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How do dynamic capabilities affect MNEs' profit resilience to exogenous shocks?

A study investigating multinational firms' ability to maintain performance post the COVID-19 pandemic through the lens of the dynamic capabilities framework

by

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Abstract

This thesis investigates the impact of dynamic capabilities (DC) on multinational enterprises' (MNE) ability to maintain and recover performance amidst shock, which is defined as *profit resilience* in this paper. In a world where exogenous shocks are increasing in frequency, research that explores the driving forces behind tackling disruption is more relevant than ever. This paper focuses on the COVID-19 pandemic using data from the years 2019 and 2021. The study employed a quantitative research design with a deductive approach, it analyzes data from large firms across various industries. Key variables included international exposure, innovation capabilities, financial flexibility, and asset flexibility, operationalized as proxies to DC capabilities via financial data. Our findings suggest that MNEs' degree of dynamic capabilities, particularly in conjunction, does have an effect on their profit resilience, highlighting the importance of the synergistic effects between variables. While the study identifies significant relationships, the explanatory power remains limited, leaving the causal relationship ambiguous. Still, this research contributes to the theoretical understanding of dynamic capabilities and offers practical insights for MNEs to enhance their profit resilience in an increasingly volatile global environment.

Keywords: Profit resilience, dynamic capabilities, multinational enterprises, exogenous shocks, COVID-19

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Table of Contents

1 Introduction

1.1 Background

Exogenous shocks — unexpected, largely unpredictable events that are out of a firm's control, and that can have a dramatic effect on the performance or markets within an industry or country. Examples could include financial crises, global pandemics, or military conflicts (Dai et al. 2017; Li & Tallman, 2011; Teece & Leih, 2016). Although exogenous shocks have been prevalent throughout history, there is reason to believe they are becoming more frequent (Beamish & Hasse, 2022). One key factor is globalization, which while having led to more economic prosperity, also made us more interconnected and exposed to external disruptions. After the 2008 financial crisis, a combination of technological and sociopolitical factors has led to a "New Normal" (Ahlstrom et al. 2020). This New Normal represents a growing awareness of major disruptive events as features of our global economy. Ciravegna et al. (2023) note a research gap surrounding what components determine an organization's success in countries affected by frequent shocks. In light of this frequently changing global environment, a firm's capability to change and adapt its resources to meet new market conditions is critical to a firm's performance (North, 1999).

Most theories developed and utilized in International Business (IB) Research tend to assume stable markets and conditions, illustrating business dynamics under a predictable environment (Oh & Oetzel, 2022). However, as previously mentioned, exogenous shocks have been on the rise, occurring in conjunction with other crises instead of isolated events and they have a significant impact on the firm performance such as by disrupting supply chains and damaging physical assets (Ahlstrom et al. 2020; Ciravegna et al. 2023). Despite the widespread impact of exogenous shocks on firms, comparatively little research has been done from a resource and capabilities view. Literature on disruptions caused by natural forces such as pandemics, in particular, is hard to come by due to their historically infrequent occurrence. The application of the resource-based view (RBV) in this context has been relatively less extensive compared to other influential perspectives like the eclectic paradigm, the Uppsala model, and institutional theory (Beamish & Chakravarty, 2021). Therefore, this paper attempts to deepen

the understanding of exogenous shocks in relation to firm performance, specifically using the dynamic capabilities framework, an extension to RBV.

The Dynamic Capabilities (DC) framework laid out by Teece et al. (1997) is designed to enhance a firm's ability to adapt and maintain a competitive advantage in a changing environment. Its addition to RBV serves as a supplement that adds more explanatory power to the theory by emphasizing the importance of flexibility alongside static resources in order to sustain a competitive advantage (Teece, 2007). It is divided into three primary categories which are; Sensing: this dimension refers to a firm's ability to recognize and interpret changes in the external environment. Seizing: which involves the firm's capacity to capitalize on opportunities identified through sensing. Reconfiguring: refers to the firm's capability to adapt its resources to the environment (Teece et al, 1997).

Since DC was developed to be used in contexts of uncertainty (Teece, 2014), adapting and using aspects of the above-mentioned three dimensions could provide valuable insights into the factors and resources that influence a firm's continued performance amidst external shocks, while also helping to understand the impact of DC's effect on maintaining performance post-shock In contrast to previous research on the subject, this study will attempt to measure DC via objective operationalization, and focus on synergistic effects among its dimensions. This has the potential to enhance the understanding of a research area that is currently underrepresented, consequently contributing to its advancement and helping spur further studies on the subject of exogenous shocks and performance in relation to DC.

1.2 Research Purpose

The purpose of our research is to delve into what determines a firm's performance during times of disruption, specifically, by leveraging the DC framework, our research intends to provide insights into the factors and resources that influence a firm's profit resilience to exogenous shocks. The term profit resilience will be defined as **a firm's ability to maintain and recover performance post-shock.** In a world where disruptions and shocks are becoming more prevalent (Beamish & Hasse, 2022), research that focuses on firm

performance in times of distress is vital. The aspiration is to contribute to expanding the use of RBV in the context of shocks, adding new knowledge to a field of research that is relatively scarce and helping spark further studies on the subject. Consequently, this paper aims to apply the Dynamic Capabilities in uncertain conditions, in hopes of elucidating what factors best predict firm success during times of shocks, which led us to the following research question:

How do dynamic capabilities affect MNEs' profit resilience to exogenous shocks?

1.3 Delimitations

Our research is delimited to one exogenous shock, namely the COVID-19 pandemic and 2019-2021. By doing so, the aim is to reduce the effect of other exogenous shocks of a different timeline, such as the Russian invasion starting in 2022, on our analysis. Having a longer scope of time could potentially give us further findings on the long-term effects of COVID-19 as an exogenous shock. However, it would also imply the risk of being unable to distinguish the short-term effects of the Russian invasion from the long-term effects of COVID-19, distorting our analysis. In addition, the selection of firms is restricted to "large" and "very large", as defined by the database Orbis.

1.4 Outline of the Thesis

This paper consists of 6 chapters. Chapter 2 gives an in-depth review of existing literature, providing the necessary theoretical background that leads to the research question. Chapter 3 covers Methodology, that is, how the data is collected and analyzed. Chapter 4 and 5 deal with the results and discussion, and lastly, Chapter 6 summarizes the conclusions of our paper.

2 Literature & Theoretical Review

The international business landscape is constantly shaped by the interplay of internal firm capabilities and external challenges. In an era where exogenous shocks are increasingly frequent, understanding the mechanics behind the sustenance of the performance of MNEs during uncertainty is more relevant than ever. Therefore, this literature review aims to explore the contributions of past literature on how the resource-based view (RBV) and the dynamic capabilities framework offer insights into MNE's ability to withstand, adapt to, and perform despite exogenous shocks ie., profit resilience. The review takes on a "funnel approach", starting from a broad exploration of foundational principles of RBV and dynamic capabilities framework as well as defining how the term exogenous shocks is used and presenting evidence on such events' effect on firms. Progressively, the findings of the review guide the continued literature search and narrow down the scope until eventually arriving at informed hypotheses in relation to the field.

2.1 Resource-Based View (RBV) of the Firm

The resource-based view (RBV) is a framework emerging from the work of Barney (1991) that explains how the resources and capabilities of a company drive its performance in an evolving competitive environment. It identifies firms' unique bundles of resources and capabilities as their main source of competitive advantage and the foundation upon which a strategy is formulated.

Although other scholars have defined firm resources differently, for instance, Daft (1983) defines it as "all the assets and firm attributes controlled by a firm that enables the firm to create and implement strategies to improve efficiency and flexibility". Barney (1991) means that firm resources do, in this context, refer specifically to three types of resources. All three categories are argued to enable a firm to conceive and implement value-creating strategies. The first category is physical capital resources which include the equipment, geographical

location, and access to raw materials of a firm. Secondly, organizational capital resources include the firm's formal and informal controlling, planning, and coordinating systems as well as the formal reporting structure and interrelations within a firm. Finally, human capital resources comprise the training, experience, and relationships of individual managers and employees within a firm. Moreover, firm capabilities have a strong connection to firm resources and are usually developed by combining physical, technological, and human resources and are based on exchanging information through the human capital that a firm possesses. Thus, firm capabilities are often defined as a firm's capacity to deploy resources using organizational processes to accomplish a desired goal (Amit & Schoemaker, 1993).

More precisely, the RBV attributes firm performance to resources and capabilities by explaining a firm's long-term competitiveness as a function of its endowment of resources that differentiates it from its competitors. (Grant, 1991); (Grant, 2021). Similarly, Barney (1991) has defined that a firm has a competitive advantage if it is implementing a value-creating strategy not simultaneously being implemented by another current or potential competitor. Moreover, according to Barney's perspective, a firm is considered to have a sustained competitive advantage when, in addition to the above requirement, the benefits of the firm's strategy cannot be duplicated by other firms, due to unique resource endowments.

Over the long run, the RBV argues that competitive advantage and the generated returns erode as the resources and capabilities associated with the competitive advantage are depreciating and imitated by industry rivals. Grant (1991) highlights four characteristics of resources and capabilities of particular importance in determining the sustainability of competitive advantages; durability to avoid the above-mentioned depreciation, as well as transparency, transferability, and replicability as determinants of the speed upon which an industry competitor can imitate. On the same note, Barney (1991) further highlights that firm resources must have four attributes to hold the potential of sustained competitive advantages. It has to (1) be valuable in order to exploit opportunities in a firm's environment, (2) it has to be rare among a firm's current and potential industry rivals, (3) it must be inimitable to prevent the competition from adopting the resources and (4) it must be non-substitutable, to not have equivalent substitutes. These attributes, according to Barney (1991), are indicators of how heterogeneous and immobile a firm's resources are and therefore, how important are for generating sustained competitive advantages.

In conclusion, the resource-based view provides valuable insights into how firms can achieve and sustain competitive advantage by leveraging their unique resources and capabilities. Resources and capabilities that a firm possesses are fundamental in formulating its strategy and identity and in being the primary source of profitability. Moreover, the resource-based view emphasizes the importance of valuable, rare, inimitable, and non-substitutable resources in generating and sustaining a competitive advantage. The firm must understand the mechanisms and relationships between resources, capabilities, and profitability and it has to conceive strategies that could exploit the firm's unique characteristics (Grant, 1991).

2.2 Dynamic Capabilities Framework

Dynamic capabilities (DC) are a concept that emerged as an extension of the RBV, where Teece et al. (1997) laid the groundwork for understanding dynamic capabilities as a "firm's ability to integrate, build, and reconfigure internal and external competencies to address rapidly changing environments". Teece (2007) emphasizes that the characteristics of RBV explaining sustainable competitive advantage aren't sufficient in environments that are fast-moving and subject to global competition and that the introduction of DC is necessary. In introducing DC, there is an important distinction to make between DC and ordinary capabilities (OC). OC is part of the original RBV framework and refers to a firm's "ability to use and coordinate tangible and intangible resources to reach a desired goal", but does not necessarily take into account change and disruption, or uncertainty about potential such, in the business environment. DC, on the other hand, is directly concerned with change and uncertainty and refers to the ability to extend, modify, or create OC to respond to disruptions affecting the business (Teece, 2014; Teece et al. 1997). Somewhat simplified, one could view OC as the source of competitive advantage today, whereas DC represents the source of maintaining competitiveness over time. Another important distinction in relation to DC is its difference from what Winter (2003) defined as "ad hoc problem solving". DC does imply a systematic, structured, and routinized way of foreseeing, recognizing, and handling change that is integrated into a firm's capabilities. In contrast, ad hoc problem solving refers more to

an improvisational way of responding to individual unforeseen events or changes that is not reliant on routines to the same extent, but rather on solving a current problem.

DC is disaggregated into three main capabilities: sensing opportunities and threats, seizing opportunities, and "maintaining competitiveness through enhancing, combining, protecting, and when necessary, reconfiguring" the firm's assets. This implies a strong need for market knowledge to sense market changes, and consequently, threats and opportunities, as well as strong innovation capabilities in order to develop new products, processes, and services adequate for addressing such market change and seizing the opportunities that emerge. More precisely, Teece et al. (1997, p.515) expressed it as:

> Winners in the global marketplace have been firms that can demonstrate timely responsiveness and rapid and flexible product innovation, coupled with the management capability to effectively coordinate and redeploy internal and external competencies.

In addition, the disaggregation of DC also highlights a need for financial resources. As external change occurs and reconfiguration of assets becomes necessary to maintain evolutionary fitness, large and costly changes are inevitable to avoid new threats and exploit new opportunities. Hence, possessing financial resources is essential, particularly in the short run, for firms to remain sufficiently flexible and able to quickly make substantial adjustments (Teece, 2007).

In short, DC constitutes the capability to adapt internal resources and capabilities to changing external conditions by being highly responsive, flexible, and innovative as a firm. The idea is that DC is vital in building the ability to respond to change. Sensing changes in the business environment in an early phase to give time to the organization to respond, having the innovation capabilities to respond appropriately, and being transformative as a firm are the fundamentals of doing so. In essence, organizations that possess strong seizing and transformation capabilities will experience superior resilience, in terms of maintaining performance and quickly recovering performance following shocks (Teece & Leih, 2016). Although the concept of DC was not originally included in the resource-based theory, it has shown to serve as an important complement by introducing the importance of responsiveness and adaptability in sustaining competitive advantage even in rapidly changing environments,

in contrast to previous RBV theory solely considering static resources as the basis for competitive advantage. Through this extension of the RBV, it is believed that DC has extended the explanatory power of how competitive advantage is maintained even under changing and disruptive conditions. (Teece & Leih, 2016; Teece, 2007).

2.3 Exogenous Shocks

2.3.1 Definition of Exogenous Shocks

There is no established standard definition of exogenous shocks as of yet, however, several scholars have provided their definition of the concept. According to Gabisch & Lorenz, (1987), the traditional attitude towards exogenous shocks is to view them as influences that disturbs economic theories and models to the extent that they are beyond the scope of abstractive, economic reasoning. Hence, exogenous shocks are seen as events originating from outside of the economic context, and for that reason, it is argued that economists should not focus on analyzing the cases where such shocks occur but rather simply categorize it as "exogenous influences". Following a similar line of reasoning, the International Monetary Fund (2003) describes exogenous shocks as "sudden events beyond the control of authorities that have a significant negative impact on the economy". Particularly, they emphasize that the key characteristics of an exogenous shock are its unpredictable nature and external origin of it and make the important distinction that exogenous shocks do not include incremental development.

