# Business Responses to Climate Change Regulations: Evidence from the Saudi Automobile Industry

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# Abstract

Businesses must adopt sustainable practices to comply with climate change regulations, which exercise pressures by imposing strict requirements, financial burdens, and operational changes. For businesses, adapting to these pressures is crucial for maintaining competitiveness and long-term viability. Given their significant impact on business strategies, climate change regulations are thus a central focus of this thesis.

Management and business literature often capture business responses to climate change regulations as isolated processes, focusing solely on individual businesses. However, this perspective overlooks the role of interactions within business networks. This thesis examines how businesses respond to climate change regulations, by adopting a network approach that highlights how interfirm adaptation emerges through continuous business interactions. By integrating a behavioural lens into the network approach, this thesis advances our understanding of business responses to climate change regulations and delivers a novel conceptual framework for adaptive business responses.

At empirical level, the thesis adopts a sequential mixed-methods research design to investigate how businesses respond to climate change regulations within the Saudi automobile industry. The qualitative phase explores business interactions in responding to climate change regulations. Findings from 28 interviews suggest that businesses respond to climate change regulations through interfirm adaptation. Product and process adjustments emerge from interaction within business networks, facilitated by resource entitlements, resource mobilisation, resource exploitation, business relationships, economic exchanges, and legal contracts, while hindered by behavioural biases encompassing present bias, reference points, and loss aversion. The quantitative phase aims to validate the conceptual framework of adaptive business responses to climate change regulations. Findings from 99 participants confirm the significant influence of interactional and behavioural factors on activity-related aspects, which in turn influence interfirm adaptation.

This contribution of the thesis has broader implications for businesses operating within networks, emphasising the value of business relationships that foster continuous interactions. Such interactions facilitate resource integration and activity linking, ultimately enhancing interfirm adaptation to external pressures like climate change regulations.

# Declaration

This thesis is submitted to fulfil the requirements for the degree of Doctor of Philosophy. It has not been previously submitted in support of an application for any other degree at this or any other institution. The research presented here is the result of my own work, except where explicitly stated. All external sources have been appropriately acknowledged through explicit references.

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# Chapter 1: Introduction

## 1.1 Research background

Businesses across various sectors are increasingly compelled to adopt sustainable practices in response to pressures associated with regulatory demands that promote environmental sustainability. These pressures stem from external forces, such as governments, industry associations, competitors, and customers, and they exert influence by setting expectations and requirements for environmental responsibility (Wang et al., 2020; Onbhuddha et al., 2024). Governments, in particular, establish regulatory systems that requires businesses to adapt their behaviours (DiMaggio and Powell, 1983). For instance, the European Union's directive to phase out the sale of petrol and diesel cars by 2035 (European Parliament, 2023) creates a new framework that simultaneously constraints and incentivises firms to change the way they conduct businesses (Nadvi, 2008; Okereke and Russel, 2010; Aragon-Correa et al., 2020). It is thus imperative for businesses to adapt to evolving sustainability pressures to maintain their competitive advantage and ensure long-term viability.

Environmental regulations fundamentally shape how businesses operate, particularly through climate change regulations, which aim to mitigate greenhouse gas emissions and drive industries toward sustainability (Cadez, 2019). These regulations impose strict compliance requirements, financial burdens, and operational shifts that businesses must navigate. For businesses, the most significant challenge comes from adapting to both current regulatory frameworks and the expectations of future international and domestic policy developments (Okereke and Russel, 2010; Shevchenko, 2021; Orazalin et al., 2024). This makes climate change regulations a central concern of this thesis, as they represent one of the most profound forces reshaping business strategies and operations.

The introduction of climate change regulations has created a conflict for businesses, which must balance short-term profitability with environmental responsibilities (Wright and Nyberg, 2017; Johnson et al., 2023). This tension means businesses need to reconcile the tension between growth objectives and sustaining the environment, such as protecting shared resources (Kotler, 2011; Wright and Nyberg, 2017). The essence of sustainability is whether the current generation can leave future generations with an equal or greater amount and diversity of resources than those that are available today (Kotler, 2011; White et al., 2019).

In several countries, tackling the issues of climate change has generated a proliferation of regulations mandating businesses to actively reduce their impact on the environment (e.g., European Parliament, 2023; Wu et al., 2024). However, our understanding of how businesses respond to these mandates remains limited.

Until recently, management and business literature have continued to capture business responses to climate change regulations in isolation, i.e., as individual businesses' responses (e.g., Shevchenko, 2021; Shui et al., 2025). However, this approach overlooks the role of business interaction within and around business networks. For instance, Shui et al. (2025) investigated the influence of regulatory pressures on environmental sustainability performance at the firm level and found that businesses in carbon-intensive industries were more responsive to climate change regulations. In contrast, businesses with exposure to foreign markets, particularly in developing countries, were less inclined to comply with climate change regulations. Similarly, Shevchenko (2021) studied the impact of penalties on businesses for violating environmental regulations and found that financial penalties did not lead to improvements in firms' environmental performance. Instead, such penalties led to further deterioration, emphasising that financial penalties

do not effectively deter businesses from breaching environmental standards. These studies (e.g., Shevchenko, 2021; Shui et al., 2025) underscore a persistent gap in the literature, where there remains a lack of attention to the complex dynamics within business networks in response to climate change regulations.

Moreover, despite the efforts of previous studies to explain business responses to climate change regulations (e.g., Kolk and Pinkse, 2004; Böttcher and Müller, 2015; Wahyuni and Ratnatunga, 2015; Shevchenko et al., 2016; Wright and Nyberg, 2017; Goworek et al., 2018; Shevchenko 2021; Shui et al., 2025), the role of business networks has been largely neglected. This oversight can limit our understanding of business responses to climate change regulations, as the necessary resources are often spread across business networks, with businesses relying on these interconnected relationships to operate effectively (Håkansson and Ford, 2002; Veal and Mouzas, 2011; Harrison et al., 2023). In addition, prior research has typically viewed business responses as atomistic and isolated processes, focusing on individual businesses as the primary unit of analysis. Yet this approach fails to capture the continuous and iterative nature of business and non-business interactions within networks, where adaptation and change emerge through ongoing exchanges (Håkansson and Snehota, 1989; Ritter, 2000; Håkansson and Ford, 2002; Vildåsen et al., 2018).

This thesis addresses this research gap by adopting a network approach, which emphasises the important role of interactions among interconnected firms (Håkansson and Snehota, 1995; Ritter, 2000; Araujo et al., 2003; Möller et al., 2005; Ford and Håkansson, 2013; Waluszewski et al., 2019). In doing so, networks become the central unit of analysis for examining how businesses respond to climate change regulations (Harrison and Håkansson, 2006; Mouzas and Naudé, 2007; Mouzas and Ford, 2011).

Prior studies, such as Patala et al. (2014) and Harrison et al. (2023), noted that although research on networks and environmental sustainability is still emerging, a network approach can significantly enhance our understanding of how interconnected actors jointly navigate regulatory demands. This perspective is particularly relevant in industries with tightly interwoven supply chains—such as the automobile sector—where suppliers, manufacturers, distributors, and other stakeholders coordinate resources and activities to meet climate change regulations (Patala et al., 2014; Harrison et al. 2023).

The inherent interdependence in business networks is best illustrated by the Activity-Resource-Actor (ARA) Model, developed by Håkansson and Johanson (1992) based on longitudinal studies of the Industrial Marketing and Purchasing (IMP) research group. The ARA model provides a conceptual framework for understanding the processes and outcomes of interaction within business networks. The model assumes that interaction is an evolving process built over time, where the characteristics of 1) actors, 2) activities, and 3) resources are as much an outcome of interaction as they are an input to it (Håkansson et al., 2009). The ARA model is particularly relevant for examining interfirm adaptation to climate change regulations, as it captures how businesses coordinate activities, access and mobilise resources, and navigate network relationships in response to external pressures. By framing adaptation as an interactive process, the ARA model allows for a deeper understanding of how businesses restructure their exchanges and strategic responses to regulatory changes.

Importantly, interfirm adaptation in business relationships and networks is an essential component in the Industrial Marketing and Purchasing (IMP) research (Håkansson, 1982; Hallen et al., 1991; Håkansson and Snehota, 1995; Brennan and Turnbull, 1996; Fang, 2001; Hagberg-Andersson and Grønhaug, 2010; Mouzas, 2024). Interfirm adaptation

refers to change or adjustment in products or processes by one firm to meet the needs or requirements of another firm in business relationships (Håkansson, 1982; Hallen et al., 1991; Yu and Fang, 2023; Mouzas, 2024). For example, a car dealer might be asked to modify its products or informed that the anticipated delivery is quantity X, which is significantly more than its current sale capacity. When a business reacts favourably to such signals, it displays adaptive behaviours (Hagberg-Andersson and Grønhaug, 2010).

Despite extensive research on interfirm adaptations (e.g., Håkansson, 1982; Hallen et al., 1991; Brennan and Turnbull, 1996; Fang, 2001; Hagberg-Andersson and Grønhaug, 2010; Ahmed et al., 2022; Yu and Fang, 2023; Mouzas, 2024), key questions remain about the mechanisms that enable or inhibit firms to adapt under the external pressures posed by climate change regulations. As Mouzas (2024) highlights, there is a pressing need to explore enablers and barriers of interfirm adaptation in business relationships. Addressing this call, this thesis adopts the network approach (e.g., Håkansson, 1982; Håkansson and Snehota, 1995; Ford and Håkansson, 2006) and integrates behavioural insights (e.g., Simon, 1955; Tversky and Kahneman, 1974; Kahneman and Tversky, 1979; Thaler, 2016) to explore the role of external pressures emanating from climate change regulations in driving interfirm adaptation. This combined perspective allows for a deeper examination of the processes through which external regulatory forces shape collaborative responses among networked organisations.

This thesis contends that understanding the fundamental role of actors' behaviour in networks of business relationships is key. A behavioural network approach "offers a more accurate picture of the actual behaviour of actors and provides a better understanding of networks" (Veal and Mouzas, 2010: p.431). A behavioural network approach enhances our understanding of behavioural biases, cognitive limitations, and

ignored opportunities for exchange among interdependent actors (Veal and Mouzas, 2010). However, empirical research examining the behaviours of business actors in networks of business relationships remains scarce (Håkansson et al., 2009; Ford and Mouzas, 2013b; Guercini et al., 2014; Thornton et al., 2015; Guercini et al., 2022). In particular, Guercini et al. (2014, 2022) call for empirical research on actors' behaviour in business networks to improve our understanding of interactions – the so called 'black box' – in business relationships.

Responding to Guercini et al.'s (2014, 2022) call requires research endeavours that go beyond the IMP literature. While IMP studies provide valuable insights into business networks, they fall short in explaining business actors' behaviours within business networks. To understand comprehensively how businesses respond to climate change regulations, the IMP literature needs to be complemented by state-of-the-art insights into behavioural science (Simon, 1955; Kahneman and Tversky, 1979; Kahneman et al., 1991; Thaler, 1981, 2016).

## 1.2 Research objectives and questions

Following section 1.1, this thesis has examined the theoretical gaps in management and business literature explaining business responses to climate change regulations. Specifically, there remains a gap in understanding how interconnected relationships and continuous interactions within business networks influence adaptive responses to climate change regulations. Specifically, a theoretical gap exists in understanding the mechanisms underlying interfirm adaptation and the processes driving interfirm adaptation in response to external pressures driven by climate change regulations. Furthermore, there is limited research exploring how cognitive limitations and behavioural biases influence business interactions and thus interfirm adaptation to climate change regulations.

The following section introduces the thesis's research objectives and questions.

The overarching aim of this thesis is to investigate businesses' responses to climate change regulation, drawing upon a network approach (e.g., Håkansson and Snehota, 1995; Araujo et al., 2003; Möller et al., 2005; Ford and Håkansson, 2013; Waluszewski et al., 2019) and behavioural insights (e.g., Simon, 1955; Kahneman and Tversky, 1979; Thaler, 2016). This research argues that relying on the behavioural perspectives in networks will reveal a clearer view of the true behaviour of actors and improve our knowledge of business networks (Veal and Mouzas, 2010; Guercini et al. 2014, 2022).

Despite extensive research on business responses to climate change regulations (e.g., Kolk and Pinkse, 2004; Böttcher and Müller, 2015; Wahyuni and Ratnatunga, 2015; Shevchenko et al., 2016; Wright and Nyberg, 2017; Goworek et al., 2018; Shevchenko 2021; Shui et al., 2025), relatively little attention has been paid to examine the role of business networks. Thus, the first research objective of this thesis is:

RO1: *To understand businesses' responses to external pressure emanating from climate change regulations.*

Achieving RO1 will provide insights into how businesses respond to external pressure emanating from climate change regulations. It will examine adaptive business responses at both product and process levels within business networks. However, such adaptive responses vary across firms, prompting the need to explore the enablers and barriers that influence these responses.

Despite the comprehensive studies of interfirm adaptations in earlier research (e.g., Håkansson, 1982; Hallen et al., 1991; Brennan and Turnbull, 1996; Fang, 2001; Hagberg-Andersson and Grønhaug, 2010; Ahmed et al., 2022; Yu and Fang, 2023; Mouzas, 2024),

there remains a gap in understanding the mechanisms and processes driving adaptation when climate change regulations exert external pressure. Therefore, the second research objective of this thesis is:

RO2: *To explore the interactional and behavioural factors of interfirm adaptation in responding to climate change regulations.*

Achieving RO2 will shed light on the enablers and hindrances of interfirm adaptation in responding to climate change regulations. However, the extent to which these factors ultimately influence businesses' adaptive capabilities remains unclear. Consequently, this requires an examination to further scrutinise the relationships between businesses' behavioural and interactional aspects and interfirm adaptation in response to climate change regulations.

Building on the qualitative exploration of behavioural and interactional aspects in RO2, the third research objective examines how these factors influence interfirm adaptation. This research adopts a quantitative methodology to examine the relationships identified in the qualitative phase and measure their impact on businesses' adaptive responses to climate change regulations. Therefore, the third research objective of this thesis is:

RO3: *To examine the relationships between businesses' behavioural and interactional aspects and interfirm adaptation in responding to climate change regulations.*

In support of these objectives, this thesis addresses the following research questions:

RQ1: *How do businesses respond to climate change regulations?*

RQ2: *What factors enable and hinder interfirm adaptation in responding to climate change regulations?*

RQ3: *How do business interactions affect interfirm adaptation in response to climate change regulations?*

Figure 1.1 summarises research gaps, research objectives, and research questions.

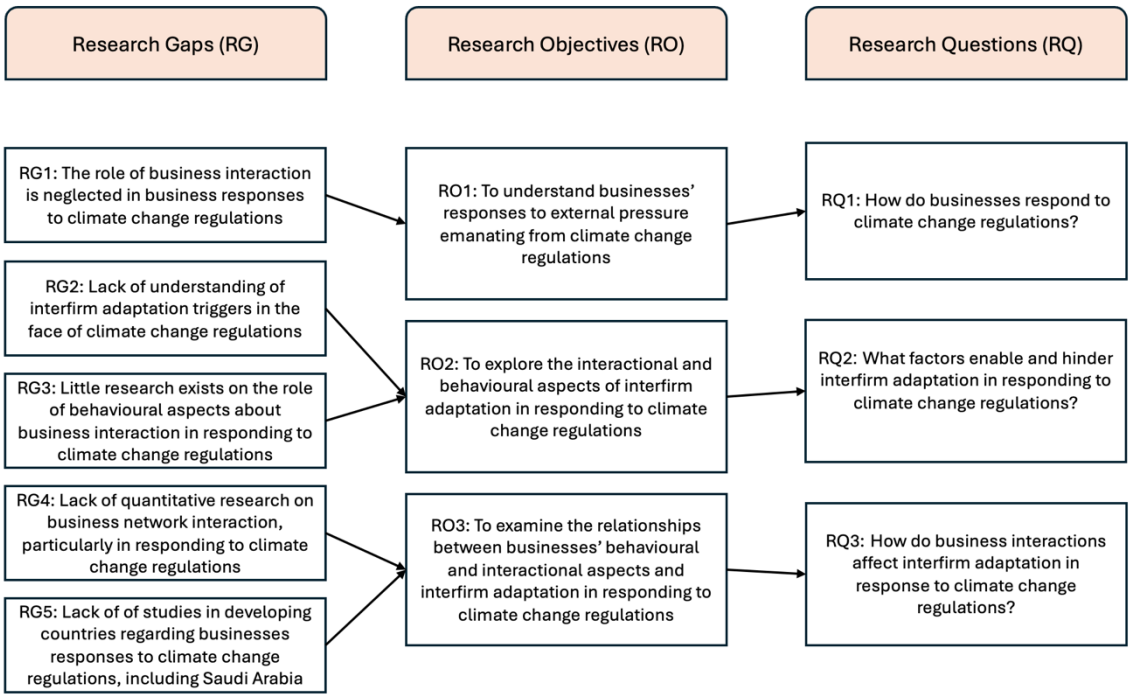


Figure 1. 1 Research gaps, objectives and questions

In brief, this thesis aims to understand business responses to climate change regulations. The motivation behind this investigation lies in addressing the challenges businesses face in responding to climate change regulations. This knowledge has a wider implication for businesses operating within networks by highlighting the importance of building strong relationships that support continuous interactions characterised by give-and-take exchanges. Such interactions enable the linking of activities and the integration of resources, ultimately leading to more effective interfirm adaptation to external pressures such as climate change regulations. The following section moves to present the proposed methodology of this thesis.

## 1.3 Methodology

This thesis adopts an exploratory sequential mixed methods research design to address the research objectives. This research design is consistent with a critical realist epistemology and network ontology. Hence, the thesis' fundamental critical realist assumption is that the reality of business response to climate change regulation waiting to be discovered "is independent of us" (Easton, 2000, p. 207). By adopting a network ontology, we assume that the business landscape consists of webs of continuous exchange relationships, such as interwoven entities of actor bonds, resource ties and activity links (Håkansson and Snehota, 1995). Our critical realist assumptions regarding knowledge generation are aligned with the network ontology and support our methodological choice of a mixed methods research design (Zachariadis et al., 2013). Utilising mixed methods also enables researchers to surpass the constraints of relying solely on either quantitative or qualitative data, resulting in more comprehensive insights (Almeida, 2018).

The first phase of the current thesis employed a qualitative inquiry. In this study, the conducted interviews aimed to explore cause-and-effect links of how businesses respond to climate change regulations in the Saudi automobile industry, thus unearth the underlying mechanisms of the observed phenomena. The quantitative phase was then conducted to inform cause-and-effect links, encompassing statistical testing for postulated relationships among the study variables. The planning and development of the quantitative phase relies on the findings of the qualitative phase.

Addressing the current research questions requires the collection of rich, in-depth qualitative data to explore business behaviours and interaction processes when responding to climate change regulations, as well as large numerical data for statistical testing of the study hypotheses. Thus, an exploratory sequential design is adopted when the researcher prioritises qualitative data collection and then develops quantitative

constructs and conceptualisations based on the qualitative findings for quantitative testing. This approach was deemed most appropriate given the thesis's aim to investigate business interactions and emergent behavioural biases in a complex environment.

The transcribed data from the interviews were analysed by applying thematic analysis. Braun and Clarke (2006, p. 79) describe thematic analysis as "a method for identifying, analysing and reporting patterns (themes) within data" and suggest six steps, which were adopted in the present study. For the quantitative phase, all measurements and structural validation, as well as hypothesis testing, were conducted through partial least squares structural equation modelling (PLS-SEM) using SmartPLS software (Hair et al., 2019; Hair et al., 2021).

Before starting data collection for both studies, the researcher secured ethical approval from the ethics committee at Lancaster University. In addition, the quality and rigour of qualitative research address the question "How good is this research report?" (Miles et al., 2020, p. 305), thereby encompassing confirmability, dependability, credibility, transferability, and utilisation throughout the research process.

## 1.4 Contribution

This thesis makes significant contributions to the literature on how businesses respond to climate change regulations. By drawing on the network approach (e.g., Håkansson and Snehota, 1995; Ritter, 2000; Araujo et al., 2003; Möller et al., 2005; Ford and Håkansson, 2013; Waluszewski et al., 2019) and complementing it with behavioural lens (e.g., Simon, 1955; Kahneman and Tversky, 1979; Thaler, 2016), it develops a novel conceptual framework of adaptive business responses to climate change regulations. In doing so, it addresses key gaps in prior research (e.g., Kolk & Pinkse, 2004; Böttcher & Müller, 2015; Wahyuni & Ratnatunga, 2015; Shevchenko et al., 2016; Wright & Nyberg,

2017; Goworek et al., 2018; Shevchenko, 2021; Shui et al., 2025) by providing evidence of how repeated interactions, shared resources, and interconnected activities within business networks drive adaptation to climate change regulations.

Guided by three research objectives, the findings advance our understanding of network-level responses to external regulatory pressures in several ways. First, the thesis moves beyond studies that treat businesses' climate change responses as atomistic and isolated events (e.g., Kolk and Pinkse, 2004; Böttcher and Müller, 2015; Wahyuni and Ratnatunga, 2015; Shevchenko et al., 2016; Wright and Nyberg, 2017; Goworek et al., 2018; Shevchenko 2021; Shui et al., 2025). Instead, it applies a network approach—emphasizing the crucial role of interactions among firms, their resources, and their collective activities (e.g., Håkansson and Snehota, 1995; Ritter, 2000; Araujo et al., 2003; Möller et al., 2005; Ford and Håkansson, 2013; Waluszewski et al., 2019) — to show how such responses emerge from continuous exchange processes. This perspective shows that business responses to climate change regulations are driven by repeated interactions and exchange processes that involve various actors, their resources and activities, resulting in product- and process-level adaptations.

At the product level, the thesis demonstrates that adaptations within business networks are integral to meeting regulatory standards. These adaptations of products through continuous interaction within the business network involve relying on their resources and linking activities, evidenced by changes to product types, features, designs, and technologies. Focusing on the automobile industry in Saudi Arabia, the research focuses on how new car models are introduced to align with environmental regulations. In this context, dealers coordinate with manufacturers to introduce more fuel-efficient car models that comply with Corporate Average Fuel Economy (CAFE) standards. This

alignment is only achievable through continuous business interactions, as manufacturers develop smaller, more advanced vehicles, while dealers adjust their inventories and sales approaches to match both consumer preferences and regulatory mandates.

At the process level, the thesis shows how firms adapt administrative, production, delivery, inventory, financial, and marketing procedures in response to climate change regulations. For instance, manufacturers' integration of fuel-saving technologies, such as turbocharged engines and advanced transmissions, demands that dealers adapt their training and maintenance processes to support these innovations effectively. At the same time, these advancements require retailers to adjust their marketing strategies. Car retailers need to educate consumers on the benefits of new technologies and promote vehicles that adhere to climate change regulations. Interestingly, the thesis findings evidence that retailers adjusted their financial procedures by accepting losses on smaller, fuel-efficient models to meet dealer targets and maintain compliance with regulatory standards. This strategic decision demonstrates how businesses adapt their profit margins for specific car models to balance regulatory demands and market needs. It reflects the adaptive efforts required within the business network to respond to external pressures emanating from climate change regulations. This implies that businesses' responses to evolving climate change regulations rely on efforts that extend beyond the boundaries of individual businesses. These responses are achieved through the adaptation of processes within business networks.

Second, the thesis offers a theoretical contribution by responding to calls in the literature (Mouzas, 2024) to investigate the mechanisms and processes driving interfirm adaptation, particularly under external pressures such as climate change regulations. While earlier studies have built a strong foundation for understanding interfirm

adaptation (e.g., Håkansson, 1982; Hallen et al., 1991; Brennan and Turnbull, 1996; Hagberg-Andersson and Grønhaug, 2010; Ahmed et al., 2022; Yu and Fang, 2023), this research advances that knowledge by examining the interactional and behavioural aspects in business networks that either enable or hinder interfirm adaptation in responding to climate change regulations. This thesis extends the current literature in interfirm adaptation literature by integrating behavioural lens (e.g., Simon, 1955; Kahneman and Tversky, 1979; Thaler, 2016) into the network approach (e.g., Håkansson, 1982; Ford and Håkansson, 2006), thus offering a more holistic view of how firms respond to climate change regulations.

This thesis advances the Activities-Resources-Actors (ARA) model (Håkansson and Johanson, 1992; Håkansson and Snehota, 1995) through the integration of behavioural science insights (e.g., Simon, 1955; Kahneman and Tversky, 1979; Thaler, 2016). In doing so, this study enriches the understanding of interfirm adaptation to climate change regulations. The updated model shows that business activities are governed by three normative systems: business relationships, economic exchanges, and legal contracts. It also advances the understanding of how businesses connect with resources by identifying the roles of resource entitlements, mobilisation, and exploitation. Furthermore, the thesis shows how behavioural biases such as present bias, loss aversion, and reference points influence actors' interpretations and responses to external pressures. These contributions provide a behaviourally informed extension of the ARA framework, demonstrating how interactive decision-making is influenced by both network interactions and bounded rationality under external pressures resulting from climate change regulations.

The findings underscore how both enabling and constraining factors critically shape interfirm adaptation to climate change regulations. Particularly, it shows that businesses

that possess a strong set of enablers are more likely to succeed in interfirm adaptation to climate change regulations, while those with fewer enablers tend to face challenges. Conversely, businesses facing fewer barriers are better positioned to achieve interfirm adaptation, whereas a high level of barriers significantly hinder their progress. Recognising and addressing these enablers and barriers is therefore vital, for understanding why some businesses respond more effectively to climate change regulations than others within networked contexts.

Third, this thesis extends the network approach (e.g., Håkansson and Snehota, 1995; Ritter, 2000; Araujo et al., 2003; Möller et al., 2005; Ford and Håkansson, 2013; Waluszewski et al., 2019) and the body of literature on business responses to climate change regulations (e.g., Kolk and Pinkse, 2004; Böttcher and Müller, 2015; Wahyuni and Ratnatunga, 2015; Shevchenko et al., 2016; Wright and Nyberg, 2017; Goworek et al., 2018; Shevchenko 2021; Shui et al., 2025) by developing and empirically testing a conceptual framework of adaptive business response to climate change regulations within business networks. This framework highlights the role played by resources (i.e., resource entitlements, resource mobilisation, resource exploitation) and actors' behavioural biases (i.e., present bias, reference points, and loss aversion) in influencing activities (i.e., business relationships, economic exchange, and legal contracts) and interfirm adaptation (i.e. supplier adaptation and customer adaptation). By applying this framework to the Saudi automobile industry, the thesis offers novel insights into how adaptive strategies unfold in a specific national context while also informing broader debates on how business network interactions and interfirm adaptation evolve under climate change regulations.

## 1.5 Thesis structure

The remaining part of the thesis is structured as follows:

**Chapter 2: Literature Review**

This chapter establishes the theoretical foundation for this thesis by examining how existing organisation and management research has approached business responses to external pressures, particularly climate change regulations. It discusses why these approaches fall short in providing a comprehensive understanding of how businesses respond to climate change regulations, how the network approach addresses these limitations, and the importance of incorporating insights from behavioural science to complement the network approach.

**Chapter 3: Methodology**

This chapter explains and justifies the methodological choices made by the researcher to address the research questions and achieve the research aim and objectives. Quality checks, ethical considerations and the limitations of the chosen techniques and tools are also discussed in this chapter.

**Chapter 4: Study context and industry**

This chapter provides an overview of the context and industry where the empirical research was carried out. It explores the Saudi socio-cultural, economic factors, and environmental regulations, emphasising their impact on businesses' responses to climate change regulations within the automobile industry. Additionally, it provides an in-depth look at key business actors and specific industry developments.

**Chapter 5: Qualitative phase**

This chapter presents the empirical findings stemming from thematic analysis of the gathered data from interviewing actors within the Saudi automobile industry

encompassing dealers, retailers and regulatory bodies. The purpose of this chapter is to achieve the research objective of understanding businesses' responses to external pressures emanating from climate change regulations and to identify the factors that enable or hinder interfirm adaptation within business networks.

**Chapter 6: Quantitative phase**

This chapter details the findings from the quantitative data analysis. It begins with a section on hypotheses development, providing the theoretical justification for the proposed hypotheses based on qualitative findings. After that, data preparation addresses data accuracy and the transformation of raw data for subsequent analysis. This is followed by preliminary analysis, which describes the participants' demographic information and checks conducted on the variables to ensure validity and reliability. Lastly, hypothesis testing focuses on presenting the results of the proposed hypotheses.

**Chapter 7: Analysis and discussion of findings**

This chapter aims to discuss the empirical findings from the qualitative and quantitative phases presented in chapters five and six. Analysing the empirical evidence, this chapter discusses the research questions "RQ1: How do businesses respond to climate change regulations", "RQ2: What factors enable and hinder interfirm adaptation in responding to climate change regulations?" and "RQ3: How do business interactions affect interfirm adaptation in response to climate change regulations?"

**Chapter 8: Conclusion**

This chapter presents the final part of this thesis. The objectives of this chapter are threefold. First, it synthesises the key contributions arising from the qualitative and quantitative phases of this research. Second, it highlights the managerial implications of the findings for managers and policymakers, offering valuable insights into business

responses to climate change regulations. Finally, it identifies the limitations of this research and suggests directions for future research.

## 1.6 Conclusion

In summary, this chapter presents in detail the research background of this thesis. The thesis's objectives and questions are specified. Then, this chapter presents the proposed methodology. After that, this chapter presents the expected theoretical contributions. Finally, the chapter presents the structure of the thesis. This chapter lays the groundwork for the thesis and outlines the structure of the chapters that follow. The next chapter presents the theoretical foundation of this research by reviewing existing literature.

# Chapter 2: Literature review

## 2.1 Introduction

This chapter establishes the theoretical foundation for this thesis by examining how existing organisation and management research has approached business responses to external pressures, particularly climate change regulations. It discusses why these approaches fall short in providing a comprehensive understanding of how businesses respond to climate change regulations, how the network approach addresses these limitations, and the importance of incorporating insights from behavioural science to complement the network approach.

The chapter begins by introducing business responses to external pressures, with a specific focus on climate change regulations. It then reviews the tensions climate change regulations have created for businesses and examines the consequences of their responses. Following this, the researcher critiques the organisation and management approaches used to explain business responses to climate change regulations. Building on the business marketing literature related to business relationships and networks, the researcher presents the network approach advanced by the Industrial Marketing and Purchasing (IMP) group as an alternative theoretical lens. Lastly, insights from behavioural science are incorporated to explore the interactions and behaviours involved when businesses respond to climate change regulations. At the end of the chapter, the researcher proposes an initial conceptual framework for investigating business responses to climate change regulations based on the interdisciplinary reviewed literature.

## 2.2 Business responses to external pressure

Businesses across various sectors are increasingly compelled to respond and adapt to external pressures. External pressure refers to force exerted on businesses that originated

outside the business. Examples of external pressure that businesses face may come from governments, industry associations, competitors, and customers (Wang et al., 2020; Onbhuddha et al., 2024). Governments typically create a regulatory system that requires businesses to adjust their present behavioural pattern (DiMaggio and Powell, 1983). For instance, environmental regulations by governments, such as the European Union's directive to phase out the sale of petrol and diesel cars by 2035 (European Parliament, 2023), create a new framework that simultaneously constraints and incentivises firms to change the way they conduct businesses (Nadvi, 2008; Okereke and Russel, 2010; Aragon-Correa et al., 2020). This regulation constrains firms by limiting their ability to produce and sell internal combustion engine cars, a traditional revenue stream. Simultaneously, it incentivises innovation in electric vehicle (EV) technologies and provides opportunities to capture emerging markets, such as EVs and related infrastructure. Manufacturers investing in EVs can benefit from subsidies, tax incentives, and a growing customer base that favours sustainable mobility solutions. Therefore, such regulations reshape industry dynamics by imposing restrictions while opening new avenues for growth. Moreover, industry associations can exert pressure on member businesses to adopt environmental strategies, such as adhering to established norms and standards for sustainability and emissions reduction (Wang et al., 2020).

In addition, competitors generate external pressure on businesses by introducing a new product, such as by adjusting their prices (Debruyne et al., 2002). Finally, customers are capable of exerting pressure on businesses to change marketing practices by altering their purchasing decisions based on environmental and social considerations (Kotler, 2011). Therefore, it is imperative for businesses to adapt to the evolving external pressures to maintain their competitive advantage and ensure long-term sustainability.

Environmental regulation refers to “the imposition of limitations or responsibilities on individuals, corporations, and other entities for the purpose of preventing environmental damage, protecting public health and/or improving degraded environments” (McManus, 2020: p.241). Environmental regulation encompasses a wide range of topics. Under the environmental regulations umbrella, climate change regulations are particularly focused on addressing and mitigating the greenhouse gas emissions that cause global warming (Cadez, 2019). Notably, the most important external pressure driving the construction of climate strategies seems to be current regulations and expectations of future international and domestic policy developments (Okereke and Russel, 2010; Shevchenko, 2021; Orazalin et al., 2024). This makes environmental regulations, particularly those related to climate change, a critical focus of this thesis as they represent the strongest and most transformative external pressure that businesses face.

Climate change is one of the 17 main goals of the United Nations (2019), specifically Sustainable Development Goal 13 (SDG 13 - Climate Action), and it has been recognised as a global phenomenon that requires immediate action (De Stefano et al., 2016; Wright and Nyberg, 2017). Since the emergence of the industrial era, mainly due to burning fossil fuels, humans have been a major reason for the current global warming crisis, which poses a major threat to humans and the earth (Nordhaus, 2013). Businesses need to make radical changes in the way they generate value to reduce their unethical environmental and social harmful effects (Shevchenko et al., 2016). Recently, climate change regulations become a notable external pressure on businesses that influence economic and financial growth of businesses (Ahmad et al., 2024). The consciousness for businesses of not responding to such external pressure may lead to financial and reputational risks such as regulatory penalties, loss of operational licences and damaging business image (Wijethilake and Appuhami, 2017). Businesses should carefully consider

the cost and benefits of responding to external pressure arising from climate change regulations (Adebanjo et al., 2016).

To understand business responses to climate change regulations, it is necessary to understand the relationship between businesses and the natural environment, the shift from economic growth to sustainable development, and businesses' efforts and strategies in responding to climate change regulations. The following sub-sections discuss these points in more detail.

### 2.2.1 Businesses and the natural environment: From economic growth to sustainable development

In the pursuit of profit maximisation, businesses in modern markets frequently avoid morally preferable actions (e.g., protecting the natural environment) when these actions conflict with their financial goals (Alexander, 2007; Johnson et al., 2023). Profit maximisation is the process firms use to determine the level of output that maximises the difference between total revenue and total costs (Carbaugh and Prante, 2011). Environmental resources, including clean air, are considered public goods (Cornes and Sandler, 1996). From a theoretical perspective, public goods are defined as non-excludable and non-rival, meaning access to public goods cannot be limited, and their use by one group does not diminish their availability for others (Barrett, 2007; Veal and Mouzas, 2011). Hardin (1968), in "The Tragedy of the Commons," demonstrates the commons issue as it motivates individuals to exploit open-access resources for their self-interest against the benefits of the group. Consequently, individuals' overuse of common resources causes the depletion of these resources (e.g., clean air). The phenomenon of climate change is characterised as one of the commons issues since we cannot expand our planet or its scarce and finite resources (Ansari et al., 2013). This concept highlights how the unsustainable use of shared resources leads to environmental degradation.

Consequently, businesses are motivated to exploit the natural environment and avoid climate change mitigation for their self-interest.

In this way, it is in the interest of businesses to exploit the natural environment by using natural resources to maximise their profits. In the absence of rights attached to natural resources, businesses are incentivised to produce as much as possible (e.g., more cars), as the negative effects of production (e.g., emissions and exhaust pollution) are dispersed throughout society. For many years, businesses have avoided the cost of harming natural resources through free riding and misuse (Ansari et al., 2013; Bertheussen, 2022). Free riding refers to benefiting from resources without bearing the associated costs (Albanese and Van Fleet, 1985). Businesses gained greatly from a stable climate and clean air without having the duty to preserve these open access resources (Hardin, 1968; Bertheussen, 2022). In light of this, the appearance of climate change seems rather certain as the cumulative impact of emissions and natural resource exploitation has led to measurable environmental degradation, including rising global temperatures, extreme weather events, and loss of biodiversity.

Businesses are now facing a transition era in which they must make fundamental changes in the way they generate value to reduce their unethical practices that harm the environment and society (Shevchenko et al., 2016). The shift in the Business Roundtable statement from shareholder primacy highlights the need for fundamental change in the way business is conducted. Since 1978, the Business Roundtable has continued to issue principles of corporate governance. In 2019, 181 CEOs signed new statements committed to driving their businesses for the advantage of all stakeholders. Besides economic growth for individual businesses, the statements emphasise that businesses share an imperative commitment with their shareholders, including protecting the natural environment by

embracing sustainable practices (Business Roundtable, 2019). This shift in Business Roundtable reflects a growing recognition of the importance of sustainability in corporate governance. Additionally, other forms of self-regulation and tools for sustainability are provided through frameworks such as the Corporate Social Responsibility (CSR), Environmental, Social, and Governance (ESG) Criteria, and B Corp Certification. CSR has evolved from being seen as a charitable initiative to being acknowledged as an essential part of strategy (Huang et al., 2022; Zhang and Hao, 2024). Collectively, these forms of corporate governance centre around the idea of integrating ethics, environment, and social concerns within business practices to satisfy the stakeholders and enhance the creation of value in the long run. In applying such toolkits, businesses can be responsible and contribute to the international pursuit of reaching sustainable development goals.

Indeed, the inability to enlarge the planet and its resources is the main reason for environmental regulations, as they protect these finite and scarce resources (Bertheussen, 2022). Hardin asserts that environmental regulation should not reduce humanity's freedom because "ruin is the destination toward which all men rush, each pursuing his own best interest in a society that believes in the freedom of the commons. Freedom in a commons brings ruin to all" (Hardin, 1968, p. 1244). This highlights the critical need for climate change regulations to prevent such a tragedy of the commons.

