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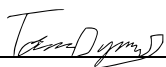
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Torger Dyrnes



Herman Rognaldsen

Abstract

The purpose of this thesis is to examine the relationship of disruption orientation, proactive risk management, industry competition, financial capital, and diversified income stream on firm resilience in the context of the recent Covid-19 pandemic. To accomplish this objective, we adopted a quantitative research methodology, employing a carefully designed questionnaire that was completed by 163 participants across various industries affected by the pandemic. The questionnaire was specifically designed to address the impact of the recent disruption caused by the Covid-19 pandemic on organizations. This choice was motivated by the disruptions recent occurrence and widespread impact across all industries. Our findings reveal significant associations between firm resilience and three key capabilities: disruption orientation, financial capital, and diversified income stream. Despite examining the potential mediating role of proactive risk management and the moderating influence of industry competition on the relationship between disruption orientation and firm resilience, our study did not yield a statistical significance supporting these hypotheses. Beyond contributing to existing knowledge of firm resilience, our study also found that financial capital and having a diversified income stream are capabilities that have a positive association with firm resilience. Furthermore, this study identifies several areas for future research aiming to deepen the understanding of capabilities associated with firm resilience. Overall, this thesis sheds light on essential factors associated with firm resilience and provides valuable insights for both scholars and practitioners interested in enhancing organizational preparedness in the face of disruptions

1. Introduction

1.1 Disruptions (Covid-19)

Firms are constantly exposed to a variety of disruptive events that have the potential to negatively impact performance and viability in today's dynamic business environment. Such threats to organizations are becoming increasingly complex and multifaceted, including a wide range of challenges such as natural disasters, data security violations, IT breaches, industrial incidents, terrorist attacks, and severe economic downturns (Williams et al., 2017). The Covid-19 pandemic serves as a compelling example of how disruptions can affect the economy, business operations, and consumer behavior (Donthu & Gustafsson, 2020), highlighting the importance of considering this issue. Gray et al. (2021) state that a commonality with both the pandemics in 2009 and 2020 is that neither of these zoonotic viruses was anticipated. Given the complex and multifaceted nature of these contemporary and unanticipated threats, organizations must mitigate the risk of heavy impact by making themselves more robust. To achieve this, organizations should focus on building or strengthening capabilities that enhance their resilience. The Covid-19 pandemic serves as an example of the challenges faced by organizations in effectively assessing and managing risks, and Peeri et al. (2020) argue that inadequate risk assessments, particularly regarding the urgency of the situation, contributed to the rapid spread of the virus.

The outbreak of Covid-19 forced countries into lockdown to prevent the virus from spreading, and companies, some more than others, have seen their operations transformed. Hence, business operations across industries have been altered significantly with a varying degree on employee performance (Narayanamurthy & Tortorella, 2021) and companies' financial performance (Devi et al., 2020; Rababah et al., 2020). All companies are affected differently by specific effects of a disruption, but it can be argued that no industry has been entirely immune to the impact of the Covid-19 pandemic. This study aims to evaluate the significance of the capabilities that contribute to firm resilience within an organization. The investigation will specifically focus on the effects posed by the Covid-19 pandemic. In order to gain insights into this, the study intends to test hypotheses pertaining to which capabilities have a positive association with firm resilience.

1.2 Purpose

The purpose of this study is to expand on the existing literature on resilience by exploring the capabilities that are critical for a firm to be resilient during disruptive events. Furthermore, we aim to explore the key capabilities that resilient organizations possess, as well as identify those that exhibit a stronger association with firm resilience than others. By including the Covid-19 pandemic at the center of our research, we can gather data from a recent and impactful disruption. This allows for drawing meaningful conclusions that are relevant to the current situation, thus enhancing the relevance of expected findings. In light of the significant impact of the Covid-19 pandemic on businesses worldwide, this study did not exclude respondents based on their geographic location, unlike previous studies such as Parker and Ameen's (2018) study which centered its attention on South Africa. This study also draws inspiration from the research conducted by Zhang et al. (2022), which delved into effects of resource reconfiguration and firm resilience on a firm's recovery and growth during the Covid-19 pandemic. In their investigation, the authors received responses from 207 organizations, targeting both Chief Executive Officers and Chief Financial Officers. However, in this study, we did not exclude respondents based on their organizational role.

1.3 Research question

A clear and guiding research question helps connect various hypotheses (Connelly, 2015). Considering our analysis encompasses multiple capabilities and is set within the context of firm resilience during the Covid-19 pandemic, we pose the following research question:

To what extent do disruption orientation, proactive risk management, industry competition, financial capital, and diversified income stream contribute to making a firm resilient in the face of disruption?

This thesis seeks to determine whether particular capabilities are positively associated with firm resilience. We will focus on disruption orientation, financial capital, and diversified income stream as independent variables, and we will also examine proactive risk management and industry competition as mediator and moderator between disruption orientation and firm resilience. The results will

assist in determining the firm's resilience either by establishing selected capabilities to be positively associated with firm resilience, or by the mediator or moderator proving significant. The chosen capabilities for this thesis are derived from a mix of prior research and additional capabilities that we hypothesize have a plausible association with firm resilience.

1.4 Structure

In the literature review (Chapter 2), we review existing literature on resilience and related concepts, including the origin and variations of the concept, theoretical underpinnings of resilience, what resilient organizations do, and why the field of resilience is researched. This chapter covers existing literature on independent variables, including disruption orientation, financial capital, and diversified income stream, as well as mediators and moderators which are proactive risk management and industry competition. This section will also present our hypotheses. The methodology (Chapter 3) introduces the research design, sample, data collection, measures and data credibility, data analysis, and ethical considerations. The research findings will be presented and analyzed in the results section (Chapter 4). Thereafter we will discuss the results against field literature in our discussion section (Chapter 5). Furthermore, practical implications will be discussed (Chapter 6), followed by our conclusion (Chapter 7), as well as limitations and future research (Chapter 8).

2. Literature Review

2.1 Conceptualizing resilience

2.1.1 Concept origin, variation, & theoretical underpinnings

The concept of resilience is a widely used term that can be ambiguous across various fields of study. A deeper understanding of what makes a firm resilient is essential for a more comprehensive understanding of the concept, which will be done in this section. The term originates from the Latin word *resiliere*, which translates to *bounce back* (Mayar et al., 2022). Thomas Young, an English physicist, introduced resilience to academia in 1807 by describing the ability of materials to absorb energy without permanent deformation (Sudmeier-Rieux, 2014). The concept gained popularity in ecology, where Crawford Stanley Holling used it to explain non-linear dynamics in ecosystems (Gunderson, 2000). Due to

his questioning of the notion of a single equilibrium and stability, he started to promote the concept of resilience (Olsson et al., 2015). Holling (1973) defined resilience as the measure of a system's ability to persist by absorbing changes in variables, parameters, and driving variables. In disaster research, a resilient ecosystem is defined as one that can withstand short-term shocks and return to its original state in a reasonable time frame (Birkland, 2016). Additionally, resilience encompasses the ability of a system to transform to a different state due to disruption (Folke, 2006). The concept was later introduced to the field of psychology by Emmy E. Werner and Ruth Smith with their longitudinal study that followed children into adulthood and examined their psychological resilience by looking at protective factors and personal traits of the participants (Walker, 2005; Weir, 2017).

Organizations face all kinds of adversity which threaten their functionality and performance (Boin, 2009; Comfort, 2002; Drabek, 1985), and as Quarantelli (1988, p. 374) states, "...there often is a big gap between what was planned and what actually happens in a major disaster crisis." Therefore, scholars are looking into crises and how organizations effectively prepare, respond, and overcome such disruptions to preserve performance, recover, or prevent the decline or failure of the firm (Williams et al., 2017). Consequently, theories of resilience have also been developed in safety science (Hollnagel et al., 2006; Hollnagel, 2011; Huang et al., 2017) and crisis management (Comfort et al., 2010) where the aim has been to improve safety, performance, and management systems (Wildavsky, 1988; Weick, 1998; Weick & Sutcliffe, 2007). For organizations to successfully face crises, crisis management examines resilience factors that make them more robust. Gittel et al. (2006) looked at the terrorist attacks of September 11 in 2001 and how it affected the U.S. airline industry, where some airlines demonstrated remarkable resilience whilst others did not. Layoffs were meant to foster recovery due to shortage of financial reserves and a viable business model. However, it was those that had maintained adequate financial reserves that had the highest levels of organizational resilience in times of crisis (Gittel et al., 2006). Weick and Sutcliffe (2007) point toward *high reliability organizations* (HROs) as role models when it comes to responding to crises. These organizations have a commitment to resilience as they fund training so that their employees develop capacities to know many jobs and processes, which facilitates for when the organization is faced with a crisis.

Although the term *resilience* can be traced back to the 1800s, it is now found in many disciplines, meaning it has gone far from its roots. Madni and Jackson (2009) state that resilience is a semantically overloaded concept that Klein et al. (2003) deem as almost meaningless due to the definition becoming too broad. A semantically overloaded concept is difficult to control (Hassler & Kohler, 2014). Given the widespread application of the term *resilience* across various fields such as resilient engineering, urban resilience, ecological resilience, economic and business resilience, industrial and organizational resilience, community resilience, psychological resilience, and socio-ecological resilience (Bosher, 2014), it is no surprise that the definition of resilience has broadened considerably. They all overlap, and an example is resilience engineering, which, according to Steen and Aven (2011), looks for ways to enhance the ability of an organization to be resilient in the sense that it can recognize, adapt to, and absorb variations, changes, disturbances, disruptions, and surprises. In comparison, business resilience is about being resilient in unpredictable business environments (Dahles & Susilowati, 2015). The commonality is that the system needs to be built to be able to handle future disruptions, which opposes the conventional risk management approaches that are based on hindsight knowledge, failure reporting, and risk assessments calculating historical data-based probabilities (Steen & Aven, 2011). However, despite many similarities, the definition does not have the exact similar wording and hence risks being interpreted differently in research.

Theoretical underpinnings of resilience are theories that help the theory to continue or succeed by supporting and strengthening the concept (“Theoretical Underpinnings,” n.d.). Resilience has been conceptualized by theoretical frameworks as for example systems theory. Systems theory studies society as a complex arrangement of individuals and beliefs (Gibson, n.d.). System theory helps us understand resilience in complex systems by demonstrating how resilient systems adapt to disruptions and maintain their functionality (Meadows, 2008). The terminology provided by modern control systems theory enables us to reconnect resilience with its conceptual foundation, offering valuable system tools for analyzing, measuring, and designing resilience across disciplines (Mayar et al., 2022). Resilience, when interpreted in terms of adaptation involving feedback, involves the system's capacity to adjust according to defined objective functions (Ackoff, 1971; Mayar et al., 2022). This adaptation is facilitated by management actions that reflect the system's composition (Mayar et al., 2022).