However, Gabisch & Lorenz (1987) and International Monetary Fund (2003) take a macro perspective and categorize exogenous shocks in relation to their effect on the economic system as a whole. Our study aims at taking the perspective of individual multinational enterprises (MNEs), and define exogenous shocks in relation to that context. In contrast to the perspective of the aforementioned scholars, Ciravegna et al. (2023) follow a managerial perspective more closely. Despite also considering exogenous shocks from a broad perspective in their definition of exogenous shocks as "unexpected, largely unpredictable events that have significant negative impacts on communities, regions, or even countries",

they address the impact of exogenous shocks on individual firms as well. Ciravegna et al. (2023) emphasize the impact that exogenous shocks have on business conditions and MNEs, by stressing the strategic implications and pressure for strategic changes that it puts on MNEs. This focus does, despite potentially lacking the profoundness to describe the impact on an entire system, contribute to a better understanding of what exogenous shocks are to individual MNEs, consistent with the scope of our research. Following the managerial perspective, Röglinger et al. (2022), are further niched in their definition. They take the perspective of business process management and put emphasis on the similarities of exogenous shocks to so-called black swan events. In doing so, Röglinger et al. (2022) define exogenous shocks as "unanticipated, low-likelihood, potentially high-impact events originating from an organization's environment". Similar to Ciravegna et al. (2023), Röglinger et al. (2022) overlook wider consequences to some extent and focus predominantly on the impact of internal processes and the importance of organizational adaptation in defining exogenous shocks.

Despite the lack of complete consensus in defining exogenous shocks, there are common factors in the past literature presented in the above definitions. Unpredictability, external origin, and substantial, potential impact are emphasized as significant characteristics by all scholars, hence those are the significant aspects in our definition. However, what is considered "external origin" differs depending on the scholars' perspective. Given the scope and focus of our research being individual MNEs, we follow Röglinger et al. (2022) in referring to external origin as external to the organization and its normal business conditions. Similarly, the definition of "substantial impact" does also depend on the scholars' perspective. Gabisch & Lorenz (1987) and International Monetary Fund (2003) consider the system-wide impact, Ciravegna et al. (2023) focus on a more narrow impact but consider a wide set of consequences in broader terms too, and Röglinger et al. (2022) predominantly stress internal impact on organizations. Again, due to the scope of our research, we follow the definition established by Ciravegna et al. (2023) and Röglinger et al. (2022) in having a focus on individual businesses and the business ecosystem. Thus, the definition of exogenous shocks that guide our further literature search is "unpredictable events with the potential to substantially impact businesses operations and need for strategic adaptation, originating from forces external to the organization and its closest environment".

2.3.2 Exogenous Shocks' Impact on MNEs

The discussion regarding the impact of exogenous shocks on multinational enterprises (MNEs), as analyzed by Ciravegna et al. (2023), describes a complex environment where both direct and indirect consequences affect businesses. These shocks have direct impact, for example, in natural disasters damaging physical assets and supply chain disruptions from the closure of production centers but are not limited to those effects. The exogenous shocks do also cause a cascade of indirect strategic, operational, and financial challenges for MNEs. Primarily, the destruction caused by these events imposes large financial challenges for firms. Exogenous events tend to result in destruction of physical assets requiring substantial reinvestment, and supply chain disruptions that cause immensely costly delays, implying a heavy financial impact on firms, particularly MNEs (Bowman et al. 2023). This direct effect on the operational and financial stability of MNEs underscores how vulnerable these firms are to exogenous shocks. However, as Ciravegna et al. (2023) highlight, the impact of such shocks extends beyond these direct effects and have further consequences through affected third parties, predominantly through demand fluctuations and regulatory changes.

The narrative around those indirect effects is deepened with the insights from Li & Tallman (2011). They explain the indirect impact further and emphasize that exogenous shocks cause sudden changes in the business environment, forcing MNEs to adjust by adapting business strategies, structures, and controls. When exogenous shocks occur, the market dynamics as well as business conditions change from one day to another, resulting in substantial uncertainty forcing firms to reorient. Morgan et al. (2020) follow a similar line of reasoning and highlight the impact of unexpected operational changes in necessitating firms to adapt their working processes. Specifically, emphasis is put on the distress coming from uncertainty regarding the duration of the shocks that cause businesses to make substantial changes to their business models.

However, the disruptive times following an exogenous shock also open up for MNEs to find strategic opportunities. For instance, pivoting business models in disruptive times is not necessarily a solely negative impact caused by forced adaptation to survive, but can be a strategy for exploiting significant innovation opportunities created by the disruptions the

shock causes in markets (Morgan et al. 2020). For example, the many online-based businesses emerging during the COVID-19 pandemic illustrate this. This perspective introduces a nuanced understanding that, while exogenous shock causes challenges predominantly, it concurrently opens for seizing newly created opportunities. However, it is worth noting that the findings of Morgan et al. (2020) were derived from a sample limited to small and medium-sized firms, implying questionable applicability to MNEs. Hence, this optimistic view could be questioned, particularly since Bowman et al. (2023) found contrasting results when studying MNEs, in predominantly negative consequences of exogenous shocks due to the financial costs, uncertainty, and destruction.

2.4 Applicability of RBV to Explain MNE Performance during Exogenous Shocks

2.4.1 Relevance of RBV in Explaining MNE Performance

The RBV framework has been instrumental in understanding how firms achieve and sustain competitive advantage through internal resources. Numerous studies have addressed the applicability of RBV to explain firm performance in general resulting in a whole body of evidence demonstrating its relevance. There are examples where RBV has been put to use in the international firm context. For instance, Fang et al. (2007), through the lens of RBV, investigate how knowledge resources impact firm performance in the international context and arrive at rare, valuable, and inimitable knowledge resources having a role in explaining long-term competitive advantage. Moreover, Ainuddin et al. (2007) explore the impact of a firm's resources on firm performance in the international context by studying international joint ventures (IJVs). They found that all four of Barney's (1991) attributes for firm resources being a source of sustained competitive advantage show significant effects on firm performance. In particular, Ainuddin et al. (2007) emphasize the combination of foreign technology resources and local market knowledge resources frequently serves as an important factor for IJV performance. Given the imitability of such resource bundles, this relates to their finding that imperfect imitability emerges as a significant resource attribute associated with

IJV performance too. These findings give supporting evidence for RBV being useful in an international context, and by extension, in the exploration of MNEs' performance.

These findings underscore RBV's applicability in analyzing MNE performance by focusing on the strategic utilization of internal resources, however taking another perspective the applicability can be questioned. While RBV has been extensively used to analyze decision-making and resource allocation within companies, the realm of research on MNE behavior, mentions that the utilization of RBV is comparatively less extensive compared to other influential perspectives. The reason for this is that the performance of MNEs is dependent on so many more factors than solely resource possession, such as location choices, entry mode choices, location-specific advantages, etc. Thus, in the context of MNEs, the general theme is that RBV is supplemented by other theories such as the Eclectic Paradigm or the Uppsala model to account for multiple levels of analysis, this being the case, it is questionable to use the RBV in isolation to explain MNE performance (Beamish & Chakravarty, 2021).

2.4.2 Relevance of RBV in Explaining Firm Performance during Exogenous shocks

Already in the early stages of RBV, Barney (1991) recognized that the theory of sustained competitive advantage did not imply sustained forever and through all conditions. Instead, he recognizes that Schumpeterian shocks, "unanticipated changes in the economic structure of an industry", may disrupt the industry structure and settings substantially. Due to such disruptions, what is a source of competitive advantage is massively overthrown, indicating that RBV may have limited explanatory power for sustained competitive advantage under such conditions. Given that many exogenous shocks most certainly could be considered Shumpeterian shocks, this raises questions regarding the relevance of RBV during exogenous shocks. Thus, determining exactly why some firms fail and why some succeed under such conditions is a tricky question to answer. Also, Furr & Eisenhardt (2021) make the argument that determining how resources determine firm performance in what they define as

low-uncertainty markets is viable, but ascertaining what makes a firm perform well in high-uncertainty markets, e.g., during times of crisis and disruption, is a lot more complex.

Despite its questionable relevance, the RBV's proposition of firm performance as a function of unique resource endowments is partly confirmed even under exogenous shocks, although not explicitly referred to, by a study on Malaysian listed firms. The authors highlighted that intangible resources have a positive and significant impact on firm performance, especially during economic crises or other exogenous shocks. However, further findings of the same study show that tangible resources, on the other hand, were found to not have a significant impact in explaining firm performance (Masood et al. 2017). This illustrates the complexity of determining precisely how resource endowments make MNEs perform well under exogenous shock, due to the multitude of factors involved. It is hard to single out the specific reason for improved or sustained performance. Given the ambiguity regarding the effect of distinct resources on MNE performance, particularly during exogenous shocks, the doubt regarding RBV in disruptive conditions also raises questions about the implications of the findings of Masood et al. (2017). They stress the value of intangible resources as crucial factors to achieve good performance and explicitly mention the ability to manage change as one essential resource. While Masood et. al (2017) highlights various intangible resources, the findings regarding change management could indicate an overlap of intangible resources with dynamic capabilities since managing change relates to the essence of DC.

Furthermore, there is a natural link to the findings of Hitt et al. (2021) that distinguish what impacts firm performance after exogenous shocks in the long run from the short run. In the short run, they do recognize the role of tangible resources, mainly financial, as an important factor in surviving the shock. However, they emphasize that tangible resources lose importance in responding to shock over the longer term. This might partly explain the disagreements regarding the role of tangible resources in relation to firm performance in previous literature. Furthermore, Hitt et al. (2021) highlight that to maintain competitive advantage and performance over time, dynamic capabilities are more essential than any specific resources. In disruptive environments, specific resources are not a constant source of superior performance, but renewal is required. Hence, firm performance can even be

negatively affected by excessive reliance on resources, especially fixed such, and DC, such as flexibility, are a much stronger determinant of firm performance in rapidly changing environments because it helps renew or replace obsolete resources.

Moreover, Hitt et al. (2021) stresses that a critical factor for such flexibility is intangible resources, such as human and technology capital. This explanation of intangible resources and IC as important parts of DC might explain the findings of aforementioned scholars that intangible resources have a stronger effect on performance than tangible such as under exogenous shocks. This is reinforced by findings of a study attempting to investigate which resources are most crucial for firms as they rebound from a significant economic crisis that found strategic flexibility, a dynamic capability, and financial strength, a prerequisite for exerting strategic flexibility, were key determinants for a firm's recovery after a crisis (Brahmasrene, 2004). In addition, Chang & Rhee (2011) found that firms with large amounts of financial resources may have the flexibility to adapt to complex competitive landscapes, change strategic behavior, and have a greater willingness to take risks compared to firms with constrained tangible resources.

2.5 Relevance of Dynamic Capabilities in Explaining MNE Performance & Profit Resilience Post Exogenous Shocks

2.5.1 Relevance of Dynamic Capabilities in Explaining MNE Performance

In contrast to RBV, the entire theoretical foundation of dynamic capabilities lies on the assumption that the framework should be highly relevant, especially in disruptive times. Hence, DC should theoretically be a particularly adequate theory to explain performance during exogenous shocks, as these are undoubtedly disruptive eras. Moreover, Teece (2007) indicates the relevance of the DC framework in analyzing MNEs by emphasizing the particular relevance of DC for firms active in international environments due to the exposure it implies to external conditions to have an impact on the firm. Consistent with such

reasoning, dynamic capabilities have been recognized to have a significant, positive effect on firm performance through the enhanced agility and responsiveness it implies to changing market dynamics (Teece & Leih, 2016; Wu, 2010). This view is explained through DC enriching firm performance by leveraging knowledge resources and learning mechanisms that foster an agile and innovative organizational culture. Moreover, empirical tests have also indicated a similar effect, at least on perceived firm performance, meaning employees' and managers' subjective assessment of service quality, sales, profitability, and overall performance (Chien & Tsai, 2012; Roberts & Grover, 2012). It should be said that those findings are not entirely unanimous as others have failed to conclude the significance of DC's effect on subjective firm performance (Morgan et al. 2009), but there are at least no research findings rejecting a relation. For objective performance, as measured by financial data such as return on assets (ROA), the significance of DC's positive effect is not as uncertain but consistently found across studies (Laaksonen & Peltoniemi, 2018; Morgan et al. 2009).

However, the observed effects of DC on firm performance are not as evident in the context of exogenous shocks. Rather, synthesizing the impact of DC on firm performance during exogenous shocks reveals a landscape with much debate and highly varying empirical findings. In contrast to previously presented findings, Eisenhardt & Martin (2000) challenge the significant positive effect of DC on firm performance. Instead, they argue for the opposite by stating that DC is rather disadvantageous for firms in rapidly changing markets. Simply because DC stems from prior experiences and are systematic by nature, they are argued to lose relevance in dynamic markets as these require "rapid creation of new situation-specific knowledge through "simple, experiential, unstable processes" (Eisenhardt & Martin, 2000). Thus, the arguments of Eisenhardt & Martin (2000) indicate that DC is less advantageous during exogenous shocks, and that, as they suggest, "simple, experiential, and unstable processes" are beneficial.

Nevertheless, the foundational argument by Teece et al. (1997) remains that DC is essential and particularly beneficial for firms in dynamic markets and rapidly changing environments, as DC enables firms to adapt to changes rapidly and effectively. Empirical tests have revealed that DC's contribution to firm performance is higher in dynamic environments, reinforcing the initial work of Teece et al. (1997) by indicating that DC is positively related to a firm's

ability to perform in changing markets (Ringov, 2017). Furthermore, Wu (2010) found that the dynamic capabilities view is superior to the RBV in explaining firm performance in volatile markets and suggests that firms with strong DC can even experience enhanced competitive advantage in such markets.

2.5.2 The Mediating Role of Dynamic Capabilities in Explaining MNE Performance

Despite the lack of complete consensus on previous findings on the matter, a predominance of research findings indicates that DC has a positive effect on firm performance in general, but particularly in dynamic markets. DC is fostering aspects such as agility, leveraging of resources, and innovation, all of which facilitate responding to uncertainty in a beneficial manner (Teece & Leih, 2016). Thus, it should be natural that DC plays a similar role under exogenous shocks. However, the literature suggests inconsistencies regarding how DC influences firm performance, particularly concerning its direct or indirect effects.