As climate change issues become a noticeable global concern, governments across the globe have implemented regulations to mitigate such negative climatic changes. These regulatory changes have driven businesses to respond to climate change by implementing measures and standards. Examples of these measures include fuel consumption standards and emissions limits. These measures and standards account for harm caused by businesses (e.g., fuel consumption standards) (Manzione Filho, 2022). This shift towards

regulatory compliance has led to a new era where businesses must resolve their immediate profit goals with the broader mandates of climate change regulations.

The appearance of climate change regulations has generated a conflict for businesses between maintaining short-term profitability and responding to climate change regulations (Wright and Nyberg, 2017; Johnson et al., 2023). Kotler (2011, p. 132) argued that businesses "in the past have based their strategies on the assumption of infinite resources and zero environmental impact". Businesses need to solve the tension between growth goals and sustaining the environment (e.g., protecting common pool resources) (Kotler, 2011; Wright and Nyberg, 2017). The core of sustainability is whether the current generation can leave future generations with an equal or greater amount and diversity of resources than those that are available today (Kotler, 2011; White et al., 2019).

The most widely cited definition of sustainable development comes from the Brundtland Report, which states that it is "development that meets the needs of the present without compromising the ability of future generations to meet their own needs" (United Nations, 1987, p. 37). Businesses have operated on the assumption of infinite natural resources, where manufacturing, distribution, and consumption do not add to pollution. This assumption has led to significant environmental impacts and a need for regulatory intervention. At the very least, businesses are exploiting the atmosphere without paying the cost of the damage they are causing. In several countries, tackling the issues of climate change and sustainability has generated a multiplicity of climate change regulations mandating businesses to actively reduce their impact on the environment. However, it remains unclear how businesses respond to these regulations. While it is imperative for businesses to modify their operations in accordance with climate change regulations, the

significance of marketing in advocating for and facilitating sustainability cannot be underestimated. Hence, there remains a need to advance the theory of environmental sustainability in marketing (Kotler, 2011; Winit et al., 2023). The following section provides a more comprehensive exploration of businesses' responses to climate change regulations.

### 2.2.2 Business response to climate change regulations

Building on the shift from economic growth to sustainable development, this section explores previous research concerned with businesses' responses to climate change regulations. The aim of this review is to enhance our understanding of businesses' responses to change emanating from external pressure, particularly, in this study, from climate change regulations which might require businesses to modify their strategies and operations.

Climate change has become a field of study for social scientists and business management researchers and is no longer a problem just for scientists or territorial planners. Management and business studies commonly capture the challenge of climate change as a strategic management field rather than an ethical or societal problem (Daddi et al., 2018; Orazalin et al., 2024). Businesses' responses to pressure have changed from being defensive, refusing responsibility, or distorting scientific facts to being proactive by reducing their emissions and adopting newer and cleaner innovations (Kolk and Pinkse, 2004). Notably, the most important external pressure of the construction of climate change strategies seems to be current regulations and expectations of future international and domestic policy developments (Okereke and Russel, 2010; Shevchenko, 2021; Orazalin et al., 2024).

Climate change regulations generate external pressure that necessitates strategic changes within businesses (Pinkse and Kolk, 2009; Okereke and Russel, 2010; Damert and Baumgartner, 2018a). Governments typically create a regulatory system that requires businesses to adjust their present behavioural pattern (DiMaggio and Powell, 1983). For instance, Damert and Baumgartner (2018b) indicate that automobile companies globally respond to climate change regulations by adopting different strategies of governance, innovation, compensation and legitimation.

Governance refers to the ability of businesses to manage risks and opportunities associated with climate change mitigation and the resulting governance mechanisms (Tang and Luo, 2014; Damert and Baumgartner, 2018b). For instance, automobile manufacturers set reduction targets and implement environmental management systems to comply with regulations like the EU Emission Trading Scheme. Innovation strategy focuses on improving existing products and developing new products to reduce corporate greenhouse gas GHG emissions and gain a competitive advantage (Kolk and Pinkse, 2005; Damert and Baumgartner, 2018b). For instance, companies within the automobile industry concentrate on developing new technologies such as hybrid and electric cars while improving the energy efficiency of production processes (Damert and Baumgartner, 2018b). Compensation strategy refers to the actions taken by a company to balance or offset its CO2 emissions, such as purchasing CO2 credits while leaving the company's technological assets and capabilities unchanged (Kolk and Pinkse, 2005; Damert and Baumgartner, 2018b). This includes reducing a company's indirect emissions by involving its suppliers (Damert and Baumgartner, 2018b). Last, the legitimation strategy refers to activities to maintain or gain legitimacy for conducting business (Talbot and Boiral, 2015). For instance, businesses engage in initiatives such as the Carbon Disclosure Project or lobbying to influence climate change regulations (Damert and

Baumgartner, 2018b). These strategies highlight the varied approaches businesses in the automotive industry use to address climate change regulations, illustrating how factors such as regulatory and regional contexts influence corporate responses to the tightening focus on reducing CO2 emissions.

The transportation sector contributes to 24% of global CO2 emissions (US EPA, 2024), with road transport powered by fossil fuels holding the largest share (EEA, 2024). However, transport emissions continue to rise (IPCC, 2022). As a major source of these emissions, the automobile industry faces substantial pressure to reduce emissions and drive innovation in low-carbon technologies. This positions the industry as vital in tackling climate change and advancing future sustainability efforts (Damert and Baumgartner, 2018b; Loder et al., 2024).

Despite the introduction of tighter regulations worldwide, mainly focused on reducing CO2 emissions from cars, these regulations may stimulate innovation in the automotive industry. This can potentially lead to new business opportunities in the development and marketing of low-emission vehicles. Weak regulatory pressure has been found to be a main reason for a reduction in the level of a business's response to climate change. On the other hand, strong government regulations can drive businesses to radically alter their behaviour towards climate change (Okereke and Russel, 2010; Sprengel and Busch, 2011; Damert and Baumgartner, 2018a). Although manufacturers are highly motivated to produce low-carbon vehicles, the lack of direct economic benefits presents a significant challenge. However, despite their efforts, manufacturers are not currently seeing immediate profits from these investments. This creates a paradox where regulations aim to boost the production of environmentally friendly vehicles, but the economic incentives for manufacturers remain limited. Awareness of the direction and nature of regulations is

crucial for businesses when considering their internal strategic capabilities and the need for internal change (Okereke and Küng, 2013).

Researches grounded in the Resource-Based View (RBV) theory introduced by Barney (1991), has explored how businesses develop competitive advantages in response to climate change regulations by leveraging their internal capabilities (e.g., Wahyuni and Ratnatunga, 2015; Wright and Nyberg, 2017). This aligns with this thesis' first research objective (RO1), which seeks to understand how businesses respond to external pressure emanating from climate change regulations, as RBV provides a theoretical lens to examine the role of unique internal resources in shaping businesses' responses to such pressure. For example, Wahyuni and Ratnatunga (2015) examined how Australian power businesses' carbon management strategies varied based on their unique resources and capabilities. The RBV perspective stresses that no standardized way to manage businesses is available and that it all depends on various situational factors specific to businesses (Ginsberg and Venkatraman, 1985). Similarly, Wright and Nyberg (2017) observed that Australian businesses often integrate environmental challenges into routine business practices, revealing how internal processes evolve in response to external pressures like climate regulations. These studies highlight that businesses' responses to climate change regulations can vary significantly depending on their internal resources and strategic orientation, ranging from reactive to proactive approaches. Further discussion of RBV in relation to the network approach will be explored later in (section 2.5.1).

Until recently, management and business literature has continued to capture business responses to climate change regulations as individual businesses' responses. The key problem with this explanation is that the role of business interaction within and around

business networks is neglected. For instance, Shui et al. (2025) investigated the influence of climate change regulatory pressures on environmental sustainability performance at the business level. They found that businesses in carbon-intensive industries were more responsive to climate change regulations. In contrast, businesses with exposure to foreign markets, particularly in developing countries, indicated a reduced response to climate change regulations. Similarly, Shevchenko (2021) examined the impact of penalties on businesses for violating environmental regulations. They found that businesses receiving penalties for environmental violations do not improve businesses environmental performance. Instead, penalties anticipated further deterioration, emphasising that financial penalties do not deter businesses from violating environmental standards. These studies underscore a persistent gap in the literature, where the complex dynamics within business networks in response to climate change regulations remain underexplored. For example, automobile manufacturers facing emission reduction regulations may need to interact with suppliers for new technologies, distributors to adjust to new product specifications, and retailers to manage the shifts in customer demand. Thus, investigating businesses responses requires understanding beyond the individual businesses' responses to cover the dynamic and interdependent nature of business responses to climate change regulations. These complexities and interdependencies will be explored further in subsequent sections.

Despite the efforts of previous studies to explain business responses to climate change regulations (e.g., Kolk and Pinkse, 2004; Böttcher and Müller, 2015; Wahyuni and Ratnatunga, 2015; Shevchenko et al., 2016; Wright and Nyberg, 2017; Goworek et al., 2018; Shevchenko 2021; Shui et al., 2025), the role of business networks has been largely neglected. This oversight can limit our understanding of business responses to climate change regulations, as the necessary resources are often spread across business networks,

with companies relying on these interconnected relationships to operate effectively (Håkansson and Ford, 2002; Veal and Mouzas, 2011; Harrison et al., 2023). In addition, prior research has typically viewed business responses as atomistic and isolated processes, focusing on individual businesses as the primary unit of analysis. However, this approach fails to capture the interactions within continuous business and non-business exchange relationships in networks (Håkansson and Snehota, 1989; Ritter, 2000; Håkansson and Ford, 2002; Vildåsen et al., 2018).

This study aims to address this gap by adopting a network approach that emphasises the substantial role of interaction within business networks (Håkansson and Snehota, 1995; Ritter, 2000; Araujo et al., 2003; Möller et al., 2005; Ford and Håkansson, 2013; Waluszewski et al., 2019). The analysis of businesses' responses to climate change regulations will thus focus on networks as the primary unit of analysis (Harrison and Håkansson, 2006; Mouzas and Naudé, 2007; Mouzas and Ford, 2011). Additionally, Harrison et al. (2023) and Patala et al. (2014) noted that research on networks and environmental sustainability is still in its early stages, suggesting that integrating networks into this research can significantly enhance our understanding of network interactions in response to climate change regulations.

In the context of automobile industry, the network approach is particularly appropriate because it captures the highly interdependent relationships among suppliers, manufacturers, distributors, and other stakeholders, all of whom need to coordinate their resources and capabilities to respond to climate change regulations (Patala et al., 2014; Harrison et al. 2023). Therefore, this thesis adopts a network approach as an intellectual lens, complemented by behavioural concepts, to improve our understanding of businesses' interactions in responding to climate change regulations. The following

section discusses the network approach to business responses to climate change regulations.

## 2.3 A network approach to business responses to climate change regulations

A network in its most abstract form is a metaphor for inter-connectivity, i.e. "a structure where a number of nodes are related to each other by specific threads" (Håkansson and Ford, 2002: p.133). In this way, a market can be viewed as a network of business relationships in which the nodes are business units, such as suppliers, manufacturers, wholesalers, and retailers and the relationships between them are the threads. The business relationships and connectivity between business units are critical factors in business networks (Johanson and Vahlne, 2011; Mouzas, 2022a). Thus, the market is not a world of single and isolated business transactions and "no business is an island" (Håkansson and Snehota, 1989, p.187). Rather, every node or business unit with its own distinctive resources is connected through its relationships with many business units in various aspects. The threads and nodes both have their own specific content in the business context. They are both *heavy* with many distinct types of resources, capabilities, knowledge and understanding. This heaviness is a consequence that has been generated over time from complicated interactions, adaptations and investments within and between businesses (Håkansson and Ford, 2002).

The embeddedness of actors in networks of business relationships is a prominent feature in the network approach (Gnyawali and Madhavan, 2001; Håkansson and Ford, 2002). This metaphor is frequently used in the business marketing literature, mostly by scholars associated with the Industrial Marketing and Purchasing (IMP) Group, to demonstrate the interconnectivity between a business and its wider networks of relationships (e.g., Håkansson and Snehota, 1995; Ritter, 2000; Araujo et al., 2003; Möller et al., 2005; Ford

and Håkansson, 2013; Mouzas and Ford, 2018). The heterogeneous distribution of resources and capabilities among actors requires reliance on other organisations' resources and capabilities. Consequently, a continuous and often complicated exchange between embedded actors in the network results from actors' interdependencies (Mouzas and Ford, 2009). This view of the network approach suggests looking at a greater level of aggregation that goes beyond the seller-buyer dyad (Johanson and Vahlne, 2011; Vargo and Lusch, 2016). The researcher will be able to explore the entire network of relationships as the unit of analysis instead of only dyadic relationships (Mouzas and Naudé, 2007; Mouzas and Ford, 2011; Öberg et al., 2012b).

The network approach, advanced by the IMP group, refutes three myths of how business markets are practised and analysed by providing an extended alternative point of view. These three myths are the myth of action, the myth of independence and the myth of completeness (Ford, et al., 2003).

First, the myth of action relies on the traditional marketing idea where the supplier is the active part that assembles its *marketing mix* for business markets. In this process, customers hold a passive role and are limited to accepting or rejecting the suppliers' mix. Following this logic, marketing is a manufacturer's duty to choose suitable suppliers and distributors as part of their manufacturing strategies; these intermediary actors are processed inactively. In contrast, the network approach lens processes all actors as "members of a business network consisting of a large number of *active* and heterogeneous companies each *interacting* with others and seeking *solutions* to their different problems" (Ford et al., 2002: p.1). Moreover, sales and purchases between actors in business markets are not a collection of isolated events. In fact, "interaction between companies is both multi-faceted and takes place over time as a recurrent pattern of episodes within

continuously evolving relationships" (Mouzas and Ford, 2009: p. 497). The repeated episodes are influenced by the perceptions of the involved actors of previous interactions as well as their future expectations. Hence, businesses interact with certain counterparts rather than being seen as acting against the world around them (Ford, et al., 2011). Interestingly, Finke et al. (2016) emphasise that the way in which companies respond to climate change could be described as an outcome of actors' interactions in business relationships and networks.

The second myth refuted by the network approach is the myth of independence, which is rooted in business strategy. According to this myth, "a company is able to *act* independently. It can carry out its own analysis of the environment in which it operates, develop and implement its own strategy based on its own resources, taking into account its own competences and shortcomings" (Ford et al., 2003: p.5). Alternatively, the network approach is grounded on the interactions between companies in relationships; companies are interrelated in various ways (Ford et al., 2002). Any company is influenced by the behaviour and desires of the companies surrounding it. Consequently, any company shares its resources and skills with the companies within its network, which can deeply impact some of these companies (Ford et al., 2011). Ford and Mouzas (2007) argue that companies operate in complex networks where "business strategy cannot realistically be regarded as an individual-company activity" (p: 3). Instead, a single company's strategy can be construed as part of a mechanism through which the firm and others are confronted with existing conditions and new evolving opportunities while complying with current trends in the network. In addition, businesses possess a restricted ability to understand the network they perform within, including their counterparts' intentions and goals. At the same time, businesses lack the capability to operate alone and they must act and react to others' intentions and actions (Ford et al., 2011).

Finally, there is the myth of completeness, which is also based on the traditional idea of strategy, stating that "a well-formulated strategy helps to *marshal* and *allocate* an organisation's resources into a *unique and viable posture* based on its relative *internal competencies* and shortcoming, anticipated *changes* in the *environment* and contingent moves by intelligent opponents" (Mintzberg et al., 2003: p.10).

The above approach stresses that companies are complete organisations that have the capacity to operate relying on their own resources and abilities. In contrast, the network approach advanced by the IMP group is based on the reality that no company holds sufficient resources to meet the needs of its customers. Thus, a company relies on other actors' resources and skills to meet its customers' requirements. In addition, a company cannot take advantage of its resources without other businesses. Even these resources are very often developed in relation with others (Ford et al., 2003). In terms of the climate change context, Veal and Mouzas (2010) stress that the required resources and capabilities to face the issue of climate change are usually not possessed by one single company but are rather distributed among actors in the network.

Acknowledging the above three myths clarifies that business networks are not static but complex systems of exchanges and interactions with suppliers, customers, competitors, regulators, and other third parties that companies are embedded in (Achrol and Kotler, 1999; Öberg et al., 2012a). A complex system can be defined as "any system that has within itself a capacity to respond to its environment in more than one way. This essentially means that it is not a mechanical system, with a single trajectory, but has some internal possibilities of choice or response that it can bring into play" (Allen, 2001, p. 150). In addition, understanding networks as complex systems highlights the vital role of applying the network approach to exploring businesses' responses to climate change

regulations, an area commonly neglected by management and business research, as discussed earlier in (section 2.2.2). The concept of interfirm adaptation potentially advances our understanding of businesses' responses to climate change regulations. The following section discusses interfirm adaptation in more detail.

## 2.4 Interfirm adaptation

Interfirm adaptation in business relationships and networks is an essential component in the Industrial Marketing and Purchasing (IMP) research (Håkansson, 1982; Hallen et al., 1991; Håkansson and Snehota, 1995; Brennan and Turnbull, 1996; Fang, 2001; Hagberg-Andersson and Grønhaug, 2010; Mouzas, 2024). Interfirm adaptation refers to change or adjustment in products or processes by one firm to meet the needs or requirements of another firm in business relationships (Håkansson, 1982; Hallen et al., 1991; Yu and Fang, 2023; Mouzas, 2024). For example, A car dealer might be asked to modify its products or a car retailer might be informed that the anticipated delivery quantity is significantly more than its current sale capacity. When a firm reacts favourably to such signals, it displays adaptive behaviours (Hagberg-Andersson and Grønhaug, 2010). The concept of adaptation indicates a change or an adjustment that is essential for businesses to meet the specific needs of their business partners.

This thesis builds upon the previous conceptualisation of interfirm adaptation advanced by the IMP literature (Håkansson, 1982; Hallen et al., 1991; Håkansson and Snehota, 1995; Brennan and Turnbull, 1996; Fang, 2001; Hagberg-Andersson and Grønhaug, 2010; Mouzas, 2024) to improve our understanding of interfirm adaptation. For this purpose, the thesis examines interactional and behavioural aspects in business networks that enable or hinder interfirm adaptation in responding to external pressure emanating from climate change regulations.

Interfirm adaptation is a defining element of lasting business relationships (Brennan and Turnbull, 1996; Fang, 2001; Mouzas, 2024). Adaptation results from the need to coordinate the activities of the involved businesses in the relationship (Håkansson and Snehota, 1995). The mere existence of a *relationship* requires adaptation in either one or both businesses (Brennan and Turnbull, 1996). Following this logic, the absence of any type of adaptation between businesses leads to a standard exchange of products or services at the standard terms and conditions (e.g., pricing and delivery) that a business may offer to any other businesses. This represents either sophistry or self-deception to claim as business relationship (Brennan and Turnbull, 1996). Interfirm adaptation is considered costly for one or both partners in a business relationship, but it may pay off in the long term by strengthening the relationship, enhancing competitive advantages, and securing a stronger position on the market (Hagberg-Andersson, 2006; Mouzas, 2024)

Previous research investigated the reasons for interfirm adaptation in business relationships. Hallén et al. (1991) seminal research differentiates between mutual and unilateral adaptations. Mutual adaptation is a consequence of trust and commitment in business relationships, while asymmetric power leads to unilateral adaptation. Businesses more dependent on their counterparts are more likely to make substantial adaptations which indicates the strategic investment in business relationships. This is because adopting a demanding partner may strengthen the competitive position relative to other relationships, leading to superior business performance (Hallén et al., 1991). Indeed, one of the main causes of adaptation in a relationship could be the need for one or both partners to make the required changes to enlarge the advantages for both (Hagberg-Andersson, 2006). Through repeated interactions and exchanges, an actor learns about the needs and requirements of their counterparts, which drives adaptation. Large-scale adaptation can occur when small, unplanned adaptive changes occur gradually (Ahmed

et al., 2022). Mouzas (2024) demonstrated that the processes underlying interfirm adaptation are business interactions and past critical events that guide current interactions. Hence, these insights highlight the vital importance of interfirm adaptation as a strategic response to maintaining and enhancing business relationships, particularly in the face of evolving external pressures such as climate change regulations.

Several attempts have been made to classify interfirm adaptation (e.g., Håkansson, 1982; Hallen et al., 1991; Cannon et al., 2000; Brennan et al., 2003; Schmidt et al., 2007; Hagberg-Andersson and Grønhaug, 2010). Håkansson (1982) identified interfirm adaptation types primarily under products and processes adaptation, which encompasses product specification, product design, manufacturing processes, planning, delivery procedures, stock holding, administrative procedures and financial procedures. A prominent example of interfirm adaptation can be observed in the customisation of products (e.g., packaging, quality specifications) that a supplier provides specifically to the requirements of the business customer (Ford and Mouzas, 2013a; Mouzas, 2024). This does not imply that adaptations occur in isolation (Hagberg-Andersson and Grønhaug, 2010). Instead, interfirm adaptation is interrelated meaning a change or modification in a single element (e.g., product) requires the changing or modifying other elements (Brennan et al., 2003; Hagberg-Andersson and Grønhaug, 2010). However, interfirm adaptation is context related meaning one classification of interfirm adaptation cannot fit all contexts and contingencies (Fang, 2001; Hagberg-Andersson and Grønhaug, 2010). Thus, examining interfirm adaptation in the context of businesses' response to climate change regulations may advance our understanding regarding the types of interfirm adaptation in business networks.

Despite the comprehensive studies of interfirm adaptations in earlier research (e.g., Håkansson, 1982; Hallen et al., 1991; Brennan and Turnbull, 1996; Fang, 2001; Hagberg-Andersson and Grønhaug, 2010; Ahmed et al., 2022; Yu and Fang, 2023; Mouzas, 2024), there is still much to learn about the mechanisms underlying adaptation as well as the processes that drive adaptation in the face of external pressure emanating from climate change regulations. For instance, Mouzas (2024) demonstrates the need for further research regarding enablers and barriers of interfirm adaptation in business relationships. In a way to response to this call, this thesis builds on the network approach (e.g., Håkansson, 1982; Håkansson and Snehota, 1995; Ford and Håkansson, 2006) supplemented with behavioural concepts (e.g., Simon, 1955; Kahneman and Tversky, 1979; Thaler, 2016) and will go in-depth to explore the role of external pressure emanating from climate change regulations in driving interfirm adaptation. The following section introduces the Activities-Resources-Actors (ARA) model (Håkansson and Johanson, 1992; Håkansson and Snehota, 1995), which captures the connectivity and interdependency of network interactions.

## 2.5 Network activities, resources and actors

The Activity-Resource-Actor (ARA) Model was developed by Håkansson and Johanson (1992) based on empirical studies in the Industrial Marketing and Purchasing (IMP) research group. The ARA model provides a conceptual framework for understanding the processes and outcomes of interaction within business networks. Interaction is an evolving process built over time, where "the characteristics of actors themselves and of their activities and resources are as much as outcome of interaction as they are an input to it" (Håkansson et al., 2009, p. 33).

What distinguishes the ARA model from other network perspectives, such as the one-dimensional (actor-focused) Social Network Theory (Granovetter, 1985), is the ARA

model emphasis on capturing the interconnected dimensions of actors, resources, and activities within business relationships. As Harrison and Håkansson (2006, p. 232) describe, “An actor embedded in a network of relationships has access to the resources of other actors. Therefore, actors control resources both directly and indirectly through exchange relationships. Resources are embedded in industrial activities.” This multidimensional approach not only makes the ARA model a widely used analytical tool for making sense of complex network phenomena (Möller & Halinen, 2022) but is also particularly relevant to this thesis, which seeks to understand how businesses respond to external pressures emanating from climate change regulations. Accordingly, the research aims to theoretically and empirically capture the interactions within business networks as businesses respond to climate change regulations by using the ARA model.

While the ARA framework offers a robust foundation for examining the structure and dynamics of business networks, this study builds on it by incorporating behavioural science insights to better understand how actors respond to complex and uncertain external pressures, specifically climate change regulations. The integration of behavioural concepts, particularly those related to cognitive biases, enables a more exploration of how actors interpret and act upon regulatory change. In addition, the study extends the resource dimension by conceptualising resource interaction through the interrelated processes of resource entitlements, mobilisation, and exploitation. It also enriches the activity layer by identifying how interfirm adaptation is governed through three normative systems: business relationships, economic exchanges, and legal contracts. In doing so, this study contributes a behaviourally and structurally informed extension of the ARA framework, offering a more nuanced understanding of interfirm adaptation in business network contexts.

As emphasised by Håkansson and Snehota (1995), the essence of relationships between companies in business markets comprises various facets and layers that differ according to the effects they produce. In this section, the researcher examines more thoroughly the three previously identified layers: resources, activities and actors. For the sake of simplicity, these layers are discussed separately, although they are closely interconnected in practice.

### 2.5.1 Resources

Resources are an essential layer of business interaction within networks. Resources are central in enabling actors to initiate and shape activities that meet their needs through interaction (Glinka et al., 2023; Baraldi et al., 2024). Resources possess attributes across numerous dimensions, implying that the potential uses of any specific resource cannot be completely or definitively defined. In addition, resources are combined in interaction, and thus, their value and usefulness emerge when resources are integrated with other resources (Håkansson and Johanson, 1992; Håkansson and Snehota, 1995). As Baraldi et al. (2024: p.3) stated, "any element is only a resource when it is used in combination with other resources". These resources include tangible assets such as products and equipment as well as intangible assets such as brands and knowledge.

In the IMP approach, there are four fundamental assumptions regarding resources, which are: 1) resource heterogeneity, 2) resources are *double-faced*, 3) resources exist in networked contexts, and 4) resources are open and variable objects (Håkansson et al., 2009; Baraldi et al., 2012a). Based on these assumptions, a body of knowledge has emerged to explain how resources are combined for value creation in business networks, which is termed *Resource Interaction* (Bocconcelli et al., 2020). Resource interaction focuses on interacting resources that are utilised within relationships in a business

network (Baraldi et al., 2024). Below is an elaboration on the four assumptions of resource interaction in the IMP approach and their connection to the current research.

First, resource interaction in a network shares a heritage in the idea of Penrose (1959) with the Resource-Based View (RBV) (Barney, 1991) that of resource heterogeneity (Baraldi et al., 2012a; Prenkert et al., 2019). Nevertheless, RBV theory stresses independent businesses and their internal resources in generating competitive advantage and business growth. Instead, the IMP approach takes a border view by considering resources as part of an interacting network. This denotes that "resources are heterogeneous not only in themselves but also in the way they can be combined" (Prenkert et al., 2019: p.141). Accordingly, a resource's features and usefulness are determined by the context in which it is applied and how it is integrated with other resources in the network (Baraldi et al., 2012a). Hence, this heterogeneity is crucial for businesses facing climate change regulations as it highlights the need to adapt by combining diverse resources (e.g., technologies and knowledge) within business networks. Recognising that different types of resources interact differently may help explain varied business responses to regulatory pressures.

Second, in the network approach, resources are *double-faced*, and interaction connects provision and use (Baraldi et al., 2012a; Baraldi et al., 2024) because a resource can only be taken into account, if producers and users can assign the resource a present or future usage (Håkansson and Snehota, 1995). Prenkert et al. (2019) termed this as *resource usefulness*, which implies that the resource gains value only when used; the interaction between the supplier and the customer is, therefore, essential. For instance, the interaction between automobile manufacturers and dealers in providing fuel-efficient cars with new technologies may illustrate how the provision and use of such resources are

interdependent and contribute to responding to climate change regulations. In the context of climate change regulations, the double-faced nature of resources highlights the importance of the interaction between automobile manufacturers and other stakeholders, such as dealers and regulators, in shaping resource value. This perspective might allow the exploration of how different actors co-create the value of resources in responding to climate change regulations, such as new technologies or expertise.

Third, resources do not exist in isolation but co-evolve in the networked context (Ford and Mouzas, 2013). Businesses' responses to climate change regulations may differ, even in the same competitive context. It has been suggested that a business's environmental strategy depends heavily on the business's specific situation, predominantly its resources and capabilities (Hart, 1995). In the IMP literature, business relationships are a key resource in networks that "entail combinations and re-combinations of resources as pre-requisites for their development, production, exchange, and use" (Baraldi et al., 2012b, p. 124). Another important point of networked context is that the control that a business has over resources is not complete since resources relevant to that business may be dispersed across the network of various actors (Baraldi et al., 2007; Mouzas, 2024). Therefore, companies have to mobilise a variety of direct and indirect relationships with other actors in business networks in order to gain access to additional resources (Baraldi et al., 2012a). In this study, examining the interaction of resources in business networks can explain the processes of businesses' responses to climate change regulations.

Lastly, resources are seen as open and variable objects. This assumption emphasises that resources are not fixed or static. Instead, the values and characteristics of a resource arise from combination with other resources through interaction in business networks (Håkansson and Waluszewski, 2002). As a result, changes in resources integration with

other resources or their interactions can alter the value and the evolving characteristics of the resources (Baraldi et al., 2012a). This assumption is mostly relevant for examining how businesses may modify and reconfigure resources in response to evolving climate change regulations. The variability of resources supports the researcher's argument that regulations pressures drive continuous resource adaptation within business networks.

The researcher posited that resources are guided by three factors, namely: 1) resource entitlements, 2) resource mobilisation, and 3) resource exploitation. These interrelated factors may advance our understanding of how business actors connect with resources in responding to climate change regulations, as elaborated below.

#### 2.5.1.1 Resource entitlements

Resources do not exist in isolation and are not freely available; they are often inextricably linked with specific actors. Actors entitlements to resources matter because they comprise the totality of rights, privileges, powers and immunities that they possess over resources (Morris, 1992; Leach et al., 1999). Entitlements refer to "the set of alternative commodity bundles that a person can command in a society using the totality of rights and opportunities that he or she faces" (Sen, 1997, p. 497). In business networks, "entitlements to resources specify the rights that actors may possess, acquire, and transfer to other actors" (Mouzas, 2022b: p283). Thus, entitlements create a link between actors and resources by defining ownership and control over tangible and intangible resources (Mouzas, 2024). Entitlements to resources are the currency that actors bring into the interaction process and they will determine whether an interaction will result in consent among actors or not (Mouzas and Ford, 2018).

While entitlements define the ownership and control over resources, it is important to recognise that resources, both tangible and intangible, are inherently heterogeneous.

Resource-Based View (RBV) assumes that businesses control their own resources to achieve competitive advantage (Barney, 1991). On the other hand, the IMP approach, as discussed earlier in (section 2.5.1) views resources as part of an interacting network, recognising their heterogeneity in both their nature and their combination, determining their features and usefulness in the context (Baraldi et al., 2012a; Prenkert et al., 2019). Moreover, resources are distributed unevenly across networks, and businesses often rely on resource entitlements to access or use the resources they need (Mouzas and Ford, 2018; Mouzas, 2024). Some businesses are entitled to own or possess certain resources, while other businesses need to gain consent from their counterparts to use or acquire the resources they require (Mouzas and Ford, 2012; Mouzas and Ford, 2018). As a result, resource entitlements determine how firms can combine and reconfigure resources to adapt to changing conditions, such as regulatory pressures (Mouzas, 2024). This highlights the importance of entitlements in interfirm adaptation, as they shape how firms manage their resource interdependencies within business relationships (Hallén et al., 1991; Mouzas, 2024).

A lack of resources can be just one of several reasons why actors do not have access to the resources they need. Entitlements to resources provide powerful explanations of the consequences of environmental change, particularly with regard to access to and control over resources (Leach et al., 1999). Different forms of entitlements generate various incentives and consequent behavioural effects (Morris, 1992). Entitlements are not limited by the ownership of physical resources but might include brands, capabilities and intellectual assets. By constructing a set of resources that is unique, creative and original, businesses advance their entitlements in business marketing (Mouzas and Ford, 2018).

Studies on resource entitlements in the IMP approach are rare. This scarce research includes (Mouzas and Ford, 2018; Mouzas, 2022b; Mouzas, 2024). Mouzas and Ford (2018) offer a starting point to examine the role of entitlements in business marketing in achieving consent. Consent signifies that an agreement among actors has been established; thus, consent occurs when one actor accepts a proposal made by another actor. The authors highlight that while interaction enables the achievement of consent, the true currency exchanged in this process lies in the entitlements that actors bring into negotiation. These entitlements may range from intellectual assets to innovation.

Mouzas (2022) conducted empirical research investigating the drivers of business transformation in manufacturer-retailer networks. The findings of this research emphasise that entitlements form a link between actors and resources by specifying the bundle of rights, duties and capabilities that actors may own, possess, acquire, or transfer to other actors. These entitlements are significant because they empower weaker actors within networks of exchange relationships, serving as the currency businesses bring into their interactions with other businesses. Therefore, what businesses ultimately exchange is not just resources per se but the specific rights to those resources.

More recently, Mouzas (2024) demonstrates that entitlements serve as bases of interfirm adaptation. Businesses need to recognise that their entitlements to resources serve as the currency they bring into interactions with other actors. By considering entitlements as a form of currency, businesses can facilitate interfirm adaptation and effectively manage the evolution of exchanges and interdependencies within business relationships. Entitlements are not limited to actors' rights to physical or tangible resources; they also encompass intangible resources such as market-based assets (e.g., brands and relationships) and knowledge-based assets (e.g., methods, know-how, skills). Indeed,

Mouzas (2024) calls for future research to provide new insights into how firms exercise entitlements in interfirm adaptation. Thus, the current thesis aims to examine the role of resource entitlements as enabling or hindering businesses' responses to climate change regulations. The following section explores the significant role of resource mobilisation in businesses' response to climate change regulations.

### 2.5.1.2 Resources mobilisation

Resource mobilisation refers to businesses' attempts to access and use resources of other businesses (Mouzas and Naudé, 2007; Thornton et. al, 2019; La Rocca and Snehota, 2021). Casanueva et al. (2014) emphasise that resource mobilisation involves a business's ability to effectively access, utilise and capitalise on the maximum possible resource endowment held by its counterparts. Indeed, resource mobilisation is a strategic practice that involves obtaining valuable resources through business relationships to take advantage of opportunities and reduce risks (Mouzas and Naudé, 2007; Thornton et. al, 2019). Mobilised resources are derived from business relationships with external partners, such as suppliers, customers, and research collaborators, hence business relationships are a prime asset of resource mobilisation (Mouzas and Naudé, 2007; Thornton et. al, 2019; La Rocca and Snehota, 2021).

Resource mobilisation emerges from the interactions within business networks, where businesses capitalise on their relationships to access valuable and scarce resources (Mouzas and Naudé, 2007). As Håkansson and Snehota (1989, p. 187) assert, "no business is an island," highlighting the importance of interfirm collaboration for resource access. Businesses mobilise resources for various reasons including, new products development, cost reduction (Mouzas and Naudé, 2007; Ellegaard and Koch, 2012; Thornton et al., 2019) solving emerging issues (Ritvala and Salmi, 2010) and extending their limited internal resources (Casanueva et al., 2014).

Access to heterogeneous resources through business interaction provides a competitive advantage (Thornton et al., 2019). However, businesses' resources are not readily available for free access and use (Ellegaard and Koch, 2012). As Mouzas and Naudé (2007) explain, resource mobilisation is a dynamic process that requires overcoming several challenges, including developing network insight and introducing new business propositions to access and use other businesses' resources. As a result, businesses differ in the ability to mobilise resources from different forms of business relationships, leading to performance differences (Thornton et al., 2019). Moreover, in response to external pressure, businesses are required to increase their internal efficiency and capitalise on the resources of other businesses (Mouzas and Naudé, 2007). Hence, differences in resource mobilisation within business networks may explain how businesses respond to external pressures, particularly climate change regulations.

While previous studies demonstrate the significance of resource mobilisation in business networks (e.g., Mouzas and Naudé, 2007; Ellegaard and Koch, 2012; Thornton et al., 2019; La Rocca and Snehota, 2021; Drummond et al., 2022), the role of resource mobilisation in businesses' response to climate change regulations remain unexplored. Hence, utilising the concept of resource mobilisation along with other posited concepts and analytical tools may advance our understanding of businesses' response to external pressure, particularly climate change regulations. The following discusses the last postulated concept of resource interaction in facilitating businesses' responses to climate change regulations, which is resource exploitation.

#### 2.5.1.3 Resource exploitation

Resource exploitation is undertaken to meet current market needs by making incremental improvements to existing resources, such as enhancing quality or providing cost-efficient advantages to customers (O'Cass et al., 2014). Businesses' exploitation of resources

focuses on incremental improvements to existing resources rather than radical transformations. The outcomes from resource exploitation are usually “positive, proximate, and predictable” (Auh and Menguc, 2005 p:1653). In addition, businesses are more willing to exploit resources because it is less risky and costly to increase efficiency and productivity in the short term (March, 1991).

Building on this focus on incremental gains, from an IMP perspective, resource exploitation is not confined to the internal resources of a single firm but is instead a product of resource interaction within business networks (Håkansson and Waluszewski, 2002; Håkansson et al., 2009). The ARA model emphasises that resources gain value through their combination and reconfiguration with those of other network actors (Håkansson and Snehota, 1995; Baraldi et al., 2012a).

Much of the innovation management literature discusses exploitation as the process of combining existing resources and knowledge to create incremental innovation (March, 1991; Lubatkin et al., 2006; O'Reilly and Tushman, 2011). However, Baraldi and Strömsten (2024) call for further studies on how these efforts to exploit resources play out at the industrial network level, particularly in terms of the resource configurations and combinations pursued by network actors.

According to recent studies, businesses in networks address resource deficiencies by exploiting the interdependencies of their partners' resources, thereby enhancing the utility of their resources (Tunisini et al., 2023). Thus, in the context of climate change regulations, resource exploitation provides businesses with an opportunity to respond to these regulations through refining and improving existing resources internally and externally through business relationships.

