mind admitting it.

21. I am always courteous, even to people who are disagreeable.
22. At times I have really insisted on having things my own way.
23. There have been occasions when I felt like smashing things.
24. I would never think of letting someone else be punished for my own wrongdoings.
25. I never resent being asked to return a favour.
26. I have never been irked when people expressed ideas very different from my own.
27. I never make a long trip without checking the safety of my car.
28. There have been times when I was quite jealous of the good fortune of others.
29. I have almost never felt the urge to tell someone off.
30. I am sometimes irritated by people who ask favours of me.
31. I have never felt that I was punished without cause.
32. I sometimes think when people have a misfortune they only got what they deserved.
33. I have never deliberately said something that hurt someone's feelings.

12. Contemporaneous Data

12.1 Opening Remarks Summary of the Governor of the Bank of Greece

According to Dr. Stournaras and the analysis of economic data during the pandemic by the Bank of Greece (<https://www.bis.org/review/r220318c.htm>), the economy of the country experienced the second highest recession among countries in the Eurozone (−9% in 2020). Consumption and spending was postponed, leading to an increase in private sector deposits. Greek companies responded to the recession with a substantial decrease in investments; in 2020, the investments in Greece were at about 12% of GDP, while the respective average for countries in the Eurozone was 22%. This indicates that Greek companies mainly froze exploration activities in 2020 because of the pandemic. Investment in the country started to recover in 2021, with an important increase by the third quarter of 2021, thanks to the gradual reopening of the

economy in the summer of 2021 and financial aid provided by the Greek State and the European Union. Hence, concerning the time period examined in this study, according to the Bank of Greece, Greek companies were very hesitant to invest; therefore, it was difficult for them to be ambidextrous, since they were not engaged in exploration.

12.2 PWC Report

The PWC Greece Report presents the responses of 142 companies listed in the Athens Stock Exchange in the first semester of 2020 (https://www.pwc.com/gr/en/media-centre/assets/Greece_Covid_Report_ENG.pdf). Although the report focuses on larger companies that are publicly traded and this sample is not representative of companies in Greece, it is important to gain an understanding of how larger companies that have more access to resources, than smaller ones, responded to the crisis. According to the report, at the end of the first semester of 2020 (compared to the first semester of 2019), listed companies reported significant decreases in revenues (-21.4%), operating costs (-19.2%), investments (-11.2%), earnings before interest, taxes, depreciation, and amortization (EBITDA -37.2%), and earnings before interest and taxes (EBIT -74.1%). On the other hand, they reported an increase in cash of 9%, which was the result of reducing operating costs and restraining investments. Hence, the response of Greek companies to the pandemic in 2020 was mainly focused on exploitation (reducing costs), whereas exploration was paused. As the report states: “In the wake of the pandemic, listed companies were particularly hesitant as not only they did not proceed to new investments, but at the same time they created cash buffers, as a safeguard to the increasing uncertainty.” (PWC Report, 2020). However, the report also notes that there were companies that managed to increase their revenues in this time period by being flexible and by taking advantage of the opportunities that the pandemic created. Examples mentioned include companies producing hygiene products, technology companies, office supplies producers and

companies in the logistics sector. Therefore, on average, listed companies responded to the pandemic by freezing exploration and focusing on exploitation activities, which led them to inferior performance; but those companies that recognized and seized exploration opportunities, while at the same time being engaged in exploitation as every company was at the time, achieved superior performance. To sum up, the general trend among listed companies was to focus on exploitation and to not explore, whereas there was a subset of listed companies that managed to be ambidextrous, and these companies were superior performers.

12.3 Piraeus Bank Report

The Piraeus Bank Report (<https://www.piraeusholdings.gr/en/oikonomiki-analisi-ependitiki-stratigiki/oikonomiki-analisi-ellinikis-oikonomias-kladikes-meletes/analysis-category/2022/tracking-greek-corporate-balance>) analyzes the balance sheets of 12,236 Greek companies in 2020 and uses the Hellenic Statistical Authority in order to model the impact of the pandemic on those companies. Based on the microsimulations used, 59.6% of firms, i.e. 6 out of 10 companies, in 2020 were estimated to have losses, although companies reduced their costs (in other words, were engaged in exploitation). The cost reductions were not enough to offset the remarkable drop in revenues, which led to a drastic deterioration of performance in 2020 compared to 2019, with 38.1% of companies being underperformers versus 16% in 2019. The inability of Greek companies, in general, to generate revenues indicates that they were not pursuing exploration opportunities that would create new revenues. Similarly to the other two reports, this report as well demonstrates how the responses of Greek companies mainly focused on exploitation, although there were companies that also explored.