For instance, Protogerou et al. (2008) challenge the notion of aforementioned scholars that DC should have a direct effect on firm performance. They suggest that dynamic capabilities impact firm performance by mediating the relationship between functional competencies & ordinary capabilities (OC) and firm performance. This perspective highlights that the suggested direct effect contradicts the fundamental nature of dynamic capabilities and their role in firms. The role of DC is to enhance firms' ability to maintain or create new OC that underpin competitive advantage and in turn firm performance. Thus, DC is not a source of superior performance but a tool to enhance a firm's ability to maintain or create OC which underpins competitive advantage and, subsequently, performance. This suggests that a company with insufficient OC cannot achieve superior performance solely through its DC.

You et al. (2023) nuanced this further by emphasizing the role of DC during exogenous shocks in particular. They highlight that the role of DC is to act as a crucial mediator in leveraging resources, in turn strengthening resilience. Certain resources provide firms with foundational strengths that contribute directly to competitive advantage. However, the

dynamic nature of crises like the COVID-19 pandemic requires even these powerful resources to be rearranged rapidly in response to changing conditions. This is facilitated by DC as they serve as a mechanism for firms to obtain, transform, and reallocate resources in response to market shifts (Eisenhardt & Martin, 2000). Hence, the mediating role of DC becomes even more relevant in times of exogenous shocks, when even the most powerful resources might need transformation.

Ultimately, while a large amount of studies have found DC to directly affect firm performance positively, particularly in dynamic markets, the insights from You et al. (2023) and Protogerou et al. (2008) that the impact of DC on performance is not direct but rather mediated through enhancing OC. This mediated effect aligns with the core idea of DC as having the primary function to modify and adapt a firm's resources thereby indirectly having an impact on performance. Thus, directly attributing firm performance to DC, as many of the mentioned scholars do, overlooks that DC should at most have an indirect, mediated effect on firm performance through its effect on OC. Therefore, to grasp the theoretical concept of DC more accurately, it is beneficial to look at changes in performance rather than static performance metrics. Doing so is critical in accurately reflecting the role of DC, as changes in DC may not necessarily have an effect on firm performance if the OC of the firm does not allow for it. (Laaksonen & Peltoniemi, 2018; Takahashi et al. 2017).

Investigating *change* in performance rather than static performance measures, as suggested by Laaksonen & Peltoniemi (2018), can and has been done by investigating DC's effect on growth and profit resilience rather than firm performance. By doing so, scholars avoid the issue of attributing DC with direct effects on firm performance that in fact are mediating effects. This is a particularly relevant method to use when investigating DC's impact following exogenous shocks since an important aspect is DC's role in resource adaptation and modification to facilitate maintained or improved performance despite the disruptive conditions (Laaksonen & Peltoniemi, 2018; Lee et al. 2009; Liao & Rice, 2010).

This method has created a wide range of research findings indicating that *performance change* is heavily affected by DC under exogenous shocks. Clampit et al. (2022) empirically tested this by examining the impact of DC on revenue change during the COVID-19

pandemic. Their study reveals that firms with robust DC were more successful in recovering (measured by revenue change) from the shock as it facilitates the adaptation of resources to the new environment created by the exogenous shock, in turn helping the firm avoid revenue losses and exploit potential opportunities. Dejardin et al. (2023) complement this perspective by investigating the role of DC during exogenous shocks with a specific focus on innovation-driven responses. Their findings indicate that DC plays an important role in fostering innovation and strategic reorientation that significantly impacts firms' resilience and recovery post-shock.

Moreover, Makkonen et al. (2014) highlight that a link exists between dynamic capabilities, organizational change, and firm growth. They illustrate that firms possessing dynamic capabilities are better equipped to implement effective organizational changes that significantly boost product innovativeness. This empirical finding aligns with the notion that DC has an indirect effect on firm performance. By facilitating organizational change and innovation, DC can enhance OC crucial for maintaining competitive advantage and performance, especially in dynamic markets.

2.6 Additional Explanatory Factors for MNE Profit Resilience to Exogenous Shock

In addition to resource possession and DC, there are several characteristics and factors that have shown significant relations to MNE resilience to exogenous shocks. For instance, post-economic shocks, hospitality firms that increased advertising expenditure showed a positive relation to firm performance as defined by stock returns and the ERC coefficient. This indicates strategic advertising can help maintain performance during financial setbacks or shocks (Kim et al. 2019). Moreover, Oh & Oetzel (2022) argue for the importance of multi-sector partnerships for firms to tackle sudden disruptions, as they mention that "partnerships are generally critical for an effective firm response to risk since disaster management efforts are generally too complex for a single organization to tackle in isolation".

However, a factor repeatedly found in the literature is the relationship between international, geographical, diversification, and long-term firm performance post-exogenous shocks. Li & Tallman (2011) have found that MNEs that expand their assets abroad gain dynamic capabilities through their diverse international experience, including flexibility in responding to exogenous shocks. The experience of disruptive events on a smaller scale that comes from international experience equips internationally diversified firms with the necessary capabilities, such as adaptability, that can facilitate the ability to maintain performance post exogenous shocks. This knowledge of how to react and deal with exogenous shocks may in the future serve as DC, equipping firms with the capability to sense changes in their environment in an early phase and respond to exogenous shocks appropriately. In other words, companies with substantial international experience are more likely to have experienced similar disruptive events in the past and developed skills, facilitating a better ability to manage future exogenous shocks.

Similarly, Bowman et al. (2023) recognize that experience, both from affected countries but also from disasters in general, increases the ability of MNEs to act rationally and thereby exploit the opportunities that arise from these events. This is consistent with the findings of Morgan et al. (2020) stating that innovation opportunities during exogenous shocks are more attractive to experienced firms as they possess the required resources and capabilities to take advantage of those. Combining the findings of the above-mentioned, the takeaway is that there is a tendency of firms' engagement in international markets to be a strong determinant of their ability to adapt to exogenous shocks in the longer term.

On the other hand, Li & Tallman (2011) also find a reverse relationship when analyzing the short-term effects. They note that international, geographical, diversification limits firms from adapting to changes to business environments arising from exogenous shocks due to the complexity of the transnational coordination needed. They argue that, since networks of highly internationally diverse businesses tend to be geographically widespread and of a complex nature, responding adequately to an exogenous shock is difficult. Doing so requires complex coordination, which might be difficult in times of rapid change, making the act of adapting to rapidly changing environments from an exogenous shock both difficult and

complex. Furthermore, Li & Tallman's (2011) findings from analyzing the aftermath of the September 11 attacks confirm these results further by proving that high internal diversification relates to the negative short-term performance of MNEs after exogenous shocks. Moreover, Bowman et al. (2023) found similar results, despite focusing solely on natural disasters and not exogenous shocks in general. They found that the degree of global presence of an MNE is a strong determinant of how likely the firm is to be affected by natural disasters, strengthening the tendency of geographical diversification and international presence making firms vulnerable to shocks. In similar findings, Yong & Liang (2020) indicated that internationalization contributes to multinational corporations being more resilient to economic shocks in the long run. They further argue, in agreement with aforementioned scholars, that internationally exposed firms are susceptible to global shocks in the short run, however, the long-term outlook for these firms is improving due to their geographical diversification and the resilience to global shocks that they have developed.

2.7 Theoretical Contribution

2.7.1 Conclusion of Literature Review

Synthesizing the literature, it becomes apparent that the dynamic capabilities framework is superior to the original RBV framework in explaining firm performance, both for MNEs and under the conditions associated with exogenous shocks. In particular, the greatest consensus among the research findings of aforementioned scholars regarding DC's impact under these conditions is that innovation capabilities (Teece, 2007; Teece et al. 1997) and flexibility (Chang & Rhee, 2011; Hitt et al. 2021; Li & Tallman, 2011; Roberts & Grover, 2012) are significant factors in how MNEs, and firms in general, respond to disruptive events. The proven importance of flexibility and innovation during exogenous shocks is consistent with the theoretical foundation of dynamic capabilities. The original work of the dynamic capabilities framework, as well as many following scholars, highlight how innovation capabilities and flexibility in the sense of new product development, adapting business models, extending and modifying OC, etc. are highly relevant parts of dynamic capabilities (Teece 2014; Teece et al. 1997). Moreover, one could even argue that innovation and

flexibility are important aspects of the three components that Teece (2007) disaggregates DC into, namely by innovation capabilities being part of the “seizing opportunities capability” and flexibility being part of the ability to reconfigure and transform. Hence, it is natural that both of these aspects have been shown to have a significant role.

Furthermore, an additional factor that has shown to be significant in explaining firm performance following exogenous shocks is the level of international exposure and experience of the firm. Internationally diverse firms are more likely to have experienced shocks and disruptions before, learning them both how to sense changes in their environment in an early phase and how to respond to disruptions. (Li & Tallman, 2011; Bowman, 2023; Yong & Liang, 2020). Again, these findings have a natural theoretical connection to the DC framework, through its emphasis on responsiveness to external change. This perspective also opens up for international exposure being part of the firm's “sensing capabilities”, the final component of Teece’s (2007) disaggregation of DC. Although it won’t capture the full scope of sensing capabilities, international exposure has been shown to impact firm performance post-exogenous shocks through capabilities that are part of those needed to sense opportunities in changing markets.

Apart from the findings summarized above that are mostly consistent across studies, it is also clear from the literature review that the relationship between DC and firm performance post exogenous shocks is both multifaceted and partly lacks consensus. The literature agrees that DC has a significant role in explaining firms’ performance, however, disagrees on the precise nature of that role. One can argue that, potentially, the absence of consensus is related to how DC is overlooked as a set of capabilities consisting of separate capabilities, as established by (Teece, 2007). The importance of the interdependency of different aspects of DC and the fact that absent the different aspects of DC, individual DCs are of little value (Teece, 2007; 2014). Despite that, many researchers have shown to focus on one or very few of the aspects of DC in isolation despite being interdependent, which might be the cause of insignificant or inaccurate findings. For instance, the superior ability to reconfigure and transform shown by flexibility is essentially worthless if the firm is unable to sense when and how to do so. Thus, if the superior ability to reconfigure and transform shown by flexibility would be used as a

proxy for DC in general, that would possibly generate findings that are not consistent with a study considering all aspects of DC. In essence, we hypothesize that there is a big chance that these capabilities do not bring the performance benefits from DC alone, but that they are interdependent, necessitating research on the different components of DC in synergy to determine DC's effect on profit resilience to exogenous shocks.

2.7.2 Theoretical Gap

In summary, our literature review identifies a theoretical gap in the limited applicability of RBV in the context of exogenous shocks, as well as the ambiguity of the role of dynamic capabilities in such contexts. The RBV alone, which focuses on static resources, falls short in explaining sustained firm performance in rapidly changing environments. (Barney, 1991; Furr & Eisenhardt, 2021) In contrast, the DC framework is theorized to be crucial in rapidly changing environments, such as exogenous shocks. Yet, the empirical findings about DC's impact during exogenous shocks are partly inconsistent (Hitt et al. 2021; Eisenhardt & Martin, 2000; Teece et al. 1997). One contributing factor to these inconsistencies may be that many previous scholars measure DC as well as performance through subjective measures such as questionnaires. The absence of objective investigations of the causal relationship between DC and profit resilience is likely explained by the fact that the processes involved in possessing DC often are abstract and that DC, in general, is quite context-dependent. However, this does still imply that it is partially left unanswered whether DC could be shown to influence firm performance and profit resilience when relying on objective measures.

Therefore, we plan to research the different dimensions of DC that have been shown to impact profit resilience to exogenous shocks in isolation through subjective measures: flexibility (Hill et al. 2021; Li & Tallman, 2011; Roberts & Grover, 2012), innovation capabilities (Teece et al. 1997; Teece, 2007) and international exposure (Li & Tallman, 2011; Bowman, 2023; Yong & Laing, 2020). Moreover, financial flexibility is split into financial flexibility and asset flexibility. This results in the following Hypothesis 1:

H1: International exposure, innovation capabilities, financial flexibility, and asset flexibility will have a significant, positive impact on MNEs' profit resilience to exogenous shocks.

As previously mentioned, we do also hypothesize that the disagreement in the literature can, at least partly, be attributed to the absence of studies considering different aspects of DC simultaneously. Because we believe that synergy effects are overlooked, we aim to grasp DC in a more comprehensive manner than previous literature by investigating the combined effect of the four capabilities referred to above. Since a significant, positive impact on firms' profit resilience to exogenous shocks has been found for each of those capabilities in isolation, we expect their combined effect to be significantly positive as well.

In addition, the dynamic capabilities framework suggests DC as a concept formed by several capabilities in synergy, illustrated by the disaggregation of dynamic capabilities into "sensing, seizing, and reconfiguring" (Teece et al. 1997). Therefore, we expect the synergy effects of possessing different dynamic capabilities to be stronger than the variables' individual effects. Hence, we hypothesize that synergy effects occur when multiple of these four factors are present together, such that the combination of the factors interacts in a way that explains more of MNEs' profit resilience to exogenous shocks than would be expected if we were only considering the individual contributions of each factor. To address this theoretical gap, we will work with the following Hypothesis 2:

H2: The synergy effects of combining international exposure, innovation capabilities, financial flexibility, and asset flexibility will have a significant, positive impact on MNEs' profit resilience to exogenous shocks beyond the sum of their individual effects.

3 Methodology

3.1 Research Approach

This study follows a deductive research approach. According to Bryman & Bell (2011), the deductive approach is when the researcher derives the hypotheses from existing theory and literature and subsequently tests the hypothesis using quantitative data. Whereas, in the inductive approach, the process begins with the data collected, and from there developing a theoretical framework. The deductive approach was chosen for our research as it aligns with our objective of testing a hypothesis derived from the already existing dynamic capabilities framework. As can be seen from the literature review, there is a substantial body of literature in the field and existing theoretical frameworks that align with our study. Therefore, our aim is not to develop new theories from our observations but rather to investigate to what extent dynamic capabilities affect MNEs' profit resilience to exogenous shocks. Thus, inductive methods are ruled out and deductive reasoning is adequate as it allows us to evaluate the relationship between dynamic capabilities and multinational enterprises' profit resilience to exogenous shocks by applying these established theoretical frameworks, such as the Resource-Based View and the literature on dynamic capabilities.