Collectively, resource entitlements, mobilisation, and exploitation are posited to explain our limited understanding of businesses' resource interactions in responding to climate change regulations. Resource entitlements create a link between actors and resources by defining the ownership and control over tangible and intangible resources (Mouzas and Ford, 2018; Mouzas, 2024). In the IMP approach, resources are seen as part of an interacting network, recognizing their heterogeneity in both their nature and their combination, which determines their features and usefulness in the context (Håkansson and Snehota, 1995; Håkansson et al., 2009; Baraldi et al., 2012a; Prenkert et al., 2019). Resources are distributed unevenly across networks, and businesses often rely on resource entitlements to access or use the resources they need (Baraldi et al., 2007; Mouzas, 2024). Therefore, resource entitlements determine how firms can combine and reconfigure resources to adapt to changing conditions, such as regulatory pressures (Mouzas, 2024). Resource mobilisation involves businesses' attempts to access and utilise the resources of other businesses through their network relationships, enabling them to effectively capitalise on opportunities and reduce risks associated with external pressures (Mouzas and Naudé, 2007; Thornton et al., 2019; La Rocca and Snehota, 2021). Resource exploitation focuses on making incremental improvements to existing resources by refining and enhancing them internally and externally through business relationships (Håkansson and Waluszewski, 2002; O'Cass et al., 2014). These three interrelated factors may advance the understanding of how business actors connect with resources within networks to respond effectively to climate change regulations. The following section discusses activities in business networks at a finer resolution.

### 2.5.2 Activities

Business networks come to life through activities such as the production, delivery, and display of products as well as the provision of services, account calculation, and bill

payment. These activities along with countless other activities are both influence and are influenced by the actors and resources to which they are linked. Activities in business networks serve both as integral parts of the interaction process and as the outcomes of the network (Håkansson et al., 2009). Activities appear when "one or several actors combine, develop, exchange or create resources by utilising other resources" (Håkansson and Johanson, 1992, p.30). Activities are interdependent (Håkansson and Snehota 1995; Håkansson et al., 2009; Ford and Mouzas, 2013a; Harrison et al., 2023). Even those activities that appear to be carried out entirely within a single company and out of sight or without the knowledge of others are dependent on and interact with things that are done by other companies, and, in turn, they affect the activities of others." (Håkansson et al., 2009).

Activities in business networks are inherently interdependent and interconnected through interactions. As Håkansson and Snehota (1995) explain, "linking activities entails adaptations and reallocation of activities between units" (p. 50). Linking activities represent efforts by businesses to develop more efficient interfirm operations. For example, mutual advantages can be achieved by linking the transportation services of one business to the production processes of another (Vildåsen and Havenvid, 2018). Interfirm adaptation results from the need to coordinate the activities of the involved businesses in the business interaction (Håkansson and Snehota, 1995). This coordination is particularly crucial in responding to climate change regulations, where businesses must adjust their activities collaboratively to meet new standards and requirements (Veal and Mouzas, 2011). Therefore, understanding how activities are linked and adapted within business networks is essential for businesses facing external pressure emanating from climate change regulations.

The researcher posits that business activities in responding to climate change are governed by three distinct, yet interrelated, normative systems: 1) business relationships, 2) economic exchanges, and 3) legal contracts (Mouzas, 2022a) as discussed below.

### 2.5.2.1 Business relationships

Business relationships are foundational in the IMP approach which are the substance of actors, resources and activities (Håkansson and Snehota, 1995; Ford et al., 2003; Mouzas, 2022a). As Håkansson and Snehota, (1995: p. 26) highlighted "a relationship links activities"; business relationships encompass activities that link the different internal activities of businesses, more or less closely. A business relationship develops through a series of exchange episodes in which businesses engage in certain activities. Business relationships link activities by influencing the way that activities are structured and executed within business networks (Mouzas, 2022a). Following this logic, the quality of relationship becomes essential for the outcome of the activities that businesses are involved in. In a high-quality business relationship, trust and fairness outweigh in the interaction and activities between businesses (Johnson,1999). Indeed, Abosag (2015) argue, with reference to Saudi Arabia, that the quality of business relationships such as trust increases cooperation by creating more synergy between activities that are competitive, especially in difficult contingencies such as climate change regulations. Despite this insight, research on business relationships within the Gulf region (including Saudi) remains relatively rare when compared with the significant economic and business growth observed in the area (Abosag, 2015). Hence, the quality of business relationships plays a vital role in linking and structuring activities, enabling businesses to respond to external pressure emanating from climate change regulations.

### 2.5.2.2 Economic exchanges

Economic exchanges refer to transactions between businesses that are quantifiable and specified in the short term (Guo et al., 2017). Economic exchanges are not merely a series of isolated transactions; instead, they comprise complex and typically long-term relationships between buying and selling businesses, characterised by ongoing interaction and adaptations (Möllera and Halinen, 2018). Businesses typically establish formal or informal agreements regarding their exchanges, thus specifying the costs and benefits they expect to receive and the timeline for these exchanges (Mouzas, 2022a). In economic exchange, businesses' behaviour is driven by incentives from surplus income that associate their activities with anticipated rewards (Ting and Ahn, 2023). Importantly, value is not inherently produced but rather emerges from these give-and-take exchanges (Mouzas, 2022a). Additionally, business survival relies on economic exchanges with other businesses indicating the high level of interdependency among businesses (Håkansson and Snehota, 1995). These exchanges of value are important for businesses' survival in the case of external pressure such as responding to climate change regulations as they enable cooperation and adaptation. For instance, a car dealer aiming to meet fuel consumption standards might engage in economic exchanges by offering lower-demand fuel-efficient cars to retailers at a reduced price. In return, the retailers would agree to actively promote these vehicles in a market that typically prefers cars with larger engines. Through such give-and-take processes, value is created which guides business activities towards interfirm adaptation. Consequently, enabling businesses to respond to climate change regulations.

### 2.5.2.3 Legal contracts

Contracts are legally “enforceable manifestations of consent” (Mouzas, 2022a: p. 103). Legal contracts refer to “the extent to which detailed and binding contractual agreements

are used to specify the roles and obligations of the parties." (Cannon et al., 2000, p. 182). Well-designed contracts encourage "businesses to collaborate successfully and perform activities in exchange relationships" (Mouzas, 2022a: p. 103; emphasis added). Contracts are the main path of interconnected activities in business interactions (Mouzas and Ford, 2012) because they increase expectation, predictability, and certainty in business interaction between contracting businesses (Cannon et al., 2000; Mouzas, 2022a). This is not understood as a substitute for relational norms but as complementary to strengthen business relationships and relational norms (Cannon et al., 2000; Mouzas, 2022a). Contracts are inherently relational as they create a relationship based on mutual recognition and respect between the businesses involved (Mouzas, 2022a). Additionally, legal contracts safeguard the continuity of exchanges by clarifying the obligations and expectations of the involved businesses. They offer a formal framework that permits modifications in response to unanticipated contingencies (Cannon et al., 2000). Thus, well-designed contracts are essential for enhancing business interactions, increasing predictability and certainty in interconnected activities, and complementing relational norms, while also offering the flexibility to adapt to unanticipated events such as changes in climate change regulations.

In conclusion, activities are the lifeblood of business networks, coming to life through activities like production, delivery, and services, and are both influenced by and influence the actors and resources to which they are connected (Håkansson et al., 2009). These activities are inherently interdependent and interconnected through interactions, requiring coordination and adaptation, especially when facing external pressures such as climate change regulations (Håkansson and Snehota, 1995; Veal and Mouzas, 2011). Collectively, business relationships, economic exchanges, and legal contracts guide business activities within networks in response to climate change regulations (Mouzas,

2022a). Business relationships link activities by influencing how they are structured and executed within the network, with the quality of these relationships playing a vital role in enabling cooperation and synergy (Håkansson and Snehota, 1995; Johnson, 1999; Abosag, 2015). Economic exchanges drive businesses to adjust their activities collaboratively, creating value through give-and-take processes essential for survival and adaptation (Håkansson and Snehota, 1995; Mouzas, 2022a). Legal contracts provide a formal framework that enhances predictability and certainty in business interactions, complementing relational norms and offering flexibility to adapt to unforeseen contingencies like changes in climate change regulations (Cannon et al., 2000; Mouzas, 2022a). Therefore, examining the ways these normative systems govern and link activities is essential for understanding businesses' responses to external pressures arising from climate change regulations.

### 2.5.3 Actors

Actors refer to businesses, parts of businesses, or individuals who perform activities and combine resources in the business network over time (Håkansson and Johanson, 1992). Actors are part of the interactive landscape; similar to activities and resources, actors influence the landscape and are influenced by it (Håkansson et al., 2009). However, a striking difference exists between actors, resources and activities: while resources and performed activities possess a human dimension, only actors can form intent. This intent is shaped by knowledge of resources, activities and other actors, as well as perspectives on their development over time and their position within a business network (Håkansson et al., 2009). Thus, actors purposefully interact with others to combine resources and link activities to solve and address short and long-term issues and challenges (Håkansson et al., 2009; Guercini et al., 2014). In addition, actors develop relationships with other actors in business networks through exchange processes (Håkansson and Johanson, 1992). The

relationships between actors can differ in strength and influence how the actors perceive possible and feasible directions for their interactions (Ford et al., 2008). In this way, understanding the behaviour of actors in business interaction becomes significant in investigating business responses to climate change regulations.

Actors do not function in isolation; they only exist as actors when recognised as such by others. Every action taken by actors involves resources and activities, and these actions impact other actors. It is the actors who initiate, learn, and gain knowledge about the outcomes of resource combinations and activity links. As a result, actors become mutually interdependent, making it difficult to separate the role of an individual actor from its interacting counterparts (Håkansson et al., 2009). This interdependence is reflected in decision-making processes in business relationships, which are inherently interactive. Accordingly, decisions emerge through a series of interactions and adaptations to others' responses (Guercini et al., 2022). Furthermore, the interaction behaviours of individuals who represent their businesses are an important facet of interaction in business relationships because the outcomes and development of these relationships are linked to individual interaction behaviours (Guercini et al., 2014).

The fundamental role of actors and their behaviour in business networks is key to understanding interactive decision-making and responses to external pressures like climate change regulations. A behavioural approach to business networks “offers a more accurate picture of the actual behaviour of actors and provides a better understanding of networks” (Veal and Mouzas, 2010: p.431). Additionally, the behavioural approach enhances our understanding of cognitive biases, conflicts, and ignored opportunities for exchange among interdependent actors within networks dealing with external pressure like climate change regulations (Veal and Mouzas, 2010). However, empirical research

focussing on the behaviours of actors towards their networks is still scarce (Håkansson et al., 2009; Ford and Mouzas, 2013b; Thornton et al., 2015; Guercini et al., 2014; Guercini et al., 2022). Guercini et al. (2014, 2022) call for further studies on the interaction and behaviour in business networks that reveal the interactions – the *black box* – in business relationships. Interestingly, the IMP group provides a starting point regarding how businesses behave and interact when responding to climate change (e.g., Veal and Mouzas, 2010, 2011, 2012; Finke et al., 2016).

Veal and Mouzas (2010) revealed in their empirical study behaviours that businesses engage in when responding to climate change, such as the recognition and judgement of risk, framing and reference points. These behaviours are linked to the cognitive biases that might lead to a failure to respond to climate change. For instance, the different reference points cause actors to struggle in interactions to agree on the required actions and goals. In contrast, when actors have shared reference points, they are better able to agree on the required actions in response to climate change. Indeed, cognitive biases are fuelled by uncertainty, which allows actors to make self-serving decisions (Veal and Mouzas, 2010). Hence, this creates barriers to reaching an agreement on how to interpret and respond to climate change regulations, as businesses may focus on differing interpretations of regulatory requirements rather than pursuing unified action. They conclude by suggesting future research that investigates these behaviours at a finer resolution.

Finke et al. (2016) have examined how barriers inherent in network interactions impede companies' collective responses to climate change. Economic reasoning drives interaction between actors (Håkansson, 1982). Companies invest resources, finances, and time to interact within the network when they have a high potential of earning financial

benefits from these interactions. However, the self-interests of actors conflict with collective interests that would include broader groups of society. Consequently, the development of a collective response to climate change often fails due to actors' economically egoistic behaviour. This is further aggravated by the tendency of businesses to focus on immediate cost savings, reflecting a preference for short-term gains over long-term benefits, which poses a significant barrier to collective action (Finke et al., 2016).

Behavioural insights regarding the recognition and perception of risk, framing of choices, anchoring and reference points or inherent biases have shown some of the inherent behaviours and cognitive limitations that emerge when businesses interact in response to climate change regulations. Veal and Mouzas (2010, p.431) offer a valuable starting point for understanding how these behaviours intertwine with interactions "among interdependent actors in complex and global networks dealing with technical and subjective issues," such as climate change. However, they also emphasise the need for examining these behaviours in greater detail.

Addressing this requires going beyond the IMP literature on interactions within business relationships and networks. While the IMP studies provide valuable insights into the connectivity within a company's business network, it falls short in explaining the behavioural dimensions. Therefore, to comprehensively understand how businesses respond to climate change regulations, the IMP literature must be complemented by behavioural science research. This is because the behavioural perspectives in networks reveal a clearer view of true behaviour of actors and improve our knowledge of business networks (Veal and Mouzas, 2010; Guercini et al. 2014, 2022). Moreover, behavioural science deepens our insight into cognitive biases, conflicts, and overlooked opportunities

for exchanges among interdependent actors facing external pressure such as climate change regulations (Veal and Mouzas, 2010).

While this research draws primarily on the behavioural science literature that emphasises biases and cognitive limitations (e.g., Kahneman and Tversky, 1979; Thaler, 2016), it is important to acknowledge alternative perspectives that view heuristics as adaptive and effective decision-making tools. Notably, the work of Gigerenzer and colleagues (e.g., Gigerenzer and Goldstein, 1996; Gigerenzer et al., 1999) introduces the concept of fast and frugal heuristics, which facilitate efficient choices under uncertainty. Likewise, Eisenhardt and colleagues (e.g., Bingham and Eisenhardt, 2011; Eisenhardt and Sull, 2015) propose the use of simple rules to guide strategic decision-making in complex environments. These approaches offer a more optimistic view of bounded rationality, highlighting the functional value of heuristics in organisational contexts (Gigerenzer and Goldstein, 1996; Bingham and Eisenhardt, 2011). Accordingly, this study focuses on biases and cognitive limitations namely present bias, loss aversion and reference points that are conceptually salient within the context of climate change regulation (Veal and Mouzas, 2010; Finke et al., 2016). The following section offers insights into the behaviour driving human activities and links it to network interactions in response to climate change regulations.

## 2.6 Behavioural aspect in responding to climate change regulations

Behavioural science made significant progress since Simon (1955) coined the term *bounded rationality* to describe actors' cognitive limitations. Thus, bounded rationality is used to assign a sufficiently rational choice based on the cognitive limitations of businesses' decision-makers. The term cognitive limitation refers to a "lack of knowledge and limited ability to forecast the future" (Simon, 1990: p. 16). Bounded rationality assumes that the decision-makers' rationality is constrained. This results in an important

shift from the previous concept of the *economic man*, who produces a fully rational decision towards the concept of the *administrative man*. The administrative man provides a rational choice that is consistent with the environment, where the decision-making takes place (Simon, 1955). Consequently, individuals make judgements that are cognitively limited, and they are prone to biases and errors (Thaler, 2016; Tversky and Kahneman, 1974).

In terms of climate change, Gifford (2011) discusses 29 behaviours and cognition limitations that might hinder people from taking action to respond to climate change, such as the belief in the freedom of the commons (Hardin, 1968). Since the majority of behavioural studies are based on the experimental approach in laboratory conditions that "underestimate the actual problem-solving capacities that people exercise in the natural environment in which they must solve problems" (Kelman, 2011: p. 72), this research intends to provide evidence from the real-life context of behaviour in business marketing.

Present bias, loss aversion and reference points are posited biases and errors that hinder businesses responding to climate change regulations. These biases are conceptually relevant because they capture behavioural tendencies such as short-termism, risk aversion, and reliance on the status quo, which pose barriers to interaction within business networks under regulatory pressure. In particular, climate change regulations often require businesses to make fundamental changes to established products and processes, but these biases reinforce a preference for familiar practices and limit the willingness to depart from past strategies (Veal and Mouzas, 2010; Finke et al., 2016). In terms of biases and errors in business, individual managers represent their companies' decision-making, and "managers' behaviours reflect how they make sense of the complex and ambiguous

context in which they act and interact" (Waluszewski et al., 2019, p. 235). The three biases and errors are discussed and linked to climate change regulations below.

### 2.6.1 Present bias

Present bias is the tendency to settle for a smaller reward immediately instead of waiting longer for a larger reward in the future (Mouzas, 2022a). For example, actors may postpone efforts for sustainable development, and delay decisions to combat climate change that require sacrifices. Present bias emphasises time inconsistency, meaning that "the discount rate between "now" and "later" is much higher than between "later" and "even later"" (Thaler, 2016, p. 1592). Following this logic, O'Donoghue and Rabin, (1999) argue that the assumption of time consistency is wrong because of the ignorance of "the human tendency to grab immediate rewards and to avoid immediate costs in a way that our "long-run selves" do not appreciate" (O'Donoghue and Rabin, 1999: p.103). Present bias might hinder decision-makers response to climate change because their cognitive concern is in the present, while climate change is slow, and usually seems unrelated and distant to the present (Gifford, 2011). The pursuit of immediate gratification implies delaying necessary sacrifices in the present (Mouzas, 2022a). In terms of the automobile industry, investment in environmentally friendly cars is expected to generate opportunities in the future as a consequence of strict regulations but is not expected to be beneficial in the meantime (Böttcher and Müller, 2015). Therefore, businesses might have a propensity towards high-consumption vehicles at present, since efficient vehicles require immediate investment to generate value that is discounted at the time it can be taken into account.

### 2.6.2 Reference point

The reference point concept as derived from prospect theory by Kahneman and Tversky (1979) which refers to a reference point as the value function is defined relative to a

reference point, which is in most cases the status quo (Kahneman and Tversky, 1979; Dowling et al., 2020). In other words, "outcomes are defined relative to a reference point, which serves as the zero point of the value scale" (Kahneman and Tversky 1979: p.275). Once a decision is compared to the reference point, the evaluation is coded in terms of the gains and losses of that option. A significant case occurs when the reference point is the status quo, and maintaining the status quo is an option. Since the losses of any alternative to the status quo are weighted more heavily than its advantages, a powerful bias in favour of the status quo exists (Kahneman, 1992). For instance, a car model might be perceived either positively or negatively relative to the current car fleet rather than for its actual monetary value per se (Kwon and Lee, 2009).

### 2.6.3 Loss aversion

Loss aversion (Kahneman and Tversky, 1979) is an example of a behavioural bias that might explain businesses' responses to climate change regulations. Loss aversion refers to an asymmetric value function that is steeper for losses than for gains. In other words, "changes that make things worse (losses) loom larger than improvements or gains" (Kahneman et al., 1991: P. 199). Decision-makers treat gain and loss differently based on what they already have (Mouzas, 2022a). The preference to remain with the status quo is because potential losses in the context of change are unrealistically large (Kahneman et al., 1991; Kim and Kankanhalli, 2009). Aljughaiman and Chebbi (2022) found that loss aversion negatively influences firms' market performance in their study of 143 firms listed on the Saudi Stock Exchange over the period from 2012 to 2021. Hence, businesses might refuse the expected profits from sustainable practices in order to maintain their current revenue. For example, Wahyuni and Ratnatunga (2015) indicate that a company that responds by complying with the minimum requirement of carbon emission regulations within contingency can be described as taking a low-risk and low-return

approach. Thus, in the context of external pressure emitted from climate change regulations, actors in the Saudi automobile network with a high loss aversion may avoid losses in inter-firm adaptation.

While these biases originate at the individual level, they can collectively influence organisational behaviour and, by extension, the dynamics within business networks. The IMP literature provides insights into how behavioural science can be applied to business contexts. For instance, Guercini et al. (2014, 2022) offer a foundation for exploring behavioural processes within business relationships and networks. Notably, Guercini et al.'s (2014) conceptual paper on behaviour in business relationships suggests that individual actors utilise heuristics to "make sensible decisions because the commitments they make and the solutions and arrangements they identify and implement have substantial economic consequences." (Guercini et al., 2014: p.930)

Heuristics, as defined by Kahneman (2011: p.98), are "a simple procedure that helps find adequate, though often imperfect, answers to difficult questions." Simon (1967, 1972) further explains that actors rely on heuristics to overcome behavioural limitations. In addition, heuristics not only guide individual decision-making but also shape interactions and adaptations within business relationships and networks (Guercini et al., 2022). Although Guercini et al. (2014, 2022) suggest that these heuristic methods are employed by actors in business relationships and networks, there is still a lack of empirical evidence to support or refute this assumption. In fact, Guercini et al. (2014) conclude that "research on business relationships dealing with factors that explain individual behaviors has been limited, and most of the research on interaction in business relationships appears to 'black-box' individual interaction behaviors." (Guercini et al., 2014, p.930). As a result,

Guercini et al. (2014, 2022) call for additional research on interaction and behaviour within business relationships.

In conclusion, behavioural biases such as present bias, loss aversion, and reliance on reference points significantly influence how businesses respond to climate change regulations. These biases can hinder proactive adaptation within business networks. However, how these individual and organisational behaviours translate into network-level dynamics remains unclear. To address this gap, the next section will apply the theoretical insights discussed to develop an initial framework for studying business responses within networks to climate change regulations.

## 2.7 Towards a conceptual framework of adaptive responses to climate change regulations

An initial framework is developed based on previous literature (Figure 2.1). This theoretical framework will assist the researcher to make sense of the empirical observation of how businesses respond to climate change regulations in the Saudi automobile network. The empirical observations could potentially result in modifications or refinements to this initial theoretical framework, to meet the study aims of an empirically evidence theory development on business network responses to climate change regulations.

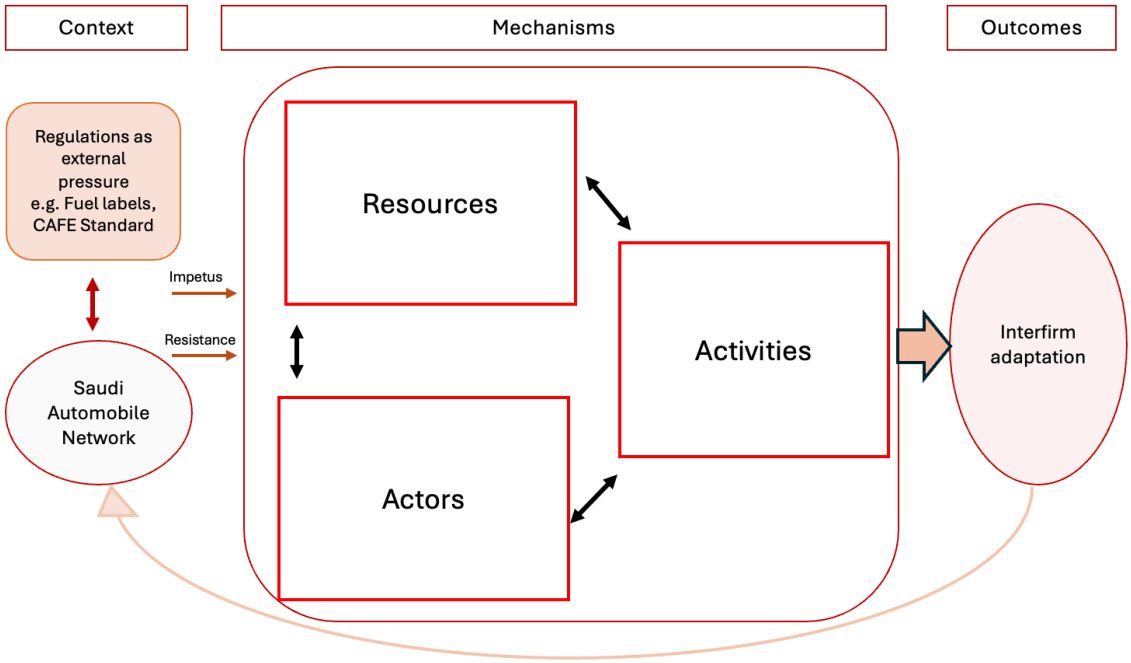



Figure 2. 1 A conceptual framework of adaptive responses to climate change regulations

Context: Environmental regulations generate external pressure on business network actors. In this framework, business networks encompass various actors, such as manufacturers, suppliers, and retailers, who provide products and services to markets. Governmental environmental regulations establish a new framework that simultaneously encourages and constrains businesses to alter their business practices (Nadvi, 2008; Okereke and Russel, 2010; Aragon-Correa et al., 2020).

Contextual contingencies such as the introduction of new environmental regulations and standards on industry can have direct and indirect impacts on the individual companies within a business network. For example, penalty charges for failing to meet environmental regulations may directly affect manufacturers. Indirectly, they can impact distributors by reducing the supply of high-demand products affected by the regulations or by increasing the prices of such products. The arrow between the external pressure and the network indicates the influence is double-faceted such that the regulations affect the

way a business network functions, and the lobbying power of the industry may in turn influence regulations.

These regulations have generated a conflict for businesses between maintaining short-term profitability and responding to climate change regulations (Wright and Nyberg, 2017; Johnson et al., 2023). Since a contextual contingency creates an external pressure for change, it gives companies either the impetus to adopt or resistance to such a pressure. This research argues that a company's response is ultimately based on the nature of its dynamic mechanism and interactions within the border business network (Mouzas and Naudé, 2007).

Mechanisms: This part of the framework highlights network interactions as central in the processes of businesses' responses arising from contextual contingencies. Network interactions refer to the continuing exchanges, coordination, and adaptation between firms within business networks, where actors engage in interdependent activities and resource combinations to achieve mutual or individual objectives (Håkansson and Snehota, 1995; Ford and Mouzas, 2013a). Network interactions happen between and among the three dimensions: resources, activities, and actors (the black double-head arrows).

This suggests that the way resources are combined in business interactions influences how activities are initiated and shaped to meet the need for responding to climate change regulations (Glinka et al., 2023; Baraldi et al., 2024). Furthermore, actors who perform activities and combine resources possess intent shaped by their knowledge and relationships (Håkansson et al., 2009; Guercini et al., 2014). Consequently, understanding their behaviour is key to explaining their interactions (Veal and Mouzas, 2010; Guercini et al., 2014, 2022).

However, emergent actor biases may hinder the effective integration of activities in interfirm adaptation efforts aimed at responding to climate change regulations. As a result, interfirm adaptation may depend on the extent to which businesses coordinate their activities within business interactions (Håkansson and Snehota, 1995).

**Resources** refer to the embedded resources in networks that actors develop and combine through interaction over time (Ford et al., 2003). As discussed earlier in Section 2.5.1, resource entitlements, mobilisation, and exploitation are important parts of businesses' resource interactions within networks in response to climate change regulations. The proposed conceptual framework incorporates the concepts of resource entitlements, mobilisation, and exploitation. In dealing with network dynamics that come from contextual contingencies, these three resource-focused dimensions illustrate how businesses negotiate ownership, access, and utilisation of resources within the network context.

Resource entitlements create a link between actors and resources by defining ownership and control (Mouzas and Ford, 2018; Mouzas, 2024). They form a bundle of rights, duties, and capabilities that firms possess, acquire, and transfer to other business actors (Mouzas, 2022b). In this research conceptual framework, resource entitlements are critical because they determine the extent to which businesses can access, use, and configure resources to adapt to regulatory pressures. Entitlements to resources act as the currency that actors bring into the interaction process, influencing the achievement of consent (Mouzas and Ford, 2018). By establishing who controls and transfers resources, they shape how businesses mobilise resources within their networks.

Resource mobilisation involves businesses' attempts to access and utilise the resources of other businesses through their network relationships, enabling them to effectively

capitalise on opportunities and reduce risks associated with external pressures such as climate change regulations (Mouzas and Naudé, 2007; Thornton et al., 2019; La Rocca and Snehota, 2021). This process highlights the role of interdependencies, as businesses need to engage with their networks to secure the necessary resources for regulatory adaptation. In response to external pressures, businesses are also required to enhance internal efficiency while leveraging the resources of other businesses (Mouzas and Naudé, 2007). Hence, variations in resource mobilisation within business networks may explain the differing ways businesses respond to external pressures, particularly climate change regulations.

Resource exploitation focuses on making incremental improvements to existing resources by refining and enhancing them internally and externally through business relationships (Håkansson and Waluszewski, 2002; O'Cass et al., 2014). Unlike mobilisation, which focuses on acquiring new resources, exploitation emphasises optimising available resources to increase efficiency and competitiveness in response to regulatory demands. These resource dynamics are significant for understanding how businesses respond to climate change regulations.

In the same way, **activities** in this framework are governed by three normative systems: business relationships, economic exchanges, and legal contracts guide business activities within networks in response to climate change regulations (Mouzas, 2022a). As aforementioned in section 2.5.2, these normative systems shape how businesses coordinate, structure, and adapt their activities within interfirm interactions.

Business relationships link activities by influencing how they are structured and executed within the network, with the quality of these relationships playing a vital role in enabling cooperation and synergy (Håkansson and Snehota, 1995; Johnson, 1999; Abosag, 2015).

As Håkansson and Snehota (1995, p. 26) highlighted, "a relationship links activities"; business relationships encompass activities that connect different internal processes of businesses to varying degrees. In the context of this framework, business relationships are expected to facilitate interfirm adaptation to climate change regulations by shaping how businesses coordinate their activities. A high-quality business relationship fosters trust and fairness, which in turn enhances cooperation by creating greater synergy between activities, particularly under external pressures such as climate change regulations (Johnson, 1999; Abosag, 2015). Thus, the way businesses manage and maintain relationships within networks may determine how effectively they adjust their activities to meet regulatory demands.

Economic exchanges drive businesses to adjust their activities collaboratively, creating value through give-and-take processes essential for survival and adaptation (Håkansson and Snehota, 1995; Mouzas, 2022a). These exchanges are not merely isolated transactions but ongoing relationships that guide businesses in structuring their activities to respond to external pressures (Möllera and Halinen, 2018). In this framework, economic exchanges are expected to facilitate interfirm adaptation to climate change regulations by shaping how businesses coordinate activities through formal or informal agreements (Mouzas, 2022a). As value emerges from these exchanges, businesses may need to continuously adjust their activities to maintain competitiveness while ensuring regulatory compliance (Ting and Ahn, 2023).

Legal contracts provide a formal framework that enhances predictability and certainty in business interactions, complementing relational norms and offering flexibility to adapt to unforeseen contingencies like changes in climate change regulations (Cannon et al., 2000; Mouzas, 2022a). Within this framework, legal contracts are expected to serve as a

coordinating mechanism that links activities by defining roles, obligations, and expectations, enabling businesses to align their interactions while adapting to regulatory demands (Mouzas and Ford, 2012; Mouzas, 2022a). Therefore, examining the ways these normative systems govern and link activities is essential for understanding businesses' responses to external pressures arising from climate change regulations.

**Actors** are part of the interactive landscape; similar to activities and resources, actors influence the landscape and are influenced by it (Håkansson et al., 2009). Importantly, this conceptual framework integrates behavioural science insights into the IMP approach. It acknowledges the cognitive limitations and behavioural biases that can hinder businesses' responses to climate change regulations. As discussed in section 2.5.3, present bias, loss aversion, and reliance on reference points have been identified as critical behavioural factors that may shape how actors within the network interact and make decisions in response to external regulatory pressures (Kahneman and Tversky, 1979; Veal and Mouzas, 2010; Mouzas, 2022a). These behavioural biases allow the framework to capture not only the structural interdependencies but also the psychological processes influencing actors' interactions.

Present bias refers to actors' tendency to settle for a smaller reward immediately instead of waiting longer for a larger reward in the future (Mouzas, 2022a). For example, actors may postpone efforts for sustainable development, and delay decisions to combat climate change that require sacrifices. Within this framework, it is assumed that present bias emerges through actors' interactions in responding to climate change regulations, potentially influencing their activities links and adaptation decisions.

The concept of reference points is derived from prospect theory, which suggests that actors evaluate outcomes relative to a reference point, often the status quo (Kahneman

and Tversky, 1979; Dowling et al., 2020). Once a decision is compared to this reference point, it is perceived in terms of gains and losses, influencing how businesses assess adaptation choices. It is assumed that reference points shape actors' decision-making in responding to climate change regulations, potentially reinforcing a bias toward maintaining the status quo. This bias may also influence business interactions, as businesses engaging in network relationships may assess new opportunities or regulatory changes relative to their existing practices, leading to resistance toward interfirm adaptation. For instance, a new car model may be judged relative to the existing fleet rather than its long-term economic or environmental value, affecting how businesses coordinate and respond to regulatory changes (Kwon and Lee, 2009).

Loss aversion refers to an asymmetric value function that is steeper for losses than for gains (Kahneman et al., 1991). Decision-makers treat gain and loss differently based on what they already have (Mouzas, 2022a). The preference to remain with the status quo is because potential losses in the context of change are unrealistically large (Kahneman et al., 1991; Kim and Kankanhalli, 2009). Within this framework, loss aversion is expected to influence actors' responses by making them more reluctant to link activities, even when interfirm adaptation offers long-term advantages.

In addition, the double-headed arrows in the framework represent reciprocal influences between elements. In the resources section, entitlements, mobilisation, and exploitation form a cyclical process, where access to resources (mobilisation) may depend on ownership rights (entitlements), and effective exploitation of resources may create new entitlements over time. Similarly, in the activities section, business relationships, economic exchanges, and legal contracts are interconnected where strong business relationships may enable effective economic exchanges, while legal contracts can

formalise and stabilise these interactions. In the actors section, behavioural biases reinforce one another; for example, sticking to the status quo emitting from present bias may potentially impose the influence of the asymmetric value function of loss aversion error. These interconnected relationships highlight the complexity of interfirm adaptation processes, where businesses continuously negotiate resources, link activities, and behavioural tendencies that shape decision-making in response to climate change regulations

Outcomes: outcomes are the observed results of continuous interactions of resources, activities and actors in business networks over time. Interfirm adaptation, which refers to changes or adjustments in products or processes by one firm to meet the needs or requirements of another firm in business relationships (Håkansson, 1982; Hallen et al., 1991; Yu and Fang, 2023; Mouzas, 2024), emerge as key outcomes of these interactions. In response to changes emitting from climate change regulations, businesses within the network may engage in interfirm adaptation, adjusting their operations collaboratively. Interfirm adaptation is a defining element of lasting business relationships (Brennan and Turnbull, 1996; Fang, 2001; Mouzas, 2024) and results from the need to coordinate the activities of the involved businesses in the relationship (Håkansson and Snehota, 1995). Indeed, the mere existence of a relationship requires adaptation in either one or both businesses (Brennan and Turnbull, 1996). While interfirm adaptation may be considered costly for one or both partners in a business relationship, it can pay off in the long term by strengthening the relationship, enhancing competitive advantages, and securing a stronger position on the market (Hagberg-Andersson, 2006; Mouzas, 2024).

However, actors may be willing to adapt some aspects but still want to preserve overall network stability because humans are attached to what they have and avoid risk, e.g., loss

aversion (Kahneman et al., 1991). This does not mean that businesses are not concerned about climate change, but they are naturally biased to the present and therefore likely to aim to preserve the status quo (Thaler, 2016). The manifestation of efforts to preserve stability can be seen in businesses delaying responses, protecting existing resources and minimising relationship changes. Thus, the tension between the need to adapt and the desire to maintain stability shapes the nature of interfirm adaptations within the network. Last, the arrow from the outcome into the context indicates that these outcomes might influence the contextual contingency. For example, the government representative bodies may face pressure from companies' responses to the regulation, which may bring stakeholders back to the negotiating table.

## 2.8 Conclusion

This chapter has established the theoretical foundation for this study. It began by introducing business responses to externally generated pressures, with a particular focus on climate change regulations. The chapter then reviewed the tensions that climate change regulations have created for businesses and critically examined the current organisation and management approaches used to explain these responses. Drawing on the business marketing literature related to business relationships and networks, the network approach was presented as an alternative theoretical lens driven by the advancement of the Industrial Marketing and Purchasing (IMP) group. Additionally, insights from behavioural science were incorporated to further explore the interactions and behaviours involved in how businesses respond to climate change regulations. At the end of the chapter, based on the interdisciplinary reviewed literature, a novel theoretical framework for exploring business responses to climate change regulations was proposed.

In the following chapter, the methodological procedures underpinning this study will be described.

# Chapter 3: Methodology

## 3.1 Introduction

This chapter explains and justifies the methodological choices made by the researcher to address the research objectives and questions. Building on critical realist epistemology and network ontology, the researcher adopted exploratory sequential mixed methods with in-depth interviews in the first phase of data collection, followed by questionnaires in the second phase. Quality checks, ethical considerations and the limitations of the chosen techniques and tools are also discussed in this chapter.

## 3.2 Epistemology – Critical Realism

Epistemology is concerned with how researchers make knowledge claims, i.e. "the idea of how knowledge is possible and of what" (Zachariadis et al., 2013, p. 856). In other words, epistemology addresses the nature, source, and scope of knowledge by questioning how we come to know what we know. It is essential to understand the epistemological assumptions underlying this research because they influence how the empirical findings of the study are interpreted and impact the research practice (Gorski, 2013).

Epistemological stances in business and management research typically involve three main positions: positivism, interpretivism and realism (Easterby-Smith et al., 2021; Saunders et al., 2023). Table 3.1 provides a comparative overview of these epistemological positions, detailing their views on what constitutes acceptable knowledge, and the data collection techniques typically employed. Consequently, this diversity of epistemological stance provides researchers with the choice of how to conduct their research. For example, choosing the positivist stance may result in a focus on measuring observable relationships between climate change regulations pressures and

business practices through structured quantitative methods. Furthermore, choosing the interpretivism stance may result in exploring subjective meanings and individual perspectives of businesses responses to climate change regulations through qualitative methods. Neither of these stances fully addresses the current research aim of exploring how businesses respond to climate change regulations, identifying the enablers and barriers of interfirm adaptation, and examining the behavioural and interactional aspects shaping these responses within the Saudi automobile network.

This research is based on a realist epistemological stance because of our research objectives and questions. A realist's underlying assumption is "that there is a reality "out there" waiting to be discovered and that reality is independent of us" (Easton, 2000, p. 207). Nonetheless, this reality will not be given to us transparently; we need theoretical lenses and critical thinking to explain the 'reality' (Easton, 2000). In this way, the researcher's critical realist assumptions are fully aligned with the network ontology that assumes an interconnected business landscape and the methodological choice of a mixed methods research design that relates to endeavours to use theory as explanatory tools (Zachariadis et al., 2013). This thesis follows Olsen (2004) who argues that the critical realism paradigm is the most suitable one for a mixed methods research methodology. In addition, critical realism encourages the use of mixed methods to overcome the complexities of the studied phenomenon (Mingers, 2006), such as firms' behaviour and interaction in response to external pressure from climate change regulations.