Complexity theory is another theoretical framework that shares a common vocabulary with systems theory. However, systems theory have embraced interpretivist and critical philosophies, whilst complexity theory remains positivist (Phelan, 1999). More recently, many ecologists have embraced the complex systems perspective on social-ecological systems, such as resilience (Folke et al., 2004). Due to systems theory being perceived as disconnected from today's research and practice demands, it has been challenged in the recent literature, and social sciences are asked to begin adopting complexity theory that better addresses complexity and open social systems (Turner & Baker, 2019). An example of such an approach is a study by Therrien et al. (2016) who bridged complexity theory and resilience with an aim to develop surge capacity in health systems. Health systems are periodically confronted by crises which require management that helps avoid interruption of essential services (Therrien et al., 2016), such as the Covid-19 pandemic. Having this ability is what resilience strategies aim to accomplish, and by using the framework of Therrien et al. (2016) which is based on complexity theory, they factor in a pragmatic approach built to increase health system resilience.

2.1.2 Why resilience?

As we can derive from the previous subchapter, resilience is a wide term that is utilized in many theories across different research. However, in an attempt to summarize, Siegel (2018) describes resilient organizations as ones that proactively identify and manage anticipated risks, as well as build the capacity to cope with anticipated and unanticipated adversity. A resilient organization recognizes that adversity and changes in daily work tasks are expected, and such adversity is heavily integrated into risk management (Siegel, 2018). Further, organizations that manage to fully integrate a proactive, enterprise-wide, multidisciplinary, and holistic risk management approach into the business management process in the organization can be described as resilient organizations (Siegel, 2018). An important note in Siegel's (2018) study is that risk assessment is not solely about imagining threats and vulnerabilities for the organization but also dissecting the internal and external context and factors that might influence the identified risk. After conducting such an analysis, it is possible to conduct a risk assessment from both the organization's standpoint and the perspective of external stakeholders.

There are many theories and beliefs about how one can best handle disruptions. Kutsch et al. (2016) distinguished the resilience approach from the predictive approach. The resilience strategy included preparing, monitoring, responding, and rebounding, whereas the predictive approach included forecasting, assessing, planning, and preventing. According to Holling (1973), resilience is based on acknowledging our ignorance, which means that one should not expect future events to be anticipated but rather unexpected. He also stated that resilience does not require the ability to precisely predict the future but rather a qualitative capacity to devise systems that can absorb and accommodate such unexpected events in whatever form or magnitude they might take. Hence, it deviates heavily from the proactive approach due to it not necessarily attempting to forecast what disruptions might arise. When examining the resilience of ecological systems, Carpenter et al. (2001) posed the question, *resilience of what to what?*. He examined how well one set of variables held up to changes in another (Wied et al., 2019). In an organizational resilience context, those would be the variables that the organization possesses to cope with the variations they experience due to a disruption.

Martin-Breen and Anderies (2011) are among those authors who state that a considerable amount of work remains before resilience will be a useful off-the-shelf concept for practitioners. However, the number of papers published with disaster and resilience in their titles, keywords, or abstracts has increased dramatically since 2009 (Tiernan et al., 2019). We want to add to that literature due to the concept's continued development and change. Resilience can be defined, understood, and measured in various ways, as shown in this section and as Tiernan et al. (2019) note. Due to the vagueness of a widely accepted interpretation of the concept, we have selected a few capabilities that, in our opinion and according to recent research, are crucial for resilient businesses. These include proactive risk management, disruption orientation, industry competition, financial capital, and diversified income stream.

2.2 Disruption orientation

Organizations that embrace disruption orientation are more likely equipped to navigate a variety of disruptions due to it increasing their resilience (Bode et al., 2011; Yu et al., 2019; Laguir et al., 2022). The fundamental idea of disruption orientation is that an organization should be proactive in anticipating and

responding to disturbances, as well as learning from past disruptions to mitigate potential disruptions in the future (Mahmoud et al., 2021). Disruption orientation is frequently associated with interruptions in the supply chain. This type of disruption is defined by occurrences that have a substantial influence on a company's supply of products and services and, consequently, have a substantial impact on the company's operations (Yu et al., 2019). Companies may become more resilient by acquiring proactive skills that help them manage these types of disturbances (Bode et al., 2011).

In today's rapidly changing business environment, focusing on disruption orientation has become increasingly critical to maintaining effective operations (Laguir et al., 2022). An example of developing a disruption-oriented approach is diversification. During the Covid-19 pandemic, some restaurants were able to adapt to restrictions preventing indoor dining by diversifying their services. In response to these challenges, a significant number of restaurants implemented takeout and delivery services to sustain their business operations and achieve their strategic objectives (Conger, 2021). Adopting takeout or delivery services as a response to a major disruption in business operations can be considered as having a disruption-oriented approach. Therefore, diversifying their services is a strategy that helps them continue operations and prevent the occurrence of similar situations in the future.

Research has demonstrated that being disruption oriented is a critical capability for organizations to effectively manage and adapt to various disruptions (Bode et al., 2011; Yu et al., 2019; Laguir et al., 2022). Being disruption-oriented involves being alert for various disruptions throughout the entire business and its supply chain. We consider this an essential step in strengthening and building a company's resilience. In this study, we aim to investigate the relationship between disruption orientation and firm resilience, specifically in the context of the Covid-19 pandemic. We will investigate how different levels of disruption orientation influences firm resilience by looking at disruption orientation as an independent variable and firm resilience as a dependent variable (Figure 1).

Hypothesis 1 (H1): *Disruption orientation has a positive association with firm resilience.*

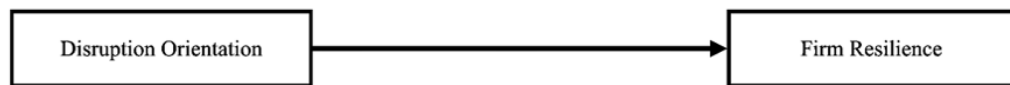


Figure 1: Disruption orientation as the independent variable

2.3 Proactive risk management

Successfully implementing proactive risk management entails being able to prevent crises from occurring or minimizing their impact. Being able to control reactive risk management behavior, which involves responding to crises as they arise without a defined risk plan, is thus a crucial skill for achieving this (Kaliprasad, 2006). In other words, proactive risk management is the process of gathering data on potential disruptions and using that data to develop response strategies (Parker & Ameen, 2018). Having a proactive approach can also create opportunities, such as identifying new business ventures. The reason is that risk, security, and business continuity are seeking potential events that could identify possible business opportunities (Siegel, 2018). Proactive risk management involves various actions, such as conducting scenario planning, analyzing historical data, and monitoring trends, to anticipate potential disruptions that an organization may face in the future (Hopkin, 2014).

According to Marc Siegel (2018), resilience is gained when a proactive, enterprise-wide strategy to risk management has been adopted by the entire firm. The distinction between proactive risk management and resilience is rooted in their respective scopes of adaptability. A resilient organization possesses the agility to navigate both anticipated and unexpected adversities effectively. On the other hand, proactive risk management primarily centers around strategizing for known challenges. Management (and employees) must be able to proactively identify and handle potential risks for a company to be resilient. As a result, organizations must change their approach to risk management such that it is more proactive than reactive.

Proactive risk management is essential for helping companies anticipate, prepare for, and recover from a variety of disturbances. As demonstrated by a study on the

HPAI outbreak in the US, proactive risk assessment is highly effective and necessary in dealing with disease outbreaks and can improve business continuity (Thompson & Pendel, 2016). Connected to the proposed association between disruption orientation and firm resilience, our literature review indicates that proactive risk management is positively associated with disruption orientation and acts as a mediator between disruption orientation and firm resilience (Parker & Ameen, 2018). This study aims to investigate this association further by examining whether proactive risk management, using a different sample, still serves as a mediator in the relationship between disruption orientation and firm resilience. Figure 2 is a continuation of Figure 1, where disruption orientation is the independent variable, firm resilience is the dependent variable, and proactive risk management is the mediator. Hence, we are investigating whether proactive risk management affects the relationship between disruption orientation and firm resilience. We suggest that organizations focusing on disruption orientation are more likely to take a proactive approach to risk management, which in turn boosts firm resilience. Additionally, we believe that companies lacking a proactive risk management approach in addition having low levels of disruption orientation may find it harder to manage disruptions. Consequently, proactive risk management could serve as a mediator in the relationship between these factors.

Hypothesis 2 (H2): *Proactive risk management mediates the relationship between disruption orientation and firm resilience.*

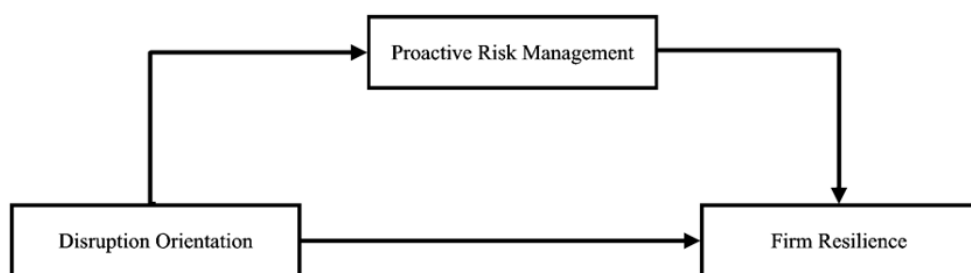


Figure 2: Proactive risk management as mediator

2.4 Industry competition

According to a study by Gunasekaran et al. (2011), there is a positive relationship between small-sized and medium-sized firm resilience and industry competition.

This means that resilient companies tend to be more competitive. As defined earlier, resilient companies are those capable of effectively responding to and adapting amidst changing circumstances. In highly competitive industries, the ability to be adaptable and open to change becomes even more critical (Reeves & Deimler, 2011). In this study, we incorporate industry competition as it is crucial to investigate how the competitive intensity within an industry influences a company's capacity to withstand and bounce back from disruptions.

The literature review suggests that there is a positive association between firm resilience and industry competition. However, we want to explore whether firms that are in competitive industries become more resilient and whether the level of industry competition impacts the relationship between disruption orientation and firm resilience. Therefore, we aim to explore whether industry competition moderates the relationship between disruption orientation and firm resilience. Figure 3 illustrates the relationship between disruption orientation and firm resilience, with industry competition as a moderator. In other words, we are examining if the degree of industry competition impacts the relationship between disruption orientation and industry competition.

Hypothesis 3 (H3): Industry competition moderates the relationship between disruption orientation and firm resilience.