By formulating a hypothesis based on theoretical insights and then testing them empirically using secondary data, we can strengthen empirical understanding in the field of international business. In contrast, an inductive approach, which involves generating theories and developing hypotheses based on data observations, may not be suitable for our study as we aim to examine (or validate) already existing theoretical frameworks rather than generate new ones (Bryman & Bell, 2011).

3.1.1 Quantitative Research

The difference between quantitative and qualitative research is that qualitative research involves the generation of new theories and primarily focuses on an inductive approach to the relationship between research and theory. Moreover, it aims to understand phenomena through interviews and words rather than quantification in the analysis of data, and therefore qualitative methods are less reliant on statistical analysis, which is central to our research objectives (Bryman & Bell, 2011). Quantitative research, on the other hand, involves the systematic collection and analysis of numerical data. It seeks to understand the causal relationship between independent and dependent variables through hypothesis testing and aims to test existing theories rather than generate new theoretical frameworks (Bryman & Bell, 2011). In this study, quantitative research is utilized to empirically investigate the relationship between dynamic capabilities and MNEs' profit resilience to exogenous shocks as the quantitative approach is suitable for examining relationships between different variables, as is the case of this study where multiple variables are utilized to investigate MNEs profit resilience to exogenous shocks. (Bryman & Bell, 2011). Furthermore, given the large and diverse sample of MNEs we intend to analyze, quantitative research allows for efficient examination of patterns and relationships across our dataset.

3.2 Research Design

This study utilizes a cross-sectional research design to investigate the relationship between dynamic capabilities and MNEs' profit resilience to exogenous shocks. A cross-sectional design involves collecting data on multiple cases and at a single point in time, in order to collect a quantifiable set of data in connection with various variables (Bryman & Bell, 2011). Therefore, using a cross-sectional research design enables us to collect data from a sample of MNEs at a single point in time, and allows us to examine the effect of multiple dynamic capabilities variables simultaneously. Thus, the cross-sectional design aligns with our research objective of testing hypotheses derived from existing theory and enables us to draw generalizable conclusions regarding the relationship between dynamic capabilities and MNE profit resilience to exogenous shocks. A longitudinal approach, which entails examining the

variables over time, would have made it possible to identify the long-term effects of DC to a greater extent as well as to ensure the generalizability of our findings across varying economic conditions (Bryman & Bell, 2011). However, since our study is delimited to the effects occurring within two years of the shock in question, the long-term effects that occur later than so will be considered outside the scope of the study and left as a direction for future studies.

3.3 Variables

As concluded from the literature review, our research focuses on four different independent variables (international exposure, innovation capabilities, financial flexibility, and asset flexibility), and one dependent variable that they attempt to explain in firms' profit resilience to exogenous shocks. For operationalization of DC, reviews of previous literature have found that it is done through managers' evaluations or tracking of past experience and performance in most cases, and through financial data or tracking manager and employee actions in some cases (Laaksonen & Peltoniemi, 2018; Loureiro et al. 2021). However, given that our data access is limited to public information and that this research aims to fill a research gap in objective DC operationalization, we follow the example of those using financial data. Below, the proxies and operationalization of each variable are explained further.

3.3.1 Independent Variables

Primarily, it must be mentioned that because our analysis extends over several industries with different characteristics, there is a need to account for the industries of the firms analyzed. Naturally, some industries are more dynamic than others, and therefore that will also be the case for firms in those industries. For instance, it is a likely scenario that firms in the technology sector are very flexible when compared to firms in other industries. However, that won't necessarily bring all technology firms sustained or renewed competitive advantage, and in turn profit resilience. For such capabilities to be considered dynamic capabilities, and thereby be a source of sustained or renewed competitive advantage, they must be assessed in

relation to the firms that you compete with, most commonly firms in the same industry. Hence, accounting for industry is essential in our analysis. Without doing so, the analysis might be distorted. For instance, firms that seem to possess strong DC when compared to firms in all industries might show to have low profit resilience to exogenous shocks. This would indicate that the relationship is not very strong, although in fact the reason that the firm in question has low profit resilience might be because it possesses weak DC in comparison to its industry peers. For this reason, all independent variables will be created by dividing the variable value by the industry average for the industry in which the firm is mainly active. Moreover, since the analysis includes firms of highly varying size, despite the delimitation to large and very large firms, each variable will also be made relative to the firm's size in different ways.

International Exposure

Multiple scholars have found that responsiveness and ability to both sense and respond to change tend to be a function of international experience and diversification (Bowman & Ambrosini, 2003; Li & Tallman, 2011). Thus, we include international exposure as one of our independent variables. Li & Tallman (2011) have defined international diversification as the extent to which a multinational corporation depends on, interacts with, and is embedded in the current global business environment. Moreover, (Hitt et al. 1997) have defined international diversification as expansion across the borders of global regions and countries into different geographic locations, or markets. Following those definitions, a firm's level of international exposure could be reflected by the number of different markets in which it operates. Hence, we operationalize international diversification through the number of foreign countries in which the firm has subsidiaries. To ensure comparability across the sample of firms of different sizes, this is divided by the total assets of the firm. Lastly, the *number of foreign countries with subsidiaries per unit of total assets* will be divided by the *average number of foreign countries with subsidiaries per unit of total assets* in the industry the firm in question belongs to. Hence, the formula for the *international exposure* variable is:

$$International\ Exposure\ = \frac{\frac{Number\ of\ foreign\ countries\ with\ subsidiaries}{Total\ Assets}}{Industry\ average}$$

Innovation Capabilities

Previous literature has found innovation capabilities to be significant for performance under disruptive times and profit resilience to shocks, particularly through facilitating opportunity seizing with the development of new products, processes, and services, and knowledge resources (Chien & Tsai, 2012; Dejardin et al. 2023; Roberts & Grover, 2012; Teece, 2007; Teece & Leih, 2016; Wu, 2010). Therefore, we use innovation capabilities as our second independent variable. Drawing from previous literature, R&D intensity is an established operationalization and a good indicator of how well a firm is doing in terms of opportunity seizing and innovation, which also is comparable across firms of different sizes. For that reason, we follow the method of previous scholars operationalizing innovation capabilities through *R&D intensity* (Aarstad et al. 2021; Chang & Rhee, 2011; Li & Tallman, 2011). Moreover, the R&D intensity will be computed as *R&D expenditure divided by operating revenue*. Lastly, *the R&D intensity* is divided by the *average* R&D intensity in the industry the firm in question belongs to. Hence, the formula for the *innovation capabilities* variable is:

$$Innovation\ Capabilities\ = \frac{\frac{Total\ R\&D\ Expenditure}{Operating\ Revenue}}{Industry\ average}$$

Flexibility

Literature on firms' responses to crises or shocks agrees that flexibility is often a vital part of DC, in line with Teece's (2007) emphasis on the capability to "maintain competitiveness through enhancing, combining, protecting, and when necessary, reconfiguring" (Brahmasrene, 2004; Chang & Rhee, 2011; Hitt et al. 2021; Li & Tallman, 2011) However, flexibility is defined and operationalized differently. Some scholars stress the importance of financial flexibility, by arguing that financial funds are required to be able to do strategic reconfigurations that imply significant costs (Teece, 2007; Brahmasrene, 2004). Others shed light on the importance of asset flexibility, in the sense of not having an excessively high proportion of fixed assets since that limits the ability of the firm to do substantial transformations making those fixed assets obsolete (Hitt et al. 2021). Therefore, we disaggregate flexibility into *financial flexibility* and *asset flexibility*.

Following the reasoning of (Rothaermel & Hill, 2005) that "an incumbent firm's financial strength is measured by the sum of its cash and all securities readily convertible to cash as

listed in the current assets section of the balance sheet", we use the available current assets to operationalize financial flexibility. However, to ensure comparability across firms, a relative measure is used and financial flexibility is operationalized as *the current ratio*. Lastly, the current ratio is divided by the average current ratio in the industry the firm in question belongs to. Hence, the formula for the *financial flexibility* variable is:

$$Financial\ Flexibility\ =\ \frac{\frac{Current\ Assets}{Current\ Liabilities}}{Industry\ average}$$

Asset flexibility on the other hand is operationalized to grasp the mechanisms highlighted by Hitt et al. (2021) in the quote:

> Fixed assets, especially those that are location bound, … are difficult to redeploy for alternative uses. Some firms may need to obtain more liquid and adaptable resources, which can support the reconfiguration of other resources.

Therefore, asset flexibility is operationalized as *the proportion of non-fixed assets out of the firm's total assets*. Again, the *proportion of non-fixed assets out of the firm's total assets* is divided by the *average proportion of non-fixed assets out of the firm's total assets* in the industry the firm in question belongs to. Hence, the formula for the *asset flexibility* variable is:

$$Asset\ Flexibility\ =\ \frac{\frac{Non-fixed\ Assets}{Total\ Assets}}{Industry\ average}$$

Since the independent variables are hypothesized to have an effect on firms' profit resilience to exogenous shocks, that would require them to be in place before the start of the exogenous shocks. Therefore, data for the independent variables is retrieved from 2019, before the start of the COVID-19 pandemic.

3.3.2 Dependent Variable

Profit Resilience to Exogenous Shocks

As explained in the literature review, DC has a limited capacity to explain firm performance directly because it does not have a direct, but a mediating, effect on performance. Moreover,

the reviewed literature found that such problems could be avoided through using *performance change* rather than static measures of performance, as the dependent variable. Doing so allows for examining DC's impact across firms with significantly varying ordinary capabilities (OC). That offers insights into how firms leverage DC to navigate change, regardless of their baseline OC and performance. In contrast, analyzing the direct impact of DC on firm performance would necessitate limiting the study to companies with similar OC levels, as any differences identified in performance could otherwise be attributed to the varying OC.

Therefore, we will follow the suggested method of examining performance change. More precisely, As return on assets (ROA) was found to be an established measure of performance in the literature addressing objective performance, our dependent variable will be operationalized through *the change in ROA from before (2019) to post (2021) the exogenous shock of the start of the COVID-19 pandemic*. By doing so, we intend to grasp firms' ability to maintain and improve performance post exogenous shocks, as well as their ability to quickly recover from exogenous shocks since those are the areas where DC theoretically should have its most significant implications, Simply put, the dependent variable is *profit resilience* to exogenous shocks. The formula for the dependent variable is:

$$Profit\ Resilience = ROA_{2021} - ROA_{2019}$$

3.4 Data Collection Method

To gather data for our variables, we utilize secondary data sourced from Orbis. Orbis is a commercial database of company profiles and financial statements provided by the publishing firm Bureau van Dijk which allows for the search of different businesses using various parameters. The initial step of our data collection was to filter the companies. We do so using the following criteria:

Search Strategy			
Search Step		Step result	Search result
1. Status	Active companies, Unknown situation	357,266,737	357,266,737
2. ROA using Net income (%)	All companies with a known value, 2021, 2019, for all the selected periods, exclusion of companies with no recent financial data and Public authorities/States/Governments	10,456,798	9,914,442
3. Size classification	Large, Very large	3,962,761	732,377
4. Total assets	All companies with a known value, 2021, 2019, for all the selected periods, exclusion of companies with no recent financial data and Public authorities/States/Governments	16,384,089	732,377
5. Current ratio (x)	All companies with a known value, 2019, exclusion of companies with no recent financial data and Public authorities/States/Governments	15,012,498	676,165
6. Tangible fixed assets	All companies with a known value, 2019, exclusion of companies with no recent financial data and Public authorities/States/Governments	15,425,520	662,795
7. R&D expenses / Operating revenue (%)	min=0.001, Last available year, exclusion of companies with no recent financial data and Public authorities/States/Governments	815,177	97,005
Boolean search	1 and 2 and 3 and 4 and 5 and 6 and 7		
TOTAL			97,005

The first criterion, limiting to firms classified as “large” or “very large” in Orbis, is intended to limit our study to larger firms. Orbis considers a firm to be very large if they either have operating revenue equal to or greater than 100 million EUR, total assets equal to or greater than 200 million EUR, or at least 1000 employees. Moreover, they consider a firm to be large if they don’t fulfill the criteria of very large companies and either have operating revenue equal to or greater than 10 million EUR, total assets equal to or greater than 20 million EUR, or at least 150 employees. It is apparent from our data collection process that larger firms are predominantly the ones disclosing the data required for our analysis in Orbis, most likely because larger companies tend to have more comprehensive financial disclosures (Buzby, 1975). For that reason, we believe that it is likely that our analysis is more disturbed than benefited by a broader scope including a few smaller firms in our sample, and that a more narrow scope allows us to generate more accurate findings. Particularly, since we suspect that the effects of dynamic capabilities on MNEs’ profit resilience might differ between smaller firms and larger firms, isolating our research to one of those segments might help clarify the present effects.

The decision to include only companies with positive R&D intensity was made to ensure internal consistency. In our data exploration through Orbis, many firms have missing values or have reported 0 R&D expenses. However, after analyzing a few of these firms’ annual reports, it is clear that they do in fact have R&D expenses but that they are categorized under other headings, possibly due to the lack of consistent reporting standards for all firms. Due to this concern, we choose to exclude all firms reporting 0 R&D expenses or lacking values, to

avoid including incorrectly reported data in our analysis. However, it should still be noted that this inconsistency of reporting raises potential concerns for discrepancies in the categorization of R&D expenses even among the firms included in the analysis. In addition to the two mentioned, the remaining criteria in Orbis are solely filtering out firms without the available data needed for the variables of the analysis.

After applying the outlined criteria of the search, 97,005 companies were found. Next, manual filtering is applied to filter out firms with solely domestic operations that cannot be considered MNEs and thereby fall outside of our scope, and firms belonging to industries underrepresented in our sample frame such that a reliable industry average can be constructed. After doing so, a final sample frame of 4914 firms remained. Based on that sample frame as a whole, industry averages were constructed for all industries present in the sample frame (Appendix 5, Figure 1). Out of these 4914 MNEs, we chose to use the entire sample frame as our sample. By doing so, our ambition is to maximize the accuracy of our findings as well as increase the statistical power of our results, in turn improving the validity. We expect the effects of each variable to be of relatively small size, due to the abundance of explanatory factors of profit resilience to exogenous shocks. Hence, using a larger sample that could increase the precision might facilitate our identification of significant explanatory variables as it reduces the standard errors, in turn allowing the detection of subtle, but significant effects.