Table 3.1 Epistemology Types

| | Positivism | Realism | Interpretivism |
|---|---|---|---|
| Epistemology: the researcher's view regarding what constitutes acceptable knowledge. | Only observable phenomena can provide credible data and facts. Focus on causality and law like generalisations, reducing phenomena to simplest elements. | Phenomena create sensations which are open to misinterpretation. Focus on explaining within a context or contexts. | Subjective meanings and social phenomena. Focus upon the details of a situation, a reality behind these details, subjective meanings motivating actions. |
| Data collection techniques most often used. | Highly structured, large samples, measurement, quantitative. | Methods chosen must fit the subject matter, quantitative or qualitative. | Small samples, in-depth investigations, qualitative. |

Source: Easterby-Smith et al. (2021); Saunders et al. (2023)

Critical realism as opposed to naïve realism differentiates across three distinct domains (Bhaskar, 2008): (1) the real, (2) the actual and (3) the empirical. Table 3.2 summarises the three domains of reality in critical realism, highlighting their distinct roles in capturing mechanisms, events, and experiences to provide a comprehensive framework for understanding complex phenomena. First, the domain of the real includes objects and structures with inherent causal powers and liabilities, which result in *mechanisms* that may not be visible. Second, the actual is a subset of the real and includes the events generated from both exercised and unexercised mechanisms. Finally, the empirical refers only to the subclass of observable, experienced events and changes (i.e. bears witness to the powers and liabilities characterising structures that constitute generative mechanisms, which, in turn, cause the experienced events) (Zachariadis et al., 2013, p. 857). These three domains of reality advocate for the utilisation of both qualitative and quantitative methods to investigate various facets of reality (Zachariadis et al., 2013). This assumption is especially significant to the study aim of understanding businesses' interactions in response to climate change regulations because qualitative methods can reveal underlying generative mechanisms and structures, while quantitative methods can be utilised to statistically analyse the observable events and outcomes.

Table 3. 2 Domains of Reality

| | Domain of Real | Domain of Actual | Domain of Empirical |
|---|---|---|---|
| Mechanisms | ✓ | | |
| Events | ✓ | ✓ | |
| Experiences | ✓ | ✓ | ✓ |

Source: Bhaskar (2008, p.2)

Following a critical realist epistemological stance, the researcher's attention was guided to unearthing hidden cause-and-effect links. This attention to causality is crucial in our research context because it enables the identification of how interacting businesses within networks of interconnected business relationships respond to climate change regulations in the Saudi automobile industry. Zachariadis et al. (2013) point out that the critical realist view of causality should be concerned with understanding the condition and process under which one event causes another. The authors add that the view on causality should not be concerned with the relationships among various events. Sayer (1992) states that "to ask for the cause of something is to ask "what makes it happen", what "produces", "generates", "creates" or "determines" it, or, more weakly, what "enables" or "leads to" it" (p. 104). Moreover, entities that are included in research have the power to cause events but also the liabilities that come with that power. As a realist researcher, it is necessary to find reasons to believe in entities' causal power because they make things happen. This can be explained with three key questions: "What are the entities that define our research field, what are their relationships and what are their powers and liabilities?" (Easton, 2010, p. 120). In the present study, the researcher identified the powers and liabilities of automobile manufacturers, dealers, retailers, government regulations and consumers to determine which events cause other events within the context of the Saudi automobile sector.

The following section discusses how suitable critical realism is to the study's ontological choice of network approach.

## 3.3 Ontology – The Network Approach

Ontology refers to "assumptions about how the world is" (Easton, 2002, p. 108). As such, ontology is about the researcher's assumptions regarding the nature of the world. In other words, it answers an ontological question: "What is there that can be known about it?" (Guba and Lincoln, 1994, p. 108). By adopting network as the researcher's ontology, we assumed that the business landscape is not simply an intersection of demand and supply in the marketplace but consists of continuous exchange relationships, such as interwoven entities of actor bonds, resource ties and activity links (Håkansson and Snehota, 1995). Moreover, the researcher's ontological assumptions establish the researcher's "system of picturing" the world that guides the questions we raise and the explanatory forms we deem plausible" (Tsoukas and Chia, 2011, p. 3). Thus, our ontological assumptions shape the way we understand and frame the research context, influencing not only the questions we ask but also the types of explanations we consider valid. In this study, the network ontology enables the researcher to conceptualise the business landscape as a web of interconnected relationships, guiding the focus on interactions, resource exchanges, and activity links as the central explanatory mechanisms. These ontological assumptions are also closely related to choices made regarding epistemology and methodology.

The ontological standpoint of a network approach is closely tied to the epistemology of critical realism, which forms the basis of this study. Critical realism stresses the significance of both *context* and *mechanism* in explaining observations (Pawson & Tilley, 1997). This is consistent with the idea that the world is a network comprising interdependent and connected elements. This connectivity is metaphorically captured by the term 'network'. The network provides the 'context' in which firms must respond to

climate change regulations, which makes it possible for generative explanations to be developed, as discussed in Chapter 2 (Araujo et al., 2003; Håkansson and Snehota, 1995; Mouzas and Ford, 2018). According to Håkansson et al. (2009), "the characteristics of actors themselves and of their activities and resources are as much an outcome of interaction as they are an input to it" (p. 33). Consequently, the researcher's ontological assumption is that the world is a web of exchange relationships among actors, activities and resources.

In sum, the philosophical foundation underpinning this study, which is grounded in a network ontology and a critical realist epistemology, supports the use of mixed methods to address the research objectives and questions. The network ontology assumes that interfirm adaptation emerges through interconnected relationships between actors, activities, and resources, while critical realism encourages explanatory research that uncovers both observable outcomes and the generative mechanisms behind them. These assumptions align with the mixed methods approach adopted in this thesis, where qualitative data are used to explore underlying behaviours and interactions, and quantitative data are employed to test and confirm relationships among identified variables. This alignment ensures coherence between the research philosophy and methodology and provides a robust basis for investigating complex, multi-layered responses to climate change regulations in business networks.

The following section discusses the researcher's methodological choice of the mixed methods approach and its suitability to the research philosophy, questions and aims.

## 3.4 Research Methodology: Mixed Methods

The selection of research methodology is guided by the research ontology and epistemology. Depending on how the research question of a research is framed, research

methods could be qualitative (i.e., principally interested in collecting and analysing words rather than numerical data (Bell et al., 2022), quantitative (i.e., mainly focusing on numerical data and analysis (Teddlie and Tashakkori, 2009) or mixed-method which encompass the collection and analysis of both qualitative and quantitative data within a single research, where the data are gathered either simultaneously or sequentially and integrated at one or more stages of the research process. (Creswell et al., 2003).

In this thesis, the methodological choices are dictated by the research objectives. The thesis aims to provide a comprehensive understanding of how businesses within the Saudi automobile network respond to climate change regulations, exploring the interactional and behavioural factors of interfirm adaptation in responding to climate change regulations. Thus, the thesis seeks to examine the relationships between businesses' behavioural and interactional aspects and interfirm adaptation in responding to climate change regulations.

Considerable thought has been given to selecting the methodology that best aligns with the objectives of the thesis. Applying only qualitative or quantitative research methodology has its limitations. For instance, the main criticisms that qualitative research might receive are its subjectivity and difficulty to replicate or generalise (Bell et al., 2022). On the other hand, the most prominent criticisms of quantitative research include the limited exploration, oversimplification of complex phenomena and narrow participant voices (Zachariadis et al., 2013).

Despite the limitation of utilising only qualitative or quantitative as research methodology, the mixed methods research has emerged as a viable alternative. Utilising mixed methods enables the researcher to surpass the constraints of using only quantitative or qualitative methodologies, resulting in a comprehensive collection of data that would

not be achievable with either method alone (Almeida, 2018). In addition, the mixed methods approach is aligned with the thesis's philosophical choices of network ontology and critical realism epistemology (Mingers, 2006; Olsen, 2004; Zachariadis et al., 2013). In mixed methods research, the research questions direct the investigation and are addressed using data "presented in *both narrative and numerical* forms" (Teddlie & Tashakkori, 2009, p. 8, emphasis in original). Answering the current research questions requires the collection of rich, in-depth qualitative data to explore firms' behaviour and interaction processes when responding to climate change regulations and large numerical data for statistical testing of the study hypotheses. Therefore, the mixed methods methodology is the most appropriate choice among the other methodological choices to answer the research questions and achieve research objectives.

A classical justification for the utilisation of mixed methods research is provided by Greene et al., (1989) and has been used by many mixed methods scholars (e.g., Clark & Creswell, 2008; Creswell & Clark, 2017; Greene, 2007; Johnson & Onwuegbuzie, 2004; McCrudden et al., 2021). Triangulation, complementarity, development, initiation and expansion are the five main purposes and rationales for conducting mixed methods research, as shown in Table 3.3. In the current research, development is the leading justification for utilising mixed methods research among the five purposes suggested by Greene (1989), alongside triangulation, complementarity and expansion. These purposes are reflected in the researcher's decision during the research process, such as the implementation of a particular research design, which will be discussed in the following section.

Table 3. 3 Purpose and Rationale for Mixed Methods Research

| Purpose | Rationale |
|---|---|

| | |
|---|---|
| **Triangulation**: Seeks convergence, corroboration, and correspondence of results from different methods. | Enhances validity by reducing biases and addressing variance sources. |
| **Complementarity**: Seeks elaboration, enhancement, and clarification of results from one method using another. | Improves interpretability and validity by leveraging method strengths and reducing biases. |
| **Development**: Uses results from one method to inform or guide another method, including sampling, implementation, and measurement decisions. | Increases the validity of constructs and inquiry outcomes by utilising the strengths inherent in different methods. |
| **Initiation**: Aims to identify paradoxes, contradictions, and new perspectives by integrating diverse methods. | Expands the breadth and depth of inquiry by analysing results through diverse methods and paradigms. |
| **Expansion**: Seeks to broaden the scope of inquiry by using different methods for different aspects of the research. | Enhances the scope of inquiry by selecting methods that best suit different inquiry components. |

Source: Greene et al. (1989)

The strengths and weaknesses of mixed methods suggested by (Johnson and Onwuegbuzie, 2004) are relevant to this study. For example, combining qualitative and quantitative approaches allows for a more comprehensive understanding of businesses' responses to climate change regulations by uncovering network interactions and behavioural biases using qualitative data and then examining these findings quantitatively. At the same time, challenges such as the time-consuming nature of mixed methods were addressed by adopting a sequential approach to data collection.

A mixed method is a way of thinking which encourages considering different ways of seeing, hearing and interpreting the phenomena under study to discover what is important and should be valued (Greene, 2008). It is a way of leveraging the advantages of both qualitative and quantitative methods while addressing certain limitations (Fetters et al., 2013). Moreover, combining both views “enhances the generalizability and explanatory power of network studies” (Mühlenhoff, 2016, p. 38). Thus, by combining the depth of qualitative data with the breadth of quantitative data, it can offer a more comprehensive

understanding of the complex firms' responses to climate change regulations in business networks.

Specifically, interview data in a qualitative study allows to discover the various processes of firms' interactions in business networks and identify the emergent behavioural biases during firms' responses to climate change regulations. In contrast, a survey in a quantitative study helps to test the hypothesised relationships among the study variables. Ultimately, using a combination of methods to offset biases of error and perspective leads to an insightful interpretation of the research findings that "are closer to the "truth" (Greene, 2008, p. 17). McKim (2017) finds that while mixed methods research may face more criticism compared to other methodological approaches, its value lies in its ability to uncover deeper meanings, confirm results and engage readers from diverse perspectives.

To sum up, this thesis employs mixed methods and utilises both qualitative and quantitative to achieve the research objectives and answer the research questions. Another reason for the choice of mixed methods is to mitigate the drawbacks of relying on a single method while still benefitting from both methods' strengths. The following section justifies and discusses the researcher's choice of the exploratory sequential mixed methods research design among other mixed methods research designs.

## 3.5 Research Design: Sequential Mixed Methods

Research designs refer to "types of inquiry within qualitative, quantitative, and mixed methods approaches that provide specific direction for procedures in the research study" (Creswell & Creswell, 2023, p. 13). Research designs are essential because they offer instructions on how to rigorously carry out investigations to successfully accomplish a study's planned objectives (Clark & Creswell, 2008).

Creswell and Clark's (2017) typology of mixed methods schemes comprises three core designs: 1) the convergent design, 2) the explanatory sequential design and 3) the exploratory sequential design. A convergent design occurs when a study gathers qualitative and quantitative data simultaneously and compares the two sets of data to identify convergence and divergence. Meanwhile, an explanatory sequential design starts with collecting and analysing quantitative data and then mainly follows a qualitative approach to explain the findings from the quantitative data. Finally, an exploratory sequential design is adopted when the researcher prioritises qualitative data collection and analysis and then develops quantitative constructs and conceptualisations based on the qualitative findings for quantitative testing. The two sequential designs are better suited to studies with a solo researcher than the convergent design because "it is easier to keep the strands separate, and the studies typically unfold in a slower, more predictable manner" (Teddlie & Tashakkori, 2009, p. 153).

Each design has its strengths and weaknesses, and researchers can adapt their research design based on their specific research questions and objectives. Despite the advantages of the convergent design, gathering both qualitative and quantitative data simultaneously presents a significant challenge for an individual researcher managing the data collection. Similarly, although the explanatory sequential design enables the use of qualitative data to elaborate on quantitative findings, it is less suitable for studies where qualitative exploration is required to conceptualise and develop variables for subsequent quantitative testing such as the current thesis. In contrast, the exploratory sequential design overcomes these limitations by prioritising qualitative inquiry, allowing the researcher to investigate business network interactions and the emergent behavioural biases in responding to climate change regulations. Consequently, using this design, variables for statistical testing can also be developed and conceptualised. This design aligns more effectively

with the research objectives and ensures a coherent progression from exploration to confirmation. Therefore, the exploratory sequential design was adopted in this thesis.

The current thesis adopted an exploratory sequential design involving two phases of research in chronological order, starting with a qualitative inquiry and followed by a quantitative study (Teddlie & Tashakkori, 2009). The predetermined order of the two studies served the researcher in answering exploratory and confirmatory questions (Teddlie & Tashakkori, 2009). Another advantage of the adopted design is the time prioritisation for qualitative inquiry exploration, which is essential for the development of instruments and the generation of hypotheses for the statistical testing in the second strand – the quantitative phase (Creswell & Clark, 2017).

Therefore, the qualitative phase was prioritised in this thesis to allow the researcher to investigate the dimensions of Håkansson and Johanson's (1992) actor-resource-activity (ARA) model within the study context of firms' responses to climate change regulations in the Saudi automobile network. In addition, the qualitative study explores emergent behavioural biases when responding to climate change regulations and support the development of scales. The quantitative study was then conducted, which encompassed statistical testing for the hypothesised relationships among the study variables.

After completing the empirical analysis of the sequential qualitative and quantitative studies, the results drawn from both studies are discussed collectively. Morgan (1998, as cited in Brannen, 2005, p. 176) indicates that the results of mixed methods research can typically be categorised as 1)corroboration – the same results are derived from both qualitative and quantitative methods, 2) elaboration – the qualitative data analysis exemplifies how the quantitative findings apply in particular cases, 3) complementarity

– the qualitative and quantitative results differ but together generate insights and 4) contradiction – where the qualitative data and quantitative findings conflict.

The present research conducted qualitative and quantitative studies separately but acknowledges that the planning and development of the quantitative stage rely on the exploration of the qualitative study. Therefore, the qualitative and quantitative study results were complementary, as they together provided new insights into how firms respond to climate change regulations in the Saudi automobile industry. Figure 3.1 below outlines the thesis' methodology framework.

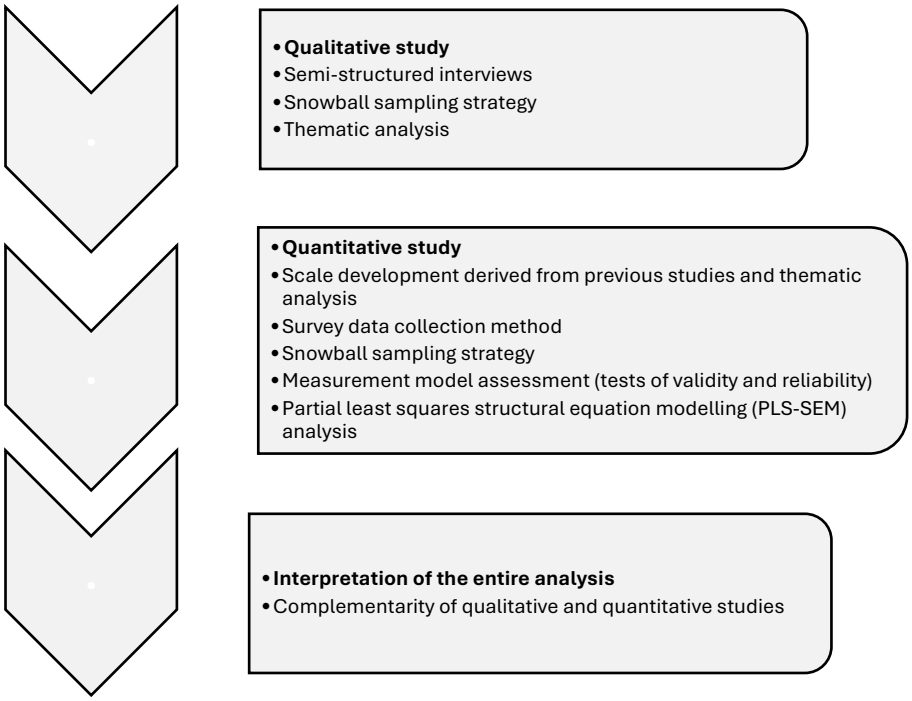



Figure 3. 1 Present Research Methodology Framework

To conclude, the utilisation of a sequential mixed methods research design for the present research was influenced by the researcher's research philosophy, which integrates critical realism epistemology and network approach ontology. Moreover, the choice of this research design had an impact on the methods of both phases. The following section discusses the ethical considerations that were taken by the researcher.

## 3.6 Ethical considerations

Ethical considerations encompass the moral values or principles that researchers must bear in mind throughout their research activities (Easterby-Smith et al., 2021). Creswell and Clark (2017) highlight the significance of ethical considerations, particularly in studies involving human participants. Maintaining research quality rests on the shoulders of the researcher, with ethical considerations serving as a crucial component in attaining this objective (Teddlie and Tashakkori, 2009; Creswell and Creswell, 2023). Hence, prior to commencing data collection for both studies, the researcher secured ethical approval from the ethics committee at Lancaster University. Approvals were obtained by submitting ethics application forms along with participant information sheets and consent forms. The approvals were granted for both studies under application numbers FL19036 for the qualitative study and FASSLUMS-2023-4196 for the quantitative study.

In the first study, the interviewees received a copy of the participant information sheet and a consent form, which they reviewed and signed before the interview. These two documents encompass information about the study's nature and the interviewee's rights, such as the ability to withdraw within six weeks without given any reason. The confidentiality matter was given higher priority by informing participants that their data was anonymous and held secure. In the second study, the online survey, all the participants had to give their consent to participate in the survey at the beginning. The researcher provided a participant information sheet and consent form on the first page of the survey. The identities of the participants were kept anonymous, and the researcher did not ask for any information that might harm them. In both studies, the researcher provided the participants with his contact details in case of concerns or complaints. For further information, see appendices 3 and 4. The next sections justify and explain in detail the tools and techniques employed in the qualitative and quantitative phases respectively.

## 3.7 Qualitative phase

The initial stage of the current study employed a qualitative inquiry to investigate how firms respond to climate change regulations in the Saudi automobile industry. Indeed, investigating firms' behaviours and interactions when responding to external pressure from climate change regulations via qualitative inquiries was vital because the interviewees provided valuable and intriguing information that would have been challenging to acquire without these discussions. The following subsections explain and justify the qualitative study's 1) data collection method, 2) sampling strategy, 3) data collection procedure, 4) analysis technique and 5) quality and rigorous considerations.

### 3.7.1 Data Collection Method: Semi-Structured Interviews

As Table 3.4 shows, there are several methods available for collecting qualitative data to meet research objectives. These methods include focus groups, observation research, and interviews. Each qualitative data collection method is tailored to a specific type of investigation and comes with its own set of strengths and weaknesses (Taherdoost, 2021). A focus group approach is likely to limit the researcher's control over the conversation, which may result in certain research themes not being covered. Similarly, participant observation lacks the ability to gain in-depth insights and participants' perceptions. On the other hand, interviews as a data collection method are known for their ability to uncover underlying constructs informing participants' opinions and beliefs, especially in situations involving unclear logic, highly confidential or sensitive subjects, or when participants might be hesitant to tell the truth, which can be addressed confidentially in a one-to-one setting (Easterby-Smith et al., 2021). Due to the limitations of focus group and observation data collection methods, interviews stand out as the most appropriate method for collecting qualitative data to address the objectives of this research.

Table 3.4 Data Collection Methods and Their Limitations

| Data collection method | Definition | Strength | Weaknesses |
|---|---|---|---|
| Focus group | "Focus groups are in-depth group interviews employing relatively homogenous groups to provide information around topics specified by the researchers" (Hughes and DuMont, 1993, p. 776). | Encourages interaction among participants, leading to the emergence of diverse perspectives on network interactions and responses to climate change regulations. Enables identification of shared behavioural patterns. | Difficult to coordinate participants within the Saudi automobile industry.<br><br>Dominant participants may skew the discussion, reducing the diversity of perspectives. |
| Observation | This refers to the researcher taking field notes about the activities and behaviours of the research participants at the research site (Creswell, 2014). | Provides insights into real-time interactions and behaviours within the network, allowing the researcher to explore interfirm dynamics in response to regulations. Captures non-verbal behaviours. | Ethical concerns may arise if private information is observed that cannot be reported.<br><br>Limited by the scope of specific business interactions observed at a given time by the researcher. |
| Interview | directed conversations evolving around questions and answers about a certain topic, whereby rich and detailed information can be gathered from respondents on their experiences and understandings" (Easterby-Smith et al., 2021, p. 195). | Enables deep exploration of individual firms' experiences and strategies in responding to regulatory pressures. Create connections, which may lead to additional insights specific to the Saudi automobile network. | Requires extensive preparation and strong interviewing skills to ensure the focus on network dynamics and behavioural aspects. Time consuming and resource intensive. |

Source: Smithson (2000); Lochrie et al. (2015); Silverman (2021); Creswell and Creswell (2023)

Interviews in qualitative research refer to directed conversations focused on specific topics, enabling the collection of detailed and comprehensive information regarding their

experiences and understandings (Easterby-Smith et al., 2021). Based on the interview structure, there are three types of interviews which are structured, semi-structured and unstructured (Table 3.5). Structured interviews tend to ask the same questions in the same order. In contrast, the unstructured interview seems like a regular conversation between two individuals with no predefined questions. Semi-structured interviews settle in the middle between the former two extreme types of interviews (Easterby-Smith et al., 2021). In this study, the aim of the collected interviews is to provide evidence of how businesses respond to climate change regulations and the underlying mechanisms of the observed outcomes. Thus, the researcher found semi-structured interviews most appropriate for addressing our study inquiries.

Table 3. 5 Interview types

| Interview type | Definitions | Relevance to current research |
|---|---|---|
| **Unstructured interview** | An interview is conducted in a conversational style that offers flexibility in terms of the topics discussed, their order, and the way they are approached. | While this type allows for open-ended and exploratory discussions, the lack of structure makes it less suitable for ensuring consistency among participants. Since this research aims to identify patterns and themes of business responses to climate change regulations, unstructured interviews may not provide a sufficiently systematic approach to data collection. |
| **Structured interview** | An interview where the interviewer tracks a set list of questions, each of which may have fixed response categories | Structured interviews ensure standardisation and comparability of responses, making them useful for large-scale quantitative research. However, this fixed structure limits the ability to explore emergent themes and capture the complexity of business interactions and behavioural biases, which are central to this research. |
| **Semi-structured interview** | An interview that covers several predetermined topics or questions but that also allows for a degree of freedom in terms of how and | This approach provides a balance between consistency and flexibility. It allows for the exploration of pre-identified themes related to interfirm adaptation while also enabling the discovery of unexpected insights. Given that this research seeks |

| | | |
|---|---|---|
| | in what order these topics are discussed, and for the opportunity to discover new ideas and lines of questioning | to investigate business network interactions and behavioural biases, semi-structured interviews facilitate in-depth inquiry while maintaining comparability across participants. Consequently, this method is the most appropriate for this research. |

Source: Easterby-Smith et al. (2021)

Semi-structured interviews were adopted in this research, which entailed obtaining rich, multi-layered data while allowing a few prepared questions to serve as an interview skeleton, with additional questions arising throughout the interviews (Hoggart et al., 2002). Questions in the semi-structured interviews generally included 1) "When did fuel consumption become an issue in the industry?" 2) "What happened afterwards?" 3) "What do you think of investing in cars that consume less fuel?" 4) "What alternative route options were considered and disregarded? Why?" and 5) "How do you maintain your privilege with network resources?" Appendix 1 contains more information about the interviews.

### 3.7.2 Sampling

The sampling frame for the qualitative phase of this thesis consisted of key decision-makers within the Saudi automobile network, specifically dealers, retailers, and regulators. These participants were selected due to their involvement in business interactions and adaptation to climate change regulations in the Saudi automobile industry. Dealers and retailers represent firms that interact closely with manufacturers and consumers. On the other hand, regulators monitor compliance and policy implementation. Their collective perspectives offer a comprehensive understanding of interfirm adaptation within the industry. The selection of participants followed a non-probability sampling approach, which is widely used in qualitative research to gain insights rather than statistical inference (e.g., Mouzas, 2022b; Gupta et al., 2024). The study employed snowball sampling; a technique designed to reach hard-to-access

decision-makers using initial participant referrals (Easterby-Smith et al., 2021). The sampling strategy for this research is discussed in detail in Section 3.7.3.

Dealers and retailers are the primary business entities in the Saudi automobile industry, playing integral roles in distributing vehicles and complying with industry regulations. Dealers are firms authorised by manufacturers to represent them in the country under the 'Law of Commercial Agencies' (Ministry of Commerce, 2019). They act as intermediaries between automobile manufacturers and customers, facilitating sales directly or through retailers, providing after-sales services, and ensuring regulatory compliance. Retailers, on the other hand, sell vehicles directly to end customers and may operate independently or in association with authorised dealers. While retailers are not responsible for after-sales services, they still adhere to climate change regulations, such as fuel economy labelling requirements (SASO, 2019). Further details about dealers and retailers in the Saudi automobile industry are presented in Section 4.5.

The inclusion of both dealers and retailers ensures that the study captures business interactions within the network rather than focusing on a single type of firm. This approach allows for a more complete understanding of how businesses respond to climate change regulations. Notably, this study does not seek to examine the differences between dealers and retailers in its findings but rather to capture a comprehensive perspective on interfirm adaptation. This approach aligns with practices in industrial marketing research, where examining interactions among various business types provides a holistic view of business networks (Håkansson and Snehota, 1995).

While regulators were included in the qualitative phase, the quantitative phase of this study focuses solely on dealers and retailers. This is because the statistical examination aims to measure interfirm adaptation and its influencing factors, which are specific to

business actors. Even though regulators play a critical role in shaping the regulatory environment, they do not engage directly in business-to-business adaptation processes in the same way as dealers and retailers. The sampling strategy for the quantitative phase is detailed in Section 3.8.2.

### 3.7.3 Sampling Strategy: Snowballing

The sampling strategy "sets out the criteria to be adopted by a researcher when selecting a subset (or sample) from a wider population of individuals, organizations, industries" (Easterby-Smith et al., 2021: p. 114). The sampling strategy is an essential step in the research design because it influences "the usefulness of the data collected, the type of analysis possible and the extent of opportunities to draw wider inference" (Ritchie et al., 2014: p. 111). When considering sampling strategies for social research, it is essential to distinguish between probability and non-probability samples (Ritchie et al., 2014). Probability sampling means that the probability of each entity being included in the sample is known, while non-probability sampling means the probability of any entity of the study population being sampled cannot be predicted (Easterby-Smith et al., 2021). Utilising probability sampling may pose challenges in identifying or reaching out to the sample.

The non-probability sampling is widely used in qualitative studies (e.g., Mouzas, 2022b; Gupta et al., 2024). The non-probability sample is not designed to be statistically representative rather the selection is based on the characteristics of the population (Ritchie et. al., 2014). A non-probability sample is appropriate for addressing research questions that prioritise obtaining insights and understanding rather than statistical inference (Saunders et al., 2023). Therefore, the present research utilises a non-probability sample to obtain insight and understand how firms respond to climate change regulations and the underlying mechanisms of the observed outcomes.

According to Easterby-Smith et al. (2021), there are four main types of non-probability sampling designs, which are 1) Convenience sampling, 2) Quota sampling, 3) Purposive sampling and 4) Snowball sampling (Table 3.6). A convenience sample is the most straightforward way to fulfil the first requirement of having a sufficiently large sample. Quota sampling and purposive sampling are both methods used to ensure that every sector in a sampling design is represented. On the other hand, snowball sampling is a technique specifically designed to address the challenge of obtaining a suitable sample of challenging to access individuals.

Table 3. 6 Main sampling designs

| Convenience sampling | Quota sampling | Purposive sampling | Snowball sampling |
|---|---|---|---|
| Entities are included in a sample on the basis of their ease of access. | The population is divided into units and a target sample size (quota) is defined for each unit; entities that meet the criteria for a specific unit are added to the sample until the target sample size for the unit is achieved. | The criteria for inclusion in a sample are defined, and entities are first screened to see whether they meet the criteria for inclusion; those entities that meet the criteria are included in the sample. | The criteria for inclusion in a sample are defined; entities that meet the criteria are included in the sample and then asked whether they know others who also meet the criteria |
| Relevance to current research | | | |
| Convenience sampling does not meet the research objectives as it does not ensure the inclusion of key actors within the Saudi automobile industry. | While quota sampling ensures representation across predefined groups (e.g., dealers and retailers), it fails to tackle the difficulty of reaching decision-makers in the Saudi automobile industry. | Purposive sampling is relevant for ensuring that participants possess specific knowledge about interfirm adaptation to climate change regulations. However, it does not fully address the challenge of accessing decision-makers in the Saudi automobile industry. | Snowball sampling is the most appropriate for this research due to its ability to reach small and hard to access key decision-makers in the Saudi automobile network through referrals. It aligns with the exploratory nature of the study and the qualitative interview method. |

Sources: Easterby-Smith et al. (2021, p. 118- 119)

The selection of the sampling strategy for the current research is a snowball sample design. The researcher employed snowball sampling to identify a large sample of

participants through referrals (Teddlie and Tashakkori, 2009). A major advantage of snowball sampling is the ability to approach a small population that is difficult to access (Ritchie et. al., 2014; Easterby-Smith et al., 2021). In this study, decision-makers and managers in the Saudi automobile network are relatively small and challenging to access and arrange an appointment for considerable time for interviewing. In addition, snowball sampling is mostly used for explorative qualitative studies that utilise interviews (Atkinson and Flint, 2001) Despite these advantages of snowball sampling, one of the challenges of this sampling design is possible sample bias when the initial participants refer to other participants who share the same characteristics and experience (Easterby-Smith et al., 2021). To avoid this issue, the researcher selected participants with different firms' characteristics from the suggested participants by the initial participants. Also, the researcher assures that the suggested participants meet the sample criteria of managers or decision-makers of the main actors within the Saudi automobile network.

There was a total of 28 participants for this study that met the sample criteria. The sample consists of senior managers or decision-makers who represent key actors within the Saudi automotive industry network. The study's participants represented two government bodies, dealers from eight manufacturer brands in five countries and retailers from over 20 automobile brands. The sample participants represent companies from 70% of the Saudi market share (PwC, 2018). In qualitative studies, samples tend to be small in size, which allows for in-depth investigation and exploration of the research problem (Ritchie et al., 2014). Creswell and Clark (2017) suggested a number of participants based on the qualitative approach, such as 1 or 2 participants for a narrative study and 20 to 30 participants for grounded theory research. However, the researcher adopted the saturation concept to measure the correct number of interviews. Saturation defines the moment in the interview process when insight obtained from the additional interview is repeated

(Edwards and Holland, 2013; Ritchie et al., 2014). Therefore, the researcher noticed that no new insights were gained approximately after the 24th interview. The four more interviews were already arranged, so the researcher conducted the interviews to ensure no further point of view could be taken.

### 3.7.4 Data Collection Procedure

The interviews were conducted personally by the researcher in the interviewees' native language, except for one interview, which was in English. The interview length ranged from 30 mins to 120 mins and took place at the interviewee's chosen site. The researcher makes sure that interviewees choose a convenient site for them to feel comfortable and provide details in the conversation. All the interviews were taken face to face at the interviewee's site, except one interview was a phone call due to the interviewee's preferences.

As discussed previously in section 3.6.2, the current study employed snowball sampling as the sampling strategy. One of the challenges of a snowball sample is accessing and gaining the trust of the initial sample (Easterby-Smith et al., 2021). To accomplish this, the researcher, as a faculty member, contacted his institution in Saudi Arabia, King Saud University, to obtain letters detailing the research's nature and requesting support for data collection for academic research purposes. An example of the supporting letters for data collection is provided in Appendix 2. While Lancaster University, as the researcher's PhD institution, approved the research ethics as discussed earlier in (section 3.6), King Saud University served as the starting point to get the snowball sampling rolled out. King Saud University is well known across the country in academic research and the first established university in Saudi Arabia (Alomar, 2023). Obtaining letters from the leading university in the country, King Saud University, helped initiate the recruitment process

and enhance the credibility and confidence of the participants, which encouraged them to participate and give detailed and accurate information to the researcher's questions.

The initial sample was chosen based on the researcher's knowledge and research about the automotive network in Saudi Arabia (Teddlie and Tashakkori, 2009). This initial sample encompasses two governmental bodies: 1) Saudi Standards Metrology & Quality Organization, 2) Saudi Energy Efficiency Centre, and the main dealers and retailers in the industry. Afterwards, the researcher approached these organisations and requested to schedule interviews with individuals considered to be the most knowledgeable about the research topic. The timing and location of the interviews were arranged based on the participants' preferences.

Using the official letters and conducting interviews with initial participants, the researcher obtained referrals to other participants with experience and knowledge relevant to the research topic within the Saudi automobile network. One potential issue in snowball sampling arises when suggested participants from the initial sample share similar characteristics, leading to a biased sample (Ritchie et al., 2014). To avoid a biased sample, the researcher selected the participants from firms with different specifications, such as different types of dealers and retailers (exclusive and non-exclusive), firms of varying sizes and ages, and participants holding different positions in their firms (general manager and purchasing manager). Furthermore, the researcher was careful not to rely on one initial participant's suggestion but rather to combine the initial participants' suggestions. After that, the researcher contacted the proposed participants by phone to provide an overview of the research and obtained an appointment for an interview. The time and site were chosen at the participants' convenience. There was a total of 28

interviews for this study that collected between June and October 2020 as Table 3.7 provides details about the interviewees.

Table 3. 7 Details of interviewees

| Participant category | Participant code | Firm type | Mode of the interview | Duration of interview | Participant title |
|---|---|---|---|---|---|
| Dealer | Dealer 1 | Car Dealer | Face to face | 37 min | Sales Operation Manager |
| | Dealer 2 | Car Dealer | Face to face | 57 min | Retail & fleet Sales Manager |
| | Dealer 3 | Car Dealer | Face to face | 36 min | Marketing Supervisor |
| | Dealer 4 | Car Dealer | Face to face | 50 min | Sales Manager |
| | Dealer 5 | Car Dealer | Face to face | 47 min | Distributor Sales Manager |
| | Dealer 6 | Car Dealer | Face to face | 31 min | Marketing Senior employee |
| | Dealer 7 | Car Dealer | Face to face | 87 min | Regional Manager |
| | Dealer 8 | Car Dealer | Face to face | 32 min | Deputy Manager |
| | Dealer 9 | Car Dealer | Face to face | 36 min | Marketing Manager |
| | Dealer 10 | Car Dealer | Face to face | 71 min | Purchase Manager |
| | Dealer 11 | Car Dealer | Face to face | 32 min | Sales Supervisor |
| | Dealer 12 | Car Dealer | Face to face | 120 min | Manager & Founder's Son |
| | Dealer 13 | Car Dealer | Face to face | 45 min | Deputy Manager |
| | Dealer 14 | Car Dealer | Face to face | 85 min | Marketing Senior employee |
| | Dealer 15 | Car Dealer | Face to face | 39 min | Human Resource Manager |
| | Dealer 16 | Car Dealer | Face to face | 58 min | Manager and owner |
| | Dealer 17 | Car Dealer | Face to face | 32 min | Sales Manager |
| Retailer | Retailer 1 | Car retailer | Face to face | 48 min | Purchase Manager |
| | Retailer 2 | Car retailer | Face to face | 30 min | Purchase Manager |
| | Retailer 3 | Car retailer | Face to face | 41 min | Owner & Manager |
| | Retailer 4 | Car retailer | Face to face | 84 min | Purchase Manager |
| | Retailer 5 | Car retailer | Face to face | 39 min | Sales Supervisor |
| | Retailer 6 | Car retailer | Face to face | 33 min | Key accounts Manager |
| | Retailer 7 | Car retailer | Face to face | 35 min | Sales Operation Manager |
| | Retailer 8 | Car retailer | Face to face | 31 min | Sale supervisor |
| Regulator | Regulator 1 | Public office | Phone call | 89 min | Deputy Director |
| | Regulator 2 | Public office | Face to face | 59 min | Deputy Director of Efficiency |
| | Regulator 3 | Public office | Face to face | 45 min | Head of Engineers |

All participants received a consent form which they reviewed and signed before the interview. Moreover, Interviews were audio recorded and transcribed for subsequent thematic analysis. The following section moves to discuss the thematic analysis in more detail.