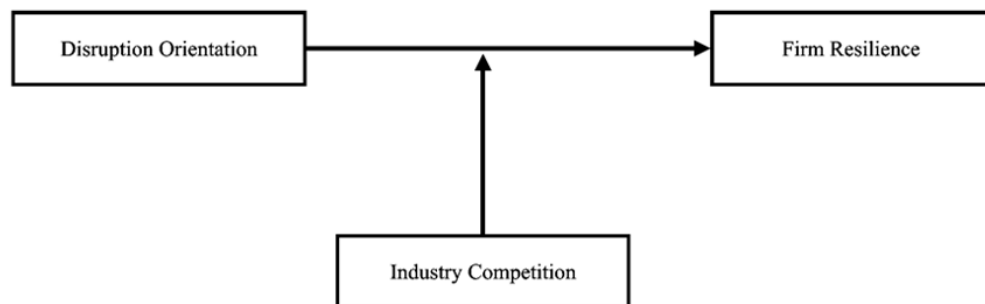


Figure 3: Industry competition as moderator

2.5 Financial capital

Another important aspect to consider when attempting to understand firms' resilience is their capital holdings. A firm's resilience can be strengthened by maintaining cash reserves in the bank, which can be utilized during a crisis

(Brende & Sternfels, 2022). During the Covid-19 outbreak, the tourism industry was one of the most heavily hit industries. Therefore, this industry received special attention when looking at resilience capabilities for responding to the Covid-19 disruption. An example of such a study is Wieczorek-Kosmala's (2022) research, where she points to the observation that companies with greater cash-driven resilience capabilities are distinguished by higher profitability and are less financially constrained. Another example can be drawn from a study of farmers in Kenya and Cameroon by Awazi and Quandt (2021), where they investigated the resilience of livelihoods to environmental changes. They discovered a statistically significant causal relationship between the farmers' resilience and their livelihood capital assets which among other factors encompassed financial capital. Financial capital was defined as access to bank accounts, ownership of livestock, ownership of farmland, ownership of farm equipment, and trees. Béné et al. (2016) also studied and compared resilience in Fiji, Ghana, Sri Lanka, and Vietnam, concluding that wealth and financial capital were important for resilience across contexts. Also, during the 2007-2009 economic recession, financial institutions that relied mainly on short-term market funding were at greater risk of failure than other institutions (Altunbas et al., 2011). Short-term market funding, such as firms relying on selling loans and not taking any deposits, saw a big failure rate (Gilbert, 2014).

In this study, we aim to determine if there exists a positive association between financial capital and firm resilience. The reason behind this purpose stems from the premise that companies with substantial financial capital have access to cash reserves and other assets that could be pivotal in handling disruptions. As seen in the previous subsection, evidence from various studies underscores the fact that companies with sufficient levels of financial capital are less restrained financially, thereby facilitating greater agility in responding to disruptions. Based on this, we will investigate whether there is a positive association between financial capital and firm resilience as illustrated in Figure 4 with financial capital being the independent variable and firm resilience being the dependent variable.

Hypothesis 4 (H4): *Financial capital has a positive association with firm resilience.*

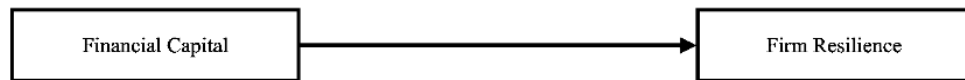


Figure 4: Financial capital as the independent variable

2.6 Diversified income stream

As referred to previously, financial institutions that mainly relied on short-term market funding faced an elevated risk of failure during the economic recession of 2007-2009. It was also specified that it was those institutions that lacked a diversified income stream that struggled the most (Altunbas et al., 2011). Another industry that was heavily hit by the Covid-19 disruption was the airline industry. These companies were severely impacted due to their most apparent income source from tourists and travelers being reduced to a minimum. According to Investopedia (2022), airlines receive nearly 40% of their revenue from selling frequent flyer miles to credit card companies and other travel partners, and the rest is revenue from passengers directly. Business travelers make up only 12% of the passengers, but they typically account for as much as 75% of the airline's profits. When Covid-19 hit, businesses practically stopped sending their employees abroad, and corporate travel still remained below 50% of pre-pandemic spending in 2022 (Daher et al., 2022). Considering 90% of passenger flights in the airline industry were canceled, airlines such as American Airlines, United Airlines, Virgin Atlantic, and Lufthansa adapted and changed their commercial passenger flights to cargo flights (Morgan, 2020). Such adaptive strategies can facilitate entry into new markets and foster multiple revenue streams (Huang & Jahromi, 2020). Airports and airlines that diversified their revenue streams beyond conventional passenger-related income managed to mitigate the worst impacts of the Covid-19 pandemic (Rooley, n.d.). This clearly underscores the significance of a diversified income stream in enhancing a firm's resilience amid disruptions.

According to Wilson (2010), rural communities can strengthen their resilience by diversifying their income streams. By relying on multiple sources of income, these communities can reduce their vulnerability to various forms of disruption. Wilson notes that certain communities have successfully opened themselves up to tourism, which has provided an alternative source of income and further enhanced

the quality of life for local residents. This highlights the potential benefits of adopting diversified income stream strategies. Even if the study is focused on rural communities, we believe that the findings may be transferable to organizations. Green et al. (2021) supports the idea that diversified income streams can contribute to financial resilience and organizational survival. The study found that charities with a more diversified income base were more financially resilient and were more likely to survive over time.

Our review of the literature reveals a correlation between an organization's adaptability and diversification of its income stream and its capacity to weather disruptions. Also, companies that were able to quickly respond and diversify their products and services post-disruption managed to mitigate the impacts of the disruption. Therefore, we aim to investigate whether there is a positive association between diversified income stream and firm resilience as illustrated in Figure 5 with diversified income stream as an independent variable and firm resilience as a dependent variable.

Hypothesis 5 (H5): *Diversified income stream has a positive association with Firm Resilience*

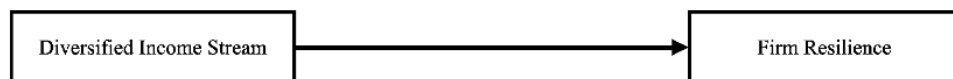


Figure 5: Diversified income stream as the independent variable

3. Method

3.1 Research design

The research strategy is the general approach to research that we have chosen to adopt (Bell et al., 2019). Although Layder (1993) says that there is not necessarily a clear-cut distinction between quantitative and qualitative research, we have in this study conducted a business research that resonates more towards a quantitative research strategy. This research strategy, as with qualitative, is a general approach that researchers might choose depending on the question that they ought to answer. The reasoning behind us taking the quantitative direction

has been our wish to quantify the collection of data and thereafter analyze the gathered data with an aim to test our hypotheses.

Research design is a framework that aims to generate evidence that is suited both to a certain set of criteria and to the relevant research question in the study (Bell et al., 2019). These criteria are meant to assess the quality of business research and they consist of reliability, replicability, and validity (Bell et al., 2019). Due to us sending out questionnaires to receive results, it is natural for this study to be based on a cross-sectional design. A big advantage of posting the survey on various social media is that it allows us access to quantifiable data that provides us with a consistent benchmark (Bell et al., 2019). Finding causal connections between variables is the aim. However, a negative aspect of a cross-sectional design is that it is difficult to conclude whether the relationships are in fact causal. As such, results are often limited to the conclusion of variables being positively or negatively associated (Bell et al., 2019).

3.2 Sample

The objective of this study is to conduct a thorough and nuanced analysis by including employees from a diverse range of industries and company sizes. The questionnaire was designed to gather subjective opinions of the respondents and asked for responses from anyone who had worked in the same organization prior to and throughout the whole disruption. While we recognize that an alternative approach could have involved surveying leaders in various companies, we opted for a more inclusive approach to prevent common method bias. This type of bias can arise when a single evaluator, such as a company CEO, is the sole source of information (Podsakoff et al., 2003). We gathered N=163 participants for our study, a sample size that falls within the recommended range of 150-200 respondents for quantitative research (Pallant, 2013). Following data cleaning procedures, we obtained a final sample of N=109. We will provide a comprehensive description of our respondents' characteristics in chapter 3.5.3.

3.3 Data collection

3.3.1 Questionnaire

To collect information on the key variables of the thesis, we made a questionnaire based on both self-made, established, and standardized scales where some are adapted to fit the relevant situation we are exploring (Appendix 1). All questions

in the questionnaire are closed-ended, meaning that one does not have the option to elaborate on a response. This was done deliberately due to a common problem with open-ended questions which is that respondents answer in too broad terms (Reja et al., 2003). A reason why this happens could be due to the difficulty of recognizing and articulating responses, which closed-ended questions could help with due to them having a limited number of possible responses (Brace, 2018). This could cause more issues than opportunities. Further, missing data due to respondents skipping questions or entering a non-valid response is more probable with open-ended questions (Reja et al., 2003).

3.3.2 Pre-testing

Following recommendations put forward by Bell et al. (2019), we conducted a pre-test to ensure that our questions were understandable to our respondents and that the data collection and analysis software functioned correctly. The questionnaire was distributed to 23 potential participants, which aligns with the recommended number for pre-testing a questionnaire (Gunawan et al., 2021). The respondents were of the same population as those who were going to be involved in the actual survey. Our aim was to verify that the questionnaire was understandable and that the software was effective. We received valuable feedback that was used to make notable changes to our questionnaire. For instance, we went from presenting answer options as multiple choice to adopting a matrix table format for displaying the questions. Additionally, we deleted five questions that delved into the company's financial performance (e.g., ROI and ROE, etc.) to prevent an increased number of incomplete answers. The reason was due to our respondents lacking the necessary knowledge for answering these types of specific financial questions. This action did not harm our study, as the questions were not directly connected to any of the hypotheses.

3.3.3 Questionnaire distribution

After pre-testing, we initiated data collection by distributing the questionnaire. To ensure a robust participation rate, we used our social networks, specifically LinkedIn and Facebook, to recruit respondents. Initially, we shared the questionnaire on LinkedIn by posting a message with a link to the survey and encouraged our network to participate and share the survey with their respective networks (Appendix 2). To further boost the response rate, we replicated the same

post and published it on Facebook one week later. The questionnaire was made publicly available on February 28th and remained open until April 28th.

3.4 Measures and data credibility

Every question has been incorporated to deepen our understanding of how firms were impacted by the Covid-19 disruption. These inquiries primarily employ a Likert scale ranging from one to five. However, in instances where the original source of inspiration utilized a Likert scale extending from one to seven, we have adhered to the same range for consistency. We also refer to Cronbach's alpha where it is relevant to understand the reliability of the posed questions in previous research. Cronbach's alpha is a measure between 0 and 1 (Tavakol & Dennick, 2011) that is concerned with the reliability of measurement (Cronbach, 1951), and measures the internal consistency of a scale (Gliem & Gliem, 2003). The reason why we base our questionnaire on other sources is due to the need for internal consistency to be determined to ensure validity (Tavakol & Dennick, 2011). In the construction of our questionnaire, we have incorporated both pre-existing questions from various articles and original questions developed by ourselves. We will in the following subchapters list the questions within each category, and where these have been gathered from.

| Questionnaire | |
|---------------------------|--------------|
| Sections | Scale |
| Introductory Questions | |
| Firm Resilience | 1-5 |
| Disruption Orientation | 1-5 |
| Proactive Risk Management | 1-7 |
| Industry Competition | 1-5 |
| Financial Capital | 1-5 |
| Diversified Income Stream | 1-5 |

Table 1: Questionnaire

3.4.1 Firm resilience

The measurement of firm resilience is based on a scale first presented by Ambulkar et al. (2015) and later adapted and amended by Zhang et al. (2022). These questions were answered based on a Likert scale ranging from 1 (strongly

disagree) to 5 (Strongly agree). Cronbach's alpha was 0.86 in the study by Ambulkar et al. (2015) and 0.94 in the study by Zhang et al. (2022), where the latter score is even satisfactory for clinical application (Bland & Altman, 1997). Due to the high Cronbach's alpha and the more general formulation of the scale applied by Zhang et al. (2022), we decided to adopt the same formulations to find a reliable result. The three-item scale include the following:

| Firm Resilience | | |
|------------------------|---|--------------|
| Variable | Items | Scale |
| Firm Resilience | We are able to cope with changes in our business brought on by sudden disruptions. | 1-5 |
| | We are able to easily adapt our business operations to a sudden disruption. | 1-5 |
| | We are able to provide a quick response to the negative effects of a sudden disruption on our business. | 1-5 |