3.5 Data Analysis

The statistical analysis of the data for the research is conducted in SPSS. Furthermore, we have chosen to conduct our analysis through multiple linear regression analysis. We are doing so because we want to consider the influence of multiple quantitative independent variables on one single quantitative dependent variable. Also, our research objectives and hypotheses, H2 in particular, emphasize the importance of combined effects and synergies, making interaction terms an important aspect of our research. Thus, that reinforces the adequacy of using multiple linear regression as our data analysis method. In addition, our ambition is that the ability of multiple linear regression allows us to handle datasets sufficiently large to find significant insights and effects beyond what could be found from more simple analyses

(Berenson et al. 2017). More precisely, two different multiple regression models are performed, one for each hypothesis. For the first model, no interaction terms are considered but for the second model, interaction terms are included due to the nature of H2.

3.5.1 Model Specification

In the first multiple regression model, which aims at testing hypothesis 1, profit resilience to exogenous shocks serves as the dependent variable. The independent variables of the model are international exposure, innovation capabilities, financial flexibility, and asset flexibility. All of the variables are operationalized as explained in 3.3. This makes the multiple regression model that tests H1, that the effect of international exposure, innovation capabilities, financial flexibility, and asset flexibility have a significant, positive impact on MNEs' profit resilience to exogenous shocks, as follows:

$$MPR = \beta 0 + (\beta 1 \times IE) + (\beta 2 \times IC) + (\beta 3 \times FF) + (\beta 4 \times AF) + \epsilon$$

Where:

- MPR is MNE profit resilience to exogenous shocks
- IE is international exposure
- IC is innovation capabilities
- FF is financial flexibility
- AF is asset flexibility

For the second hypothesis, we want to take it a step further and consider the synergy effects of the independent variables. As we hypothesize that the effect of DC is reinforced when multiple aspects of DC are present, that suggests our different DC proxies interact. Therefore, we introduce interaction terms into the multiple regression model. Since we cannot with certainty say beforehand which interactions between independent variables are most likely to be significant, all two-, three-, and four-way interactions among our four independent variables are explored. Thus, for H2, an exploratory best subset regression will be employed to find the most suitable model including only interactions between variables that are

statistically significant. Therefore, the best subset regression model that is testing H2, that the synergy effects of international exposure, innovation capabilities, financial flexibility, and asset flexibility have a significant, positive impact on MNEs' profit resilience to exogenous shocks beyond the sum of their individual effects, is not pre-specified but is created through exploratory analysis.

3.5.2 Model Interpretation

For interpreting our first regression model, to test H1, we start our analysis by investigating the adjusted R-squared to assess the explanatory power of the model as a whole. Furthermore, we perform an F-test to test the overall significance of the model, and test H1. In addition, the p-values of the t-test of each independent variable are assessed to extend our analysis. In our analysis, H1 is confirmed if the p-value for the F-test is 0.05 or less and the p-value for the t-tests is 0.05 or less for all variables.

For interpreting our second model, testing H2, we start our analysis by analyzing the interaction terms that were included in the best subset regression model. Their individual coefficients and statistical significance will be analyzed to conclude if the interaction terms are significant or not. We conclude the significance of an interaction term if the p-value for the t-test is 0.05 or less. Moreover, we assess the adjusted R-squared of the second model too to determine if the inclusion of interaction effects makes the model's explanatory power go beyond the sum of the independent variables' individual effects. We conclude the second model's inclusion of synergies to go beyond the sum of the independent variables' individual effects if its adjusted R-squared is higher than that of the first model while being statistically significant (p-value for the F-test ≤ 0.05).

3.6 Validity and Reliability

Validity revolves around the question of to what extent the source of measurement measures the concept that it is supposed to be measuring. In many ways, this is the most important

element of a study. Reliability, on the other hand, refers to the consistency and stability of measurement over time; it indicates the degree to which the results of a study are dependable, consistent, and replicable (Bryman & Bell, 2011). While there are concerns about accuracy and/or representability using secondary data, our ambition is that using Orbis improves the reliability of our findings since Orbis globally standardizes the data. This is particularly useful for our research where we study firms that originate from different parts of the world and industries where the financial reporting standards as well as accounting practices might be varying, causing inconsistencies within our dataset. Using standardized data from a database like Orbis improves internal consistency and reduces such issues. Despite this, data for one company may not be entirely comparable to another company due to the mentioned differences. However, as we are using a large sample size of 500+ companies, this issue should not be of major concern. We also take measures to remove firms that are listed as having zero, or not at all reported, R&D expenditure, ensuring better internal consistency. Something else worth mentioning is that we have to clean some of the data we obtain from Orbis, which could result in minor measurement inconsistencies due to human error. To improve the construct validity of the variables that we are attempting to measure, we base our concepts of measurements on similar studies that have been done before. The details for this can be found under "3.3 Variables"

Regarding the validity of using COVID-19 as a proxy for exogenous shock, the literature is in general consensus that external large-scale disruptions that come from *outside the economy* are forms of exogenous shocks (Dai et al. 2017; Li & Tallman, 2011; Teece & Leih, 2016). The COVID-19 pandemic is a valid example of this. The issue lies in the multitude of other factors that could affect firm performance, especially in a global context. Something we attribute to the pandemic may as well be due to other factors. The large sample size should alleviate some of this issue, but nonetheless, we are aware of the limitations.

Internal validity focuses on the issue of causality, questioning whether the observed results genuinely represent the studied population (Bryman and Bell, 2011). To strengthen causality and ensure the data is not representative of something else, we will validate the regression model by assessing the necessary assumptions. External validity is whether our findings are applicable beyond the specific search criterion in our study. The results should be generalizable to a wide variety of contexts, as our studied sample contains firms from many

different industries, situated in varying geographical locations and with differing market capitalizations. One caveat is that we are using larger firms as our target which may result in our findings not being relevant for smaller firms.

3.7 Limitations

Naturally, the study includes several limitations due to our method choices, data collection procedures, and analysis tools. As already mentioned, one of these limitations lies in the cross-sectional nature of our research. Some scholars argue that DC shows their full effect first after the firm has been able to reconfigure its business model or certain operations, as well as adapt strategy, in response to the environment. If so, that implies that large parts of the effect of DC on profit resilience to exogenous shocks are missed due to our limited scope of only the two years following the COVID-19 pandemic. On the other hand, it would be difficult for us to do the study in any other way as there have been other exogenous shocks after 2021 that have most likely affected firms' ROA and in turn would have had an impact on our results.

Another aspect is that exogenous shocks can be of a different nature, further implying a possible limitation of how generalizable our findings are. Potentially, DC's effect on MNE profit resilience might be different depending on whether the exogenous shock is in the shape of a financial crisis, a pandemic, or a war. Such differences could be overlooked by our study. Moreover, our criteria to find a sample frame might also limit our study by introducing biases. For instance, despite that not being the intention, our criteria might cause an unproportionate concentration of firms from certain geographical regions or industries in our sample. Similarly, our exclusion of firms with no R&D expenses might imply a bias towards R&D-intensive industries. If so, it could be questioned if our findings are representative of a broader population or if the findings only hold for certain industries or regions frequently occurring in our sample.

4 Results

In this section, the output and results of our data analysis will be presented. First, the results of the assumption testing will be presented for both regression models. Moreover, the measures and steps taken to overcome potential assumption violations or other issues will be outlined. Also, the descriptive statistics for each of the variables of both models will be presented. After doing so, conclusions will be drawn regarding the appropriateness and validity of the two models. Lastly, we will assess the models' results in relation to H1 and H2 to either confirm or reject those.

4.1 Descriptive Statistics & Model Assumptions

4.1.1 Regression Model 1

Table 4.1 below presents the descriptive statistics of the first regression model, testing H1. As could be seen by the dependent variable "ROA_Change", the firms of our sample did on average improve their ROA by 1.48 percentage points from 2019 to 2021, with the range of change extending between -92.7 and +165.15 percentage points. The average values for all four independent variables were very close to 1.0. Also, the minimum values were all close to 0 whereas the maximum values deviated significantly more from the mean indicating a skewness. This high and obvious skewness was observed in X1 (international exposure), X2 (innovation capabilities), and X3 (financial flexibility).

Table 4.1: Descriptive statistics of Model 1 with unadjusted variables.

VARIABLE	N	MIN	MAX	MEAN	ST. DEV	KURTOSIS
ROA_Change	4914	-92,70	165,15	1,43	11,95	20,10
LOG_International_Exposure	4914	-3,23	1,60	-0,51	0,69	0,26
LOG_RD_Intensity	4914	-3,89	1,46	-0,36	0,67	2,31
LOG_Financial_Flexi	4914	-2,21	1,42	-0,10	0,27	2,51
Asset_Flexibility	4914	0,06	1,78	1,00	0,19	1,63

Given that the independent variables are calculated as industry-relative variables divided by industry averages, this naturally constrains the data and creates skewness. Due to the independent variables being created like his, they will have a mean value of approximately 1.0. Moreover, the minimum possible value of all variables is 0, which is 1 below the mean. This implies that the downward deviation from the mean is bounded to a maximum of 1 whereas the deviations above the mean can go significantly higher than 1 above the mean. This results in the right-skewness of the data since the nature of the data limits outliers on the lower end but not on the higher end. This skewness is shown in Table 4.1 above by the kurtosis of the variables indicating substantial non-normality for international exposure, innovation capabilities (R&D intensity), and financial flexibility. Also, the graph of predicted Y vs residuals for Model 1 did show indications of potential heteroscedasticity (Appendix B, Figure B1). Moreover, none of the independent variables showed a linear relationship, or very weak such, with the dependent variable (Appendix B, Figure B2).

To avoid that the right-skewness of the data harms the fit of the model, and eventually causes issues with heteroscedasticity, as well as to improve linearity, X1, X2, and X3, were transformed using logarithmic transformation. By performing the transformation, our ambition was to compress the large range of values, reducing skewness and improving the normality of residuals and heteroscedasticity issues. As could be seen by the descriptive statistics in Table 4.2 below, both the range and the standard deviation of the independent variables decreased dramatically, indicating successful compression of the data and likely more normality in the data.

Table 4.2: Descriptive statistics of Model 1 with transformed variables.

VARIABLE	N	MIN	MAX	MEAN	ST. DEV	KURTOSIS
ROA_Change	4914	-92,70	165,15	1,43	11,95	20,10
International_Exposure	4914	0,00	40,21	1,01	2,38	72,79
RD_Intensity	4914	0,00	28,74	1,00	1,53	65,05
Financial_Flexibility	4914	0,01	26,06	1,00	1,02	141,05
Asset_Flexibility	4914	0,06	1,78	1,00	0,19	1,63

It could also be seen that this effectively reduced the skewness of the independent variables through the heavily reduced kurtosis indicating that the transformed variables approach normality. Also, Figure C1 in Appendix C indicates that the transformation was successful in reducing heteroscedasticity. Still, some individual outliers did exist. These were checked manually against data from annual reports to ensure they were not related to data entry errors. It could also be seen from Appendix C (Figure C2) that the linearity between the independent variables and the dependent variable was not effectively solved. However, since the scatter plots do not show any other patterns than linear, we assume that the cause of the low linearity is simply the low predictive power of the individual independent variables on the dependent variable and that an alternative, non-linear, method would not necessarily do a better job. Moreover, as neither combined nor interaction effects are considered in this phase, the synergy effects that are hypothesized to be a significant driver of the relationship between the X variables and Y is not displayed in these graphs. Hence, we proceeded with the model despite the very low linearity and will return to this question in our discussion.

For the remaining assumptions, we could see that no assumptions are violated. Since the data for each variable is retrieved at one single point in time in a cross-sectional design, rather than a longitudinal one, the independence of observations is naturally not violated. However, we did still compute the Durbin-Watson statistic to eliminate any worries of autocorrelation with a lagged dependent variable, as could be seen in Appendix C (Figure C4). The result of the Durbin-Watson statistic of 1.982 indicated an almost non-existent autocorrelation. For normality of errors, the histogram of the residuals in Appendix C (Figure C3) indicates that these are close to normally distributed around the mean residual of 0. There is a slight right-skew in the residuals as well as an “over-clustering” around the mean. However, as there seem to be no other issues with heteroscedasticity or other assumptions caused by this, these issues do not appear substantial enough to violate the normality assumption. Lastly, the variance inflation factors (VIFs) of the 4 independent variables are all very close to 1.0, indicating that there are no issues with multicollinearity among them (Appendix C, Figure C5). Given these findings, we conclude that the model is valid.

4.1.2 Regression Model 2

For model 2, the best subset regression testing H2, the transformed data was used. Below in Table 4.3 are the descriptive statistics of all interaction terms that were explored in the second regression model, where X1 represents international exposure, X2 represents innovation capabilities, X3 represents financial flexibility, and X4 represents asset flexibility.

Table 4.3: Descriptive Statistics of Model 2 with Transformed Variables.

VARIABLE	N	MIN	MAX	MEAN	ST. DEV
ROA_Change	4914	-92,70	165,15	1,43	11,95
LOG_International_Exposure (LOG (X1))	4914	-3,23	1,60	-0,51	0,69
LOG_RD_Intensity (LOG (X2))	4914	-3,89	1,46	-0,36	0,67
LOG_Financial_Flexibility (LOG (X3))	4914	-2,21	1,42	-0,10	0,27
Asset_Flexibility (X4)	4914	0,06	1,78	1,00	0,19
LOG (X1) * LOG	4914	-4,52	6,77	0,22	0,67
LOG (X1) * LOG	4914	-1,69	2,08	0,08	0,25
LOG (X1) * X4	4914	-3,57	1,96	-0,49	0,71
LOG (X2) * LOG	4914	-1,67	3,89	0,06	0,23
LOG (X2) * X4	4914	-4,52	2,00	-0,34	0,69
LOG (X3) * X4	4914	-2,74	1,96	-0,09	0,28
LOG (X1) * LOG (X2) * LOG (X3)	4914	-2,75	2,93	-0,05	0,23
LOG (X1) * LOG (X2) * X4	4914	-5,54	9,54	0,20	0,66
LOG (X1) * LOG (X3) * X4	4914	-1,93	4,76	0,07	0,25
LOG (X2) * LOG (X3) * X4	4914	-2,79	3,64	0,06	0,22
LOG (X1) * LOG (X2) * LOG (X3) * X4	4914	-92,70	165,15	-0,04	0,22

Performing the best subset regression shown in Appendix D (Figure D1) revealed that only 5 interaction variables possess significance enough to be included in the model. Moreover, the introduction of these did not cause any major changes neither regarding linearity, variance of residuals, or normality of residuals. Thus, no violations of assumptions were caused through the inclusion of interaction terms. On the other hand, multicollinearity increased slightly due to several independent variables being present in multiple interaction terms as could be seen

by the VIFs in Appendix D (Figure D1). However, the VIFs are still not deviating enough from 1.0 to be a source of worry about the model's validity. Thus, we conclude that model 2 is also valid.