### 3.7.5 Thematic Analysis

The transcribed data from the interviews was analysed by applying thematic analysis. Braun and Clarke (2006: p. 79) described a thematic analysis as "a method for identifying, analysing and reporting patterns (themes) within data" and described the data set in (rich) detail. Themes emerge through iterative and reflexive examination and textual data re-examination (Braun and Clarke, 2006). The data was analysed abductively to address the research question, meaning switching between theoretical tools and empirical data (Thompson, 2022; Dubois and Gadde, 2002). Indeed, thematic analysis is commonly used in mixed methods research (e.g., Lin et al., 2023; McKim, 2017). Moreover, thematic analysis is a powerful tool that can be used for developing variables and conceptualisation for the following quantitative phase (Creswell and Clark, 2017; Proudfoot, 2023) to achieve the study's objective of hypotheses statistical testing.

Braun and Clarke (2006) suggest six steps for the process of thematic analysis, which the researcher adopted in the present study. First, the analysis started when the researcher conducted the interviews himself, which provided the researcher with a holistic understanding and the ability to take notes, as suggested by Braun and Clarke (2006). This phase included transcribing the interviews, reading them several times, and getting an initial idea. Second, the researcher coded the data manually, except using Microsoft Word to highlight relevant data in each code. Indeed, there are two main types of coding: using programmes such as NVivo or coding manually. The researcher chose to code the data manually because it gives depth to understanding the data (Fayed, 2003). Third, after coding the data, the researcher identified themes deductively based on theories in the literature while still searching inductively for emergent themes from the data during the analysis (Proudfoot, 2023). This phase necessitates the researcher to aggregate codes into potential themes and compile all related data for each potential theme. Fourth, the themes

were reviewed and refined, ensuring they reflected both the coded extract and the full data set. A thematic map of the analysis was also generated in this step. Fifth, the themes were then clearly defined and named, ensuring their distinctiveness and relevance to the research. Sixth, the final phase of the analysis involves choosing rich extracted examples to be included in the final story. The qualitative findings chapter presents the outcomes of the analysis process along with striking data quotations.

In this study, the research analysis unit is the network of relationships (Mouzas and Ford, 2011; Mouzas and Naudé, 2007; Öberg, Henneberg, and Mouzas, 2012a). The network-level analysis suggests looking at a greater level of aggregation that goes beyond the seller-buyer dyad (Johanson and Vahlne, 2011; Vargo and Lusch, 2016). The network-level analysis can capture the direct and indirect effects of actors' interactions in networks by moving beyond a single entity level analysis (Öberg et al., 2012a). Hence, analysing the network seems like a necessity to capture how firms respond to climate change regulations in the Saudi automobile industry. The matter of trustworthiness is covered in the section that follows.

### 3.7.6 Research Quality and Rigour

The quality and rigours of qualitative research address the question "How good is this research report?" (Miles et al., 2020: p. 305). Quantitative research relies on reliability and validity to establish the quality of research findings, while qualitative research concerns qualitative indicators (Anney, 2014). In this study, the researcher followed Miles et al.'s (2020) approach to qualitative research quality that is considered sufficient for the researcher's epistemological choice of critical realism (Miles et al., 2020). The approach encompasses five criteria which are *confirmability, dependability, credibility, transferability, and utilization*. These criteria are distinct yet overlapping, providing a comprehensive examination of the research quality from different angles (Miles et al.,

2020). Table 3.8 presents the quality criteria definitions, the strategies utilised under each criterion, and the researcher's actions to fulfil them.

Table 3. 8 Research quality and rigours

| Quality Criteria | Recommended Strategies | Researcher's Actions |
|---|---|---|
| Confirmability: the extent to which other researchers can verify or support the findings of an investigation. | 1. Presenting interview questions to colleagues.<br>2. Presenting analysed data to colleagues.<br>3. Audit trail.<br>4. Having multiple sources of data collection | 1. The researcher discussed and edited the interview questions with his supervisors.<br>2. The analysed data was shared and discussed with supervisors and two PhD colleagues.<br>3. The researcher provided details about the study's method and procedures.<br>4. The data were collected from different actors' positions within the Saudi automobile network. |
| Dependability: the consistency of results across time. | 1. Comprehensive data collection across appropriate settings, times, and respondents.<br>2. Peer examination.<br>3. Clear specification of paradigm and analytic tools.<br>4. Researcher's skills to perform interviews. | 1. Data were collected from the main actors in the Saudi automobile network (regulators, dealers and retailers) at their preferred time in their offices.<br>2. The research processes and results were discussed with supervisors, PhD colleagues and at an academic conference.<br>3. The researcher discussed the adaptation of network ontology, critical realism epistemology and thematic analysis.<br>4. The researcher attended in person classes and online courses (e.g., Graham Gibbs). |
| Credibility: the level of assurance in the truth value of the research results. | 1. Prolonged engagement.<br>2. Peer debriefing.<br>3. Adopting established research methods. | 1. Engaging with the study participants and building trust to understand their culture, context and interaction within business networks.<br>2. This has been accomplished by:<br>- Receiving continuous feedback from supervisors. |

| | | |
|---|---|---|
| | | - Department panel reviews and guidelines.<br>- Participating in conferences to gain scholars' feedback.<br>3. The researcher used well-known methods like thematic analysis, previously justifying these choices and maintaining coherence in methodological decisions. |
| Transferability: the results have any larger import. | 1. Providing thick description.<br>2. Using an appropriate sampling method to ensure relevant participants. | 1. The researcher provided detailed information about the participants and findings.<br>2. The researcher adopted snowball sampling, which is widely used in qualitative research to access key decision-makers who are difficult to reach. To enhance transferability, the researcher ensured diversity in firm characteristics and roles within the Saudi automobile network. |
| Utilisation: the research benefit for participants. | 1. Physical and intellectual access to the results by potential users.<br>2. The study addresses ethical concerns. | 1. The research results are partly presented and published in a conference, and a PhD thesis will be available at Lancaster University Library.<br>2. The researcher presented potential ethical concerns and the process to address them such as Lancaster University ethical approval, participant consent forms and anonymizing participants' names. |

Source: Miles et al. (2020); Anney (2014)

As the table above shows, the researcher considered strengthening the research quality and rigour through the research processes. Accordingly, errors and inconsistencies are inspected and suggestions to strengthen the research rigour and quality have been made. Considering these processes, such as other researchers' assessments of the analysis and data, the reported themes' credibility may be truly fulfilled.

## 3.8 Quantitative phase

The second study employed a quantitative study to examine firms' interaction factors and interfirm adaptation in responding to climate change regulations in the Saudi automobile industry. Indeed, quantitative research commonly centres on testing theories by investigating the relationships among identified variables. The survey data collection method is utilised in this stage to investigate the potential relationships between the study variables. Previous studies have widely adopted surveys as a data collection method in business marketing research (e.g., Joshi, 2023; Griffith et al., 2021; Kashyap et al., 2012; Hammervoll, 2012). The following subsections explain and justify the quantitative study's 1) data collection method, 2) sampling strategy and data collection procedure, 3) measurement development 4) common method variance and 5) data analysis procedure.

### 3.8.1 Data Collection Method: Survey

Quantitative research commonly centres on testing theories by investigating the relationships among identified variables. An overview of data collection methods primarily associated with quantitative studies and their relevance to the current research is presented in Table 3.9. In the current thesis, the research objectives informed the researcher's selection of the data collection method. One of the main research objectives focuses on examining the relationships between businesses' behavioural and interactional aspects and interfirm adaptation in responding to climate change regulations in the Saudi automobile industry. As will be discussed later in (chapter 6, section 6.2), the proposed hypotheses aim to explain how activity aspects (i.e., business relationships, economic exchange, and legal contracts) mediate the effects of resources (i.e., resource entitlements, resource mobilisation, resource exploitation) and actors' biases (i.e., present bias, reference points, and loss aversion) on interfirm adaptation.

The experimental data collection method might be a suitable choice if the researcher aims to test predicted relationships by systematically manipulating independent variables to evaluate how the manipulation affects the outcomes (Creswell and Creswell, 2023). Nevertheless, the present research is designed to investigate the relationships between businesses' behavioural and interactional aspects in responding to climate change regulations. On the other hand, the use of archival research is inadequate for the present inquiry because of the unavailability of the data the researcher is interested in examining.

Table 3. 9 Overview of data collection methods and justify the use of the survey.

| Data collection method | Overview | Relevance to current research |
|---|---|---|
| Survey | It is a data collection method that allows the researcher to collect primary and standardised data from a large number of participants to investigate behaviours and opinions or test for relationships between variables. A deductive approach is primarily employed in survey research, typically in exploratory and descriptive studies. A questionnaire is a common tool for the survey data collection method. | The aim of utilising the survey data collection method is to meet the research objectives by examining the relationships between independent and dependent variables. Utilising the survey data collection method will assist the researcher in testing the relationships between interaction components and interfirm adaptation in responding to climate change regulations. |
| Experiment | The experiment as a data collection method allows researchers to examine the relationships between variables. The researcher assigned participants to either an experimental or control group. The experimental group experiences | This research excluded this option as this study aims to examine the relationships between interaction components and interfirm adaptation in responding to climate change regulations. |

| | | |
|---|---|---|
| | manipulated conditions while the control group does not, which enables the researcher to compare the effects of the manipulated conditions. The rationale for using experiments in research is to study the probability of a change in the independent variable causing a change in the dependent variable. | |
| Archival data | The archival data as quantitative data collection method enables researchers to analyse and evaluate information from archival sources (e.g., firms annual reports) in order to address certain research questions. Archival data is regarded as secondary data because it was produced for a different reason. | This research excluded archival data as a collection method because the type of data is not necessarily available in archival data. For example, data about automobile dealers' behaviour, such as their tendency to appreciate immediate profit (i.e., present bias). |

Source: Easterby-Smith et al. (2021); Saunders et al. (2023); Creswell and Creswell (2023)

Despite the limitations of both experimental and archival data, the survey data collection method emerges as the most appropriate method to address the current research objectives. The survey data collection method is utilised in this research to investigate the potential relationships between variables. Previous studies have widely adopted surveys as a data collection method in business marketing research (e.g., Joshi, 2023; Griffith et al., 2021; Kashyap et al., 2012; Hammervoll, 2012). For instance, Joshi (2023) applied a survey as a data collection method to investigate the relationships between manufacturers' actions (i.e., incentives and investments) and supplier performance. Furthermore, the research explores the role of technological change as a moderator in the

relationship between manufacturer actions and supplier performance. The following section discusses the researcher's choice of sample strategy and data collection procedure.

### 3.8.2 Sampling Strategy and Data Collection Procedure

Sampling strategy "sets out the criteria to be adopted by a researcher when selecting a subset (or sample) from a wider population of individuals, organizations, industries" (Easterby-Smith et al., 2021: p. 114). The significance of the sampling strategy in the research design lies in its ability to impact "the type of analysis that can be performed, the extent of opportunities to draw wider inference, and the usefulness of the data collected" (Ritchie et al., 2014: 511). In this study, the choice of snowball sampling directly influenced the type of analysis, opportunities to draw inferences, and the usefulness of the data collected. Unlike other non-probability sampling methods, snowball sampling enabled access to a small and hard-to-reach population of managers and senior employees in the Saudi automobile network through referrals. This ensured the inclusion of participants, such as dealers and retailers, who provided rich and relevant data for examining relationships between interaction components and interfirm adaptation. While this approach limits generalisability, it enhances the usefulness of the data by targeting individuals with direct insights, aligning with the study's objectives.

Making the distinction between probability and non-probability samples is crucial when thinking about sampling techniques for social science research (Ritchie et al., 2014). According to Easterby-Smith et al. (2021), probability sampling involves knowing the likelihood of each entity being included in the sample, whereas non-probability sampling implies that it is impossible to predict the likelihood of any entity from the study population being sampled. Hence, determining or contacting the sample when using probability sampling may present difficulties.

Applying the non-probability sampling strategy may help in accomplishing the aim of this thesis. According to Easterby-Smith et al. (2021), there are four main types of non-probability sampling designs which are 1) convenience sampling, 2) quota sampling, 3) purposive sampling and 4) snowball sampling. The researcher applied snowball sampling in this research instead of the other sampling designs because of its ability to obtain a suitable sample from a small population that is difficult to reach. (Ritchie et. al., 2014; Easterby-Smith et al., 2021; Saunders et al., 2023). Moreover, the researcher used snowball sampling to find a sizable sample of participants through referrals (Teddlie and Tashakkori, 2009). In this study, managers and senior employees in the Saudi automobile network are relatively small and challenging to reach. Therefore, the present research utilises a snowball sample to examine the relationships between interaction components (i.e., resource entitlements, resource mobilisation, resource exploitation, business relationships, economic exchanges, legal contracts, present bias, reference points, and loss aversion) and interfirm adaptation through actors' positions in the business network (i.e., dealers or retailers).

The target sample for the quantitative study includes managers and senior employees of Saudi Automobiles' dealers and retailers, both exclusive and non-exclusive. The sample size was carefully considered, as enlarging it enhances its precision (Bell et al., 2022). One justification for determining the sample size is to use previous studies in the same research field as guidance, with the researcher's resource constraints serving as a secondary justification (Lakens, 2022). Castro et al. (2010) suggest a minimum of 40 participants for conducting statistical analysis in the quantitative phase of mixed-methods research. In addition, an acceptable sample size in business marketing research for a survey study can be as few as 75 participants. For instance, Hammervoll (2012) investigated how different types of interactions can be managed so that buyer firms make

important contributions to the development of their suppliers' capabilities by analysing a total of 75 collected questionnaires. Regarding resource constraints, the research made all the effort in terms of dedicating time for data collection and bearing the cost of direct international calls to participants, as will be detailed later in this section. Therefore, the sample size was aimed at between 40 and 75. The sample size exceeded for this study and was 99 participants.

The data collection tool in this phase was an online questionnaire. The data was gathered via online means because, given the deadline for submitting this thesis, this tool made it possible to gather a substantial amount of data economically. The online survey has advantages and disadvantages, just like any other data collection tool. Evans and Mathur (2005) provide a comprehensive overview of these benefits and drawbacks, as summarised in Table 3.11. The researcher utilised the online survey benefits to reach the study objectives while overcoming the drawbacks in a number of procedures. First, the researcher built a questionnaire using Qualtrics, an online survey software provided by Lancaster University. This software has sophisticated features that enable presenting questions in various formats and different languages. Second, the researcher provided a clear structure that was tested by academic supervisors and PhD colleagues prior to distributing the survey. Third, the researcher made a direct call if possible or, alternatively, sent a personalised message to participants, followed by two reminders. Finally, the researcher assured the anonymity and security of the distributed survey by using Qualtrics.

Table 3. 10 Strengths and weaknesses of online surveys

| Strength | Weaknesses | How the Researcher Addressed the Weaknesses |
|---|---|---|
| 1. Global reach.<br>2. Flexibility | 1. Perception as junk mail. | 1. The researcher made a direct call if possible or, alternatively, sent a personalised message to participants, followed by two reminders. |

| | | |
|---|---|---|
| 3. Speed and timeliness.<br>4. Convenience.<br>5. Ease of data entry and analysis<br>6. Question diversity.<br>7. Low administration cost<br>8. Large sample easy to obtain<br>9. Control of answer order<br>10. Required completion of answers<br>11. Knowledge of respondent vs. non-respondent characteristics | 2. Lack of representativeness<br>3. Respondent lack of online experience/expertise<br>4. Technological variations<br>5. Unclear answering instructions.<br>6. Impersonal<br>7. Privacy and security issues<br>8. Low response rate. | 2. The researcher first contacted participants from the interview phase, ensuring they met the sample criteria. Participants were also asked to refer others who fit the criteria.<br>3. The researcher provided a clear structure that was tested by academic supervisors and PhD colleagues prior to distributing the survey.<br>4. The survey was designed using Qualtrics, which supports different question formats and multiple languages to accommodate variations in respondents' technological expertise.<br>5. The researcher ensured that the survey had a clear structure and was tested before distribution to avoid ambiguity in answering instructions.<br>6. To build trust, the researcher first informed participants of the person who referred them before explaining the study. Additionally, a personalised message of thanks and blessings was sent to all participants.<br>7. The researcher assured anonymity and security by using Qualtrics, an online survey platform provided by Lancaster University.<br>8. Two reminders were sent—one after a week and another after two weeks—to increase the response rate. The final response rate was 38%, which is acceptable in business marketing research (Hammervoll, 2012; Griffith et al., 2021). |

Source: Evans and Mathur (2005, p.197)

The researcher started the data collection by first communicating with the interviewees in the first phase of this research, who were considered carefully as discussed in Section 3.6.3. While participants from the first phase were not included in the survey, they were used to initiate the snowballing process by recommending participants who fit the research criteria. The researcher asked the new participants to fill out a questionnaire themselves. In addition, the researcher asked them if they could provide the contact information of potential participants who met the sample criteria. When the researcher

contacted participants, he first told them the name of the person who referred them to build trust. Then, the researcher provides an overview of the study to make sure the participants are knowledgeable about the study topic. All the participants in the study sample received two reminders, a week later and two weeks later. A personalised message of thanks and blessings was sent as well. The survey was distributed in the winter of 2023 to 260 managers and senior employees at Saudi automobile dealers and retailers. The overall number of respondents was 119. Twenty respondents were removed because of their incompleteness. Thus, there were a total of 99 useful respondents (38% response rate), which is acceptable in business marketing research (Hammervoll, 2012; Griffith et al., 2021).

As discussed previously, the current study employed snowball sampling as the sampling strategy. Snowball sampling has several benefits, but it also has drawbacks, including the potential for sample bias when original participants recommend other participants with similar backgrounds (Easterby-Smith et al., 2021). In order to avoid this problem, the researcher selected participants whose firms have different characteristics, such as dealers and retailers, both exclusive and non-exclusive. Furthermore, the researcher makes sure that the referred participants fulfil the sample requirements of managers and senior employees at Saudi automobile dealers and retailers. The following section discusses the measurement development approach that the researcher adopted.

### 3.8.3 Measurement Development.

The measurements in the questionnaire were developed based on the main themes and codes derived from the semi-structured interviews with the Saudi automobile industry in the research's exploratory phase and reviewing the literature. The questionnaire encompasses both established measurements from previous studies (e.g., Hallen et al., 1991; Cannon et al., 2000; O'Cass, et al., 2014; Guo et al., 2017; Ting and Ahn, 2023)

and developed measurements based on the qualitative findings. Table 3.12 presents the study variables, including their definitions, items and the source of these variables.

The rationale for selecting measurements from previous studies is their relevance to the current study and their proven reliability. In the current study, the methods applied to assess the variables had consequences for both reliability (the consistency of measurement from one application to another) and validity (the extent to which a measurement precisely evaluates the intended variable) (Hair et al., 2023).

On the other hand, the new developed measurements were a necessity due to the unavailability of measurements in the previous studies that were consistent with the current study variables. Therefore, the researcher performed Castro et al., (2010) approach for items generation from qualitative findings in mixed methods research. This approach encompasses four steps which are:

1) Eliciting verbal response to a focus question

2) Identifying response codes

3) Creating thematic categories

4) Converting these categories into thematic variables

The relevant variable responses were collected during the semi-structured interviews in the first phase of this thesis. Specifically, the researcher carefully noted the interviewees responses to focus questions regarding firms' interactions and reactions to climate change regulations. Next, the researcher coded the data manually and utilized Microsoft Word for highlighting verbal responses. Accordingly, the researcher assigned multiple response codes that have functionally equivalent meanings to a higher order thematic category

(Castro et al., 2010). Last step is converting the thematic categories into thematic variables. Thematic categories are dimensionalised via scale coding, which involves assigning levels or degrees of intensity to the identified categories. Consequently, newly created thematic variables are reliable for conventional data analysis such as correlation and regression using Likert scales (Castro et al., 2010). Last, the generated thematic variables were shared with the academic supervisors and two Saudi PhD colleagues, and adjustments were made based on their recommendations.

All items were measured by a 7-point Likert-scale ranging from (1= strongly disagree to 7= strongly agree) except items for present bias and loss aversion were measured using the selection between two options based on provided scenarios. More details about variables developments will be provided in chapter six. In the following section, the researcher addresses Common Method Variance issues.

Table 3. 11 The measurement scales for the quantitative phase

| Variables | Items | Adopted from |
|---|---|---|
| **Interfirm adaptation:** refers to change or adjustment in products or processes by one firm to meet the needs or requirements of other firms in business relationships (Håkansson, 1982; Hallen et al., 1991; Yu and Fang, 2023). | **Customer adaptation:**<br>Since the implementation of fuel efficiency regulations in 2016 (e.g., fuel labels), our firm has made adaptations to meet our suppliers' needs and wants, particularly in the adaptation of…<br>**A. Product adaptation**<br>1. product types.<br>2. product features.<br>3. product design.<br>4. product technologies (e.g., hybrid, turbo).<br>5. product quantity.<br>6. new car models.<br>**B. Process adaptation**<br>1. administrative procedures.<br>2. delivery.<br>3. stock.<br>4. distribution processes.<br>5. planning.<br>6. financial procedures.<br>7. information exchange.<br>8. marketing.<br>**Supplier adaptation:**<br>Since the implementation of fuel efficiency regulations in 2016 (e.g., fuel labels), our suppliers have made adaptations to meet our firm's needs and wants, particularly in the adaptation of…<br>**A. Product adaptation** | Håkansson, (1982); Hallen et al., (1991); Cannon et al., (2000); Brennan et al., (2003); Walter, 2003; Walter et al., (2003); Hagberg-Andersson and Grønhaug, (2010) and the qualitative findings. |

| | | |
|---|---|---|
| | 1. product types.<br>2. product features.<br>3. product design.<br>4. product technologies (e.g., hybrid, turbo).<br>5. product quantity.<br>6. new car models.<br>**B. Process adaptation**<br>1. administrative procedures.<br>2. delivery.<br>3. stock.<br>4. production processes.<br>5. planning.<br>6. financial procedures.<br>7. information exchange.<br>8. marketing. | |
| **Resources entitlements:** a bundle of rights, duties and capabilities that firms possess, acquire, and transfer to other business actors (Mouzas, 2022b). | Our firm has the right to …<br>1. select car models from supplier/suppliers.<br>2. choose the distribution channels for supplier/suppliers.<br>3. order cars from supplier/suppliers at any time.<br>4. reduce cars prices.<br>Our firm has the duties to …<br>1. achieve an annual target for supplier/suppliers.<br>2. promote suppliers' fuel-efficient cars.<br>3. meet the end consumers' needs on behalf of the supplier/ suppliers.<br>Our firm has the capability to ….<br>1. promote new cars<br>2. generate creative marketing strategies.<br>3. conduct research and development. | Mu and Benedetto, (2011) and qualitative findings |
| **Resources mobilization:** refers to firms attempt to access and use network resources (Thornton et. al, 2019). | Our firm has access to supplier/suppliers …<br>1. sales information.<br>2. long-term goals.<br>3. pricing strategy.<br>4. new car models.<br>5. administrative procedures.<br>6. stock level.<br>7. distribution processes and strategies. | Qualitative findings |
| **Resource exploitation:** "is pursued to respond to existing market needs and introduce new products that offer incremental improvements (e.g., higher quality) and cost-efficient advantages to customers." (O'Cass, et al., 2014 p:863). | To market new cars, our firm…<br>1. refined existing pricing processes.<br>2. improved existing sales and distribution channels.<br>3. refined existing advertising processes.<br>4. refined existing promotion processes.<br>5.refined existing market research processes.<br>6. improved existing marketing processes. | O'Cass, et al., (2014) |
| **Business relationships:** the overall depth of the interfirm relationship based on the extent of trust and fairness in | 1. A strong spirit of fairness exists in our relationship with our suppliers.<br>2. We usually get a fair share of the rewards in our supplier relationship.<br>3. There is a high level of trust between us and our suppliers. | Johnson, (1999) and Lai, et al., (2008). |

| | | |
|---|---|---|
| the relationship. (Johnson,1999). | 4. The suppliers do not feel the need to monitor every aspect of their transactions with us. | |
| **Economic exchanges: "**economic exchange as the transactions between parties that are specified and quantifiable in the short term" (Guo et al., 2017: p.362). | 1. As long as our suppliers and our firm fulfil our responsibilities to each other, we will do business with each other.<br>2. As long as good-quality products are provided, we will stay in business with our suppliers.<br>3. As long as reasonable prices are offered, we will stay in business with our suppliers.<br>4. What suppliers and our firm expect from each other is clearly specified.<br>5. The most accurate way to describe our purchase situation with our suppliers is to say that we give a fair payment for a fairly good products.<br>6. The price we pay for the products is comparable to the level of products we get. | Guo et al., (2017) and Ting and Ahn, (2023). |
| **Legal contracts:** "the extent to which detailed and binding contractual agreements are used to specify the roles and obligations of the parties." (Cannon, et al, 2000 p: 182). | 1. Specific, well-detailed agreements with our suppliers.<br>2. Formal agreements that detail the obligations of both parties.<br>3. Detailed contractual agreements with our suppliers.<br>4. Clearly defined legal contracts that outline the right and responsibilities of both our firm and our suppliers. | Cannon, et al, (2000). |
| **Present bias:** the tendency to settle for a smaller reward immediately instead of waiting longer for a larger reward in the future (Thaler, 1981; Mouzas, 2022a). | 1. Imagine your firm made an order of 100 cars that you need from your supplier. You are now given two options:<br>(Option 1) Your order will be delivered within one month at a full price.<br>(Option 2) Your order will be delivered within two months with 2% discount.<br>2. Imagine your firm made an order of 100 cars that you need from your supplier. You are now given two options:<br>(Option 1) Your order will be delivered within seven months with 2% discount.<br>(Option 2) Your order will be delivered within six months for full price. | Thaler, (1981) and qualitative findings. |
| **Reference points:** the value function is defined relative to a reference point, which is in most cases the status quo (Kahneman and Tversky, 1979; Dowling et al., 2020). | Imagine your firm considers adding 10 new car models to your current fleet. To what extent the following statements are true.<br>1. We compare the profit margin of the new cars to the current profit margin of the existing cars.<br>2. We assess the fuel efficiency of the new cars versus the existing cars.<br>3. We assess how customers would value the new cars relative to the existing cars.<br>4. We use current cars as benchmarks to evaluate the overall advantages and disadvantages of the new cars.<br>5. We generally value new cars more than existing cars (reversed). | Qualitative findings. |
| **Loss aversion:** an asymmetric value function that is steeper for losses than for gains. In other words, | Imagine your firm has to decide between the two options in the following statements. Please select the option that your firm would be most likely to choose.<br>Our firm makes greater efforts to...<br>(Option 1) avoid losing market share. (Option 2) gain market share. | Qualitative findings. |

| | | |
|---|---|---|
| "changes that make things worse (losses) loom larger than improvements or gains" (Kahneman et al., 1991. P: 199). | (Option 1) avoid losing profits. (Option 2) gain profits.<br>(Option 1) avoid losing relationships. (Option 2) gain relationships.<br>(Option 1) avoid losing reputation. (Option 2) gain reputation.<br>(Option 1) avoid losing a million Riyals in profits. (Option 2) gain a million Riyals in profits. | |

### 3.8.4 Common Method Variance

The presence of common method variance (CMV), characterised as "variance that is attributable to the measurement method rather than to the constructs the measures represent," poses a potential issue in marketing research (Podsakoff et al., 2003, p. 879). Chang et al. (2010) state that when data is gathered through self-report surveys, CMV may be a concern. This concern is higher when the data is collected simultaneously from the same participants. A significant amount of CMV research has concentrated on identifying potential method bias origins and evaluating various procedural and statistical techniques for addressing such biases (Podsakoff et al., 2003). The following paragraphs primarily address the identification of potential sources of method biases and the techniques employed to mitigate them. Additionally, they present the statistical approaches utilised for managing method biases.

In order to minimise CMV, it was first necessary to ensure that each item was specific and clear (Peterson, 2000). To achieve this, the researcher assessed the clarity and precision of all questionnaire items. Accordingly, experts were consulted to judge potential issues such as complexity or ambiguity arising from double-barrelled questions, words with multiple meanings, technical jargon, or unfamiliar terms (Podsakoff et al., 2003). The expert judges included academic supervisors and two PhD colleagues. Based on these evaluations, the researcher was able to assess item clarity, and adjustments were made to the final survey based on the recommendations provided.

Secondly, methodological separation was employed to mitigate the impact of CMV (Podsakoff et al., 2003). For instance, each measurement was presented to participants on a separate page, accompanied by a brief instruction at the beginning of each measurement.

Third, reverse-coded items were utilised on some items on the questionnaire (Hinkin, 1995). The rationale for utilising this technique was to create cognitive *speed bumps* that may reduce the potential effect of response pattern biases and control the CMV effect (Podsakoff et al., 2003).

Finally, different scale formats were applied, such as "strongly disagree to strongly agree" and "avoid loss vs. gain." In terms of statistical remedy, details regarding the specific test employed will be elaborated in the following part. The following part of this chapter moves on to describe the data analysis procedure in greater detail.

### 3.8.5 Data Analysis Procedure

All the conducted data were inserted into SPSS version 29.0 software. The present research used a systematic process to address data accuracy, extract value from the raw data for additional analysis, confirm the fit of measurements, and test the hypotheses. This process was divided into three distinct steps: data preparation, preliminary analysis, and hypothesis testing.

Regarding data preparation, it is necessary to address data accuracy and derive value from raw data for subsequent analysis (Tabachnick and Fidell, 2019; Pallant, 2020). Data preparation involves considering six issues: data validation, editing and coding, error detection, outliers, normality, and common method variance (CMV) before proceeding with preliminary analyses. Table 3.13 summarises these issues, their purposes, and the statistical techniques used.

Table 3. 12 Summary of data preparation

| Issue | Purpose | Statistical technique |
|---|---|---|
| Data validation | Evaluating the precision of the survey and ensuring it is without any fraud or bias elements (Hair et al., 2006). | Descriptive statistics |
| Editing and coding | The raw data are examined for faults made by either the participants or the researcher (Hair et al., 2006). | SPSS transformation tool |
| Error detection | Recognizing incorrect data types and making necessary edits (Hair et al., 2006). | Descriptive statistics such as mean, minimum, and maximum |
| Outliers | Check for extreme score values that may alter the mean value to result in distorts statistics (Tabachnick and Fidell, 2019). | Univariate detection method (a standardised score (z-score)) |
| Normality | Graphical plots and statistical tests to evaluate if the data normally distributed (Hair et al., 2023). | Q–Q plots, Kolmogorov–Smirnov and Shapiro–Wilk tests, and the values of skewness and kurtosis |
| Common method variance | Examining if a substantial amount of common method variance is present (Podsakoff et al., 2003). | The Harman's one-factor test |

Regarding preliminary analysis, this section covers participants' demographic profile, Item purification, convergent and discriminant validity, reliability and multicollinearity. All the measurements and structural validation, as well as hypothesis testing, were conducted through partial least squares structural equation modelling (PLS-SEM) using SmartPLS software version 4.1 (Hair et al., 2019; Hair et al., 2021). The PLS-SEM is composite-based and is increasingly used in business research particularly in business marketing (Guenther et al., 2023) (e.g., Jain et al., 2024; Cao and Weerawardena, 2023). One of the advantages of PLS-SEM is its effectiveness as an analytical method, particularly useful when a small population limits the sample size, such as in business-

to-business research (Hair et al., 2019). Another advantage of PLS-SEM is that it effectively handles complex models and small samples by separately computing measurement and structural model relationships using partial regression (Fornell and Bookstein, 1982; Willaby et al., 2015; Hair et al., 2019). Table 3.14 summarises the preliminary analysis stages, their purposes and the analytical techniques employed by the researcher.

Table 3. 13 Summary of preliminary analysis' analytical techniques

| Stage | Purpose | Analytical Technique |
|---|---|---|
| Demographic profile | Assist readers in gaining a better understanding of the sample's characteristics (Pallant, 2020). | Descriptive statistics and frequencies |
| Item purification | Removing low-loading items (Hair et al., 2021). | Factor loadings |
| Convergent and discriminant validity | Convergent validity measures "the extent to which construct converges in order to explain the variance of its items" (Hair et al.,2021: p78). Discriminant validity measures "the extent to which a construct is empirically distinct from other constructs" (Hair et al.,2021: p.78). | Factor loadings, average variance extracted (AVE), composite reliability (CR), the square root of (AVE), and the heterotrait-monotrait ratio of correlations (HTMT). |
| Reliability | Assessing internal consistency by examining the association between items measuring the same construct (Hair et al., 2021). | Cronbach's alpha |
| Multicollinearity | Examining potential collinearity among constructs in the structural model (Hair et al., 2021). | Variance inflation factor (VIF) |

Lastly, hypothesis testing is the final section on the quantitative data analysis. As mentioned above, PLS-SEM analysis was conducted to examine the proposed

hypotheses. The strength and statistical significance of all direct and indirect path coefficients were tested using bootstrap procedure with 5000 subsamples as recommended by (Hair et al., 2021). This analysis provides advanced analytical modelling, including mediation analysis, which offers a deeper understanding of data relationships (Guenther et al., 2023; Hair et al., 2021). Specifically, this study assesses the mediating role of activities (relationships, exchanges, and contracts) in the positive relationships between resources (entitlements, mobilisation, and exploitation) and interfirm adaptation (customer adaptation and supplier adaptation). Furthermore, examining the mediating role of activities (relationships, exchanges, and contracts) in the negative relationships between actors' biases (loss aversion, present bias, and reference points) and interfirm adaptation (customer adaptation and supplier adaptation).

## 3.9 Conclusion

This chapter discusses the researcher's philosophical point of view, which encompasses critical realism epistemology and business network ontology. This thesis adopted an exploratory sequential mixed-method research design, starting with a qualitative phase followed by a quantitative phase to discover business responses to climate change regulations in the Saudi automotive industry. In the qualitative phase, interviews were the data collection tool with the main actors in the Saudi automotive networks, and the data were analysed using thematic analysis techniques. The quantitative study was the second phase; an online survey was utilised to collect data for statistical hypothesis testing based on the first phase's findings and established literature. Research quality and validity were assessed in line with obtaining ethical approval from Lancaster University for both studies. The following chapter will discuss the qualitative study findings in more detail.

# Chapter 4: Study context and industry

## 4.1 Introduction

This chapter provides an overview of the context and industry where the empirical research was carried out. The study examines how firms in the Saudi automobile industry respond to climate change regulations, utilising a behavioural perspective and analysing interactions within business networks. The Saudi automobile industry functions within a complex and dynamic socio-cultural, economic, and regulatory landscape, which both influences and is influenced by various organisational actors. Understanding this landscape is crucial for assessing how firms respond to external pressures arising from climate change regulations. This chapter explores the Saudi socio-cultural, economy factors, and environmental regulations, emphasising their impact on firms' responses to climate change regulations within the automobile industry. Additionally, it provides an in-depth look at key business actors and specific industry developments. This contextual outline lays the basis for the discussion and analysis of the empirical findings in the chapters that follow.

## 4.2 Socio-cultural

Socio-cultural factors create essential implications for the Saudi automobile industry, such as demographic growth and lifting the ban on women driving. Firms in Saudi Arabia must adapt to these changes to remain competitive and responsive to the evolving market dynamics. In particular, aligning their strategies with climate change regulations is crucial, as discussed below.

Demographic growth

Saudi Arabia is the second-largest country in the Arab world, and its population is 37 million (Worldometer, 2024). The median age of the Saudi population is 29.2 years

(Statista, 2024a). Although the growth rate of Saudi Arabia's population has recently decreased, it still remains a significant growth rate of population worldwide, at 1.43% as shown in Figure 4.1 (Worldometer, 2024). With regard to automobile consumption, Saudi families commonly own many cars and change their cars frequently (Assad, 2008). More importantly, the majority of vehicles on the roads are SUVs, accounting for almost half of the new vehicles sold for the last decade; see Appendix 5 (Statista, 2024b). The young population forms an increasingly significant consumer segment. Considering the economic changes in Section 4.3 (e.g., increased fuel prices, and introduced VAT taxation), the young users might be interested in suitable vehicle options – economy in petrol consumption, small and affordable. This results in dealers and retailers discovering opportunities for car types that are more adaptable to shifting consumer preferences and regulatory requirements. Examples include compact cars, hybrid cars, and electric cars that comply with climate change regulations and meet the potential growing demand from young users.