Table 2: Firm resilience

3.4.2 Disruption orientation

To assess disruption orientation, our study drew inspiration from the research conducted by Bode et al. (2011), where they looked at how companies responded to supply chain disruptions. The questions were amended by ourselves to reflect general disruptions instead of supply chain disruptions to make it more suitable for this thesis. Questions were answered based on a Likert scale ranging from 1 (strongly disagree) to 5 (Strongly agree). The Cronbach's alpha value attained in the article of inspiration was 0.72 which is deemed satisfactory (Tavakol & Dennick, 2011). The five-item scale includes the following:

| Disruption Orientation | | |
|-------------------------------|---|--------------|
| Variable | Items | Scale |
| Disruption Orientation | We feel the need to be alert for possible disruptions at all times. | 1-5 |
| | Disruptions show us where we can improve. | 1-5 |
| | We recognize that disruptions are always looming. | 1-5 |
| | We think a lot about how a disruption could have been avoided. | 1-5 |
| | After a disruption has occurred, it is analyzed thoroughly. | 1-5 |

Table 3: Disruption orientation

3.4.3 Proactive risk management

Proactive risk management is measured based on Parker and Ameen's (2018) study regarding the role of resilience capabilities in shaping how firms respond to disruptions. Again, questions have been amended to suit more general questioning, due to our study not being directed towards a specific industry. This

section was meant to seek out whether firms actively sought information and evaluated alternatives in advance that would help them respond appropriately to disruptions (Parker & Ameen, 2018). Questions were answered based on a Likert scale ranging from 1 (strongly disagree) to 7 (Strongly agree), and the Cronbach's alpha value attained was 0.81. The three-item scale include the following:

| Proactive Risk Management | | |
|---------------------------|--|-------|
| Variable | Items | Scale |
| Proactive Risk Management | We had strong measures that helped us cope with disruptions from the Covid-19 pandemic. | 1-7 |
| | We had comprehensive management plans and processes in place to respond to the effects of covid. | 1-7 |
| | We regularly consulted with the industry and authorities about the “way ahead” and planned our work accordingly. | 1-7 |

Table 4: Proactive risk management

3.4.4 Industry competition

Based on a study by Jaworski and Kohli (1993), we attempted to figure out the industry competition of the responding firms. The concept described in that study was called “Competitive intensity”, and they attained a strong reliability with a Cronbach's alpha value of 0.81 (Jaworski & Kohli, 1993). However, Bode et al. (2011) also took inspiration from this source where they attained a weaker, but still sufficient, Cronbach's alpha value of 0.74. Both studies used a 5-point scale. However, Jaworski and Kohli (1993) used a 5-point Likert scale whilst Bode et al. (2011) employed a scale ranging from “not at all” (1) to “to a very large extent” (5). We have decided to use the 5-point Likert scale, but use the questions applied in the Bode et al. (2011) study. The four-item scale include the following:

| Industry Competition | | |
|----------------------|---|-------|
| Variable | Items | Scale |
| Industry Competition | The business climate for the final product(s)/service(s) is very competitive. | 1-5 |
| | Anything that one competitor can offer others can match readily. | 1-5 |
| | Competition in this industry is cutthroat. | 1-5 |
| | Winning in this marketplace is a tough battle. | 1-5 |

Table 5: Industry competition

3.4.5 Financial capital

A company's financial position and stability prior to, as well as during, unexpected events such as the Covid-19 pandemic are important indicators of its ability to withstand challenges and maintain its operations. Evidence supporting

this notion identified public sector banks to be more vulnerable to stress in the corporate sector due to weaker starting capital positions (Gornicka et al., 2021). Additionally, a study conducted by Falato et al. (2021) highlighted the significant outflows experienced by corporate-bond funds during the disruption caused by Covid-19. This impact was most evident for funds holding liquid assets, those vulnerable to fire sales, and those exposed to sectors most adversely affected by the pandemic. These findings underscore the vital importance of effectively managing a firm's capital both prior to and during times of crisis to ensure robust coping mechanisms. Effective financial capital management and optimization for maximum return also contribute to a company's resilience, as an organization's treasury functions can help combat disruptions such as high borrowing costs and market volatility (Capital One, 2023). In order for us to assess the financial capital of respondents organizations, we posed the following three questions in our questionnaire:

| Financial Capital | | |
|--------------------------|---|--------------|
| Variable | Items | Scale |
| Financial Capital | The firm's financial position was stable and secure prior to the Covid-19 pandemic. | 1-5 |
| | The firm's financial position was stable and secure during the Covid-19 pandemic. | 1-5 |
| | The firm's financial capital is well managed and optimized for maximum return. | 1-5 |

Table 6: Financial Capital

These questions were answered based on a Likert scale ranging from 1 (strongly disagree) to 5 (Strongly agree). They were not gathered from any other articles, and were hence developed by ourselves with an aim to determine the financial capital of the firms that the respondents work for. To formulate questions that could provide us with insightful information, we included these questions in the pre-testing. This way we could get feedback from our test sample and attain a Cronbach's alpha value indicating the reliability of the measure. The Cronbach's alpha we obtained in our final sample was 0.77, indicating a strong reliability.

3.4.6 Diversified income stream

Having a variety of different revenue sources and a balanced distribution of income across them reduces the dependence on any single source, mitigating the risk and impact of any potential decline of demand in any one source (Carroll & Stater, 2009). In order for us to assess the income diversification of the firm of the respondent, we posed the following two questions in our questionnaire:

| Diversified Income Stream | | |
|----------------------------------|--|--------------|
| Variable | Items | Scale |
| Diversified | The firm has a variety of different revenue sources. | 1-5 |
| Income Stream | The firm has a balanced distribution of income across its revenue sources. | 1-5 |

Table 7: Diversified Income Stream

We designed these questions ourselves with the intention of understanding the diverse income streams of the respondent firms. By pre-testing, we gained insight into how the respondents interpreted the questions, and their feedback gave valuable input that was utilized in the final version of the survey. The reliability of our data, measured by Cronbach's alpha, was determined to be 0.79 in our final sample, which we deem sufficient for our research purposes.

3.5 Data analysis

To collect the required data for this study we utilized a program called Qualtrics, which is a web-based survey tool where one can collect feedback at scale for the questions that we pose (Qualtrics, n.d.). Following the sample collection, the data was transferred from Qualtrics to the statistics program RStudio. Before testing the hypotheses and analyzing the results we prepared the data for analysis. This entailed downloading the sample to an Excel file, importing it to RStudio, before cleaning the data by removing any rows that contained empty cells. We also imported the cleaned dataset in SPSS in order to both check our results as well as utilizing the PROCESS macro model by Hayes (2013) for the mediation and moderation analysis. After cleaning the data for rows containing missing info, we progressed to perform descriptive statistics of all the items in the dataset which can be found in Table 9. This was done to check if there were any potential threats to the reliability of the data. However, these threats were not found due to there being a relatively low standard deviation and mean standard error for all items.

3.5.1 Regression analysis

We performed simple linear regressions to test the following hypotheses: H1 (disruption orientation has a positive association with firm resilience), H4 (financial capital has a positive association with firm resilience), and H5 (diversified income stream has a positive association with firm resilience). After testing whether the hypotheses are significant, we further wanted to test them in a multiple linear regression analysis. A multiple regression is a sophisticated

extension of correlation that is used to explore the predictive ability of a set of independent variables on one continuous dependent variable (Pallant, 2020), which is firm resilience in our case. This will make it possible to test the significance with all independent variables considered.

3.5.2 Mediation & moderation

In addition to using simple and multiple linear regression analyses, we also conducted a mediating analysis with an aim to test if proactive risk management had a mediating effect that influenced the relationship between disruption orientation and firm resilience in the organization (H2). In order to measure the mediating effect of proactive risk management on the relationship between disruption orientation and firm resilience, we used the PROCESS macro Model 4 in SPSS by Hayes (2013). This macro has become widely used by researchers interested in testing their hypotheses where mediation is studied (Hayes & Rockwood, 2017).

We also wanted to look at the moderating role of industry competition in the relationship between disruption orientation and firm resilience (H3). A moderating variable is a variable that “influences the nature (e.g., magnitude and/or direction) of the effect of an antecedent on an outcome” (Aguinis et al., 2017, p. 666). To test this hypothesis, we also used the PROCESS macro by Hayes (2013) in SPSS. However, since this is a moderation analysis rather than a mediation analysis, Model 1 was utilized.

3.5.3 Control variables & demographics

Our study contains control variables, which have been employed to eliminate their impact or influence on the association between the variables being studied (Bernerth & Aguinis, 2015). The control variables in this study are firm size, industry category, and gender. We have included firm size as a control variable, due to previous studies demonstrating that larger firms possess more resources which may assist them in overcoming disruptions (Baghersad & Zobel, 2022). Industry category is also included as the effects of the pandemic varied significantly between different industries (Li et al., 2022). Lastly, gender is another control variable included in our study, as gender and other demographic characteristics can potentially impact the resilience of firms (Kim, 2020). A study investigating organizational resilience of cultural institutions during Covid-19

found that male respondents gave relatively higher ratings to firm resilience (Boyce, 2021).

The results of our survey indicate that the sample population encompasses a diverse range of firm sizes. The most represented firm size was large companies (> 250 employees), constituting 47.2% of the total sample. Medium-sized companies (50-249 employees) account for 32.4% of the respondents, while small (10-49 employees) and micro (1-9 employees) companies represent 10.6% and 9.9%, respectively. A wide range of industries are represented by the participants (Appendix 3). Notably, the most represented sectors include banking and finance (17.6%), insurance (15.5%), information and communication technology (9.2%), and retail and wholesale trade (8.5%). The results also show a male overrepresentation with 70.2% of respondents being male and 29.8% being female. Only 30.7% of the sample reported having personnel responsibility, with the remaining 69.3% not holding such responsibilities.

3.6 Ethical considerations

In evaluating the ethical implication of our research, we are following Diener and Crandall's (1978) guidelines. The first guideline pertains to the possible harm that a study may have upon its participants. Such harm can manifest in various forms, including physical, psychological, social, or legal implications (Bhandari, 2022). Although it's difficult to identify all potential harms (Bell et al., 2019), we believe social harm is the most relevant risk in our study. This is because disclosing participant responses could have negative repercussions for both the individual and the company. To reduce the risk of social harm, we implemented several measures to ensure the respondent's anonymity. Firstly, we refrained from collecting identifiable personal information such as name, email, age, position, or company name. Secondly, we activated the *anonymize response* function in Qualtrics, which prevented the recording of identifiable information like IP address and location data. Thirdly, the questionnaire was published on social media platforms and accessible to everyone. Therefore, due to the reach of the survey, anonymity was enhanced. Finally, we solely present responses in aggregate form in the final version of the thesis and do not grant access to individual responses.