4.1.3 Industry Differences

Furthermore, one could observe differences in how the ROA of firms was affected by the COVID-19 pandemic, depending on the industry. This is natural as the exogenous shock of the global pandemic predominantly presented challenges to certain industries, whereas other industries were presented with new opportunities as a consequence of it. As could be seen from Appendix E (Figure E1), textiles & clothing manufacturing, wood, furniture & paper manufacturing, and construction were on average negatively impacted by COVID-19, in contrast to the other studied industries that had a positive ROA development on average. For communications and mining & extraction, these positive effects were most prominent with an average ROA increase of 2.49 and 3.90 percentage points, respectively.

4.2 Regression

4.2.1 Regression Model 1

The first regression model, concerning H1, did show a significant but poor fit. The adjusted R-squared value for regression model 1 was 2.7%, indicating that the model explains as little as 2.7% of the variance in the profit resilience of MNEs to exogenous shocks (see Appendix C, Figure C4). This implies that approximately 97% of the variance in the dependent variable is not explained by our independent variables. Simultaneously, it was found that the model is undoubtedly statistically significant, since the conducted f-test for H1 gave a p-value less than 0.001. This could indicate either that the predictors included in the model are not accurate or comprehensive enough in explaining the dependent variable, or that they are accurate but solely explain very small effects.

Table 4.5: Model Output for Regression Model 1.

VARIABLE	BETA COEFFICIENT	T-STAT	P-VALUE
(Constant)	2,556	2,64	0,01
LOG_International_Exposure	1,451	5,80	0,00
LOG_RD_Intensity	1,333	5,19	0,00
LOG_Financial_Flexibility	-6,345	-9,76	0,00
Asset_Flexibility	-0,538	-0,59	0,55

	F-STAT	P-VALUE	R SQUARE
Model Total	37,63	0,00	0,027

Observing the individual independent variables, 3 out of 4 ones (international exposure, innovation capabilities as well as financial flexibility) proved to be statistically significant at a 95% confidence level with a p-value of less than 0.001. However, for asset flexibility variables, the p-value was 0.55 indicating that this variable is not significant as an individual independent variable (see Appendix C, Figure C5). Consequently, this suggests that although most independent variables show a significant relationship with profit resilience to exogenous shocks, the effects are too small to reach high explanatory or predictive power.

Moreover, the coefficients for the international exposure and innovation capabilities showed to be positive just as hypothesized, but the coefficient for financial flexibility showed to be negative in contradiction to the hypothesis. To conclude, the model as a whole is statistically significant. However, since the significant variables show opposite effects in their coefficients, and since one variable lacks statistical significance, the findings do not resonate fully with what was hypothesized. Therefore, we cannot conclude that the effects of all four variables are positive and must reject H1:

H1: The effect of international exposure, innovation capabilities, financial flexibility, and asset flexibility will have a significant, positive impact on MNEs' profit resilience to exogenous shocks.

4.2.2 Regression Model 2

For hypothesis 2, best subset regression was used in identifying the variables with the best prediction accuracy while remaining statistically significant. Performing the best subset regression with all individual independent variables as well as two-, three- and four-way interactions between them ended up at what is seen in Model 5 in Appendix D (Figure D1).

Table 4.6: Model Output for Regression Model 2.

VARIABLE	BETA COEFFICIENT	T-STAT	P-VALUE
(Constant)	2,168	9,64	0,00
LOG (X3) * X4	-7,776	-11,51	0,00
LOG (X1) * X4	1,717	6,15	0,00
LOG (X2) * X4	1,899	6,63	0,00
LOG (X1) * LOG (X2)	1,459	4,62	0,00
LOG (X1) * LOG (X3) * X4	-2,637	-3,15	0,00

	F-STAT	P-VALUE	R SQUARE
Model Total	39,43	0,00	0,039

As could be seen from Table 4.6 above, the following variables were included:

- The two-way interaction between LOG (Financial Flexibility) and Asset Flexibility
- The two-way interaction between LOG (International Diversification) and Asset Flexibility
- The two-way interaction between LOG (Innovation Capabilities) and Asset Flexibility
- The two-way interaction between LOG (International Diversification) and LOG (Innovation Capabilities)
- The three-way interaction between LOG (International Diversification), LOG (Financial Flexibility), and Asset Flexibility

For each of the included interaction terms, the p-value of the t-tests were below 0.05 indicating statistical significance for all of them (see Appendix D, Figure D1). Also, the

p-value for the f-stat (see in Appendix D, Figure D2) shows that the model as a whole possesses statistical significance. Moreover, the adjusted R-squared was 3.9%, implying that model 2 has higher explanatory power than model 1 despite still having very low such. Still, this indicates that the inclusion of interaction effects improves the explanatory power of the model beyond only considering the sum of the individual effects of the independent variables (see Appendix D, Figure 2). Also, the results show that no individual independent variables are included in the final model when interaction terms are considered, indicating that the individual effects of the DC variables are not significant, particularly not when assessed in comparison with interaction terms.

In conclusion, we can partially confirm H2 as we find results confirming that synergy effects of combining international exposure, innovation capabilities, financial flexibility, and asset flexibility have a significant impact on MNEs' profit resilience to exogenous shocks beyond the sum of their individual effects. However, just as for H1, the direction of the relationships between interaction terms and the profit resilience to exogenous shocks are varying. Therefore, we cannot with certainty know if the combined effect is positive or not, and in turn not fully confirm the H2.

H2: The synergy effects of combining international exposure, innovation capabilities, financial flexibility, and asset flexibility will have a significant, positive impact on MNEs' profit resilience to exogenous shocks beyond the sum of their individual effects.

5 Discussion

This study has investigated how dynamic capabilities affect MNEs' profit resilience to exogenous shocks, focusing on the international business settings following the COVID-19 pandemic. In doing so, it has been found that certain aspects do indeed have a significant effect, but that DC, as it is operationalized in this study, can not be used as an isolated predictor of profit resilience to exogenous shocks as its explanatory power is too low. Thus, the answer to the research question "How do dynamic capabilities affect MNEs' profit resilience to exogenous shocks?" is that DC has a slight effect, but too minor to draw any meaningful conclusions. Moreover, the studied aspects of DC have shown to have highly varying effects with some being positive and others being negative. This further indicates the complexity and difficulty of drawing meaningful conclusions from the results.

5.1 The Role of Dynamic Capabilities in MNE Profit Resilience

As concluded above, the low adjusted R-squared value of model 1 at 2.7% implies that only a small proportion of the variance in MNE profit resilience to exogenous shocks can be attributed to the independent variables included in this model. However, the statistical significance for three out of four independent variables (international exposure, innovation capabilities, and financial flexibility) and for the model as a whole does suggest that relationships between the independent variables and MNE profit resilience to exogenous shocks do exist. This finding is consistent with the literature highlighting the relationship between dynamic capabilities and firm performance/profit resilience, particularly during exogenous shocks. However, despite some of the variables impacting profit resilience in some form, the relationship between our variables is too minor to reach any solid predictive power, as there is still such a high proportion of the variability in the profit resilience variable that remains unexplained by the independent variables. Consequently, that implies our operationalization of DC's ability to predict the profit resilience of firms impacted by exogenous shocks is limited.

The reasons for our model lacking substantial explanatory power are complex and can most likely be attributed to a multitude of factors, with a likely culprit being that our "objective" variables did not fully encompass the Dynamic Capabilities we set out to measure. That is to say, the aspects we considered and the financial data we used do not correctly predict or serve as a good proxy for the sense, seizing, and reconfiguring capabilities as a whole despite accurately reflecting certain dimensions of it. Laaksonen & Peltoniemi (2018), mention several studies that, similarly to our study, use financial data to measure DC, but that this "conflicts with the idea of DC", and that it is hard to operationalize and compare between firms. This is likely one of the major contributing factors to our limited explanatory power. Not to mention that these examples of using financial data were done under stable conditions. Uncertain circumstances only serve to further aggravate the issue of the quantifiability of DC via financial data.

Another aspect that might explain why model 1 lacks high explanatory power is that it only considers the independent variables in isolation, which partly contradicts the DC concept of sensing, seizing, and reconfiguring which heavily emphasizes the interplay between different dimensions of dynamic capabilities. Therefore, it is not surprising that it is observed in model 2 that all of the effects between individual independent variables and profit resilience to exogenous shocks lose their significance when interaction terms are introduced. This does, in essence, mean that the interaction of different aspects of DC is more accurate in explaining profit resilience to exogenous shocks than individual aspects of DC in isolation. Returning to the original theory of Teece et. al (1997) and contrasting it to the original theory of RBV, this has its logical explanation.

As known, the RBV assigns competitive advantage to firms' unique resource endowments. One could argue that the individual predictors; international exposure, innovation capabilities, financial flexibility, and asset flexibility, represent such resource endowments rather than dynamic capabilities when considered in isolation. For instance, R&D intensity alone might reflect strong new product development resources rather than dynamic capabilities, despite being an important part of DC and profit resilience when considered in conjunction with other dimensions. The interaction effects on the other hand, where combined and synergetic effects of the predictors are considered, might more accurately reflect DC. DC are, in contrast to

RBV, more concerned with abilities than resources, and such abilities might be formed by combining the different dimensions captured in the predictor variables. For instance, despite R&D intensity possibly reflecting a resource endowment more than dynamic capabilities on its own, it might form the ability to efficiently pivot a business model in response to changing environments when considered in combination with asset flexibility. Similarly, other combinations of the independent variables could also form abilities that more accurately capture the essence of DC than the variables on their own. Given that Teece (2007) already disaggregated DC into the dimensions of sensing, seizing, and reconfiguring, it is nothing but expected that DC is multifaceted and difficult to capture by individual resources, abilities, or dimensions. Hence, the pure nature of dynamic capabilities as a set of capabilities, rather than individual ones, makes up a likely reason as to why synergetic effects are superior in capturing dynamic capabilities, and in turn, explaining profit resilience to exogenous shocks.

Taking that perspective, it is natural that the individual factors lack significance as predictors of profit resilience to exogenous shocks when considered relative to interactions between them, and why combined effects showed to be more significant than isolated effects. Despite a comprehensive body of evidence indicating RBV's relevance in explaining firm performance, Barney (1991) himself questioned the relevance of the theory under disruptive conditions. For DC, on the other hand, both theoretical foundation and empirical validation indicate particular relevance during disruptive times (Teece et al. 1997; Teece & Leih, 2016; Wu, 2010). With this in mind, it is not surprising that the isolated variables, that are more likely to capture resource endowments, are inferior to interactions between variables that are more likely to represent DC, in explaining profit resilience. Especially so in the context of exogenous shocks that, per definition, are highly disruptive events. Thus, a probable explanation, in line with the reasoning of previous scholars, to model 2 being superior in explaining profit resilience to exogenous shocks is a more accurate operationalization of DC through incorporating synergic effects.

This explanation aligns with the industry-specific data, which indicates that most industries with higher average profit resilience tended to have a high average across all four independent variables as well. For example, the communications sector and the industrial, electric & electronic machinery sectors showed high values across all these dimensions and averaged

significant ROA increases of 2.5 and 1.9 percentage points, respectively. Conversely, several industries with lower average profit resilience demonstrated strength in certain factors but lacked high values across all four aspects. This more macro perspective of industry differences reinforces the findings regarding the importance of synergistic effects and further highlights that a holistic presence of different DC dimensions is crucial for profit resilience to exogenous shocks.

Nevertheless, model 2 still only explains a very small part of profit resilience to exogenous shocks with an adjusted R-squared value of 3.9%, despite being more comprehensive and accurate. Thus, while Teece et al. (1997) and subsequent studies emphasize the positive impact of DC on firm performance in changing market dynamics, Eisenhardt & Martin (2000) challenge this idea, suggesting that DC may be less advantageous for firms during exogenous shocks, might be an adequate explanation. They argue that DC is not as relevant for profit resilience during exogenous shocks as other scholars have suggested since these shocks require rapid adaptation and the creation of new knowledge rather than relying on pre-existing capabilities. The results of both regression models 1 and 2 in this study fail to find the magnitude of effects that previous scholars have found. Also, the observed effects of the independent variables and synergies on MNE profit resilience are small and vary between positive and negative effects.

The inconsistent coefficients in our models underscore the complexity of the relationship between these independent variables and MNE profit resilience. This complexity is also showcased by the observed variability of profit resilience to the COVID-19 pandemic across industries, with some experiencing a positive development and others a negative one. These variations indicate that two firms, despite having the same level of DC according to the variables of this study, would likely not have the same profit resilience to exogenous shocks. Hence, the importance of contextual factors when considering DC and its effect on profit resilience is highlighted. Possibly, the lack of such contextual factors in the models might serve as an explanation to the low explanatory power of the models. Alternatively, as many previous studies have generated their findings during times that are not as disruptive as a global pandemic, our results might also reflect an ambiguity regarding the impact of DC

during exogenous shocks and indicate that the previously reported, positive effects of DC are weakened during and after periods of exogenous shocks.

5.2 Impact of Individual Aspects of Dynamic Capabilities

Despite previous discussion and model 2 suggesting individual aspects of DC do not affect profit resilience to exogenous shocks, model 1 indicates that some do. For example, international exposure has been shown to have a positive effect on profit resilience, in accordance with Li & Tallman's (2011) paper on the subject. They argue that being present in multiple countries increases the probability for firms to be exposed to disruptions in various ways and build experience which should lead to enhanced responsiveness, similar to what Teece refers to as sensing. Moreover, Li & Tallman (2011) suggest that the experience from dealing with disruptive events on a smaller scale, gained through international diversification, equip firms with the necessary capabilities to build profit resilience and adaptability to exogenous shocks over time.