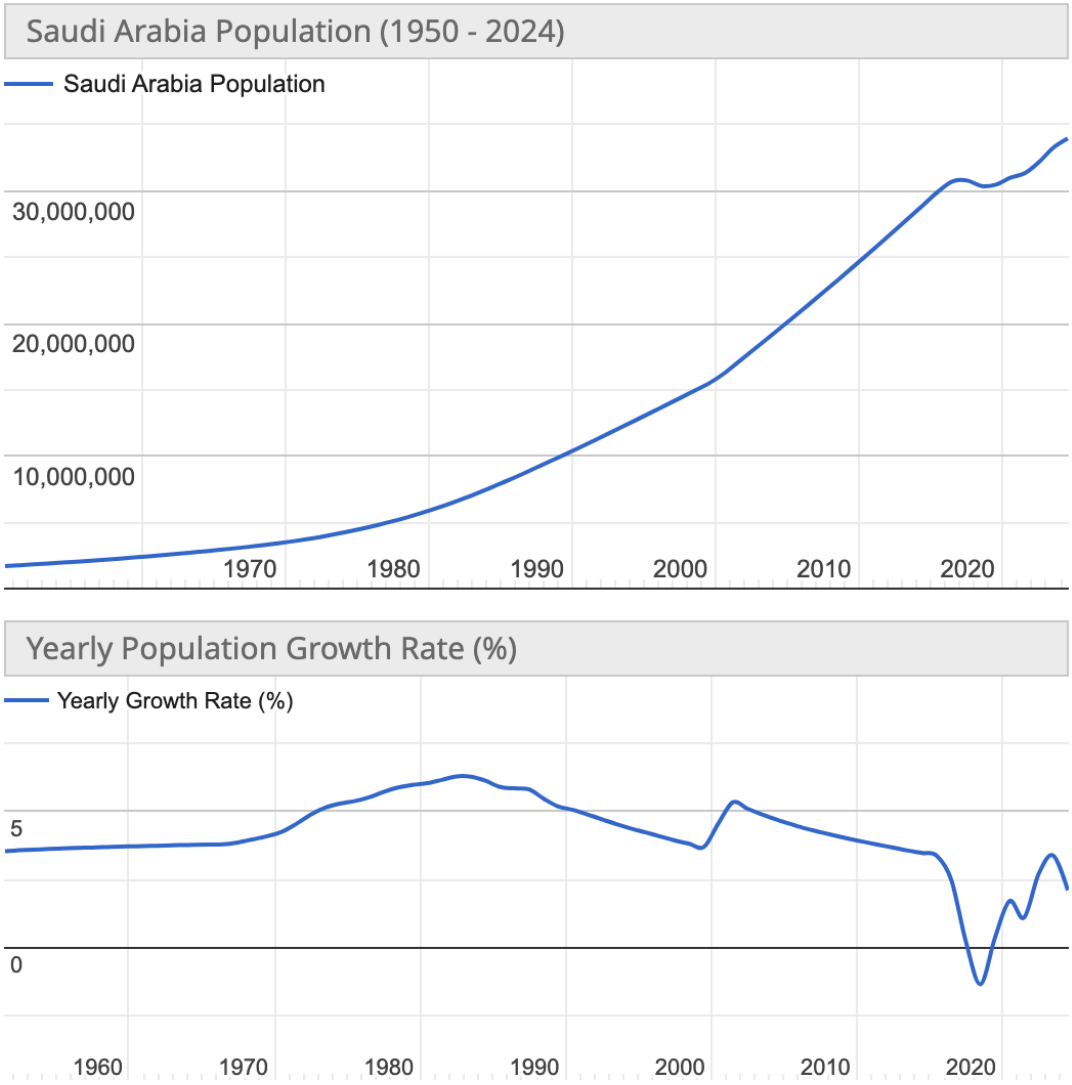


Figure 4. 1 Saudi Population and growth rate. Source: Worldometer (2024)

Women driving

Women were not allowed to drive cars in Saudi Arabia until the ban was lifted on June 24, 2018, making Saudi Arabia the last country in the world to remove the ban on female drivers (Alkhaleej, 2023). Dealers and retailers need to adapt to this significant change to capitalise on the emerging opportunities and stay competitive during the radical changes in the local automobile industry. This change has constructive impacts on both social and economic levels. The entrance of women as a new segment to the market provides a positive economic impact in the short and long term on various investment industries, mainly the automobile industry (PwC, 2018). Automobile dealers and retailers will benefit from the large number of additional users after lifting the band that results from

women driving (PwC, 2018). According to Bloomberg Economics, lifting the ban is expected to add US$90 billion to the Saudi economy's output (Fattah, 2018). Recent research and surveys have shown that women are more likely than men to prefer environmentally friendly products, such as cars (Zhao et al., 2021; EIB Climate Survey, 2022). This trend is influenced by social norms and personal values that link women with more environmentally friendly behaviours. For instance, studies indicate that women are more likely to travel sustainably and to express concern about their impact on the environment (Zhao et al., 2021; EIB Climate Survey, 2022). Women driving cars in Saudi Arabia not only indicates a significant social change but also presents an opportunity for automobile dealers and retailers. They can leverage their capabilities to provide efficient cars that align with climate change regulations and enhance their market position within these social changes.

## 4.3 Saudi economy

In this section, the researcher presents an overview of the Saudi economy and then provides details of two critical economic factors influencing the automobile industry. These factors are related to the increase in fuel prices and the introduction of VAT taxation for the first time in the country's economic history. It seems that these changes require automobile firms to adapt their strategies and operations to meet economic challenges and new regulatory requirements. This response to economic shifts highlights the dynamic nature of the Saudi market, offering unique opportunities and challenges for businesses operating within the automobile industry.

Saudi Arabia is the largest economy in the Arab world, with 301.3 billion US dollars in revenue for the year 2023 (Argaam, 2023), and one of the top twenty economies in the

world (G20)[1] (Cahyadi and Magda, 2021). Saudi Arabia relies on oil as the main driver of the country's economy. It is the largest exporter of petroleum in the world and a founder member of OPEC. Around 50% of Saudi GDP is represented by petroleum production, and it accounts for around 70% of the country's export income (OPEC, 2018). However, this is changing under the ambition Saudi 2030 vision to diversify the economy, as a main objective of the vision. The non-oil GDP growth rate has changed from 1.82% in 2016 to 4.93% in the first half of the year 2023 (Vision 2030, 2024). One of the Saudi 2030 vision targets is to increase Saudi Arabia's share of non-oil exports in non-oil GDP to 50% in 2030 (Vision 2030, 2024).

GDP Annual Growth Rate in Saudi Arabia averaged 4.03% from 1969 until 2019 (Trading Economics, 2019). In 2022, the Saudi GDP reached 1.109 trillion US dollars (General Authority for Statistics, 2023). Since oil generates the main income for the country, changes in oil prices are a vital factor in the country's GDP. The recent OPEC agreement to cut oil production by 1.2 million barrels a day from January 2019 will potentially increase oil prices. In 2016, Crown Prince Mohammed bin Salman launched the Saudi Vision 2030, which aims to diversify the country's economy and income, rather than relying solely on oil. The economic reform programme has moved from the planning phase into implementation. Consequently, the highest government spending ever in the history of Saudi Arabia was announced in 2019 to support businesses growth and job creation. The government spending increased by more than 7% compared to 2018. In fact, the Saudi GDP increased by 2.3% after the Saudi economy fell into recession in 2017. This increase in GDP growth is expected to continue, with 2.6% in 2019. The Saudi

[1] The "G20 is an international forum that brings together the world's major economies. Its members account for more than 80% of the world's GDP, 75% of the global trade, and 60% of the world's population" (Cahyadi and Magda, 2021, p. 2).

Finance Minister asserted that the country is still attracting investment and that growth opportunity for investors are high and investors will find many of them (Alomran, 2018).

In regard to the automobile industry, Saudi Arabia is the leading importer and supplier of automobiles and automobile parts in the Middle East (Export.gov, 2016). The country is also ranked among the top twenty automobile markets globally in terms of car sales per year (Ahmed, 2024). Moreover, the country aims to develop its automobile industry by manufacturing cars and interesting automobile brands to build their manufacturers in Saudi Arabia (USSABC, 2016). For instance, Ceer, a Saudi automotive brand, is set to launch electric vehicles in Saudi Arabia, aligning with the Saudi's Public Investment Fund (PIF) strategy aimed at unlocking the automotive industry's capabilities. Ceer cars are scheduled to be available in 2025. The company is expected to attract over $150 million in foreign direct investment and create 30,000 jobs, contributing USD 8 billion to the Saudi's GDP by 2034 (Ceer, 2022; Ceer, 2024). Another example is the Saudi's Public Investment Fund (PIF) has accumulated investment reached an ownership of 60% in the US electric car company Lucid (Campbell, 2024). Consequently, business negotiations between Lucid Group and Saudi's Public Investment Fund (PIF) led to the Lucid Group opening its first-ever electric car manufacturing facility in Saudi Arabia in September 2023. This manufacturer produces Lucid Air electric vehicles and exports them to other markets, making it the second manufacturer and the first international manufacturer for the company outside the USA (Lucid, 2023). This manufacturer is expected to produce other lines of electric cars other than luxury cars, which are more affordable electric cars, such as the Tesla Model 3. Indeed, the predicted production of the new line is expected to start producing these cars in 2026. Part of Saudi Arabia's plan to diversify away from oil and increase investments in clean energy and technology was the government's commitment to Lucid (Campbell, 2024). Hence, the economy is

reforming, and the government's substantial efforts to diversify from oil create a total need for firms to adapt to these changes. This also makes Saudi Arabia an attractive market for industrial businesses, particularly in the automotive industry. This is evidenced by significant investments such as the launch of Ceer, Saudi Arabia's first electric vehicle brand, and Lucid Group's establishment of its first international manufacturing facility in Saudi Arabia (Ceer, 2022; Ceer, 2024; Lucid, 2023).

Fuel prices

The rises in fuel prices are part of the energy price reform in the government's fiscal balance programme. Stimulating rational consumption is one of the goals of the energy price reform (Kingdom of Saudi Arabia, 2018). The fuel prices for retail in Saudi Arabia are fixed in all outlets by the government, and any changes in pricing are announced by Aramco (Aramco, 2024). Below are details of the gasoline price increase as the major fuel for passenger cars and light trucks, followed by diesel fuel.

The recent gasoline price increase in Saudi Arabia might influence firms' responses to climate change regulations in the Saudi automobile industry. Despite the current low price of gasoline in Saudi Arabia compared to the global average price, the price in Saudi Arabia has increased more than four times what it was in 2015. From 2007 until 2015, the gasoline price in Saudi Arabia has been subsidised intensively, and the prices were fixed at 0.45 SR (0.12 US$) per litre for standard gasoline (Alotaibi et al., 2022). After this period of time, fuel prices witnessed a gradual rise due to energy price reforms, as shown in Figure 4.2. The Saudi government has announced continuous increases in gasoline prices until they reach the global average price (Kingdom of Saudi Arabia, 2018). However, in response to rising crude oil prices, the government set a price cap in July 2021 at 2.18 SR (0.58 US$) per litre for standard gasoline (Aldubyan and Gasim, 2021). In fact, the domestic market has witnessed a dampening of demand for gasoline

and diesel after prices increased (Krane and Majid, 2018; Aldubyan and Gasim, 2021). This is because fuel prices are a vital element in consumers' usage patterns and preferences for cars (Burke and Nishitateno, 2013). Consequently, the increase in gasoline prices may prompt dealers and retailers to explore opportunities in new technologies, such as hybrids, for consumers who demand fuel-efficient cars.

The majority of passenger cars and light trucks in Saudi Arabia are gasoline vehicles because of the limited infrastructure for diesel fuel, which is mainly used by heavy-duty trucks. For instance, most petrol stations inside cities do not provide diesel; see Appendix 6 (Almuraba, 2019). In addition, petrol stations that offer diesel would have fewer diesel pumps, and the pumps would be separated from the service area for easy access for heavy-duty trucks. The diesel price has increased gradually, reaching 1.15 SR (0.30 US$) in 2024 (Aramco, 2024). This increase is still relatively lower than the petrol price, hardly reaching 50% of the premium petrol price of 2.33 SR (062 US$) in 2024 (Aramco, 2024). Despite the mentioned barriers to the use of diesel for passenger cars and light trucks, the price difference in fuel creates an opportunity for dealers and retailers to fulfil a new segment of end consumers. The recent increase in demand for diesel vehicles is partly due to higher gasoline prices and the efficiency of diesel engines. Faisal Abu Shoush, Chairman of the National Committee for Car Dealers in the Council of Saudi Chambers, calls for improved infrastructure and coordination between Aramco and petrol stations to expand the use of diesel cars (Almuraba, 2019). Hence, automobile firms must consider the implications of infrastructure and fuel price variations in their strategies to comply with climate change regulations as they navigate the changing automobile environment of Saudi Arabia. Beside the fuel prices increase, there were an introduction of value-added tax (VAT) which will be detailed below.

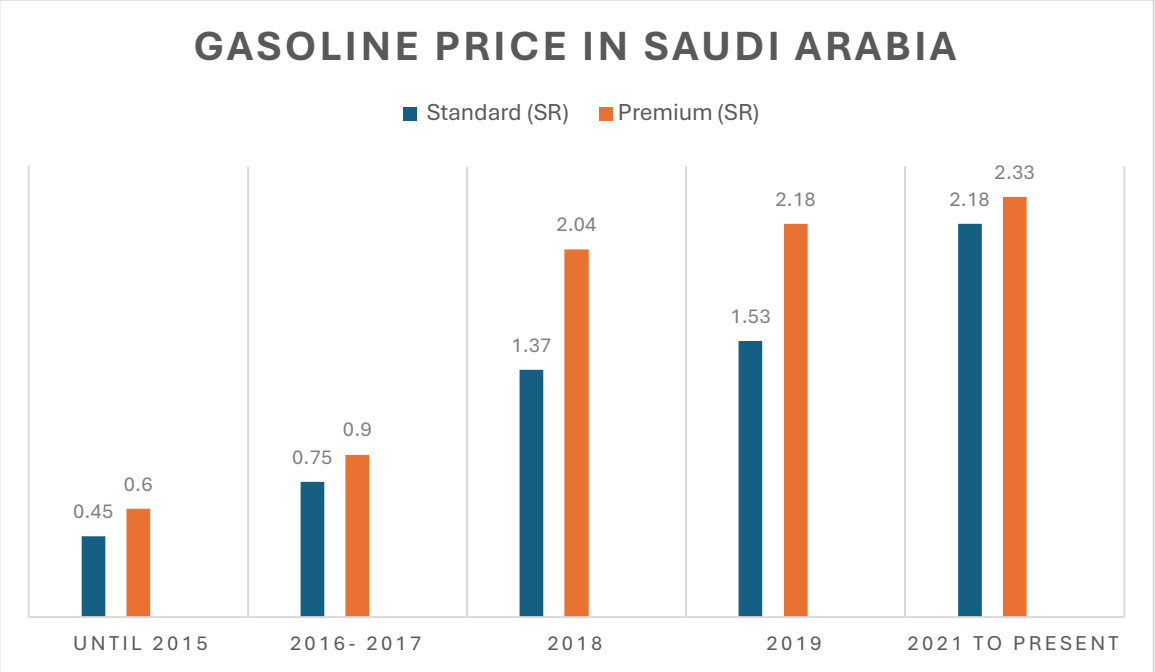


Figure 4. 2 Gasoline price in Saudi Arabia. Source: The fuel price (2020); Alotaibi et al., (2022)

VAT taxation

Before 2018, Saudi Arabia did not have a value-added tax (VAT) system in place, which significantly changed the economic landscape for businesses and consumers. In January 2018, Saudi Arabia introduced a value-added tax (VAT) of 5%, which was later increased to 15% in July 2020. The introduction of VAT has reduced new car sales in the Saudi automotive market (Fitch Solutions, 2019). The VAT was applied to the majority of products and services, but there was a zero-tax rating for certain categories, such as medicine and medical equipment (General Authority of Zakat and Tax, 2019). Gulf countries, including Saudi Arabia, were attractive for a long time for foreign workers as they represented tax-free living (BBC, 2018). VAT is part of the implementation of the GCC (Gulf Cooperation Council) agreement, and it is planned to be one of the main sources of non-oil revenue for the Saudi government (Kingdom of Saudi Arabia, 2018). The revenue from VAT in Saudi Arabia was SAR223 billion in 2022 (Statista, 2023a). Although VAT has generated notable revenue for the government with the prediction of increases, it has reduced the number of purchases of new cars. Fitch Solutions reported

that new vehicle sales were down by some 23.4% y-o-y in 2018, at 411,223 units (Fitch Solutions, 2019). Hence, the implementation of VAT taxation may generate challenges for dealers and retailers, requiring them to modify their pricing strategies to align with the new economic conditions while complying with the emerging climate change regulations.

## 4.4 Environmental regulations

Environmental regulations play a vital role in shaping firms' responses to climate change. The Presidency of Meteorology and Environment (2017) reports that car emissions are one of the main reasons for air pollution in Saudi Arabia because of the weakness of environmental regulations for automobiles and the high number of vehicles. However, the Saudi government aims to reduce its yearly emissions by up to 130 million metric tonnes in 2030 through various policy implementations on industries causing emissions in the country. The targeted cut on emissions was submitted as Saudi Arabia's NDC (National Determined Contributions) at the United Nations Climate Change Summit in Paris in 2015. Indeed, since the implementation of various environmental regulations in 2016, improvement was observed as the yearly average emission from cars has decreased by nearly 31% as shown in figure 4.3. In the following sub-section, the researcher discusses the main environmental regulations in the Saudi automobile industry, which are fuel economy labelling, Saudi Corporate Average Fuel Economy (CAFE), and annual fuel economy fees.

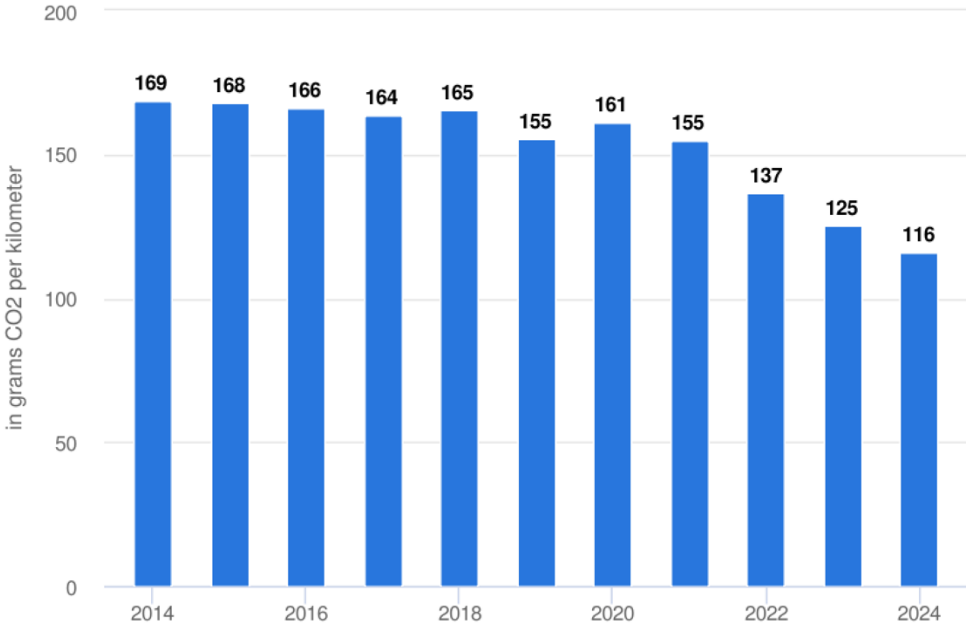


Figure 4. 3 Average CO2 emission. Source: Statista (2024b)

### 4.4.1 Fuel economy labelling

Fuel economy labelling standards require dealers and retailers in the Saudi automobile industry to adapt and respond to these regulations. Fuel economy labelling has been widely spread in many automobile markets across the globe for a long time (Wu et al., 2024). For instance, it has been used since 1978 in the UK and USA automotive markets (Yang, 2018). In China, Phase I and Phase II standards were announced to take effect in 2005 and 2008, respectively, following the implementation of its first fuel consumption laws for passenger cars in 2004 (Wu et al., 2024). The fuel economy labelling is a vital method for raising consumers' awareness of car consumption, and it makes it easier to compare the efficiency of different car models (Yang, 2018; Wu et al., 2024; EPA, 2024). On the other hand, fuel economy labelling impacts manufacturers' technology investment strategies (Yang, 2018; Wu et al., 2024; EPA, 2024).

In late 2015, vehicle fuel economy labelling became mandatory in the Saudi automobile industry. This regulation is concerned with the fuel economy labelling requirements of all new cars implemented by the Saudi Arabian Standards Organisation (SASO). SASO

is “responsible for issuing and updating the standards and regulations and managing inspection and testing activities in the Kingdom of Saudi Arabia” (SASO, 2019: p. 4). In addition, the Ministry of Commerce is “responsible for market surveillance and laboratories registry in the Kingdom of Saudi Arabia” (SASO, 2019: p. 4). Dealers and retailers are responsible for displaying the fuel economy labels on all new cars for sale. These labels need to be placed on the rear left window with all the correct information. An example of the Saudi fuel label economy from the official fuel labelling requirements of Reg No. SASO /FDS / UPDATE OF 2847/2015 is presented in Figure 4.4. Dealers and retailers' failure to meet the fuel labelling requirements leads to fines and penalties.

The fines for non-compliance with fuel labels by dealers and retailers are of two types. First, up to SR5000 for a non-commercial violation that is not aimed at deceiving consumers. Second, up to SR100000 and closing the showroom for intentional violations aimed at misleading consumers (Muhammad and Muhammad, 2015). The Ministry of Commerce observed several violations during their inspection tours of dealers and retailers regarding fuel economy labels. These violations resulted in the imposition of various fines according to the severity of the observed violation. In total, there were 1,500 violations among the 800 automobile dealers and retailers inspected in the Saudi market (Ministry of Commerce, 2016). Hence, Saudi automobile dealers and retailers need to comply with fuel labels swiftly to raise consumers’ awareness and avoid fines and penalties. The types of vehicles and the fuel consumption levels under the Saudi fuel label standards are detailed below.

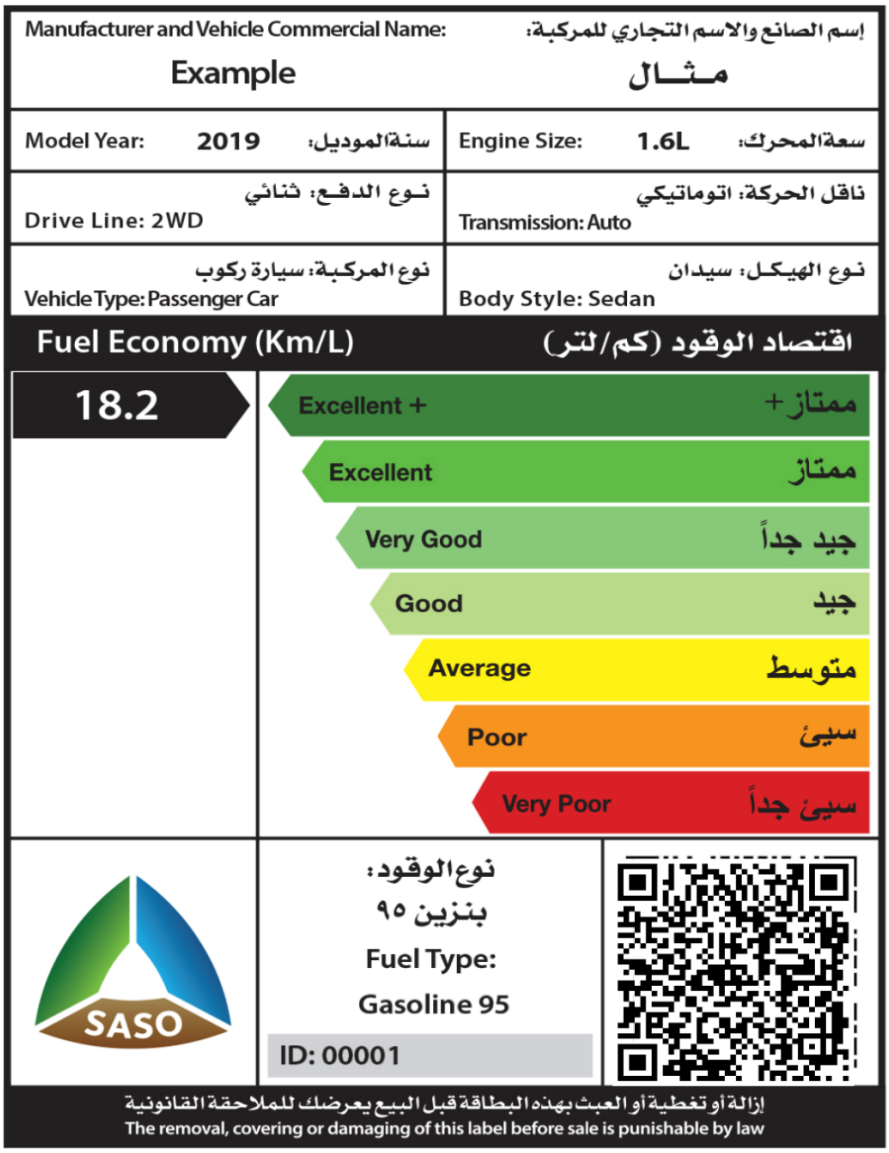



Figure 4.4: Example of fuel economy labelling. Source: The FUEL ECONOMY LABELING Reg. No. SASO /FDS / UPDATE OF 2847/2015

According to the fuel labelling requirements of Reg. No. SASO /FDS / UPDATE OF 2847/2015, the fuel economy labelling in the Saudi automobile industry covers all light-duty vehicles. In the published standard mentioned above, light-duty vehicles refer to vehicles with a maximum gross weight of 3,500 kg that are primarily used to transport passengers or goods. These light-duty vehicles are categorised into two types, namely passenger cars and light trucks. Passenger cars refer to any light-duty vehicle manufactured primarily for use in the transportation of not more than 10 individuals. Light trucks refer to light-duty vehicles not classified as passenger cars, including those

designed to transport more than 10 people or perform specific functions like cargo carrying.

The fuel labels standard categories light-duty vehicles into seven levels based on their fuel consumption. The seven levels are different in terms of fuel consumption for the two types of light-duty vehicles: passenger cars and light trucks, as presented in Table 4.1. The information in Table 4.1 presents the last update of fuel economy labelling levels, which are valid for cars manufactured in 2019 and beyond until any further update by the Saudi Arabian Standards Organisation (SASO).

Table 4. 1 Passenger cars and light trucks levels of fuel economy labels

| | Levels | Passenger Cars (km/l) | Light Trucks (km/l) |
|---|---|---|---|
| 1 | Excellent + | ≥ 17.8 | ≥ 14.3 |
| 2 | Excellent | 14.7 – 17.79 | 12.1 – 14.29 |
| 3 | Very Good | 14.2 – 14.69 | 11.6 – 12.09 |
| 4 | Good | 13.6 – 14.19 | 11.1 – 11.59 |
| 5 | Average | 13.0 – 13.59 | 10.5 – 11.09 |
| 6 | Poor | 12.5 – 12.99 | 10.0 – 10.49 |
| 7 | Very Poor | < 12.5 | < 10.0 |

Source: Saudi Arabian Standards Organization (SASO, 2019)

To sum up, dealers and retailers in the Saudi automobile industry are required to adapt to the introduction of fuel economy labels on all new cars. Implementing fuel economy labels in Saudi Arabia aims to increase consumer awareness and facilitate informed vehicle choices. By classifying vehicles into seven levels based on their fuel efficiency,

these labels encourage manufacturers to invest in fuel-efficient technologies. The Saudi Arabian Standard Organisation (SASO) and the Ministry of Commerce support the fuel label standard, aligning it with Saudi Arabia's Vision 2030 to promote energy efficiency and environmental sustainability in the Saudi automobile industry. One of the advantages of fuel labels is that they enable the implementation of other sustainability standards in the automotive industry (Yang, 2018). Below, the researcher discusses another sustainability standard that was implemented simultaneously in the Saudi automobile industry.

### 4.4.2 Saudi Corporate Average Fuel Economy (CAFE)

Despite the negative impact of car emissions in the previous decade on air quality in Saudi Arabia (Presidency of Meteorology and Environment, 2017), the Saudi Corporate Average Fuel Economy (CAFE) Standard will contribute significantly to mitigating fuel consumption. The CAFE standard requires automobile manufacturers to enhance fuel efficiency across their fleets, which forces them to invest in new technologies and redesign vehicles to meet the strict standards. As a result, dealers and retailers must adapt their fleet and marketing strategies to align with these regulations and remain competitive in the industry. In fact, the fuel targets of the CAFE standard applied in Saudi Arabia for the first phase from 2016 to 2020 are similar to the USA standard for the period from 2012 to 2016 (ICCT, 2014). Zirogiannis et al. (2019) indicate that the CAFE standard has a negative effect on sales of new cars because of consumers' valuation of fuel savings and uncertainty about fuel price variation over time.

According to the Saudi Arabian Standards Organisation (SASO, 2014), the document SASO/FDS/29242:2014 is part of Saudi Arabia’s integrated approach to enhancing energy efficiency in the transportation industry. Its objective is to set the fuel economy performance requirements for both passenger cars and light trucks. The goal of the CAFE

standard is to encourage automobile manufacturers to introduce the latest energy-efficient technologies to the domestic market and decrease the supply of vehicles equipped with inferior technologies. The standards are effective from January 1, 2016 until the end of 2020 in 12-month cycles for the first phase. For the period from 2021 to 2025, a review of the fuel economy targets was shared with all stakeholders, including automotive manufacturers and importers, by the end of 2018. Based on that, an update for phase two from 2021 to 2023 was published under the document SASO/FDS/2864 (PHASE II), followed by the third phase from 2024 to 2028 under the document SASO/FDS/2864 (PHASE III).

According to document SASO/FDS/29242:2014, the CAFE standard gives manufacturers flexibility as they are allowed to average fuel economy for all of the imported fleet instead of being required to meet the average for every vehicle separately. This means that the overall average of a manufacturer's fleet on a 12-month cycle has to meet that cycle average. In the event that a manufacturer's overall fuel average does not meet the cycle average, there are penalties (e.g., achieve the target on each model rather than on a fleet average). In contrast, if a manufacturer's overall fuel average is superior to the cycle average, the manufacturer is gaining credit for the difference between the averages in the following cycle. The latest fuel economy performance report for manufacturer brands that published by SASO is in Appendix 7. The report shows that some brands have achieved a surplus in fuel credits, while others have experienced deficits. This difference may be attributed to the effectiveness of promoting fuel-efficient cars through strong interactions with dealers.

Moreover, manufacturers can accumulate fuel credits and carry-back deficits that would be generated from other enforcement cycles. The overall reduction in light-duty vehicles

aims to improve the average fuel economy by 4% annually. This means improving Saudi Arabia's fuel economy from 12 km/l in 2016 to 19 km/l by 2025 (IEA, 2019). For the implementation period from 2016 to 2020, the targeted total improvement of fuel economy is 20%, with an average fuel consumption goal of 17 km/l (Yang et al., 2018; ICCT, 2014).

An attribute-based target curve is defined as a curve linking the fuel economy target of the vehicle to one of its attributes (e.g., weight, engine displacement, or footprint). CAFE adopts the footprint of the vehicle as the attribute of average standards, even though the weight of the vehicle is a common method globally. The rationale behind the chosen method is that "footprint was deemed the most effective attribute due to weight and engine downsizing incentives. Reducing weight and engine displacement are two effective means to improve the vehicle fuel economy" (SASO /FDS/29242:2014 No.4.2).

This passage indicates the awareness of the Saudi government of the need to motivate manufacturers to import vehicles with the latest efficient technologies. Manufacturers are not willing to reduce a car's weight or engine size if the standard measurement uses these attributes because it would increase the fuel economy targets (Wu et al., 2024). In contrast, applying an attribute-based target for the footprint of the vehicle adds advantages for manufacturers, allowing them to offer spacious vehicles that benefit from their light weight and smaller engine technologies.

A crucial point in the new regulation emphasises the responsible entities. It states that "Automotive manufacturers shall be held responsible for meeting the standard requirements for all new incoming vehicles.". Thus, manufacturers' contracts with dealers would be affected in the situation where a manufacturer has more than one dealer in the Saudi market representing their brand.

The CAFE standard places responsibility on the manufacturers to meet the required fuel consumption average. Indeed, there is a potential for developing the CAFE standard beyond fuel efficiency to include advantages for manufacturers who provide vehicles with CO2 reduction technology in the Saudi automobile market. The CAFE standard Reg. No. SASO /FDS/ 29242:2014 under the title Off-cycle Technology Credits, clarifies all the details regarding how a manufacturer can benefit from vehicles' CO2 technology that are not required at the time of implementation:

"Starting on the third enforcement cycle of the standard (Jan 1, 2018 – Dec 31, 2018) onwards, automotive manufacturers, eligible to receive the additional flexibilities, will be allowed to generate credits, for the use, in their fleet of passenger cars or light trucks, of technologies designed to reduce real-world fuel consumption which cannot be completely measured using the testing approach specified in Section 4.5.2.1 of this standard. These credits are referred to as "off-cycle technology credits"".

Moreover,

"Automotive manufacturers may generate off-cycle technology CO2 credits (grams CO2/mile) for certain technologies in agreement with U.S Code of Federal Regulations Title 40 CFR 86.1869 – 12 (b)(1)".

This passage of the CAFE regulation indicates the government's measure of CO2 directly, which might be advanced in the future. Examples of technology features included in this passage are solar panels, high-efficiency lighting, and start-stop engine systems. Therefore, the rapid development of environmental regulations might threaten actors' norms in the Saudi automobile market. Consumers' awareness of green products remains low because the concept is relatively new for the masses in Saudi Arabia. Time and efforts will need to be invested in order to educate and make people aware of

environmental threats (Alam et al., 2012). Hence, the added value of environmentally friendly vehicles would be appreciated by consumers. On the other hand, Hashmi et al. (2015) point out that the weakness of sustainability and carbon management in Saudi businesses is due to a lack of education about environmental challenges and the lack of commitment to environmental problems by high management.

In conclusion, the Saudi Corporate Average Fuel Economy (CAFE) Standard significantly impacts the automobile industry by requiring manufacturers to enhance fuel efficiency, thereby influencing their technology investments and vehicle designs. Dealers and retailers must adapt their fleets and marketing strategies to align with these regulations, ensuring compliance and maintaining competitiveness. As manufacturers are held accountable for meeting these standards, their interactions with dealers and retailers are crucial to access the necessary resources in responding to the evolving environmental regulations. For instance, these interactions enable manufacturers to coordinate the distribution of fuel-efficient vehicles and ensure alignment with marketing strategies that promote compliance. Additionally, manufacturers' contracts with multiple dealers, as discussed earlier in this section, highlight the importance of collaboration in meeting fuel economy targets and leveraging advantages like off-cycle technology credits.

### 4.4.3 Annual fuel economy fees

Despite the expected impact of the CAFE standard on reducing fuel consumption and mitigating CO2, vehicle taxation measures for consumers need to be applied to support Saudi Arabia’s contribution to global climate change and sustainability improvement targets. The majority of G20 countries, of which Saudi Arabia is part, as mentioned in Section 4.3, are applying at least one vehicle taxation factor related directly to vehicles’ CO2 emission performance (e.g., based on CO2, fuel economy). These factors can be

categorised into two groups: one-time fee measures, which usually take place at purchase time (purchase tax), and annual fee measures all through the lifetime of the vehicle (ownership tax). The adoption of CO2 measurement for vehicle taxation is crucial for influencing consumers' purchase behaviour, and it would mean that countries are more likely to witness policy-led improvements in vehicle fleet efficiency (Yang et al., 2018). Recently, Saudi Arabia announced the implementation of the second type of fee (ownership tax), which is detailed below.

Recently, Saudi Arabia started a regulation to charge an annual fee to the vehicle owner through the lifetime of the vehicle. These fees are added to the issuance and renewal of the Vehicle Registration License based on the vehicle's fuel economy level. The implementation of the regulations is divided into two phases. The first phase started on October 20, 2023, and the fees are charged to only the owners of new vehicles in the model year 2024. The second phase will start in 2024 on all vehicles (Saudi Gazette, 2023; Markabati, 2024).

According to Markabati (2024), the official national platform for annual fees for fuel economy, the calculation of the annual fees falls into two groups. First, vehicle model years of 2016 and later are calculated based on their fuel economy. Second, vehicle model years of 2015 and earlier are calculated based on the engine size. This is because there were not official Saudi fuel labels for vehicles model 2015 and earlier, as mentioned in Fuel Label Economy (Section 4.4.1). The annual fees are categorised into five levels, ranging from zero fees for efficient vehicles to SR190 for inefficient vehicles. The main aim of the Saudi annual vehicle fees is to continue improving the environmental impact of vehicles by reducing emissions through enhanced fuel efficiency standards (Markabati,

2024). The following section discusses the main business actors and the industrial context.

## 4.5 Business actors and industry context

The major brands in the Saudi automobile market are Toyota, Hyundai, Chevrolet, Nissan, Mazda and Ford. These brands account for 73% of the market share, as shown in Figure 4.5. Toyota and Hyundai are the dominant brands, with almost half of the market share. In 2023, the total number of cars sold was 476,200 (Statista, 2024b).

Toyota brand as the market leader by market share with significant differences from the second brand. Toyota is represented in the Saudi automobile industry by its largest regional partner, Abdul Latif Jameel. Abdul Latif Jameel has a deep, well-established relationship with Toyota that extends for over 60 years. As evidence for the strong relationships is the launch of Toyota's Crown brand, which has historically only been sold in Japan (Fitch Solutions, 2024). This deep relationship may facilitate the interaction in responding to external pressure such as climate change regulations.

Hyundai, as the second brand by market share, shifted to manufacturing automobiles in Saudi Arabia through a USD 500 million joint venture with the Saudi Public Investment Fund (PIF). The production is expected to start by 2026 with the goal of producing 50,000 automobiles a year, including internal combustion engines, hybrids, and electric vehicles (Fitch Solutions, 2024). By committing to local production of hybrids and electric vehicles, Hyundai is enhancing capacity to respond effectively to climate change regulations while deepening business integration within the Saudi automobile industry.

However, the recent continued growth of Chinese brands market share gaining popularity among consumers in the Saudi market is creating competition with leading brands in the

market. Indeed, Saudi Arabia is the largest importer of Chinese cars in the Gulf region and one of the top ten importers of Chinese cars globally. This is witnessed in the sales increase from 9% of total Chinese brands sales in 2020 to 13% in 2021, a 70% year-to-year growth rate (Fitch Solutions, 2024). This market share of Chinese brands increased from less than 1% in 2017 (Smith, 2024).

Changan and MG are the most popular Chinese brands in the Saudi market. Chinese automobiles are popular because they are affordable; in Saudi Arabia, Chinese brands local retail prices are 20% to 40% less than their South Korean and Japanese competitors (Fitch Solutions, 2024). In addition, Saudi customers, whose demographics tend to be younger than those in Europe or North America, are drawn to Chinese auto designs. The advanced features that come standard on the cars are another draw (Smith, 2024).

Hence, the aggressive pricing strategies of Chinese brands seem challenging for established brands in the local market like Toyota and Hyundai to compete in the affordable, efficient car segment. This is evident as Chinese brands increased their market share from less than 1% in 2017 to 13% in 2021, happening simultaneously with a drop in Toyota's market share from 35% in 2018 to 30.8% in 2024 (PwC, 2018; Fitch Solutions, 2024; Smith, 2024). The overlap in these timelines may suggest that consumers are shifting towards Chinese brands due to their affordability and appealing features (Smith, 2024). In addition, the pricing competition may not only affect the market share of established brands but also influence their business interactions in responding to climate change regulations.

Moreover, the influence of Chinese brands is reshaping the interactions between established automobile brands and dealers in Saudi Arabia. Several dealers who previously represented only established brands are now entering contracts to represent

Chinese brands as well. For instance, Almajdouie Motors, traditionally a dealer for Hyundai since 1985, has expanded its portfolio to include Changan, the Chinese brand as the exclusive dealer in Saudi Arabia in 2016 (Almajdouie, 2024). This strategic contracting between the Chines brand and Almajdouie dealer enable the rapid expansion of Changan in 27 cities across the Kingdom at 40 locations, including 25 after-sale services (Almajdouie, 2024).