The second guideline involves insufficiently informed consent, which occurs when participants do not receive enough information to make an informed

decision about their involvement in the research (Bell et al., 2019). To ensure that participants were fully informed, we took several measures. Firstly, we provided a brief and precise description of the study on the front page of the questionnaire. Additionally, we included our contact information on the front page, enabling potential participants to reach out to us in case of any inquiries. Notably, no participants contacted us, indicating that the information was sufficiently comprehensive. We also included a feature where participants actively had to consent to be a part of the study, thereby ensuring that each participant made an informed and deliberate decision. A copy of the information note is provided in Appendix 1.

The third ethical guideline is invasion of privacy. While this principle is closely intertwined with informed consent, it differs by the fact that the participants should have the opportunity to skip or not answer questions (Bell et al., 2019). As mentioned, the participants needed to provide their consent to participate in the study. Additionally, they were also able to withdraw from the survey at any point in time. Our findings indicate that 54 participants did not complete the survey, signifying that it is plausible that they may have felt uncomfortable or uneasy in responding to certain questions.

The final ethical guideline is preventing deception, which can arise when researchers misrepresent the study and its objectives, resulting in participants being misled into participating based on false information (Bell et al., 2019). In our study, we ensured that this principle was not violated by providing accurate and truthful information about the research. The participants' responses were only used for the intended purpose and were not employed for any other purposes.

Additionally, to ensure compliance to the ethical principles of anonymity and privacy, we consulted the Norwegian Center for Research Data (NSD). After careful consideration of the information gathered and the broad categories of the questions in the survey, it was determined that none of the respondents could be identified, thereby safeguarding their anonymity. Accordingly, registration of the study with the NSD was deemed unnecessary. Lastly, to further protect participant privacy, the questionnaire will be permanently deleted on August 15th 2023.

4. Results

Table 8 presents an overview of the results of our study, indicating which of our hypotheses were supported and which were not. While this table provides an initial understanding of our principal findings, we will delve into a more comprehensive analysis in the subsequent subsections for a thorough interpretation.

| Summary of results | | |
|--------------------|--|---------------|
| Hypothesis | Description | Result |
| H1 | Disruption orientation has a positive association with firm resilience | Supported |
| H2 | Proactive risk management mediates the relationship between disruption orientation and firm resilience | Not supported |
| H3 | Industry competition moderates the relationship between disruption orientation and firm resilience | Not supported |
| H4 | Financial capital has a positive association with firm resilience | Supported |
| H5 | Diversified income stream has a positive association with firm resilience | Supported |

Table 8: Summary of results

4.1 Descriptive statistics

Prior to combining the sets of items into constructs to test the hypotheses, we performed descriptive statistics on all items to examine the descriptives of the dataset. To streamline the data analysis, we rescaled the 1-7 Likert scales to a 1-5 scale. Table 9 shows the mean, mean standard error, and standard deviation of all items in the study. The mean represents the average value of the dataset, the mean standard error tells us how precise the estimate of the mean is, and the standard deviation indicates the spread of the data points deviating from the mean (Altman & Bland, 2005). These items will be used to construct the following variables: Firm Resilience (FR), Disruption Orientation (DO), Proactive Risk Management (PRM), Industry Competition (IC), Financial Capital (FC), and Diversified Income Stream (DIS). According to Table 9, all means are above 3 on the Likert scale, and none of the items exhibit a high standard deviation, suggesting relative data clustering around the mean.

| | | Variables and Descriptive Statistics | | |
|---------------------------|--|--------------------------------------|----------------|--------------------|
| Variable | Items | Mean | | |
| | | Mean | Standard Error | Standard deviation |
| Firm Resilience | We are able to cope with changes in our business brought on by sudden disruptions. | 4,17 | 0,07 | 0,73 |
| | We are able to easily adapt our business operations to a sudden disruption. | 3,94 | 0,08 | 0,80 |
| | We are able to provide a quick response to the negative effects of a sudden disruption on our business. | 3,84 | 0,08 | 0,78 |
| Disruption Orientation | We feel the need to be alert for possible disruptions at all times. | 3,64 | 0,08 | 0,89 |
| | Disruptions show us where we can improve. | 3,95 | 0,07 | 0,71 |
| | We recognize that disruptions are always looming. | 3,59 | 0,09 | 0,94 |
| | We think a lot about how a disruption could have been avoided. | 3,19 | 0,09 | 0,94 |
| | After a disruption has occurred, it is analyzed thoroughly. | 3,56 | 0,09 | 0,97 |
| Proactive Risk Management | We had strong measures that helped us cope with disruptions from the Covid-19 pandemic. | 3,73 | 0,09 | 0,96 |
| | We had comprehensive management plans and processes in place to respond to the effects of covid. | 3,24 | 0,10 | 1,07 |
| | We regularly consulted with the industry and authorities about the "way ahead" and planned our work accordingly. | 3,77 | 0,09 | 0,98 |
| Industry Competition | The business climate for the final product(s)/service(s) is very competitive. | 3,99 | 0,09 | 0,93 |
| | Anything that one competitor can offer others can match readily. | 3,41 | 0,10 | 1,09 |
| | Competition in this industry is cutthroat. | 3,32 | 0,09 | 0,98 |
| | Winning in this marketplace is a tough battle. | 3,73 | 0,10 | 1,04 |
| Financial Capital | The firm's financial position was stable and secure prior to the Covid-19 pandemic. | 4,18 | 0,08 | 0,86 |
| | The firm's financial position was stable and secure during the Covid-19 pandemic. | 3,97 | 0,10 | 1,05 |
| | The firm's financial capital is well managed and optimized for maximum return. | 3,77 | 0,10 | 1,00 |
| Diversified Income Stream | The firm has a variety of different revenue sources. | 3,42 | 0,11 | 1,15 |
| | The firm has a balanced distribution of income across its revenue sources. | 3,26 | 0,11 | 1,10 |

Table 9: Variables and Descriptive Statistics

Internal consistency of the constructs has been measured, showing that all Cronbach's alpha are equal to or above 0.60 (Table 10) in our dataset. Although an alpha of 0.70 or above is typically indicative of internal consistency (Tavakol & Dennick, 2011), Malhotra (2010) posits that an alpha exceeding 0.60 is still indicative of acceptable reliability. With all constructs surpassing 0.60 and most exceeding 0.70, we deem all variables reliable.

| Chronbach's Alpha | | | | | | |
|-------------------|------------------------|---------------------------|----------------------|-------------------|---------------------------|------|
| Firm Resilience | Disruption Orientation | Proactive Risk Management | Industry Competition | Financial Capital | Diversified Income Stream | |
| 0,82 | 0,60 | 0,69 | 0,77 | 0,77 | | 0,79 |

Table 10: Cronbach's Alpha

Examination of the construct correlations (Table 11) reveals a very weak to weak relationship between the variables (Moore et al., 2013). This indicates some degree of association between them, although there is no strong correlation between any pair. We also note that all variables have a positive correlation, meaning they all move in the same direction when amended. This can imply that there is not only one construct that is solely responsible for driving the outcome of our study. Instead, it is more likely that there is a combination of variables and factors.

Correlations

| | Firm Resilience | Disruption Orientation | Proactive Risk Management | Industry Competition | Financial Capital | Diversified Income Stream |
|----------------------------------|------------------------|-------------------------------|----------------------------------|-----------------------------|--------------------------|----------------------------------|
| Firm Resilience | 1 | | | | | |
| Disruption Orientation | 0,21 | 1 | | | | |
| Proactive Risk Management | 0,26 | 0,45 | 1 | | | |
| Industry Competition | 0,12 | 0,18 | 0,11 | 1 | | |
| Financial Capital | 0,28 | 0,23 | 0,27 | 0,33 | 1 | |
| Diversified Income Stream | 0,22 | 0,28 | 0,23 | 0,28 | 0,37 | 1 |

Table 11: Correlations

Upon analyzing the items individually, we also evaluated the mean, standard error of the mean, standard deviation, and the 95% confidence interval of the finalized constructs (Table 12). By examining these statistical measures, we can gain a more comprehensive understanding of the relationship between the different variables and evaluate the strength and significance of the relationship between them.

Mean, Mean Standard Error, Standard Deviation, & 95% Confidence Interval

| Variable | Mean | Mean Standard Error | Standard deviation | 95% Confidence Interval |
|----------------------------------|-------------|----------------------------|---------------------------|--------------------------------|
| Firm Resilience | 3,99 | 0,06 | 0,66 | 3,86 - 4,11 |
| Disruption Orientation | 3,59 | 0,05 | 0,56 | 3,48 - 3.69 |
| Proactive Risk Management | 3,58 | 0,08 | 0,79 | 3.43 - 3.73 |
| Industry Competition | 3,61 | 0,07 | 0,78 | 3.46 - 3.76 |
| Financial Capital | 3,98 | 0,08 | 0,81 | 3.82 - 4.13 |
| Diversified Income Stream | 3,34 | 0,10 | 1,02 | 3.15 - 3.53 |

Table 12: Mean, Mean Standard Error, Standard Deviation, & 95% Confidence Interval

4.2 Firm resilience

We assessed the FR construct using three statements (Table 2). As shown in Table 9, the means indicate that organizations' employees perceive that they are able to cope with changes brought on by sudden disruptions (4.17), that they easily adapted the business operations to the disruption (3.94), and that they provided a quick response to the negative effects (3.84). Further, the mean for FR was 3.99, with a mean standard error of 0.06. The low level of mean standard deviation

suggests minimal variation in responses. The standard deviation of 0.66 indicates a relatively low spread of responses, suggesting that there is a degree of agreement among participants regarding the perceived level of FR. Further, the 95% confidence interval ranged from 3.86 to 4.11.

4.3 Disruption orientation

4.3.1 Analysis of DO's association with FR (H1)

Measuring the construct of DO, we posed five statements (Table 3). As per Table 9, the means suggest that organizations' employees perceive that they feel the need to be alert for disruptions at all times (3.64), that disruptions show them where to improve (3.95), that they recognize that disruptions are always looming (3.59), that they analyze the disruption thoroughly after it has happened (3.56). However, we note a lower score in whether the organization thinks a lot about how a disruption could have been avoided (3.19). Standard deviation scores low on the statement regarding disruptions showing the organization where they can improve (0.71). However, the standard deviation scores for all other statements are notably higher, ranging from 0.89 to 0.97, signifying a greater spread in the responses. Table 12 shows a mean DO score of 3.59, with a 95% CI [3.48 - 3.69].