Innovation capabilities have a positive significant relationship, indicating that high R&D intensity by itself improves a firm's capability to withstand exogenous shocks. Being able to innovate could allow the firm to quickly adapt and come up with the necessary products or services in the new environment caused by an exogenous shock. Specifically, high innovation capabilities could lead to a company being able to pivot i.e. change the direction of business operations. This would be in line with Morgan et al's (2020) research on innovation opportunities present during shocks. In light of this, it is to be expected that innovation capabilities have a more substantial impact on profit resilience when combined with other variables via synergy effects, such as with asset flexibility, as it would facilitate the pivoting aspect.

The financial flexibility variable contradicts the hypothesis and previous findings of a positive effect by displaying a significant, negative relationship with profit resilience to exogenous shocks. This directly opposes research suggesting financial strength is crucial for recovery post-crisis and flexibility to adapt to change (Brahmasrene, 2004; Chang & Rhee, 2011). Thus, while companies with high current ratios might appear well-positioned to face exogenous shocks, the results indicate the opposite. High current ratios might indicate risk aversion, where firms prioritize liquidity over investments that strengthen profit resilience, such as R&D or diversification in foreign markets. This conservative approach could paradoxically reduce profit resilience, making firms appear more well-positioned than they are in practice.

Lastly, asset flexibility was the only variable with results resonating with the idea that the interplay of different dimensions is necessary for building DC, and in turn profit resilience. Its lack of statistical significance aligns with this view and was expected since previous findings rarely point towards a direct effect of the degree of fixed or non-fixed assets on profit resilience. Rather, excessive fixed assets could limit reconfiguration possibilities, and in turn adaptability (Hitt et al. 2021). Instead of a direct effect on profit resilience, excessive fixed assets are more a risk factor that *could* cause difficulties in responding to shocks rather than a direct determinant of profit resilience, which emphasizes the need to assess asset flexibility together with other aspects.

Possibly, having a high proportion of fixed assets only implies a negative effect on profit resilience if this is not compensated for through other means, or if the firm is particularly vulnerable to shocks in other aspects too. For instance, a firm might possess a very high degree of fixed assets (and thereby low asset flexibility) but have excellent routines for change management such that the asset base will never become a source of worry in the case of exogenous shocks. Similarly, a firm would likely not be more resilient to exogenous shocks simply by having fewer fixed assets. Rather, firms with less fixed assets might possess the prerequisite to effectively reconfigure and redeploy in response to the shock, but that would

still have to be supplemented with abilities and capabilities for actually doing so. This illustrates that the degree of fixed assets lacks relevance in explaining profit resilience alone.

5.3 Synergy Effects among Dynamic Capabilities

As previously mentioned, the inclusion of synergy effects improved the explanatory power of the model in line with the findings of previous scholars. However, aforementioned authors and scholars indicate that DC should have a positive impact on profit resilience to exogenous shocks. Still, the results of this study indicate that this is just the case for certain interactions, while others have a negative effect.

The two-way interaction between financial flexibility and asset flexibility, as well as the three-way interaction including international exposure, financial flexibility, and asset flexibility, showed negative effects. Remarkably, asset flexibility only negatively impacts profit resilience when interacting with financial flexibility. This suggests that a high proportion of non-fixed assets limits the profit resilience of firms that also possess a high degree of financial flexibility. The explanation for this may relate to these factors affecting the potential to build profit resilience rather than directly on a firm's profit resilience. For instance, if a firm is highly flexible both from an asset and financial perspective, that will not bear them advantages on its own. Rather, they must take advantage of that flexibility by utilizing the opportunities it brings through, for example, rapid business model pivoting or strategic shifts, for it to provide profit resilience. However, if that was the only explanation, the interaction between asset flexibility and financial flexibility would lack significance rather than be significantly negative.

The explanation of this result extends beyond what could with confidence be explained by this study and the previous research findings building its premises. Nevertheless, as the only interactions that showed to have negative effects were those including financial flexibility, the

sole variable that showed a significant, negative effect in Model 1, a potential, but somewhat speculative, explanation for the negative effects of all interaction terms including financial flexibility might be that the interactions with asset flexibility and international exposure further amplify the negative effects of the underinvestment possibly associated with a high current ratio.

Although not the most likely scenario, since the negative effects are present even when international exposure is not part of the interaction, it is not impossible that found negative effects of the three-way interaction between asset flexibility, financial flexibility, and international exposure related to the findings of Li & Tallman (2011) and Bowman (2023). They emphasize the complexity of transnational coordination that limits internationally exposed firms from adapting to change in the short term. Potentially, underinvestment in profit resilience strategies and lack of a fixed asset base that provides stability might expose this vulnerability and limited adaptability of internationally diverse firms. If so, in the cases of highly internationally exposed firms, high financial flexibility might reveal a lack of preparedness and in turn, also lack of profit resilience. However, the interaction between only international exposure and financial flexibility is not significant, indicating that this is not the entire explanation. For this negative effect to be present, asset flexibility must also be high. Hence, that could imply that the potential "lack of preparedness" coupled with high vulnerability to exogenous shocks, might only become a problem for firms that lack the stability of possessing a high degree of fixed assets.

In contrast to the effects above, the interaction between International Exposure and Asset Flexibility had a positive impact. This resonates well with Li & Tallman's (2011) suggestion that firms with extensive international operations will encounter more disruptions in different markets than companies with low international exposure, necessitating rapid adaptation and resource redeployment. This implies that for internationally exposed firms, asset flexibility becomes paramount to enable such adaptation and redeployment. Similar effects were discovered for asset flexibility in conjunction with innovation capabilities, signifying that

there are certain aspects of having a higher proportion of non-fixed assets that are benefited further by having high R&D intensity, or vice versa. This might, for instance, relate to the fact that high R&D expenses can involve risks, including the potential failure of innovations and projects. However, when supported by a strong base of non-fixed assets such as brand names and patents, it could mitigate some of the inherent risk associated with new ventures, which would explain some of the positive synergy effects. Another aspect that is likely to play a part in the positive coefficient of this interaction is that innovation when supported by asset flexibility could allow firms to quickly pivot and adapt their business models in response to sudden market changes, which might become essential for some firms after exogenous shocks.

When innovation capabilities were paired with international exposure, it did also show positive effects on profit resilience to exogenous shocks. Morgan et al. (2020) emphasize that, apart from the negative effects, strategic opportunities can arise from disruptions like exogenous shocks. A contributing factor to the effect of this interaction could be that a firm with these two capabilities could leverage the global insights it has gained to adapt and come up with the necessary solutions to seize those new opportunities. This would then manifest itself in a corresponding increase in profit resilience, as Model 2 suggests. Moreover, as previously discussed, firms that have exposed themselves to multiple countries and different markets via having subsidiaries have developed a better understanding of how to respond to changes and uncertainty in the market. If the firm in question also has substantial R&D expenditure, that might signal that they have explored different innovative ways to take advantage of such change. Hence, the combined experience from both innovation activities and international presence might be an alternative, or supplementary, explanation to why a firm that has high innovation capabilities, together with being exposed to multiple markets, has a better chance of creating a resilient business, even during times of shock.

5.5 Limitations and Future Research

5.5.1 Limitations

The relatively low explanatory power of the models of this study, highlights a potential limitation in the operationalization of DC. It is important to acknowledge the challenge of accurately assessing our independent variables. One example is the effectiveness of investment in R&D activities. While higher R&D intensity might enhance a firm's potential to modify and expand its resource base, it does not necessarily capture the abilities of firms to leverage these investments effectively (Laaksonen & Peltoniemi, 2018). As such, R&D intensity does not have a direct correlation with R&D competence, and in turn innovation capabilities. This concern of inaccuracy might be relevant for others of the independent variables too. Another point to bring up is that the residuals are somewhat over-clustered around the mean, this could indicate non-normality, which could affect the validity of the statistical tests and consequently the findings.

Also, the abstract nature of dynamic capabilities and the difficulty in measuring them directly via our chosen variables present inherent limitations. For instance, the cognitive and emotional skills of managers come into play in how DC is developed and leveraged (Hitt et al. 2021). Thus, incorporating qualitative assessments of managerial capabilities might enable enhancing the understanding of the mechanisms underlying how DC is acquired, developed, and managed within firms. However, to include such aspects and obtain valid and reliable measures of managerial skills, a more in-depth analysis, likely using a qualitative research design, of the firms investigated might be necessary. This is not feasible with the research approach of this study, as it is of quantitative nature. Thus, while the study may provide valuable insights into the relationship between DC and profit resilience, it may not fully capture the nuanced role of managerial skills in shaping organizational responses to exogenous shocks (Hitt et al. 2021).

Moreover, despite our results being statistically significant, it is challenging to account for all the reasons that could contribute to maintaining performance, especially in the complex and multifaceted international environment and particularly during periods of exogenous shocks.

Factors outside the scope of this study are also likely to significantly impact profit resilience, such as organizational culture, which influences how quickly and effectively a firm can adapt to changes, and leadership styles, which can affect decision-making processes during crises.

Since this study spans from 2019 to 2021, it could potentially overlook the long-term effects and how dynamic capabilities influence profit resilience. This relatively short time frame may not fully capture the longer-term impacts of the exogenous shock on profit resilience. Profit resilience might be affected over several years following a major disruption. Therefore, the time frame of this study limits the depth of the analysis, as the true impact of dynamic capabilities on profit resilience may evolve over the years rather than within the time period of this study. Additionally, our proxy for an exogenous shock may not apply to other types of shocks. The impact and opportunities created by a shock can vary greatly; for instance, a pandemic might devastate the restaurant sector while benefiting the online entertainment industry. Similarly, a financial crisis or a war will affect different industries in unique ways. The complexity and variability of exogenous shocks cannot be overstated, and findings from one type of shock may not apply to another.

5.5.2 Suggestions for Future Research

Given the low degree of explanation of profit resilience observed in this study from the variables of DC measured, future researchers could consider exploring alternative methods for measuring dynamic capabilities, and alternative explanatory variables, or considering different approaches altogether. For instance, longitudinal studies tracking firms over extended periods could provide valuable insights and observe aspects that were overlooked by this study, although the unpredictable nature of exogenous shocks presents a challenge in designing such research. Similarly, studies of a qualitative nature could also supplement the findings of this study by understanding dimensions of dynamic capabilities that are difficult to grasp unless you fully understand the context and organization of a firm.

In addition, future researchers could focus on examining different types of shocks or investigating specific industries. Delimiting the research in that way could provide an in-depth understanding of how dynamic capabilities work in specific contexts, rather than

trying to grasp a general view of effects that might differ substantially, which in turn could lead to clearer and more significant results.

Lastly, this study was unable to confidently explain the negative effects of financial flexibility, the two-way interaction between asset flexibility and financial flexibility, and the three-way interaction between asset flexibility, financial flexibility, and international exposure. Therefore, the discussion of this study regarding those variables and interactions is of a somewhat speculative and hypothesizing nature, and we suggest that future research should aim to reveal the mechanisms behind these, in the context of this study, counterintuitive results.

6 Conclusion

This study aimed to investigate the effect of dynamic capabilities on multinational enterprises (MNE) profit resilience to exogenous shocks. Through an analysis of the effects of various aspects of dynamic capabilities (DC) following the COVID-19 pandemic, it was found that international exposure, innovation capabilities, and financial flexibility individually show statistically significant relationships with profit resilience, but that their effects are small and lack uniformity in the direction of their effects.

Furthermore, the study highlights the importance of considering synergy effects among various aspects of DC. The inclusion of interaction terms in the regression models improved their explanatory power, suggesting that the synergistic effects of considering multiple dimensions of DC in conjunction are more relevant in explaining profit resilience to exogenous shocks than individual factors alone. This finding supports the theoretical foundation that DC are inherently interdependent and must be assessed holistically to capture their true impact. This has some implications for companies and how they should prioritize enhancing their capabilities in order to best handle uncertainty. Rather than focusing on one capability in isolation, companies should attempt to improve them in combination. This could allow them to reap the benefits of the added effects that arise from synergies. Granted, the practical implication and generalizability of the paper is fairly limited, owing to the low explanatory power of the models.

Lastly, the findings of this paper indicated that while most dimensions of DC that were included do have a significant effect on profit resilience, the overall explanatory power of the models is relatively low. This underscores the complexity and need for a more nuanced understanding and operationalization of DC than through financial data alone. The inherent difficulty in capturing the multifaceted nature of DC, which includes sensing, seizing, and reconfiguring capabilities, points to the need for more nuanced and possibly qualitative approaches in future research.

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Appendix A - Authorship and AI usage statement

Authorship Statement

The students (Isak Sjöholm, Joel Petrén, and Georgios Chaniotakis) involved in this study are informed and have acknowledged the guidelines of using artificial intelligence within academic research, adhering to the established rules and ethical principles. All parts of the text are ascribed to all authors throughout the whole thesis.