The dealers' diversification of the represent brands indicates their re-combination of their resources to respond to the growing demand for Chinese brands. Consequently, established brands like Isuzu may face challenges in maintaining exclusive relationships with dealers and their resources, potentially diluting their market presence and brand loyalty. This dynamic not only intensifies competition but may also require established brands to reconsider their distribution strategies and interactions with dealers. In the context of climate change regulations, brands like Isuzu may need to adapt more rapidly to innovative trends such as the development of affordable electric vehicles (e.g., GMC's dealer announcement of coming soon electric cars; see Appendix 8) and strengthen their interaction with dealers to retain their market position.

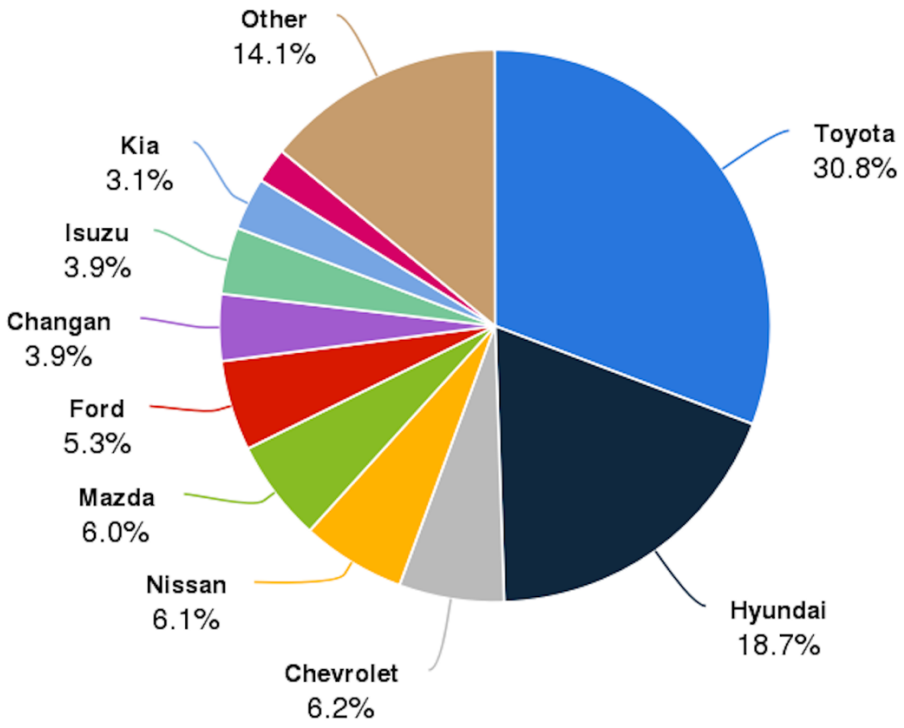


Figure 4. 4 Market share by brand. Source: Statista (2024b)

Business actors in the automobile industry must adapt swiftly to any changes impacting the industry to remain competitive and compliant. The automobile industry in Saudi Arabia is complex because of the different distribution outlets and the various entities involved in regulating the industry. Business actors included in this research are automobile dealers and retailers in the Saudi automobile industry. Figure 4.6. presents a simplified dealer-retailer relationship within the larger network, including the main regulatory bodies that implement environmental regulations introduced earlier in Section 4.4. To clarify, wholesale-retailer network is a metaphor that best describes dealer-retailer relationships. The following describes dealer-retailer types, resources and responsibilities within business networks.

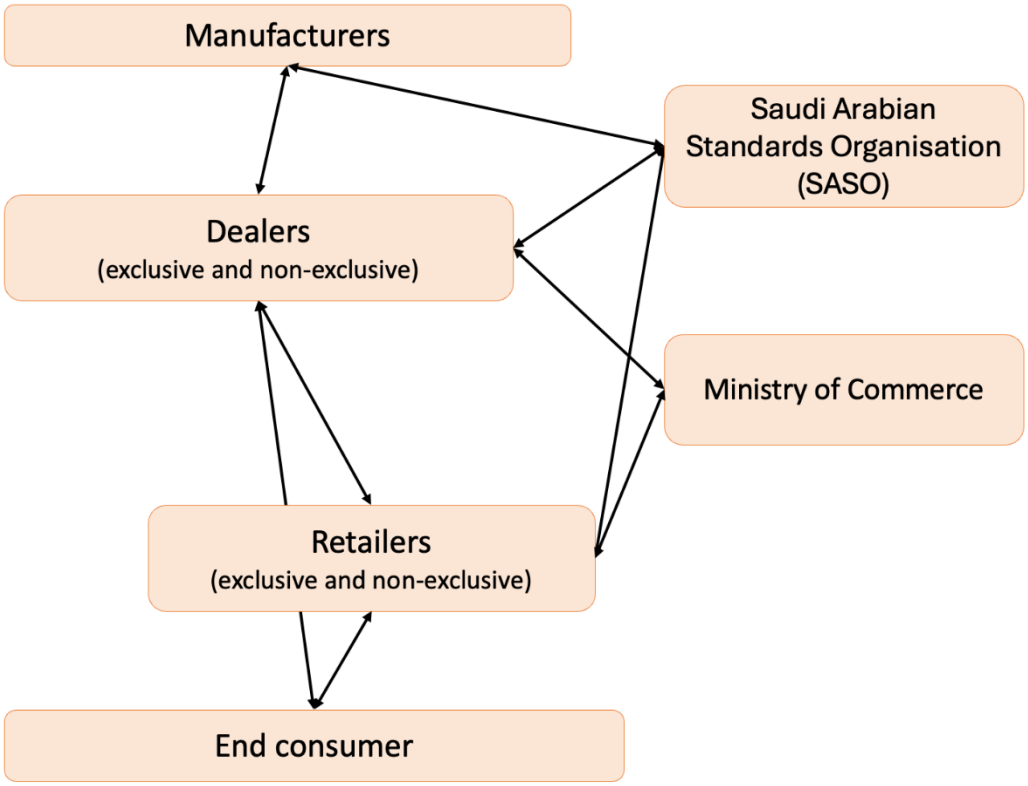


Figure 4. 5 Dealer-retailer relationships in Business networks

Dealers in the Saudi automobile industry are firms authorised by manufacturers to represent them in the country under the Law of Commercial Agencies[2] (Ministry of Commerce, 2019). They act as intermediaries between the automobile manufacturers and the end customers, facilitating the sales process directly or through automobile retailers, providing after-sales services, and ensuring customer satisfaction. In the Saudi automobile industry, dealers can be called automobile agencies (e.g., Aljazirah vehicle agencies) or, more commonly, automobile dealers (e.g., SMACO dealers). To avoid confusion, the researcher refers to this type of firm as a dealer in this research.

[2] Commercial agencies that are in relation to the implementation of the Commercial Agencies Law and its amendments refer to anyone who contracts with a manufacturer or his representative in his country to conduct business as agent or distributor, in any form of agency or distribution for profit, commission or facilities of any nature, including agencies for maritime, air or land transportation or any other agencies that would be decided by the Minister of Commerce.
The agent or distributor may contract with sub-distributors within the territory of the agency, provided that the original agent or distributor remains liable for the legally established obligations towards the consumer. (Ministry of Commerce, 2019: Article one).

Dealers have a wealth of resources in after-sale services, manufacturer warranty, extended warranty, cars inventory, car parts, R&D, distribution and marketing of reputable automotive brands that meet customer needs. Dealers' responsibilities include a) importing vehicles, including dealing with Saudi customs; b) providing manufacturers' warranties and maintenance services for end consumers; c) distributing vehicles around the Kingdom through their showrooms and retailers; d) advertising the represented manufacturer's brand in the local market; e) maintaining sufficient car stock and managing orders and deliveries; f) ensuring compliance with dealer regulations to avoid fines and penalties (e.g., delay providing spare parts within 14 days) (Ministry of Commerce, 2019, 2023); and g) adhering to the environmental regulations mentioned in Section 4.4. Understanding dealers' resources and the attached responsibilities to them are crucial for investigating how firms in the Saudi automobile industry respond to climate change regulations within their business networks.

Dealers can be exclusive or non-exclusive. Exclusive dealers are firms that have the exclusiveness to represent a manufacturer's brand or brands in the Saudi industry. For example, SMACO represents exclusively Audi, Volkswagen, Bentley, Bugatti, Lamborghini, and Porsche brands. On the other hand, non-exclusive dealers are the type of firms that share the representation of a car manufacturer brand in the Saudi automobile industry. For instance, Hyundai is represented in Saudi Arabia by three dealers, namely: 1) Wallan Company in the Central Region and North; 2) Naghi Motors in the Western Region and South; and 3) Almajdouie Motors in the Eastern Region and Northern Borders (Fitch Solutions, 2024). The three official dealers jointly presented *Day with Hyundai*, and they offered various events for the education of women after the driving ban was released (Fitch Solutions, 2019). The interconnectivity between the brand's dealers indicates the brand's stability as the second-largest brand in the domestic market,

even with the recent market challenges as reported by Fitch Solutions (2024). Understanding these dealer dynamics is crucial for analysing how firms in the Saudi automobile industry respond to climate change regulations, as dealer networks play a significant role in implementing and adapting to new regulations.

The second layer of the Saudi automobile industry is characterised by automobile retailers. The key resources of car retailers include well-located showrooms, a deep understanding of customer preferences, a diverse range of automobiles from multiple brands, strong business relationships and interactions with dealers, flexible financing and instalment options for customers, and a skilled sales team to provide expert guidance and support to customers. Automobile retailers are firms that sell new or used cars directly to end consumers. In this research, only retailers of new cars are considered because the environmental regulations examined are applied to new cars in the industry, as discussed in Section 4.4. Retailers act as intermediaries between automobile dealers and end consumers. Retailers may operate independently or in association with authorised dealers. Some retailers rely on a specialty in one category from different brands, such as luxury vehicles or SUVs, while others provide a range of car models to meet the needs of end consumers. In addition, retailers in the Saudi market are not responsible for providing after-sales services; these are the dealers' responsibility, but still, retailers need to comply with environmental regulations such as fuel economy labels that were discussed previously in Section 4.4.

Some retailers are exclusively representing a dealer in a specific region (e.g., Alouda is the exclusive retailer for Toyota Abdullatif Jamil in the Qassim Region), while other retailers are non-exclusively distributing dealers' cars (e.g., Alfalah Auto in different regions). In the case where a retailer sells a car that is not supplied by a local dealer, the

local dealer is required by the Law of Commercial Agencies to provide the manufacturer's warranty, required parts, and maintenance as long as the car holds the same manufacturer's brand. However, during the researcher's investigation, this law was amended recently as a result of dealers' pressure in the Ministry of Commerce to protect dealers' share of manufacturers fleets (e.g., high consumption and high demanded cars such as Land Cruiser). Hence, the continuously changing legal environment in the Saudi automobile industry emphasises the importance for firms to modify their strategies in response to regulatory changes, especially ones that impact their ability to comply with regulations related to climate change.

The continued introduction of new environmental regulations might influence business interactions within their business network in the Saudi automobile industry. For instance, the introduction of the CAFE standard could affect the interconnectivity between dealers and retailers since manufacturers are limited by average consumption over their fleets to avoid penalty charges for exceeding the allowed cars' fuel consumption average. Dealers might delay supplying retailers with popular models because dealers want to meet the demands in their showrooms. The automobile industry could witness instability or changes in contracts as a result of the external pressure emanating from environmental regulations. Nevertheless, dealers and retailers' actions are impacted by external pressure such as consumers' preferences, which are not solid as they are affected by the discussed socio-cultural trends (e.g., Shevchenko et al., 2016). On the other hand, GCC (Gulf Cooperation Council) countries perform on a free market, which creates a competition from their dealers to local dealers. The automobile industry witnesses a business relationship between GCC dealers and domestic retailers who associate their showrooms with the GCC dealers (e.g., Bahwan and Buraimi). These complexity of business

relationships needs to be revealed to understand firms' responses to climate change regulations in the Saudi automobile industry.

To sum up, the Saudi automobile industry operates within a multifaceted network of dealers and retailers, each with specific roles, resources and responsibilities. Dealers are central to ensuring compliance with environmental regulations and facilitating the import and distribution of vehicles. Retailers, on the other hand, focus primarily on sales but also play a crucial role in adhering to these environmental regulations. The dynamic regulatory context necessitates that both dealers and retailers continuously adapt their strategies. This adaptability is essential for meeting the challenges posed by climate change regulations and maintaining competitiveness in a rapidly evolving Saudi automobile industry.

## 4.6 Conclusion

This chapter has provided a comprehensive overview of the Saudi automobile industry, emphasising the economic, socio-cultural, and regulatory landscape influencing firms' responses to climate change regulations. Key economic factors, such as fuel price increases and the introduction of VAT taxation, have reshaped market dynamics, necessitating strategic adjustments by automobile firms. Socio-cultural changes, including demographic shifts and the lifting of the ban on women driving, present both opportunities and challenges for the industry. The introduction of environmental regulations like fuel economy labelling and the CAFE standard underscores the need for manufacturers, dealers, and retailers to adopt more sustainable practices and technologies. Understanding these contextual elements is crucial for analysing how business actors within the Saudi automobile industry interact and adapt to external pressures, particularly those arising from climate change regulations.

The question is how Saudi automobile firms respond to climate change regulation within the continuous changes in the Saudi economy, socio-cultural, and environmental regulation as discussed. The following chapter presents a qualitative thematic analysis to answer how Saudi automobile firms respond to climate change regulation. As the industry continues to evolve, the ability of firms to navigate this complex landscape will be key to their success and sustainability

# Chapter 5: Qualitative phase

## 5.1 Introduction

This chapter presents the empirical findings stemming from thematic analysis of the gathered data from interviewing actors within the Saudi automobile industry encompassing dealers, retailers and regulatory bodies. The purpose of this chapter is to achieve the research objective of understanding businesses' responses to external pressures emanating from climate change regulations and to identify the factors that enable or hinder interfirm adaptation within business networks. The chapter aims to answer the following research questions:

RQ1: How do businesses respond to climate change regulations?

RQ2: What factors enable and hinder interfirm adaptation in responding to climate change regulations?

The first research question (RQ1) is examined through the discussion of interfirm adaptation as a business response to climate change regulations (Section 5.2), highlighting how businesses adjust their products and processes through interactions within business network. The second research question (RQ2) is addressed by identifying the enablers (Section 5.3) and barriers (Section 5.4) of interfirm adaptation, supported by empirical evidence.

The transcribed data from the interviews were analysed by applying thematic analysis following Braun and Clarke's (2006) approach as discussed in the methodology chapter section (3.6.4). The study themes emerge through iterative and reflexive examination and re-examination of textual data. The data was analysed abductively to address the research

question, meaning switching between theoretical tools and empirical data (Thompson, 2022; Dubois and Gadde, 2002).

In this chapter, the researcher first explores the aggregated concept of interfirm adaptation in responding to climate change regulations within the Saudi automobile industry. This is followed by an in-depth analysis of the enablers and barriers of interfirm adaptations that provide insight into how businesses interact within their networks in responding to climate change regulations.

The result from the thematic data analysis distinguishes between enablers and barriers of interfirm adaptations in responding to climate change regulations. Figure 5.1 presents a thematic analysis map, structuring interfirm adaptations based on these factors. Enablers include 1) resource entitlements, 2) resource mobilisation, 3) resource exploitation, 4) building relationships, 5) economic exchanges, and 6) legal contracts. On the other hand, the barriers include 1) present bias, 2) reference points, and 3) loss aversion. Importantly, the results demonstrated that businesses with strong enablers tend to succeed in interfirm adaptation. Conversely, businesses facing strong barriers struggle to adapt. Understanding these enablers and barriers is crucial because they influence the extent to which businesses can effectively adapt in response to climate change regulations.

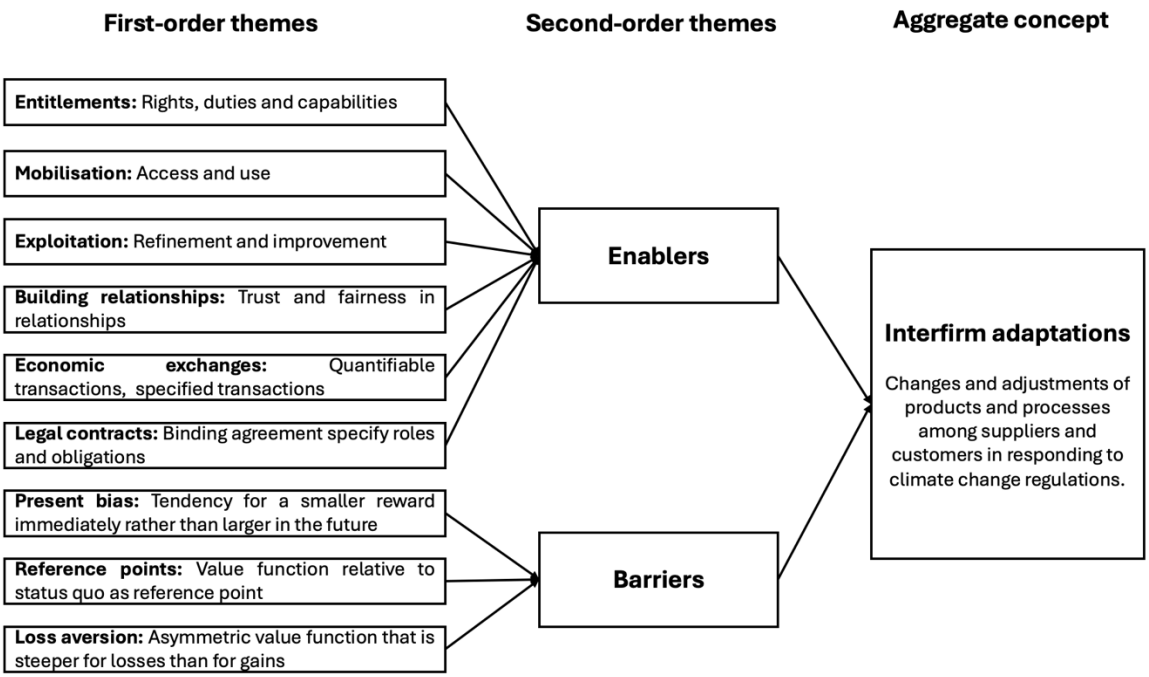


Figure 5. 1 Thematic analysis map

The chapter is structured as follows:

Section 5.2 examines interfirm adaptation as a business response to climate change regulations, highlighting how businesses adjust their products and processes through interactions within the network. Section 5.3 investigates the enablers of interfirm adaptation, such as resource entitlements, resource mobilisation, and business relationships, supported by empirical evidence from the interviewees. Section 5.4 discusses the barriers to interfirm adaptation, including present bias, reference points, and loss aversion, and how these factors impede businesses' adaptive efforts. Finally, Section 5.5 summarises the key findings.

## 5.2 Interfirm adaptation as business responses to climate change regulations

This section addresses RQ1 by examining how businesses respond to climate change regulations through interfirm adaptation. It explores how businesses adjust their products and processes through interactions within business networks to meet regulatory requirements. In this research, interfirm adaptation refers to change or adjustment in

products or processes by automobile businesses to meet the needs or requirements of another business in business relationships (Håkansson, 1982; Hallen et al., 1991; Yu and Fang, 2023; Mouzas, 2024). Interfirm adaptation is fundamentally interactive. This involves negotiation, cooperation and alignment among network actors which reflect the embedded environment of businesses within border business relationships.

The current thematic analysis builds upon the previous conceptualisation of interfirm adaptation advanced by IMP literature (Håkansson, 1982; Hallen et al., 1991; Håkansson and Snehota, 1995; Fang, 2001; Brennan and Turnbull, 1996; Hagberg-Andersson and Grønhaug, 2010; Mouzas, 2024) but expands our understanding of interfirm adaptation. In particular, the interactional and behavioural aspects in business networks that enable or hinder interfirm adaptation in responding to external pressure emanating from climate change regulations. The empirical data reveal that business response to climate change regulations is not atomistic processes undertaken by individual businesses but are instead driven by repeated interactions and exchange processes between businesses which leads to interfirm adaptations.

These interfirm adaptations were manifested in products and process adaptation which together allow businesses to comply with climate change regulations while strengthening business relationships and maintaining competitiveness in the market. The following sub-sections provide empirical evidence illustrating how interfirm adaptations of products and processes occur among manufacturers, dealers, and retailers in the Saudi automobile industry in response to climate change regulations such as Corporate Average Fuel Economy (CAFE) and fuel labels standards.

### 5.2.1 Product adaptation

Product adaptation emerges as a significant aspect of interfirm adaptation. Businesses within the Saudi automobile industry faced external pressure that required them to make changes and adjustments to their product offering to meet the new regulations. Product adaptation has been recognised in the literature as a response to external pressures. For example, Ford and Mouzas (2013a) discussed the importance of product adaptation in maintaining business relationships when suppliers customise product offerings to meet customer requirements. Similarly, Hagberg-Andersson & Grønhaug (2010) indicated that adaptation often occurs as a result of sustained business interactions, where firms adjust their products based on mutual learning and negotiation. In line with these insights, the findings from the interviews reveal that product adaptations occur through continuous interaction among businesses including changes to product type, features, design, technologies, and even the introduction of new car models to the local market that are more aligned with the new environmental regulations.

For instance, dealers needed to adjust their product types and collaborate with manufacturers to ensure compliance with the CAFE standards. One dealer explained:

> *"The CAFE is there; it is implemented in the market… We have annual requirements of cars, with a mix and match of different engines. These requirements are sent to [manufacturers], which makes calculations to ensure CAFE compliance… You can order 50 [high-fuel consumption model], and 30 of that and 400 [low-fuel consumption model] to match CAFE. Basically, if you sell one big-engine car, you need to sell 10 small-engine cars. So before CAFE, whatever we ordered from manufacturers, they would come back to us with an agreement to the exact order of cars. By now it has changed. Every year it changes. Every year is becoming stricter." (Dealer 3).*

This quotation highlights how dealers and manufacturers interact to adjust the product mix. They work together to balance the sale of high-consumption vehicles with more

fuel-efficient models to meet the regulation requirements. The dealer adaptation involves strategic decisions on the types and quantities of vehicles imported and sold in the Saudi market.

Manufacturers also play a significant role in product adaptation by introducing car models with smaller, more efficient and advanced technologies. As another dealer noted:

> *"Manufacturers focused on supporting vehicles with modern technologies like Auto Stop and Active Fuel Management... Transmission technology now reaches up to 10 speeds, which reduces fuel consumption, and turbocharged engines have entered our lineup... The new engines are 1500 cc with a turbo, and their consumption is 16 km per litre." (Dealer 2).*

This reflects manufacturers' efforts to redesign and improve vehicles for better fuel efficiency. These enhancements allow dealers to offer products that comply with the new regulations and meet consumers' preferences.

Moreover, there is a shift towards planning for eco-friendly alternatives such as electric vehicles. As noted by several dealers:

> *"Currently, most companies are directing their focus toward electric vehicles. This is a new era in the automotive industry, and in the Arab world, it resonates, like in the UAE and Jordan. Electric cars are the future. In some countries, like Jordan, electric cars are cheaper than petrol cars. It doesn't eliminate petrol, but it will dominate… By 2025, there will definitely be a move towards electric cars." (Dealer 9).*

> *"Electric vehicles have no limits (the technology can be applied to all different car models). Of course, there are infrastructure challenges and public acceptance of electric vehicles... In Jordan, for example, electric cars are widespread." (Dealer 2).*

These quotes indicate that both manufacturers and dealers are proactively planning to introduce electric cars as an important element in product adaptation in responding to climate change regulations. They acknowledge the global and regional shift towards electric cars, recognising electric cars as the future of the automotive industry, especially

within the Arab world. This anticipation of increased demand for electric vehicles by 2025 reflects the collaborative efforts and strategic interactions between dealers and manufacturers to align their product offerings with environmental regulations and evolving consumer preferences.

### 5.2.2 Process adaptation

Process adaptation emerges as another substantial aspect of interfirm adaptation in responding to climate change regulations. Businesses within the Saudi automobile industry needed to adjust and change their processes and operations to meet the new regulations, such as fuel labels and corporate average fuel consumption (CAFE) standards. Process adaptation has been discussed in the literature as an important component of interfirm adaptation. For example, Håkansson (1982) identified process adaptation as essential for maintaining long-term business relationships, where businesses modify their internal processes to align with their network counterparts. Similarly, Hagberg-Andersson & Grønhaug (2010) showed that process changes are often interrelated with product adaptations, as businesses adjust their administrative and logistical processes in response to new demands. In line with these insights, the findings from the interviews revealed that process adaptations through continuous interaction among businesses included administrative procedures, delivery, inventory, production processes, planning, financial procedures, information exchange and marketing.

The data revealed that dealers adjust their inventory management and ordering processes in collaboration with manufacturers to ensure a compliant mix of cars. As illustrated by the following quotations:

> *"The dealer must order from the entire range – [car model], [car model], and all models needed in the market... Japan doesn't allow that [only ordering specific models]." (Dealer 7).*

> *“There is a separate team. It is not us; it is the manufacturers. They have a separate team with manufacturers in compliance departments. They have this CAFE team who manage CAFE… The objective of CAFE is to control CO2 emissions… Regarding the calculation, we tell them we want to sell this much of [high-fuel consumption model], this much of that, and then they come back to us with the best balance for CAFE. (Dealer 3).*

These quotes demonstrate the need for dealers to work with manufacturers' constraints while adapting their ordering processes to meet both retailers' demands and regulations requirements. Retailers, on the other hand, are adjusting their profit margins for fuel-efficient cars. As Retailer 2 highlighted:

> *"Honestly, the profit margin for small cars is below zero, and as a distributor, I sell them at a loss... We want to keep moving the stock and compensate for the loss from other models." (Retailer 2).*

This quote emphasises how financial procedures are adjusted by taking a loss on smaller, fuel-efficient models to meet dealer targets, demonstrating adaptive behaviour in response to regulatory pressures.

Additionally, adaptation in supply chain decisions is evidenced by a shift driven by climate change regulations. Interviewees illustrate this change, explaining that they have moved from gasoline to diesel pickups:

> *“Before the fuel consumption restrictions, the focus was on gasoline for pickups due to lower maintenance costs... Now, we have pickups and vans, and we have to adjust.” (Dealer 8).*

This adaptation requires ongoing strategic decisions around vehicle inventory and fuel options, reshaping distribution to meet regulatory standards. Dealer 8 adds that switching to diesel offers benefits due to its better fuel consumption average, supporting compliance with fuel standards. While gasoline pickups were once preferred for their lower maintenance costs, rising gasoline prices have shifted demand toward diesel vehicles, which reduce fuel expenses. This shift demonstrates a responsive approach within the

supply chain. Dealers adjust car selections and manage inventory to improve fuel efficiency. These actions are essential for adapting to regulatory changes.

Technological advancement of cars also contributed to process adaptation among businesses in the Saudi automobile industry. As Dealer 2 highlighted:

> *"Transmission technology now reaches up to 10 speeds, which reduces fuel consumption, and turbocharged engines have entered our lineup." (Dealer 2).*

Manufacturers' incorporation of fuel-saving technologies such as turbocharged engines and advanced transmissions require dealers to adjust their training and maintenance processes to support these new technologies effectively. Dealers need to ensure that their employees are knowledgeable about the latest added technologies and provide sufficient services to support customers.

Simultaneously, these technological advancements in cars necessitate retailers to change their marketing strategies. Car retailers need to educate consumers about the advantages of new technologies and promote cars that comply with climate change regulations. For instance, retailer 3 highlighted the impact of these changes:

> *"The biggest incentive was the fuel labels, which encouraged consumers to decide to buy low-consumption cars and also helped in comparing different types. In the past, consumers were unaware of consumption levels… For example, the [car model] has a 1,500 cc engine with a turbo. Customers prefer it for its small engine size because the savings are significant and clear. On the other hand, [car model] customers insist on a 2,000 cc engine due to the lack of a significant consumption difference between it and the smaller engine of the same type and model." (Retailer 3).*

This quotation shows how retailers have adapted their marketing strategies to focus on fuel efficiency and new technologies like turbocharged engines. Consumers are more aware of fuel consumption due to regulations like fuel labels. As a result, retailers must

highlight these features to appeal to customers and drive sales. By focusing on benefits like fuel savings from smaller, efficient engines, retailers align their marketing with both regulatory standards and consumer demand.

These adaptations in favour of meeting the requirements of the regulations represent significant process adaptations among all levels of the industry. Manufacturers are developing advanced technologies to create more fuel-efficient vehicles. This requires dealers to adjust their training, maintenance, and operational processes to support these new models. At the same time, retailers are promoting cars that environmental compliance and technological innovation. They focus on educating consumers about the benefits of fuel-efficient technologies. This alignment among manufacturers, dealers, and retailers keeps businesses competitive in a market shaped by climate change regulations and shifting consumer expectations. These coordinated efforts reveal the interactive nature of interfirm adaptation, where businesses work together to respond to external pressures.

### 5.2.3 The interactive nature of interfirm adaptation

This empirical evidence proves that businesses' responses to climate change regulations are not isolated and atomistic practices but rather are interactive decisions of responding to such pressure that goes beyond individual business boundaries. Manufacturers, dealers and retailers engage in continuous negotiations and collaborations to align their strategies and operations with climate change regulations. For example, balancing the CAFE standards involves interaction between dealers and manufacturers:

> *"If we sell one [high-fuel consumption model], I need to sell 30 or 40 [low-fuel consumption model] to balance it... if you sell one big engine car, you need to sell 10 small engine cars." (Dealer 3).*

This interactive coordination ensures that the overall fleet meets the average fuel economy standards which necessitate joint planning and adaptation. Similarly, manufacturers adjust their production and supply based on feedback from dealers regarding market demands and regulations constraints:

> *"Every manufacturer is introducing small cars in the domestic market [a manufacturer], 40% of their sales are coming from [fuel-efficient model]. [another manufacturer], their new cars are coming from China, like the new [model]; they switched its engine from a 3.6 to a 2.0 turbo engine when it moved to China. Even when they have the small [model] car, and [manufacturer] comes with a model called […] for 32 thousand Riyals. So we also told our manufacturers we need small cars. " (Dealer 3).*

This quotation demonstrates how manufacturers respond to dealers' needs by producing cars that comply with regulations while satisfying consumer preferences in the local market. It illustrates the pattern of manufacturers adjusting their car types based on dealers' needs, especially when facing competition from other dealers who provide smaller cars within their brands. This adjustment is a strategic response to both regulatory constraints and market competition, highlighting the interactive coordination between manufacturers and dealers in adapting to climate change regulations.

The interactive nature of interfirm adaptation is consistent with Guercini et al. (2022), who emphasise that decisions in business relationships are inherently interactive and unfold through a flow of decisions shaped by mutual adaptation. The empirical evidence demonstrates how manufacturers and dealers continuously adjust their strategies and product offerings in response to regulatory constraints and market feedback, reinforcing the view that business relationships cannot arise, nor be maintained, without mutual adaptations (Guercini et al., 2022). Moreover, this study responds to the call for further research on decision-making in business relationships (Guercini et al., 2022), extending prior work by showing how businesses engage in ongoing negotiations and joint planning

rather than relying on predefined strategic choices. This supports the argument that decision-making in interactive business relationships is shaped by adaptive rationality, where managers make choices contingent on evolving circumstances rather than adhering to rigid planning (Guercini et al., 2022).

In conclusion, the findings demonstrate that business responses to climate change regulations in the Saudi automobile industry are interactive decisions that extend beyond individual business boundaries. Manufacturers, dealers, and retailers engage in continuous interactions events and episodes that involve negotiations and coordination to align their strategies and operations with evolving climate change regulations requirements. These recurrent interactions lead to significant changes in products and processes that are facilitated by interfirm adaptations. The following sections reveal the enablers and barriers of interfirm adaptation in responding to climate change regulation within the business network of the Saudi automobile industry. The researcher will explore how each theme under enabler facilitates adaptations. Following that, the researcher explores how each emergent theme under barriers impedes interfirm adaptation in responding to climate change regulations. By analysing these factors, the researcher aims to address the research questions and achieve the research objectives by providing a comprehensive understanding of what factors enable and hinder interfirm adaptation. In addition, this analysis will contribute valuable insights into how businesses within the network can enhance their adaptive capabilities to meet external pressures effectively.

## 5.3 Enablers of interfirm adaptation in responding to climate change regulations

The thematic analysis reveals a set of emergent themes that act as enablers of interfirm adaptation in responding to climate change regulations within the Saudi automobile industry. These enablers demonstrate how businesses achieve effective responses to

climate change regulations through interaction within business networks leading to interfirm adaptations. Understanding these enablers addresses the research questions by exploring the factors that facilitate interfirm adaptation, thus contributing to the overarching study aim of understanding businesses' responses to climate change regulations. Below are illustrations for these enablers' themes supported with quotations from interviewees in the Saudi automobile industry.

### 5.3.1 Resource entitlements

The first enabler of interfirm adaptations in responding to climate change regulations that emerge through thematic analysis is resource entitlements. Resource entitlements refer to a bundle of rights, duties and capabilities that firms possess, acquire, and transfer to other business actors (Mouzas, 2022b). In business networks, entitlements serve as the currency that actors bring into interactions which determent the achievement of consent (Mouzas and Ford, 2018). By considering entitlements as a form of currency, businesses can facilitate interfirm adaptation and effectively manage the evolution of exchanges and interdependencies within business relationships (Mouzas, 2024). These entitlements establish a link between actors and resources by defining ownership and control over tangible and intangible resources, such as brands, knowledge, and capabilities (Mouzas, 2024).

Interviewees illustrate how the uneven distribution of resources and the need for adaptation drive businesses to rely on their entitlements. Businesses are entitled to some resources such as brand rights, car types, or technical capabilities, while they may lack others. To respond to climate change regulations, businesses interact with their counterparts to negotiate or acquire the necessary entitlements. In this way, resource entitlements enable interfirm adaptation by providing a framework within which

businesses can secure the resources required for responding to climate change regulations.

For instance, interviewees highlight that the right to represent manufacturers' brands in the local market, along with the duty to achieve specific sales targets, enables dealers to adapt to the manufacturers' evolving car types. By exercising their entitlements, dealers can align their product offerings with the change toward fuel-efficient cars required by climate change regulations. At the same time, this arrangement imposes capability-related obligations on dealers. They must have the means to promote, service, and maintain these cars, ensuring their adaptation efforts are both feasible and effective.

Interviewees highlight that in responding to climate change regulations, manufacturers must introduce more fuel-efficient car models into the market. However, manufacturers often lack direct access to end consumers and the operational reach to ensure that these cars are promoted and sold effectively. Instead, they rely on entitlements such as granting dealers the right to represent their brands, which structure interactions and motivate compliance with new regulations. This is consistent with Mouzas (2024), who argues that entitlements extend beyond tangible assets to include brands and relationships. By specifying duties like meeting annual sales targets, manufacturers align dealers' activities with evolving regulatory standards. In exchange, dealers gain access to the manufacturer's brand portfolio, including fuel-efficient models, and are expected to develop the capabilities to sell, service, and maintain these new offerings. This interplay of rights, duties, and capabilities ensures that both manufacturers and dealers can combine and reconfigure their resources, ultimately enabling interfirm adaptation to climate change regulations.

> *"**Dealer 3:** We have an annual agreement between us and manufacturers. We agree on sales targets, and we agree on car ordering. If we want to retain distributorship and represent manufacturers' brands, we have to order a certain number of units in this kind of agreement. If we want to have distribution of [manufacturers brands] cars in Saudi Arabia, we must do this in the next two years; it is based on that.*
>
> ***Researcher:** Has it changed because of the effect of CAFE?*
>
> ***Dealer 3:** Yes, for sure. It became tougher now. They are now promoting smaller cars like [efficient model]. So we have to sell a certain number of [efficient models] to be able to sell well-known models with high fuel consumption." (Dealer 3).*

Interviewees also highlight scenarios where retailers hold rights that allow them to adjust pricing or promotional strategies, enabling them to support dealers' adaptation efforts. This aligns with research suggesting that entitlements establish a framework for structuring resource access in networks (Mouzas, 2022b). When retailers exercise their right to set prices on low-consumption cars, they help move stock and influence consumer behaviour. Although sometimes unprofitable in the short term, these measures help maintain long-term entitlements with dealers (e.g., favourable credit terms, and the privilege to access in-demand models), enabling continued adaptation within the business network.

> *"Honestly, the profit margin for small cars is below zero, and as a retailer, I sell them at a loss. Because we have purchase targets from the dealer that we must meet to earn a good standing with them, which in turn grants us privileges from the dealer. For example, I buy a [small fuel-efficient mode] for 48,000 SAR and sell it for 45,000 SAR. We want to keep moving the stock and compensate for the loss from other models." (Retailer 2).*

In contrast, interviewees indicate that the lack of certain entitlements such as resource capabilities may hinder interfirm adaptation in responding to climate change regulations. For instance, without the necessary technical expertise, parts inventory, or trained technicians to support diesel or hybrid engines, a business may struggle to introduce or

maintain more environmentally friendly car models. This lack of entitlements constrains interfirm adaptation at both product and process levels in responding to the evolving climate change regulations in the Saudi automobile industry.

> *"We don't import diesel because diesel vehicles require different parts, maintenance, and technicians than petrol. It's not just about bringing the car in; you also need the right support for it." (Dealer 2).*

By considering resource entitlements as a form of currency in interfirm adaptation (Mouzas and Ford, 2018), businesses strategically leverage their rights, duties, and capabilities to navigate the complexities of climate change regulations. Secure access to supplier brands, compliance-driven product portfolios, and the technical know-how to maintain new car technologies all hinge on the presence, negotiation, and transfer of entitlements. Consequently, resource entitlements underpin how businesses in the Saudi automobile industry interact, negotiate, and consent to changes that enable them to respond to external pressures emanating from climate change regulations.