Analysis of Disruption Orientation's Association with Firm Resilience

| Model Summary | R-squared | Adjusted R-squared |
|---------------|-----------|--------------------|
| | 0,042 | 0,033 |

| Coefficients | Unstandardized B | Std. Error | Standardized B | t | Sig. |
|------------------------|------------------|------------|----------------|-------|-------|
| (Constant) | 3,108 | 0,409 | | 7,602 | 0,001 |
| Disruption Orientation | 0,244 | 0,113 | 0,205 | 2,17 | 0,032 |

a. Dependent Variable: Firm Resilience

Table 13: Analysis of DO's Association with FR

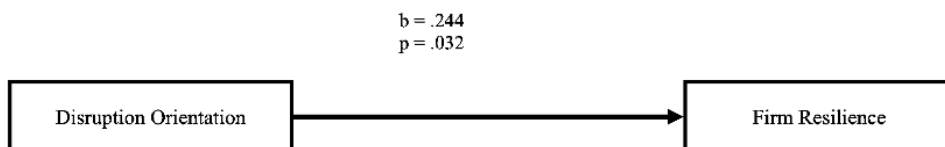


Figure 6: Analysis of DO's Association with FR

In the correlation matrix (Table 11), a weak positive correlation (0.21) exists between DO and FR. This suggests that FR tends to increase as DO increases, but

the relationship is not very strong. A simple linear regression model (Table 13) reveals an R-squared of 4.2% and an adjusted R-squared of 3.3%, signifying a small proportion of variance in FR is explained by DO. This suggests that the model may not be a good fit. Nevertheless, a statistically significant standardized beta (0.205) and p-value (0.032) from the simple linear regression analysis conclude H1 to be statistically significant.

4.3.2 Analysis of the mediating effect caused by PRM on FR (H2)

Measuring the construct of PRM we posed three statements (Table 4). Table 9 shows that organizations' employees perceive that their organization had strong measures that helped cope with disruptions from the Covid-19 pandemic (3.73) and that they regularly consulted with the industry and authorities about the “way ahead” and planned their work accordingly (3.77). On the other hand, a lower score was recorded on whether they had comprehensive management plans and processes in place to respond to the effects of Covid-19 (3.24). We also note that the standard deviation for all statements was ranging from 0.96 to 1.07. Further, table 12 reports a mean score of 3.58 for PRM, with a 95% CI [3.43 - 3.73].

Mediation by Proactive Risk Management

| Outcome Variable: Proactive Risk Management | | | | Adjusted R-squared | | |
|--|-----------------|--------------------------|-------------|---------------------------|--|--|
| | Sample size | R | R-squared | | | |
| Model summary: | 109,00 | 0,4544 | 0,2064 | 0,1979 | | |
| | Coefficient (b) | Mean Standard Error (SE) | t-value (t) | p-value (p) | Lower Limit Confidence Interval (LLCI) | Upper Limit Confidence Interval (ULCI) |
| Disruption Orientation | 0,6471 | 0,1226 | 5,2761 | 0,0000 | 0,4039 | 0,8902 |

| Outcome Variable: Firm Resilience | | | | Adjusted R-squared | | |
|--|-----------------|--------------------------|-------------|---------------------------|--|--|
| | Sample size | R | R-squared | | | |
| Model summary: | 109,00 | 0,2797 | 0,0782 | 0,0659 | | |
| | Coefficient (b) | Mean Standard Error (SE) | t-value (t) | p-value (p) | Lower Limit Confidence Interval (LLCI) | Upper Limit Confidence Interval (ULCI) |
| Disruption Orientation | 0,1291 | 0,1246 | 1,0361 | 0,3025 | -0,1179 | 0,3762 |
| Proactive Risk Management | 0,1782 | 0,0875 | 2,0362 | 0,0442 | 0,0047 | 0,3517 |

| Indirect Effects of X on Y | Effect | BootSE | BootLLCI | BootULCI |
|-----------------------------------|--------|--------|----------|----------|
| Indirect Effect | 0,1153 | 0,0764 | -0,0171 | 0,2844 |

Table 14: Mediation by PRM

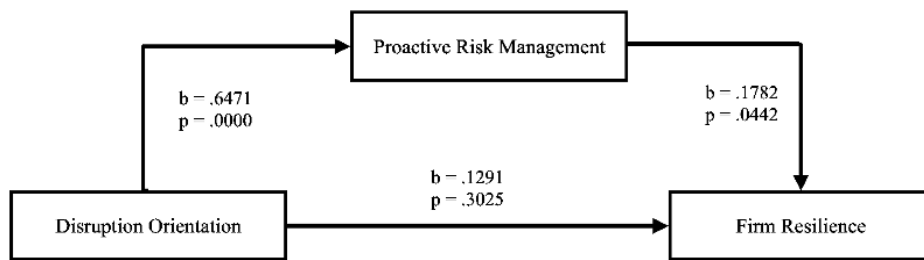


Figure 7: Mediation by PRM

Table 11 reveals a moderate correlation between DO and PRM (0.45). It also shows a weak correlation between PRM and FR (0.26). Table 14 shows that DO explains 20.64% of the variance in PRM, meaning that companies that are more disruption oriented are more likely to engage in PRM activities. The adjusted R-squared is 19.79%, indicating a reduced variance when adjusting for sample size. This means that the model is a relatively good fit. The results further indicate, based on the adjusted R-squared value, that DO and PRM together explain 6.59% of the variance in FR, meaning that companies who are both disruption oriented and engaged in PRM activities are more likely to be resilient in the face of disruptions. However, DO does not have a significant direct effect on FR in this analysis ($b = 0.1291$, $p = 0.3025$). Moreover, the indirect effect of DO on FR through PRM is not significant ($b = 0.1153$, 95% CI [-0.0171, 0.2844]). In contrast, the effect of DO on PRM is significant ($b = 0.6471$, $p = 0.0000$), suggesting that an increase in DO is likely to lead to an increase in PRM. However, the indirect effect of DO on FR through PRM is not statistically significant at the 95% confidence level, and H2 is consequently not supported. Furthermore, the direct relationship between DO and FR is not statistically significant when controlling for PRM. As a result, we are not able to conclude that PRM mediates the relationship between DO and FR.

4.3.3 Analysis of the moderating effect caused by IC (H3)

Measuring the construct of IC, we posed four statements (Table 5). Table 9 reports means suggesting that organizations' employees perceive the business climate for the final product(s)/service(s) to be very competitive (3.99) and that winning in the marketplace is a tough battle (3.73). However, the notion that anything one competitor can offer, others can match readily garnered a somewhat lower mean score (3.41). Similarly, the assertion that competition in the industry

is cutthroat obtained a lower score (3.32). The standard deviation for all statements ranges from 0.93 to 1.09, which is relatively high. Table 12 indicates a mean score of 3.61 for IC, with a 95% CI [3.46 - 3.76].

Moderation by Industry Competition

| Outcome Variable: Firm Resilience | | Sample size | R | R-squared | Adjusted R-squared | | |
|-----------------------------------|-----------------|--------------------------|-------------|-------------|--|--|--|
| Model summary: | | 109,00 | 0,2411 | 0,0581 | 0.0312 | | |
| | Coefficient (b) | Mean Standard Error (SE) | t-value (t) | p-value (p) | Lower Limit Confidence Interval (LLCI) | Upper Limit Confidence Interval (ULCI) | |
| Constant | 3.9941 | 0,0633 | 63,1405 | 0,0000 | 3,8686 | 4,1195 | |
| Disruption Orientation | 0,2312 | 0,1147 | 2,0151 | 0,0465 | 0,0037 | 0,4586 | |
| Industry Competition | 0,0458 | 0,0886 | 0,5167 | 0,6065 | -0,1299 | 0,2215 | |
| Interaction term | -0,1234 | 0,1313 | -0,9392 | 0,3498 | -0,3838 | 0,1371 | |

Table 15: Moderation by IC

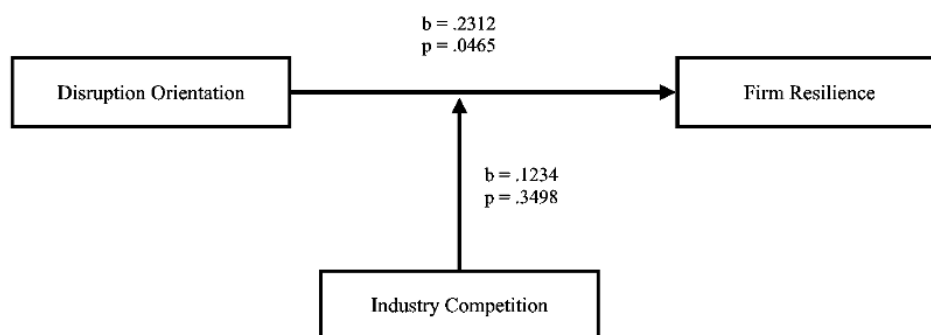


Figure 8: Moderation by IC

The correlation matrix (Table 11) suggests a slight positive correlation between IC and both DO (0.18) and FR (0.12). This insinuates that businesses operating in more competitive environments might lean more towards DO and exhibit higher resilience, although these relationships are relatively weak. This moderation analysis was performed using a regression model featuring an interaction term between DO and IC. According to the model, the R-squared value suggests that the model accounts for 5.81% of the variance in FR. Yet, when adjusted for sample size and the number of predictors, the R-squared value drops to 3.12%, implying that the model explains a modest portion of the variance in FR. The lower value of the adjusted R-squared could be attributed to the introduction of a moderating variable, complicating the interpretation of the relationship between the independent and dependent variables. In this case, the effect of DO on FR depends on the level of IC, introducing an additional layer of complexity to the model. The interaction term's coefficient points towards a negative moderation effect (-0.1234). However, the overall model lacks statistical significance, as

indicated by an F-statistic of 2.1596 and a p-value of 0.097. Moreover, the interaction term between DO and IC is statistically insignificant, with a p-value of 0.3498 and a confidence interval ranging from -0.3838 to 0.1371. Therefore, we find no evidence to support the hypothesis that IC moderates the relationship between DO and FR since both the overall model and the interaction term is deemed non-significant.

4.4 Analysis of FC's association with FR (H4)

Measuring the construct of FC, we posed three statements (Table 6). Table 9 shows that means indicate that organizations' employees perceive their firm's financial position to be stable and secure prior to the Covid-19 pandemic (4.18), that the firm's financial position was stable and secure during the Covid-19 pandemic (3.97), and that the firm's FC is well managed and optimized for maximum returns (3.77). High standard deviations for the last two measures (1.05 and 1.00, respectively) highlighting variability in responses. Looking at Table 12, we see that the mean for FC is 3.98, with a 95% CI [3.82 - 4.13].

Analysis of Financial Capital's Association with Firm Resilience

| Model Summary | R-squared | Adjusted R-squared |
|---------------|-----------|--------------------|
| | 0,081 | 0,072 |

| Coefficients | Unstandardized B | Std. Error | Standardized B | t | Sig. |
|------------------------|------------------|------------|----------------|-------|-------|
| (Constant) | 3,055 | 0,309 | | 9,886 | 0,001 |
| Disruption Orientation | 0,234 | 0,076 | 0,284 | 3,069 | 0,003 |

a. Dependent Variable: Firm Resilience

Table 16: Analysis of FC's Association with FR

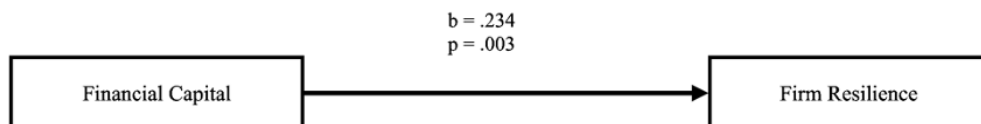


Figure 9: Analysis of FC's Association with FR

Our correlation matrix (Table 11) reveals a moderate positive correlation (0.28) between FC and FR, suggesting that financially stronger firms could be more resilient. A simple linear regression model demonstrated that FC accounts for 8.1% of the variance in FR. This value slightly overstates the relationship,

dropping to 7.2% when adjusted for sample size. Hence, the model may be considered a reasonable fit. Nonetheless, with a standardized beta coefficient of 0.284 and a p-value of 0.003, we found significant evidence supporting that H4 is statistically significant.