AI Usage Statement

The students have used ChatGPT4 for the sake of gaining feedback and identifying possible areas of improvement within their research. They have done so using previous bachelor theses from Lund University School of Economics and Management as examples showcasing good academic papers. The used prompts and generated answers can be found through the following links:

https://chat.openai.com/share/512263e8-0252-4b6c-855f-0384e4580b48

https://chatgpt.com/share/996229e8-f299-4488-a633-412e4a9b07ed

https://chatgpt.com/share/bceb4988-fab2-4381-98c1-fb45779ffa41

Appendix B - Regression Model 1 with Original Data

Figure B1 - Variance of Residuals:

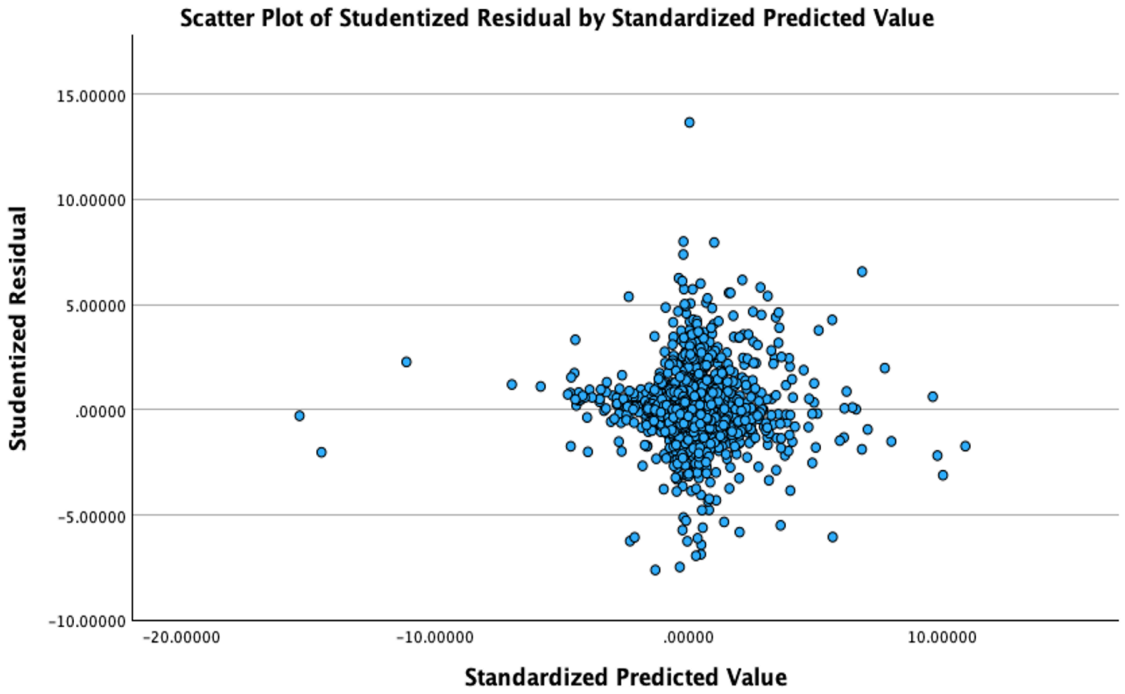
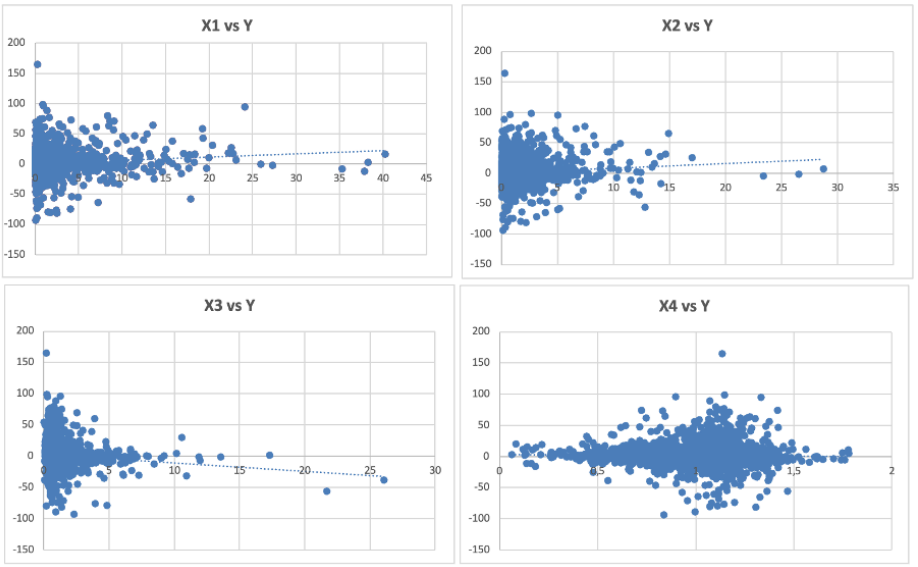


Figure B2 - Linearity of X/Y Variable Relationships:



Appendix C - Regression Model 1 with Transformed Data

Figure C1 - Variance of Residuals:

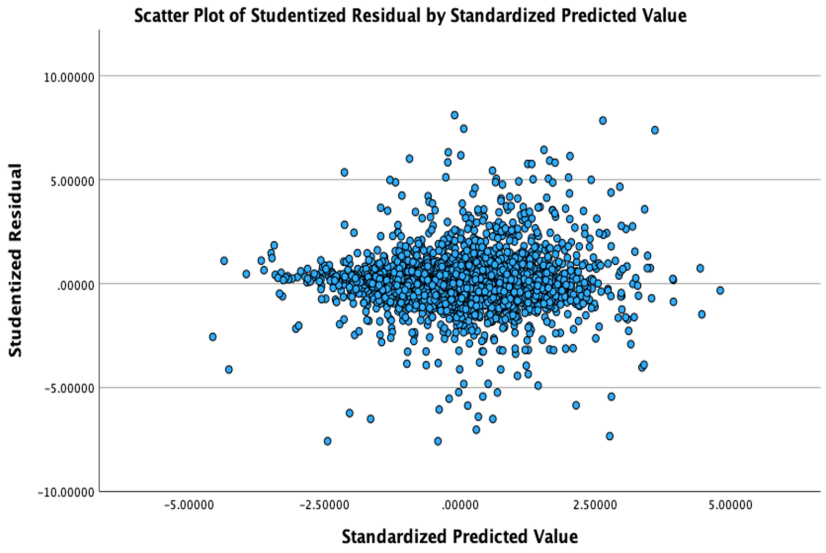


Figure C2 - Linearity of X/Y Variable Relationships:

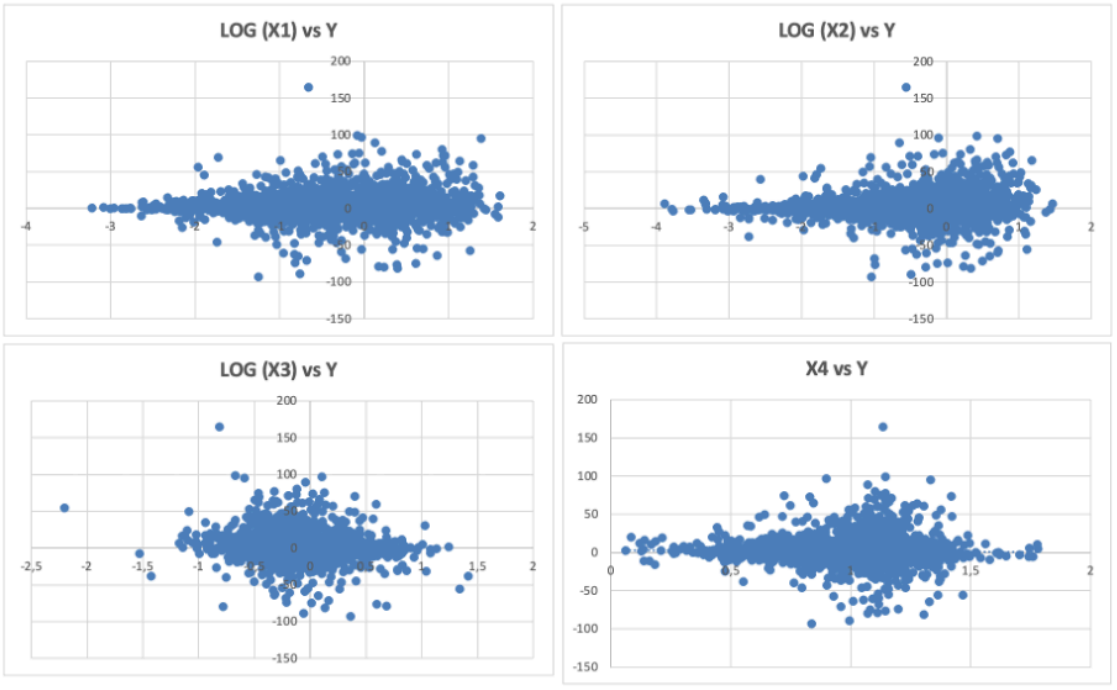


Figure C3 - Histogram of Residuals

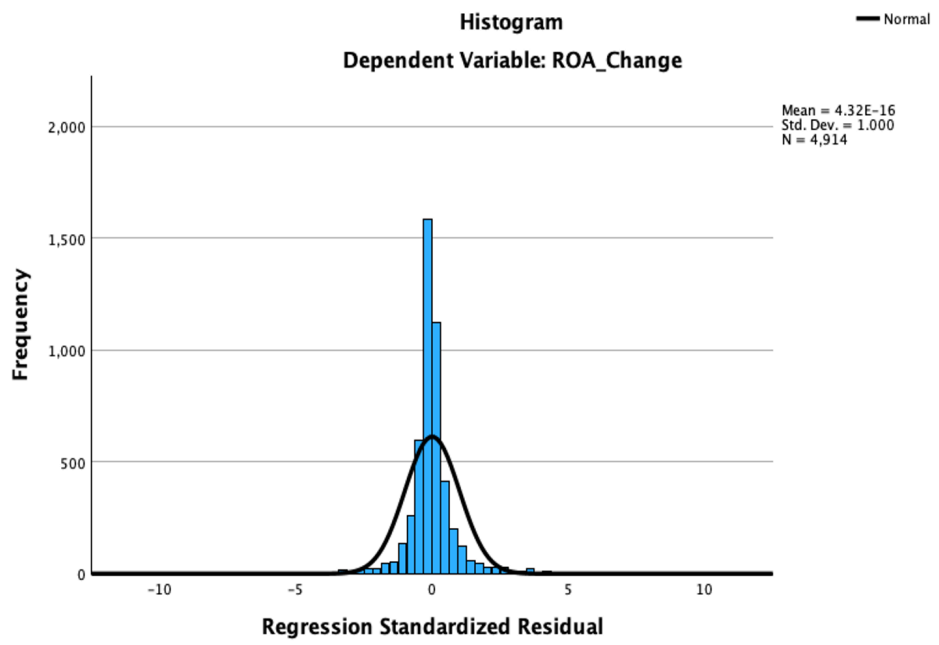


Figure C4 - Model Summary:

MODEL	R SQUARE	ADJUSTED R SQUARE	STD. ERROR OF THE ESTIMATE	DURBIN-WATSON	F-STAT	P-VALUE
1	0,027	0,026	11,79	1,982	37,625	0,00

Figure C5 - Coefficients:

VARIABLE	BETA COEFFICIENT	STD. ERROR	T-STAT	P-VALUE	COLLINEARITY TOLERANCE	VIF
(Constant)	2,556	0,97	2,64	0,01		
LOG_International_Exposure	1,451	0,25	5,80	0,00	0,96	1,04
LOG_RD_Intensity	1,333	0,26	5,19	0,00	0,95	1,05
LOG_Financial_Flexibility	-6,345	0,65	-9,76	0,00	0,91	1,10
Asset_Flexibility	-0,538	0,91	-0,59	0,55	0,92	1,09

Appendix D - Regression Model 2 with Transformed Data

Figure D1 - Coefficients:

MODEL	VARIABLE	BETA COEFFICIENT	STD. ERROR	T-STAT	P-VALUE	COLLINEARITY TOLERANCE	VIF
1	(Constant)	0,963	0,18	5,34	0,00		
	LOG (X3) * X4	-5,935	0,61	-9,71	0,00	1,00	1,00
2	(Constant)	1,736	0,21	8,20	0,00		
	LOG (X3) * X4	-6,570	0,62	-10,67	0,00	0,98	1,02
	LOG (X1) * X4	1,677	0,24	6,87	0,00	0,98	1,02
3	(Constant)	2,105	0,22	9,42	0,00		
	LOG (X3) * X4	-6,965	0,62	-11,25	0,00	0,96	1,04
	LOG (X1) * X4	1,625	0,24	6,66	0,00	0,98	1,02
	LOG (X2) * X4	1,275	0,25	5,07	0,00	0,98	1,02
4	(Constant)	2,215	0,22	9,86	0,00		
	LOG (X3) * X4	-6,913	0,62	-11,18	0,00	0,96	1,04
	LOG (X1) * X4	2,027	0,26	7,75	0,00	0,84	1,18
	LOG (X2) * X4	1,852	0,29	6,47	0,00	0,75	1,32
	LOG (X1) * LOG (X2)	1,314	0,31	4,20	0,00	0,67	1,50
5	(Constant)	2,168	0,22	9,64	0,00		
	LOG (X3) * X4	-7,776	0,68	-11,51	0,00	0,80	1,24
	LOG (X1) * X4	1,717	0,28	6,15	0,00	0,74	1,35
	LOG (X2) * X4	1,899	0,29	6,63	0,00	0,75	1,33
	LOG (X1) * LOG (X2)	1,459	0,32	4,62	0,00	0,65	1,53
	LOG (X1) * LOG (X3) * X4	-2,637	0,84	-3,15	0,00	0,66	1,52

Figure D2 - Model Summary:

MODEL	R SQUARE	ADJUSTED R SQUARE	STD. ERROR OF THE ESTIMATE	DURBIN-WATSON	F-STAT	P-VALUE
1	0,019	0,019	12,08		94,191	0,000
2	0,028	0,028	12,03		71,109	0,00
3	0,033	0,033	12,00		56,214	0,00
4	0,037	0,036	11,98		46,720	0,00
5	0,039	0,038	11,97	1,989	39,432	0,000

Appendix E - Industry Averages

Figure E1 - Industry Averages for Independent and Dependent Variables:

BvD sectors	Number of firms	Foreign countries w. subsidiaries / Total Assets	R&D expenses / Operating revenue	Current ratio	Proportion of non-fixed assets	ROA Change
Business Services	276	0,000027	6,222	2,399	0,873	1,274
Chemicals, Petroleum, Rubber & Plastic	870	0,000030	6,789	2,536	0,723	1,720
Food & Tobacco Manufacturing	228	0,000025	1,336	2,127	0,704	0,516
Industrial, Electric & Electronic Machinery	1630	0,000028	7,836	2,729	0,806	1,895
Computer Software	229	0,000028	12,007	2,578	0,895	1,544
Media & Broadcasting	101	0,000020	7,996	3,147	0,884	1,123
Communications	257	0,000024	8,682	2,248	0,854	2,490
Metals & Metal Products	331	0,000021	2,159	2,235	0,702	1,667
Transport Manufacturing	272	0,000029	3,643	1,640	0,724	1,049
Wholesale	195	0,000028	4,308	2,414	0,813	0,294
Textiles & Clothing Manufacturing	145	0,000023	2,685	2,136	0,695	-0,747
Mining & Extraction	107	0,000022	3,637	1,768	0,562	3,905
Wood, Furniture & Paper Manufacturing	147	0,000026	2,221	2,157	0,655	-0,207
Construction	126	0,000034	1,009	1,694	0,842	-0,651