4.5 Analysis of DIS's association with FR (H5)

Measuring the construct of DIS we posed two statements (Table 7). Table 9 shows that means indicate that organizations' employees perceive their firm to have various revenue sources (3.42) and that the firm has a balanced income distribution across its revenue sources (3.26). Notably, high standard deviations are recorded for both measures (1.15 and 1.10, respectively), which highlight variability in responses. Looking at Table 12, we can also see that the mean for DIS is 3.34, with a 95% CI [3.15 - 3.53].

Analysis of Diversified Income Stream's Association with Firm Resilience

| Model Summary | R-squared | Adjusted R-squared |
|---------------|-----------|--------------------|
| | 0,048 | 0,039 |

| Coefficients | Unstandardized B | Std. Error | Standardized B | t | Sig. |
|------------------------|------------------|------------|----------------|-------|-------|
| (Constant) | 3,51 | 0,213 | | 16,45 | 0,001 |
| Disruption Orientation | 0,142 | 0,061 | 0,22 | 2,328 | 0,022 |

a. Dependent Variable: Firm Resilience

Table 17: Analysis of DIS's Association with FR

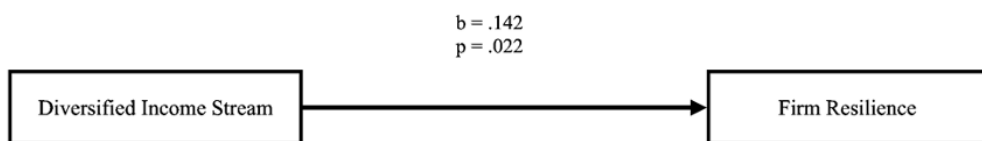


Figure 10: Analysis of DIS's Association with FR

The correlation matrix (Table 11) revealed a positive correlation (0.22) between DIS and FR, suggesting that firms with more diversified income streams tend to be more resilient. Further, a simple linear regression model showed that DIS explained 4.8% of the variance in FR. However, this dropped to 3.9% when adjusted for sample size, proving that the model might not be a good fit. Despite this, a positive relationship was found with a standardized beta of 0.22 and a p-value of 0.022, supporting H5.

4.6 Multiple regression analysis

Analysis of Disruption Orientation, Financial Capital, and Diversified Income Stream's Association with Firm Resilience

| Model Summary | R-squared | Adjusted R-squared |
|---------------|-----------|--------------------|
| | 0,111 | 0,085 |

| ANOVA | df | F | Sig. |
|------------|-----|------|--------|
| Regression | 3 | 4,35 | 0,006b |
| Residual | 105 | | |
| Total | 108 | | |

a. Dependent Variable: Firm Resilience

b. Predictors: (Constant), Diversified Income Stream, Disruption Orientation, & Financial Capital

| Coefficients | Unstandardized B | Std. Error | Standardized B | t | Sig. |
|---------------------------|------------------|------------|----------------|-------|-------|
| (Constant) | 5,51 | 0,454 | | 5,534 | 0,001 |
| Disruption Orientation | 0,15 | 0,115 | 0,126 | 1,303 | 0,195 |
| Financial Capital | 0,179 | 0,082 | 0,218 | 2,177 | 0,032 |
| Diversified Income Stream | 0,067 | 0,066 | 0,104 | 1,021 | 0,31 |

a. Dependent Variable: Firm Resilience

Table 18: Multiple Regression Analysis

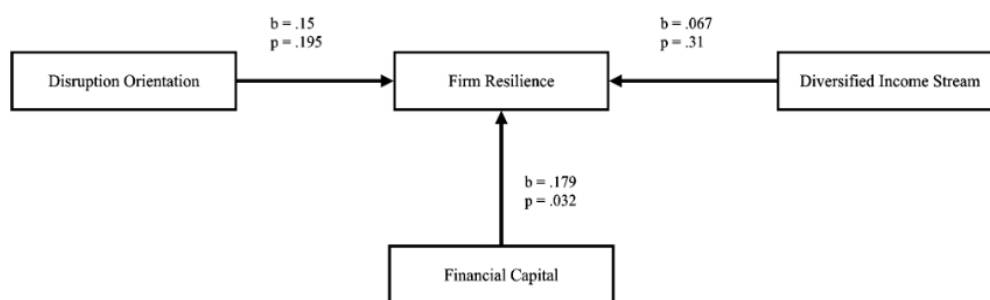


Figure 11: Multiple Regression Analysis

When examining all independent variables using a multiple regression analysis, we obtained different results compared to the previous subchapters where simple regression analysis was conducted. The difference can arise due to confounding factors (Johnston et al., 2017) or shared variance (Nathans et al., 2012) among independent variables. While the simple regression analyses deemed H1, H4, and H5 statistically significant, only H4 retained significance in the multiple regression analysis. This suggests that H4 holds up better when controlling for other variables.

A multiple regression analysis helps us understand the relationship between the independent variables while also controlling for other relevant factors. Hence, even though these three hypotheses are all deemed statistically significant in a simple regression analysis, it becomes evident that H4 stands strongest statistically when controlling for other relevant factors. It is also interesting to look at the standardized beta as it allows for comparison of the relative importance

of all the predictors in the model. It then becomes evident that FC is the predictor with the highest relative importance (2.18) in the model. Additionally, when performing an ANOVA test, we find that the F-statistic is 5.35. The p-value of the model is 0.006 according to the ANOVA test, which suggests that the overall model is statistically significant. Further, the R-squared indicates that the model can explain 11.1% of the variance in FR. However, after accounting for the number of predictors and sample size, we get an adjusted R-squared showing that 8.5% of the variance in FR is explained by the model.

5. Discussion

The results of this study suggest that there is a positive association between disruption orientation and firm resilience (H1), indicating that firms with a stronger disruption orientation exhibit higher levels of resilience. These findings are consistent with prior research suggesting that disruption-oriented firms are better equipped to identify and prepare for potential disruptions, leading to a reduced impact when such events occur (Bode et al., 2011; Yu et al., 2019; Laguir et al., 2022). The identified association implies that disruption orientation is an important factor for firms seeking to enhance their resilience in the face of an increasingly uncertain and dynamic business environment. Even though H1 is significant when analyzed in a simple linear regression analysis, our results suggest that it is non-significant when controlling for confounding variables and comparing effects from the other independent variables in this thesis. Our results indicate that there is a positive association between firm resilience, financial capital, and diversified income stream. Since these are positively related, it is possible that the effect of disruption orientation is being covered by the effect of these variables. This means that while a firm's ability to anticipate and prepare for potential disruptions is important for building resilience, it is far from the only factor influencing organizational resilience.

However, our hypothesis about the mediating role of proactive risk management (H2) were not supported by our data, which were contrary to our expectations and previous research (Parker & Ameen, 2018). Marc Siegel (2018) deemed resilience to be gained when a proactive, enterprise-wide strategy to risk management has been adopted by the entire firm. In our research, proactive risk management did not mediate the relationship between disruption orientation and firm resilience in a significant way. This result suggests that the relationships between these variables

may be more complex than initially thought, or that other factors not considered in our study could influence these relationships. One possible explanation is that the questions about the involved constructs, disruption orientation and proactive risk management, were not formulated well enough in order to capture the nuance of the variable. Looking at the reliability of the disruption orientation and proactive risk management constructs, we see that the Cronbach's alpha is 0.60 and 0.69, respectively. Consequently, as both constructs register scores below 0.7, it is often interpreted as an absence of strong internal consistency. However, this explanation is contradicted by previous research that used similar questions and reached different conclusions. Thus, the reason for different results could be due to the difference in sample size and sample population.

Additionally, the moderating role of industry competition (H3) was not supported. This meant that our study did not find evidence to support our hypothesis that industry competition did not significantly alter the relationship between disruption orientation and firm resilience. One potential explanation for not finding a significant result in the moderating role of industry competition (H3) could be a small sample size, which is described as one common reason for not detecting moderators in research (Cohen & Cohen, 1983; Cohen 1988).

The results of this study supported our hypothesis that financial capital (H4) and diversified income stream (H5) are positively associated with firm resilience. Notably, financial capital emerged as the most robust predictor of firm resilience in our analysis. This supports the Gittel et al. (2006) study, which argued that the ability to maintain adequate financial reserves played a crucial role in organizations' ability to withstand crises. Unlike disruption orientation and diversified income stream, financial capital remained significant in the multiple regression analysis. This emphasizes the vital role of financial resources in enabling firms to deal with disruptions and crises. Further, it aligns with previous research that suggests financial capital is an important capability within firm resilience (Awazi & Quandt, 2021; Wieczorek-Kosmala, 2022). What we can derive from these results is that having access to capital and other assets can equip companies with the necessary resources to increase efficiency and maximize profits (Saalmuller, 2022).

As mentioned, diversified income stream is also a capability that is proven to be vital for improving or building an organization's resilience. By implementing a diversified income stream strategy, firms can reduce their reliance on one market

or product, thereby reducing their vulnerability to external shocks. The significant result for the positive association between diversified income stream and firm resilience (H5) also coincides with the idea that firms with diversified income streams were better positioned to adapt to the changes brought by the pandemic, showing the relevance of adaptation in resilience as noted by Mayar et al. (2022). Furthermore, the idea is supported in rural communities where, according to Wilson (2010), resilience can be strengthened through diversification of income streams.

6. Practical implications

This research has found financial capital to have a vital role in enabling companies to withstand disruptions. Companies must prioritize establishing a stable and secure financial position in order to achieve this. By doing so, organizations can reduce the impact of unexpected disruptions without experiencing significant financial strain. In addition to establishing a stable financial position, effective financial management is essential. This involves monitoring and analyzing financial data closely. By regularly evaluating financial performance, companies can identify areas for improvement, implement cost-cutting measures, and optimize their financial resources. Additionally, businesses must strive to maximize returns on financial capital, which involves saving capital that can be helpful in the event of disruptions.

We also found the importance of having a diversified income stream in successfully navigating disruptions. For organizations, this emphasizes the benefits of carrying multiple revenue sources and ensuring a balanced income distribution across these sources. By offering a variety of products or services catered to different market segments, companies can mitigate their dependence on any single sector. This strategic diversification not only diminishes vulnerability but also bolsters the company's resilience in the face of disruptions.

Lastly, we have identified disruption orientation as another crucial variable for successfully navigating a disruption. Being alert for disruptions at all times is crucial, meaning companies should have contingency groups and conduct continuous risk assessments to identify and address potential threats to business operations. By remaining alert and proactive, companies can effectively anticipate and respond to disruptions in a timely manner. A key aspect of disruption orientation involves learning from past disruptions and analyzing how the

company performed during such events. By reflecting on previous experiences, companies can identify valuable insights into their strengths, weaknesses, and areas for improvement. By adopting this approach, organizations can strengthen their resilience, improve their ability to navigate disruptions, and thus increase their chances of long-term success.

7. Conclusion

Disruptions are always looming and present themselves in various forms and magnitudes, as the Covid-19 pandemic has powerfully demonstrated on a global scale. Therefore, it is imperative to leverage such experiences for research to guide organizations in identifying capabilities that can assist them during future disruptions. Our research serves as a significant stepping-stone within the field of firm resilience and the focus on financial capital and diversification of income streams, particularly in the context of global disruptions. Due to our results yielding significant results, we establish the role of robust financial capital and diversified income streams in enhancing firm resilience, thereby deepening our understanding of how firms can effectively navigate disruptions. While many studies have focused on operational and strategic factors in building resilience, our research underscores the importance of financial health and revenue diversity, elements that have not been extensively explored in past studies. Hence, this work encourages a wider perspective of firm resilience, one that recognizes the multifaceted nature of an organization's ability to withstand and bounce back from disruptions. Our exploratory effort can contribute to a more comprehensive theoretical framework for firm resilience that hopefully can enable researchers to address disruption challenges from a well-rounded viewpoint. Further, our hypotheses regarding disruption orientation have been inspired by previous research. We can conclude that organizations embracing a more disruption-oriented approach can become more resilient. However, our research was not able to yield evidence to support the idea that proactive risk management mediates the relationship between disruption orientation and firm resilience. Likewise, we were unable to determine whether industry competition moderates this relationship. Due to the increasing frequency and magnitude of global disruptions, the urgency for explorations within the field of firm resilience have never been as urgent. An increased understanding can foster better equipped organizations in facing future

challenges, thereby making them more resilient which further contributes to a sustainable global economy.

8. Limitations and future research

This study overlooks the distinctions among departments within an organization, potentially introducing uncertainty concerning responses in general. It is reasonable to expect that organizational insights may diverge across departments, given that each has its unique understanding and focus on different aspects of business. By concentrating on respondents holding similar roles, such as managerial positions, the data obtained could offer a more accurate and nuanced picture. For future studies, it would be advantageous to precisely identify the roles of interest within the organizations being studied. In addition to this previous point, our study lacks precision regarding the targeted population. Although we gathered responses from a diverse range of employees with various characteristics, such as industry and gender, it would be beneficial for future research to narrow its focus to a specific industry. However, our decision to cast a wide net was motivated by a desire to achieve generalizability in our results. Given concerns about obtaining a sufficient sample size from a single industry, we opted for a more inclusive approach.

A higher number of respondents would be preferable, despite our sample size falling within the recommended range. While our study initially found H1, H4, and H5 significant, it is important to note that the significance of H1 and H5 was lost when conducting a multiple regression analysis. A higher sample size could also improve the chances of finding stronger support for our mediation and moderation analyses in H2 and H3. According to Bell et al. (2019), a larger sample size is essential for enhancing the generalizability of a heterogeneous sample due to the increased standard deviation. As our study draws from a diverse population (i.e. heterogeneous), it is logical to suggest that expanding our sample size would increase generalizability of the results in our thesis. To ensure the validity and reinforce the findings of this study, scholars should consider conducting similar studies with larger sample sizes. By increasing the sample size, we can obtain more robust and reliable results, thereby improving the generalizability of the findings to different contexts.

Another limitation of this research is connected to the chosen research design. Our priority in this study has been trying to express causal connections between

variables. However, a negative aspect of a cross-sectional design is that it is difficult to conclude whether the relationships found are in fact causal. As such, results are often limited to the conclusion of variables being positively or negatively associated (Bell et al., 2019). We will therefore recommend future researchers to investigate the same relationships but with other research methods. Different kinds of research methods will also help enhance our understanding of how these capabilities contribute to building a more resilient company. This can be accomplished by conducting in-depth interviews with managers, to explore the specific ways in which these capabilities are utilized. By delving into the underlying mechanisms and strategies that contribute to building a resilient company, such research would provide valuable insights, by hopefully finding effective approaches and providing knowledge for organizations seeking to enhance their resilience and thrive in the face of disruptions. Furthermore, conducting in-depth interviews could provide more detailed and specific information, enhancing the findings of quantitative research. This would help in gaining a comprehensive understanding of the topic by considering the context and nuances that quantitative data alone may not capture.

Another area that researchers could explore is the positive correlations observed among several variables, as indicated in Table 11. These include industry competition & financial capital, proactive risk management & disruption orientation, and financial capital & diversified income stream. Future research could delve deeper into this correlation, exploring the underlying factors and mechanisms and investigating whether there are any significant relationships between them. A more nuanced understanding of the relationship between these variables may be found by conducting additional analyses or utilizing complementary research methods, such as case studies or longitudinal studies.

Lastly, a valuable area for future research is to include a more detailed investigation of the financial performance of the specific company. This approach could reduce the level of potential biases or inaccuracies in the responses, thereby enhancing the credibility and validity of the research findings. The reason is because researchers can control how the specific company performed. To obtain this level of credibility, we would recommend directing inquiries regarding a company's financial performance to the finance department. By involving employees with expertise in financial matters, the collected data becomes more reliable, laying a solid foundation for drawing well-founded conclusions and

making informed recommendations. The expertise and insights provided by the finance department professionals can greatly contribute to the quality of the research, ultimately increasing its overall value and impact.

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10. Appendix

Appendix 1: Survey questions

Introduction to the questionnaire:

We would like to express our gratitude for your participation in this study as a part of our master's thesis at BI Norwegian Business School.

Our research aims to examine the capabilities that enable firms to effectively respond to disruptions, with a specific focus on the Covid-19 pandemic and how companies have managed the situation.

The questionnaire should take approximately 5 minutes to complete and all responses will be kept strictly confidential and anonymous. Your valuable input will greatly enhance the validity and depth of our findings.

Should you have any questions or concerns, please do not hesitate to reach out to Torger Dyrnes or Herman Rognaldsen via email at torger.dyrnes@hotmail.com or hermanrognaldsen@gmail.com.

Thank you again for your contribution to our study.

Please confirm your consent for participation, and proceed.

- I consent
- I do not consent

Introductory Questions

Firm size (number of employees)

- 1-9 (Micro company)
- 10-49 (Small company)
- 50-249 (Medium company)
- >250 (Large company)

Industry category of the firm

- Banking and finance
- Insurance
- Consulting
- Recruitment and human resources
- Oil, gas & energy
- Transportation and logistics
- Retail and wholesale trade
- Healthcare
- Information and communication technology
- Shipping
- Education
- Law
- Other

Your gender

- Male
- Female
- Other

Do you have personnel responsibility?

- Yes
- No

Part. 1 - Firm Resilience

Firm resilience is the ability to withstand and recover from unanticipated events such as disruptions, crises, or shocks. The term includes a firm's capacity to maintain its operations, adapt to changes, and ensuring its long-term success.

How would you rate your company on the following statements regarding firm resilience?:

| | Strongly Disagree | Disagree | Neutral | Agree | Strongly agree |
|---|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| We are able to cope with changes in our business brought on by sudden disruptions. | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| We are able to easily adapt our business operations to a sudden disruption. | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| We are able to provide a quick response to the negative effects of a sudden disruption on our business. | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

Part. 2 -Disruption Orientation

Disruption orientation, which is characterized by the capacity to adapt quickly to change, is a proactive mindset and approach to accepting and adapting to disruptive events as opportunities for growth and innovation.

How would you rate your company on the following statements regarding disruption orientation?

| | Strongly Disagree | Disagree | Neutral | Agree | Strongly agree |
|---|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| We feel the need to be alert for possible disruptions at all times. | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Disruptions show us where we can improve. | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| We recognize that disruptions are always looming. | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| We think a lot about how a disruption could have been avoided. | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| After a disruption has occurred, it is analyzed thoroughly. | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

Part. 3 - Proactive Risk Management

Proactive risk management is the systematic process of identifying, assessing, and prioritizing potential risks and implementing strategies to mitigate or avoid their negative impact on an organization.

How would you rate your company on the following statements regarding proactive risk management?

| | Strongly Disagree | Disagree | Somewhat Disagree | Neutral | Somewhat Agree | Agree | Strongly Agree |
|--|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| We had strong measures that helped us cope with disruptions from the Covid-19 pandemic. | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| We had comprehensive management plans and processes in place to respond to the effects of covid. | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| We regularly consulted with the industry and authorities about the "way ahead" and planned our work accordingly. | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

Part. 4 - Industry Competition

The purpose of this section is to analyze the industry's competitiveness.

How would you rate your company on the following statements regarding industry competition?

| | Strongly Disagree | Disagree | Neutral | Agree | Strongly agree |
|---|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| The business climate for the final product(s)/service(s) is very competitive. | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Anything that one competitor can offer others can match readily. | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Competition in this industry is cutthroat. | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Winning in this marketplace is a tough battle. | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

Part. 5 Financial Capital and Part. 6 Diversified Income Stream

Financial capital refers to the resources that an organization has available for investment and growth, while diversified income streams refer to having multiple sources of revenue, reducing the dependence on a single source of income and increasing overall financial stability and resilience.

How would you rate your company on the following statements regarding financial capital and income stream?

| | Strongly Disagree | Disagree | Neutral | Agree | Strongly agree |
|---|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| The firm's financial position was stable and secure prior to the Covid-19 pandemic. | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| The firm's financial position was stable and secure during the Covid-19 pandemic. | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| The firm's financial capital is well managed and optimized for maximum return. | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| The firm has a variety of different revenue sources. | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| The firm has a balanced distribution of income across its revenue sources. | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

Appendix 2: LinkedIn and Facebook post

“We are in need of your assistance!

The time has come to gather data for our master thesis! My master thesis companion, and myself are investigating firm resilience during Covid-19. We aim to investigate capabilities that enable firms to effectively cope with disruptions by looking at how various companies reacted and responded to the Covid-19 disruption.

We would be extremely grateful for your participation in this study, as it would provide us with valuable data to better understand how different companies coped with the Covid-19 disruption. Your input will be kept confidential and anonymous, and the survey will take no more than 5 minutes of your time.

More responses mean more accurate results, so please share the questionnaire with your network to help us gather data. Thank you for your support!”

Appendix 3: Industry category distribution

| Industry category distributions | |
|--|--------------------------|
| <i>Industry</i> | <i>Percentage</i> |
| Banking and finance | 17,60 % |
| Insurance | 15,50 % |
| Information and communication technology | 9,20 % |
| Retail and wholesale trade | 8,50 % |
| Consulting | 8,50 % |
| Oil, gas & energy | 7,04 % |
| Healthcare | 7,04 % |
| Education | 6,30 % |
| Recruitment and human Resources | 3,50 % |
| Law | 2,11 % |
| Shipping | 1,41 % |
| Transportation and logistics | 1,41 % |
| Other | 12,00 % |

| Gender distributions | |
|-----------------------------|--------------------------|
| <i>Gender</i> | <i>Percentage</i> |
| Male | 70,20 % |
| Female | 29,80 % |

| Firm size distribution | |
|-------------------------------|--------------------------|
| <i>Firm size</i> | <i>Percentage</i> |
| Micro (1-9) | 9,90 % |
| Small (10-49) | 10,60 % |
| Medium-sized (50-249) | 32,40 % |
| Large (>250) | 47,20 % |