In conclusion, resource entitlements act as a crucial enabler of interfirm adaptation, guiding how businesses secure, negotiate, and combine resources to meet the requirements of climate change regulations. By defining which actors own, control, or can acquire certain resources, entitlements shape the structure and content of interfirm interactions. When rights, duties, and capabilities are well-aligned, businesses can respond proactively to regulatory changes, reconfiguring products, processes, and relationships. Conversely, limited entitlements such as capability gaps may hinder interfirm adaptation. Thus, it is conceivable to state that resource entitlements enable interfirm adaptation, empower businesses in the Saudi automobile industry to coordinate their activities, fulfil regulatory requirements, and ensure long-term strength in a rapidly evolving environment.

### 5.3.2 Resource mobilisation

After demonstrating resource entitlements, resource mobilisation emerges as another enabler of interfirm adaptation in responding to climate change regulations in the Saudi automobile industry. Resource mobilisation manifested in businesses' attempts to access suppliers' valuable resources such as their brand's long-term goals, pricing strategy, new car models, administrative procedures, stock level, distribution processes and strategies. This aligns with Mouzas and Naudé (2007), who highlight that resource mobilisation is a strategic process where businesses engage with network counterparts to access and integrate valuable resources for competitive advantage. Businesses' access to heterogeneous resources through business interaction facilitates interfirm adaptation while businesses lacking such access present a low level of interfirm adaptations.

Interviewees illustrate the role of resource mobilisation such as aligning their strategies as an effective mechanism that enables interfirm adaptation in responding to the evolving climate change regulations. Interviewees show how the dealer and the manufacturer interact to mobilise resources by aligning their strategies towards compliance with climate change regulations. The manufacturer discontinued high-consumption models and reallocated resources to develop electric vehicles. Through collaborative efforts and shared long-term goals, the dealer gains access to the manufacturer's evolving product lineup, enabling them to adapt their offerings to meet regulatory requirements and prepare for introducing electric cars into the Saudi market.

> *"The [car model] was partially withdrawn because of fuel concerns. With our manufacturing partner, there's a trend toward producing vehicles that align with fuel and emissions standards, and these factors are interlinked. One of the cars that got discontinued by the manufacturer was the [car model]. It's a sedan with a 3.6 engine, which is high in consumption, so they stopped its production, even though it was successful and had great sales. [the manufacturer] has since closed the [car model] factory, shifting its budget toward electric vehicles. [the manufacturer] now has electric models,*

> *not yet available in our market, but they are in production. Globally, there's a shift; every brand has or is investing in electric cars. So, we're witnessing a transition from fuel-based technology to electric as a long-term investment, and it's expected that we'll bring electric cars into the Saudi market." (Dealer 2).*

In addition to aligning strategies, dealers' access to the long-term goal of their manufacture is witnessed to enable process adaptation. Interviewees show how access to such as a manufacturer's long-term plans and anticipated new car models such as electric cars enable dealers to adapt their processes and enhance their relationships with governmental bodies.

> *"We approached government sectors to provide training on electric vehicles because to bring in any electric car, you need first-response teams to have experience in handling them. We wanted to get approvals ahead of time to be prepared" (Dealer 2).*

Although interfirm adaptation is costly such as offering these training by dealers to firefighters, resource mobilisation enabled these interfirm adaptations in responding to climate change regulations. This interaction facilitates resource mobilisation, allowing both businesses to effectively adjust their products and processes in responding to climate change regulations.

In contrast, low resource mobilisation may limit interfirm adaptation. Interviewees highlight the challenges dealers faced due to insufficient access to supplier resources. For example, when manufacturers independently decide to discontinue models without adequate consultation or coordination with dealers, it leads to a lack of interaction and communication. This, in turn, impedes the dealer's ability to plan and adapt to changes, leading to frustration and uncertainty. Consequently, the dealer's inability to mobilise resources effectively from the manufacturer limits their adaptation in responding to climate change regulations and market demands. Without access to the suppliers'

necessary resources, businesses may struggle to adapt their operations and offerings to meet regulatory requirements.

> *"There are things the manufacturer sees ahead and gives you bullet points, like "We're going to stop this model; we're going to reduce this model." For example, now in 2020, we received word from the manufacturer that this car won't be available next year; we've stopped it! So, there are variables that come not by your will, but from above… It's frustrating to work hard and build a product only for it to be suddenly cut off. I worry that the [car model] might be next. Of course, there's a new model coming from China with good demand, and I'm afraid they might stop it as well." (Dealer 10).*

> *"This car comes at an attractive price that fits with a good segment that we target, but I cannot be sure if the manufacturer will import it to us next year or not! The point is that I plan for several years ahead and share that with the manufacturer, then I'm surprised when the manufacturer stops importing these cars because there is not a demand!" (Dealer 10).*

Therefore, it is conceivable that resource mobilisation such as businesses access to suppliers' resources enables interfirm adaptation in responding to climate change regulations. This is because businesses need to plan for the future of their businesses and operations, and without access to suppliers' resources, businesses may not attempt to adapt to their counter partners.

### 5.3.3 Resource exploitation

After demonstrating resource mobilisation, resource exploitation emerges as another enabler of interfirm adaptation in responding to climate change regulations within the Saudi automobile industry. Resource exploitation involves the refinement and incremental improvement of existing resources to meet market needs and regulatory requirements (O'Cass et al., 2014). Unlike resource mobilisation, which focuses on accessing resources externally, exploitation emphasises maximising the value of resources already available. The findings under this theme support prior studies which highlight that resource exploitation is less risky and costly, providing businesses with

efficiency and productivity gains in the short term (March, 1991; Auh and Menguc, 2005). Furthermore, the findings reveal resource exploitation's role in responding to climate change regulations suggesting an expanded application of the concept. From an IMP perspective, this process is embedded in business interactions, where resources are refined and reconfigured within networks to increase their utility and effectiveness (Håkansson and Snehota, 1995; Baraldi et al., 2012a).

Resource exploitation plays a vital role in addressing regulatory challenges because it enables businesses to achieve efficiency and compliance without the risks and costs associated with radical innovation. In responding to climate change regulations, businesses exploit existing resources by refining processes related to pricing, advertising, sales, distribution, and marketing.

Interviewees highlight resource exploitation as an effective mechanism for enabling interfirm adaptation to evolving climate change regulations in the Saudi automobile industry. For example, following the implementation of climate change regulations, some manufacturers introduced incremental improvements in car technology to respond and meet a new regulatory requirement. This approach demonstrates how manufacturers refine existing car models with improved technology to meet fuel efficiency standards. By applying these advancements to a well-known and trusted car model, manufacturers enable dealers to adapt more effectively to climate change regulations. The familiarity of a well-known and trusted car model reduces the risk and cost that are usually associated with promoting an entirely new car model. This is because consumers already recognise and trust the car model. Additionally, manufacturers' focus on improving existing car models rather than introducing entirely new car models enables dealers to adapt by relying on established marketing and operational processes. In this way, dealers can

exploit their existing resources such as a stock of car parts for the same car model but with improved fuel efficiency technology to meet regulations requirements and consumers' demand for reputable automobile brands. Thus, resource exploitation among businesses' interaction enables interfirm adaptation in responding to climate change regulations.

> *"The manufacturer's reaction has been to produce the same cars but with more fuel-efficient engines. Active Fuel Management technology which allows some cylinders to deactivate, ranging from 2-cylinder to 8-cylinder modes, is now in models like the new [car model]." (Dealer 2).*

In addition, interviewees highlight how dealers refine their pricing and warranty strategies to support interactions with retailers, enabling interfirm adaptation in responding to climate change regulations through a balanced and collaborative relationship. The dealers ensure profitability for retailers by setting a price floor. This not only enhances retailers' adaptability but also retains business relationships and economic exchanges. For instance, dealers' refinement of pricing strategy could reduce the risk of price undercutting for retailers which may result in relationship conflict and economic exchange inefficiencies among businesses. In addition, dealers' exploitation of their current resources such as the introduction of five years of unlimited mileage instead of three years with a limited mileage warranty maximises the value of their current resources. At the same time, ensuring lower prices for retailers enables adaptation using their resources such as flexible financing and instalment options for customers.

> *"We maintain a certain price floor to ensure they [retailers] make a profit. For instance, if I sell a car to them for 112,000 and they sell it at 116,000, I make sure not to drop below 120,000. I also offer a five-year unlimited mileage warranty, which they don't have. This way, customers are distributed between us and the retailers without competing against each other for the same product." (Dealer 1).*

In conclusion, it is conceivable that resource exploitation manifested by incremental improvements to existing resources is a vital enabler of interfirm adaptation in responding to climate change regulations. By refining processes such as pricing, promotion, and advertising, businesses optimise their resources to meet regulatory demands efficiently. These adaptations occur through interactions within the network, where firms collaboratively enhance the value of their resources. The findings highlight how the emergent pattern of resource exploitation may allow businesses in the Saudi automobile industry to respond to climate change regulations.

### 5.3.4 Business relationships

After exploring resource exploitation, business relationships emerge as another enabler of interfirm adaptation in responding to climate change regulations within the Saudi automobile industry. Business relationships are foundational in the IMP approach and serve as the core of interaction that links activities between businesses (Håkansson and Snehota, 1995). Activities include sales, after-sales services, delivery, and display of products.

Interviewees illustrate how building and maintaining business relationships guide and link activities, enabling interfirm adaptations in facing challenges. Within business networks, relationships provide the foundation for organising activities such as sales, delivery, and after-sales services. Through recurring interactions like trade negotiations and performance reviews, businesses ensure that activities remain aligned, enabling collaboration and adaptability. In this way, the quality and continuity of business relationships might enable businesses to respond to external pressure such as climate change regulations.

> *" If you can operate the brand with sales and after-sales services, the manufacturer will be close to you … When I take on several brands, I do not*

> *look at what I have done in the first or second year. I look at 20 or 25 years down the line… The relationship remains the same. If performance such as sales declines in a region for a day, a month, or a year, the dealer and manufacturer must always agree on how to get out of that tunnel." (Dealer 9).*

The quality of business relationships manifested in trust and fairness plays an essential role in enabling firms to link and structure activities across networks (Johnson, 1999). Consistent with this perspective, interviewees highlight that fairness and trust in business relationships are significant in linking activities such as promotional campaigns. Interviewees show how fair practices in business relationships such as product pricing empower collaboration and coordination among actors in the business network. For instance, the negotiation of business actors about a campaign for a fuel-efficient car model by a brand that is represented by several dealers in the local market demonstrates the values of business relationships in adaptation toward climate change regulations. Interaction with competitors who represent the same brand presents the depth of trust and fairness in business relationships that might lead to overcoming challenges like the new climate change regulations.

> *"We sit with [other dealers] and the manufacturer to discuss campaigns that focus on the car without mentioning the specific dealer. The price is usually stated, with a focus on the brand. Agreement on price is essential. It doesn't always happen—sometimes there's price competition, but there is some level of collaboration." (Dealer 2).*

In contrast, weak business relationships may hinder interfirm adaptation in responding to climate change regulations. For instance, the interviewees highlighted that a lack of trust in business activities such as pricing products might hinder adaptation toward efficient fuel car models. This is manifested in the dealer's negative reaction to the researcher's information regarding a retailer's radical dropped price of a fuel-efficient car model by 8,000 riyals below the price floor. The absence of trust and fairness in business

relationships hinders interfirm adaptation in challenging times such as responding to climate change regulations.

> *"Researcher: Do your distributors receive offers with the cars they want for something else?*
>
> *Dealer 10: Of course, we give them what they want along with something from what we started with [fuel efficient models] to help us.*
>
> *Researcher: For example, the [efficient car model]. I see some distributors say [this dealer] has constrained us with it.*
>
> *Dealer 10: Yes, there was pressure on it.*
>
> *Researcher: Like one saying he lost 8,000 so far on the [efficient car model] just to get it moving.*
>
> *Dealer 10: May I know the name of the showroom?*
>
> *Researcher: I'm sorry, I cannot disclose the name.*
>
> *Dealer 10: I'd like to know because we have policies with distributors and require them not to drop below a certain price. An amount of 8,000!! In general, I can tell if I see the market... Is it [a retailer name]?*
>
> *Researcher: No, I'm sorry.*
>
> *Dealer 10: The reason I'm interested is that we strive to keep the difference minimal; if consumers see a small difference, they come to us as the dealer.*
>
> *Researcher: These are pricing policies that make a difference in the market; some set conditions, while others don't. It seems you don't set conditions.*
>
> *Dealer 10: There are agreements between us and distributors on the selling price. But honestly, it's unreasonable to have an 8,000 difference."*

In conclusion, it is credible to say that business relationships' quality built on trust and fairness are crucial enablers of interfirm adaptation in responding to climate change regulations. These relationships facilitate the exchange of resources and knowledge, ensuring that businesses within the network can combine their activities effectively. The findings highlight how the quality of business relationships enables the adaptability of businesses in the Saudi automobile industry.

### 5.3.5 Economic exchanges

After exploring business relationships, economic exchanges emerge as another enabler of interfirm adaptation in responding to climate change regulations within the Saudi automobile industry Economic exchanges are defined as transactions between businesses that are quantifiable and specified in the short term (Guo et al., 2017). However, these transactions are not treated as isolated; they involve ongoing interactions that create mutual value through give-and-take processes (Mouzas, 2022a). Consistent with this perspective, the findings present that economic exchanges drive business activities enabling interfirm adaptation to meet external pressures emanating from climate change regulations.

Interviewees illustrate how economic exchanges guide and structure activities like pricing strategies and promotions that enable businesses to adjust their products and processes to meet environmental regulations. Within business networks, economic exchanges provide the foundation for organizing activities such as purchasing, sales, and marketing. Through recurring interactions involving negotiations and agreements on pricing and promotions, businesses ensure that their activities remain linked. In this way, economic exchanges might enable businesses to respond effectively to external pressures like climate change regulations.

For instance, interviewees highlight how economic exchanges influence purchasing decisions and pricing strategies to promote fuel-efficient vehicles. Retailers negotiate pricing offers with dealers to purchase low-consumption cars, which are essential for compliance with fuel economy standards. This interaction reflects the role of economic exchanges in enabling the interfirm adoption of environmentally friendly cars. Competition among dealers and favourable pricing motivate retailers to invest in low-consumption models. This supports their adaptation to climate change regulations. The

mutual value derived from these transactions strengthens the cooperative relationship between dealers and retailers.

> *"We buy based on current prices and offers from dealers. The market is open and available for competition between our dealers and those in the Gulf. What we currently face from dealers are pricing offers when purchasing low-consumption vehicles." (Retailer 3)*

Additionally, interviewees emphasize the role of promotional strategies as a key component of economic exchanges that enable interfirm adaptation. Dealers implement promotions on products, such as offering free fuel for a year with the purchase of certain models. This is planned to shift consumer behaviour towards fuel-efficient cars. These promotions are part of the economic exchanges that incentivize consumers and support environmental regulatory compliance. By offering tangible benefits to consumers, dealers can motivate demand for environmentally friendly models, facilitating adaptation to climate change regulations. These promotional activities require coordination and agreement between manufacturers and dealers, reflecting the collaborative nature of economic exchanges.

> *"In 2019, we offered promotions like free fuel for a year with models like the [efficient car model] or some smaller cars. This was one of the tools we used to shift consumer behaviour, helping customers worry less about fuel costs and pushing smaller, fuel-efficient cars more strongly in the market." (Dealer 2).*

In contrast, interviewees highlight that a lack of successful economic exchanges can hinder interfirm adaptation. For example, insufficient incentives or misaligned pricing strategies may discourage retailers from promoting fuel-efficient vehicles, thereby impeding compliance with regulatory requirements.

> *"There are agreements between us and distributors on the selling price. But honestly, it's unreasonable to have an 8,000 difference." (Dealer 10).*

In conclusion, it is credible to state that economic exchanges guided by structured pricing strategies, promotional efforts and mutually beneficial transactions among businesses may act as important enablers of interfirm adaptation in responding to climate change regulations. By guiding and structuring activities through collaborative exchanges, businesses within the Saudi automobile industry network can link their operations effectively. The findings highlight how economic exchanges enable the necessary adjustments in activities and resources, ensuring that businesses remain competitive while complying with climate change regulations.

### 5.3.6 Legal contracts

Lastly, legal contracts emerged as significant enablers of interfirm adaptation in responding to climate change regulations within the Saudi automobile industry. Contracts are legally "enforceable manifestations of consent" (Mouzas, 2022a: p. 103). Legal contracts refer to "the extent to which detailed and binding contractual agreements are used to specify the roles and obligations of the parties." (Cannon et al., 2000, p. 182). Well-designed contracts encourage "businesses to collaborate successfully and perform *activities* in exchange relationships" (Mouzas, 2022a: p. 103; emphasis added). Consistent with this perspective, the findings highlight that legal contracts safeguard the continuity of exchanges by clarifying the obligations and expectations of the involved businesses. They offer a formal framework that permits modifications in response to unanticipated contingencies (Cannon et al., 2000). Thus, well-designed contracts enhance business interactions by increasing predictability and certainty in interconnected activities while providing the flexibility to adapt to unexpected changes such as new climate change regulations.

The interviewees illustrate how binding contractual agreements serve as a framework to ensure compliance with climate change regulations. By signing agreements with regulatory authorities, manufacturers commit to achieving specific standards within a specified timeline, which creates predictability and enhances business interactions. These agreements also safeguard adaptation efforts by clarifying expectations and imposing penalties for non-compliance. Consequently, well-structured contracts underpin interfirm adaptation by establishing clear terms and accountability, enabling businesses to align their activities with evolving regulatory requirements.

> *"Ultimately, fuel economy is a national project (CAFE). It consists of figures defined by the authority in agreement and signatures from nearly 99% of the manufacturers. Most of them signed a commitment to the Saudi Authority to adhere to this specification, and failure to comply results in penalties. There are fines if they delay, which are called scheduling or raising the standard for the following year, meaning how much they will save for the next year to compensate for the current year. We have a monthly report submission by manufacturers every November. If a manufacturing company delays, they will pay a fine of 150,000 SAR for each month of delay, even if it's just one day.*
>
> *The second point is that the standard is based on meetings with manufacturers. It's not that the authority sat down and decided alone. There were proposed figures from the authority, and there was debate and negotiations between the authority and manufacturing companies. In the end, we agreed on the standard figures. Currently, we are working on negotiations regarding the second round for the upcoming five years." (Regulator 2).*

Moreover, interviewees highlight the role of formal contracts in facilitating logistical coordination and ensuring compliance with regulatory processes. Contracts create a structured approach to business interactions because they specify obligations such as car types, sales targets, and fuel consumption standards. Consequently, formalisation reduces uncertainty which may allow businesses to efficiently manage their activities while obeying to the requirements set by regulatory bodies. Thus, these legal contracts support interfirm adaptation by enhancing operational predictability and compliance.

Interviewees emphasise that formal agreements detailing obligations in business relationships enable adaptation to climate change regulations. For instance, agreements between manufacturers and dealers outline responsibilities such as representing the manufacturer's brand for a specified period, meeting sales targets, and promoting certain car models. These contracts enable dealers to align their promotional activities with the manufacturer's requirements, enabling interfirm adaptation. Additionally, dealers invest their resources based on these agreements, such as investing in technologies and car models that facilitate the response to climate change regulations, including hybrid and electric vehicles.

> *"We have an annual agreement between us and manufacturers. We agree on sales targets, and we agree on car ordering. If we want to retain distributorship and represent manufacturers' brands, we have to order a certain number of units in this kind of agreement. If we want to have distribution of [manufacturers brands] cars in Saudi Arabia, we must do this in the next two years; it is based on that… It became tougher now. They are now promoting smaller cars like [efficient model]. So we have to sell a certain number of [efficient models] to be able to sell well-known models with high fuel consumption." (Dealer 3).*

This quotation demonstrates how legal contracts between manufacturers and dealers specify obligations that drive interfirm adaptation. By agreeing on sales targets and car ordering, dealers commit to promoting and selling fuel-efficient models required by the manufacturer to comply with climate change regulations. These contracts facilitate the alignment of activities, enabling dealers to plan investments in technologies and promotional strategies that support regulatory compliance.

In contrast, legal contracts between businesses that are not well-detailed may hinder interfirm adaptations in responding to climate change regulations. For instance, interviewees highlight having contracts just for the purpose of legal requirements such as delivery and documentation to do economic exchanges does not impose the adaptation of

counterparts toward efficient cars. This is because the contracts do not encompass obligation details such as annual targets, or types of cars that could be linked to incentives that facilitate economic exchanges. Consequently, these contracts do not govern business activities toward responding to climate change regulations.

> *"We have contracts, and the reason is solely for cars delivery with a customs card. I'm obliged to set up retailers for customs cards. Because if I impose a target on them [retailers], I have to offer incentives, and we cannot provide these incentives" (Dealer 8).*

In conclusion, it is conceivable to assert that legal contracts act as crucial enablers of interfirm adaptation in responding to the evolving climate change regulations within the Saudi automobile industry. Well-designed contracts, which specify roles, obligations, and expectations, enhance business interactions by increasing predictability and certainty. They facilitate the alignment of activities among businesses, enabling interfirm adaptation to regulatory changes. Conversely, poorly structured contracts lacking detailed obligations may hinder interfirm adaptation efforts. The findings emphasise the importance of comprehensive legal contracts in supporting interfirm adaptation, enabling businesses to navigate the complexities of climate change regulations collaboratively.

## 5.4 Barriers of interfirm adaptation in responding to climate change regulations

After demonstrating the prior six enablers of interarm adaptations, the thematic analysis reveals a set of emergent themes that act as barriers of interfirm adaptation in responding to climate change regulations within the Saudi automobile industry. These barriers reveal how businesses within the Saudi automobile industry may fail to reach effective responses to climate change regulations through interaction within business networks that leads to interfirm adaptations. Understanding these barriers addresses the research questions by exploring the factors that may facilitate or hinder interfirm adaptation, thus

contributing to the overarching study aim of understanding businesses' responses to climate change regulations. Below are illustrations of these barriers themes supported by quotations from interviewees in the Saudi automobile industry.

### 5.4.1 Present bias

Present bias emerged as a significant behavioural error in business interaction that hinders interfirm adaptation in responding to climate change regulations within the Saudi automobile industry. Present bias refers to the tendency to settle for a smaller reward immediately instead of waiting longer for a larger reward in the future (Mouzas, 2022a). Present bias might hinder decision-makers' response to climate change because their cognitive concern is in the present, while climate change is slow, and usually seems unrelated and distant to the present (Gifford, 2011). The pursuit of immediate gratification implies delaying necessary sacrifices in the present (Mouzas, 2022a). In terms of the automobile industry, investment in environmentally friendly cars is expected to generate opportunities in the future as a consequence of strict regulations but is not expected to be beneficial in the meantime (Böttcher and Müller, 2015). Therefore, businesses might have a propensity towards well-known high-consumption cars at present, since efficient cars with new technologies such as hybrid require immediate investment (e.g., maintenance know-how and promotion) to generate value that is discounted at the time it can be taken into account.

Interviewees highlight that businesses that have the tendency to settle for immediate rewards are more likely to not adapt to their counterparts in responding to climate change regulations. For instance, Interviewees illustrate how present bias manifests in the reluctance to shift focus away from immediate gains (e.g., quick sales of well-known models) to strategies that align with climate change regulations, which might require longer-term adjustments in inventory management. Such behaviour prioritises short-term

rewards at the expense of broader collaboration with other businesses and compliance with climate change regulations. This finding aligns with O'Donoghue and Rabin (1999), who argue that present bias leads decision-makers to overvalue immediate gains while discounting long-term strategic benefits.

> *"Sales are fast, but my concern is to provide what is known, not just [new fuel-efficient model]. Do you understand? I won't accept when a retailer comes to me and says, "I want 100 [well-known high-consumption model]." I'll say I don't have them! But when they say, "I want 500 [new fuel-efficient model]," I'll say, "Go ahead, the stock is full.""* *(Dealer 8).*

In contrast, interviewees illustrate that businesses overcoming the tendency to settle for immediate gratifications have shown interfirm adaptation in responding to climate change regulations at both product and process levels. For instance, businesses use promotions to influence customer behaviour towards fuel-efficient cars. This reflects how a forward-looking approach, even at an initial cost to the business (e.g., offering free fuel), not only supports interfirm adaptation but also encourages long-term changes in market behaviour. This adaptation often stems from activities collaborations between manufacturers and dealers to promote fuel-efficient models and align with climate change regulations requirements, demonstrating that businesses overcome present bias through strategic activities enabling interfirm adaptation in responding to climate change regulations.

> *"In 2019, we offered promotions like free fuel for a year with models like the [fuel-efficient model] or some smaller cars. This was one of the tools we used to shift consumer behaviour, helping customers worry less about fuel costs and pushing smaller, fuel-efficient cars more strongly in the market."*

To sum up, it is conceivable to say that present bias acted as an emergent behavioural error that might hinder interfirm adaptation in responding to climate change regulations in the Saudi automobile industry. On the other hand, businesses that overcome this

tendency to settle for immediate gratification are more willing to interfirm adaptation in responding to climate change regulations as external pressure.

### 5.4.2 Reference points

After discussing present bias, reference points emerge as another hindrance of interfirm adaptation in responding to climate change regulations within the Saudi automobile industry. Derived from prospect theory (Kahneman and Tversky, 1979), the concept posits that outcomes are evaluated relative to a baseline or status quo. Maintaining this status quo can lead to resistance towards changes that appear to involve potential losses, outweighing perceived gains (Kahneman, 1992). In the Saudi automobile industry context, businesses anchored on the status quo may be reluctant to accept newer, environmentally compliant car models or processes introduced by their counterparts.

Interviewees illustrate how relying heavily on current practices and familiar car models hinders interfirm adaptation to climate change regulations. When businesses treat their established offerings and sales strategies as reference points, they tend to resist unfamiliar alternatives that could support compliance. This is consistent with Kwon and Lee (2009), who highlight that a car model is often perceived in relation to the current car fleet rather than for its actual monetary value per se, reinforcing the tendency to favour familiar options. For instance, some interviewees noted that retailers prefer sticking to existing models with proven demand, avoiding the risk of slower sales for less familiar yet more eco-friendly vehicles.

> *"We don't want to take risks with models that customers are unfamiliar with. Even if the dealers insist on promoting models with hybrid technology, we stick to what sells fast. Customers know what they want, and we deliver that." (Retailer 6).*

In contrast, interviewees also indicate that businesses capable of challenging their reference points are more likely to adapt effectively. By recognizing that maintaining the same product mix or routines is not viable, these businesses collaborate with their partners to introduce changes aligning with evolving market conditions and regulatory demands. Accepting that the old reference point was no longer sustainable enabled some dealers to update their product mix, thereby complying with shifting regulations.

> *"We recognised early on that the market was shifting. So, to adapt to that we worked with the manufacturer to introduce smaller engines and hybrid models. It was not easy change, but we knew staying the same was not an option." (Dealer 16).*

In conclusion, it is credible to say that reference points may significantly impact interfirm adaptation in the Saudi automobile industry. Businesses that remain anchored to existing car models, sales strategies, and market assumptions often resist the unfamiliar changes needed to meet climate change regulations. On the other hand, businesses that are willing to adjust or abandon the status quo are better positioned to adapt collaboratively with manufacturers, suppliers, and retailers. This dynamic highlights how overcoming reference points is essential for fostering innovation, aligning with external pressures arising from climate change regulations within the Saudi automobile industry.

### 5.4.3 Loss aversion

After discussing reference points, loss aversion emerges as the last hindrance of interfirm adaptation in responding to climate change regulations within the Saudi automobile industry. Stemming from prospect theory (Kahneman and Tversky, 1979), loss aversion refers to an asymmetric value function that is steeper for losses than for gains, meaning that businesses weigh potential losses more heavily than potential gains (Kahneman et al., 1991). This bias may lead businesses to reject expected profits from sustainable

practices in order to maintain their current revenue (Aljughaiman and Chebbi, 2022), hindering interfirm adaptation to climate change regulations.

Interviewees illustrate how loss aversion can discourage businesses from engaging with newer, more efficient models or processes. When businesses fear that adapting to regulatory demands might result in immediate financial loss or unsold inventory, they often choose to preserve the status quo. This aligns with prior research indicating that businesses often overestimate potential losses associated with change, leading them to maintain the status quo rather than pursue adaptation (Kim & Kankanhalli, 2009; Kahneman et al., 1991). Aljughaiman and Chebbi (2022) found that loss aversion negatively influences firms' market performance in Saudi Arabia, as businesses may refuse the expected profits from sustainable practices in order to maintain short-term revenue stability. This propensity to avoid potential short-term losses may hinder opportunities for compliance and long-term market gains. For instance, the following shows how the prioritisation of avoiding losses, even at the expense of potential gains, can impede interfirm adaptation. By refusing to stock fuel-efficient vehicles due to short-term uncertainty, the retailer risks falling behind in a market that is increasingly governed by climate change regulations.

> *"We cannot afford to stock cars that do not sell quickly. Even if these cars are fuel-efficient, we cannot take that chance when the market is unpredictable." (Retailer 7).*

In contrast, some businesses overcome loss aversion by recognising the long-term risks of not adapting. By framing interfirm adaptation as a way to stay competitive and sustain market performance, they shift focus from short-term losses to the benefits of regulatory compliance and future-orientated strategies.

> *"Switching to new car models that the manufacturer suggested was challenging, but we realised the loss of not adapting were greater. For us, it is about staying competitive in the long run." (Dealer 14).*
>
> *"Honestly, the profit margin for small cars is below zero, and as a distributor, I sell them at a loss... We want to keep moving the stock and compensate for the loss from other models." (retailer 2).*
>
> *"Smaller cars may not give high margins individually, but if you multiply the quantity, they're worthwhile. The [fuel-efficient model] boosted our market share numbers and supports rental sales because it builds relationships." (Dealer 9).*

These examples show how reframing adaptation highlights long-term gains in revenue, market share, and relationships, thereby mitigating the effects of loss aversion. By acknowledging that holding larger engines or older models could threaten future competitiveness, dealers choose to adapt to manufacturers to align with fuel economy standards.

In summary, loss aversion can significantly hinder interfirm adaptation by pushing businesses to avoid immediate financial risks, even when new models or processes could lead to long-term gains in responding to climate change regulations and competitiveness. In contrast, businesses with low loss aversion, which reframe interfirm adaptation in responding to climate change regulations as a gain, effectively shift their focus from short-term losses to broader benefits, thereby enabling them to adapt to climate change regulations in the Saudi automobile industry.

## 5.5 Conclusion

The chapter demonstrated that businesses in the Saudi automobile industry respond to climate change regulations through interfirm adaptation, a process characterised by adjustments in products and processes within interactive business networks. The findings highlight how negotiation, cooperation, and alignment among network actors facilitate

these adaptations, reflecting the embedded and relational nature of businesses' responses to external pressures.

The findings show that businesses' responses to climate change regulations are not isolated and atomistic practices but rather are interactive decisions of responding to such pressure that goes beyond individual business boundaries.

Businesses engaged in continuous negotiations and collaborations to align their strategies and operations to adapt to climate change regulations. These adaptations are evident in product adjustments, such as introducing smaller, fuel-efficient, and electric vehicle models, as well as process changes, including modifications to administrative procedures, inventory management, and marketing strategies. These efforts enable businesses to comply with regulatory standards like Corporate Average Fuel Economy (CAFE) and fuel labelling requirements while maintaining competitiveness.

Importantly, the findings from the thematic data analysis distinguish between enablers and barriers of interfirm adaptation, providing insights into the factors that support or obstruct businesses' ability to respond to climate change regulations. Among the enablers, resource entitlements, mobilisation, and exploitation play key roles in shaping how businesses access, negotiate, and utilise resources to adapt effectively. For example, resource entitlements provide a framework for securing necessary resources, mobilisation ensures access to suppliers' assets, and exploitation maximises the value of existing capabilities. These enablers are further strengthened by strong business relationships, economic exchanges, and well-structured legal contracts, all of which enhance coordination, predictability, and compliance within the network.

Conversely, the findings reveal that behavioural and cognitive biases, such as present bias, reliance on reference points, and loss aversion, act as significant barriers of interfirm

adaptation. Present bias leads to a focus on immediate rewards, which undermines long-term strategic decisions required for responding to climate change regulations. Similarly, reliance on existing reference points creates resistance to change, and loss aversion discourages businesses from pursuing new opportunities due to an exaggerated fear of potential losses. These barriers highlight the behavioural challenges businesses face when responding to climate change regulations.

The interactive nature of interfirm adaptation has been further clarified through the thematic analysis. The interplay of enablers and barriers demonstrates that businesses with a higher level of enabling factors and fewer hindering biases are more likely to achieve effective adaptation. This alignment highlights the importance of advancing collaborative networks and addressing behavioural barriers to improve businesses' adaptive capacities in responding to climate change regulations.

In brief, the findings of the qualitative phase are aligned with and extend prior research on interfirm adaptation by reinforcing the interactive nature of business responses to climate change regulations (Håkansson, 1982; Hallen et al., 1991; Håkansson and Snehota, 1995; Mouzas, 2024). Consistent with previous studies, resource entitlements (Mouzas, 2022b; Mouzas and Ford, 2018), resource mobilisation (Mouzas and Naudé, 2007), resource exploitation (O'Cass et al., 2014), economic exchanges (Mouzas, 2022a), business relationships (Håkansson and Snehota, 1995) and legal contracts (Cannon et al., 2000; Mouzas, 2022a) are identified as key enablers of interfirm adaptation. Additionally, findings on behavioural biases including present bias (Mouzas, 2022a; Gifford, 2011), reference points (Kahneman and Tversky, 1979), and loss aversion (Kahneman et al., 1991; Aljughaiman and Chebbi, 2022), reinforce previous research on cognitive barriers to interfirm adaptation while demonstrating their impact at the interfirm

level. By integrating these references, the study clarifies how businesses' adaptive responses align with existing theoretical perspectives. The following chapter moves to present the analysis and findings of the second phase of this thesis which is the quantitative phase.

# Chapter 6: Quantitative phase

## 6.1 Introduction

This chapter details the findings from the quantitative data analysis. It begins with a section on hypotheses development, providing the theoretical justification for the proposed hypotheses based on qualitative findings. After that, the discussion follows the structure outlined in the data analysis procedures from the methodology chapter (Chapter 3, section 3.7.5). The chapter is organised into three primary sections. The first section, data preparation, addresses data accuracy and the transformation of raw data for subsequent analysis. The second section, preliminary analysis, describes the participants' demographic information and checks conducted on the variables to ensure validity and reliability. The third section, hypothesis testing, focuses on presenting the results of the proposed hypotheses.

## 6.2 Hypotheses development

This section presents the development of hypotheses grounded in the qualitative findings and existing literature. The proposed hypotheses aim to explain how legal contracts, economic exchanges, and business relationships mediate the effects of resource enablers and behavioural biases on customer and supplier adaptation, highlighting the interactive nature of interfirm adaptation in responding to climate change regulations.

Business responses to climate change regulations are shaped by their ability to manage complex interactions within networks. Contracts, as a critical governor in these interactions, mediate the influence of the constructs namely, resource entitlements, mobilisation, and exploitation, on customer and supplier adaptation. Contracts serve as governance mechanisms that formalise expectations, align incentives, and reduce uncertainty in business interactions (Cannon et al., 2000; Mouzas, 2022a). By structuring

obligations and ensuring predictability, contracts might facilitate resource entitlements, mobilisation, and exploitation in interfirm adaptation.

The qualitative findings reveal that resource entitlements, such as brand rights and technical expertise, establish a foundation for interfirm adaptation by structuring interactions and obligations between actors. For instance, dealers exercise their rights to manufacturers' brands while fulfilling their duties to meet sales targets, which enables alignment with evolving regulatory requirements. Simultaneously, resource mobilisation enables adaptation by providing businesses access to heterogeneous resources. Businesses interact to align their strategies, jointly developing products and processes to comply with regulations like the Corporate Average Fuel Economy (CAFE) standards. Finally, resource exploitation plays a vital role in refining existing resources to meet regulatory demands efficiently. Incremental improvements, such as introducing fuel-efficient technologies in established car models, demonstrate how businesses optimise resources to maintain competitive advantage while ensuring compliance with climate change regulations.

The idea for this study came from the realisation that, despite the existing literature on contracts (e.g., Cannon et al., 2000; Mouzas, 2022a; Mouzas and Ford, 2012), the important role that contracts play in interactions within business networks remains inadequately explored. Contracts mediate these resource-based interactions by formalising economic exchanges among network actors. They provide a structured framework for coordination, ensuring that entitlements, mobilisation and exploitation of resources are effectively leveraged to achieve customer and supplier adaptation. Therefore, the following hypotheses are proposed:

H1: Contracts mediate the positive effect of entitlements (H1a), mobilisation (H1b), and exploitation (H1c) on customer adaptation.

H2: Contracts mediate the positive effect of entitlements (H2a), mobilisation (H2b), and exploitation (H2c) on supplier adaptation.

Interactions within business networks are driven by economic exchanges that enable businesses to adapt to external pressures, such as climate change regulations. Economic exchanges, encompassing the flow of goods, services, information, and financial resources, play a crucial role in linking resource entitlements, mobilisation, and exploitation to customer and supplier adaptation. These exchanges not only enable interfirm adaptation but also reinforce the collaborative efforts necessary to respond to climate change regulations. This role of economic exchanges in linking resource-based processes to adaptation is well recognised in business network research, where economic exchanges serve as structured mechanisms that support collaborative adjustments in response to external pressures such as climate change regulations (Möller & Halinen, 2018; Håkansson & Snehota, 1995; Mouzas, 2022a).

The qualitative findings highlight that resource entitlements serve as a foundation for economic exchanges within networks. For example, dealers leverage their entitlements, such as the rights to specific brands and models, to align their offerings with regulatory standards. These entitlements are critical for structuring the economic exchanges between manufacturers and dealers, ensuring that both parties meet their duties and benefit from the relationship. Similarly, resource mobilisation enables businesses to access and integrate the capabilities of their network partners. Dealers and manufacturers collaborate to mobilise resources such as advanced technologies and supply chain adjustments, fostering a coordinated response to evolving regulations like CAFE standards.

Furthermore, resource exploitation maximises the utility of existing resources, as demonstrated by manufacturers' refinement of car technologies to improve fuel efficiency and comply with climate change regulation requirements.

Economic exchanges mediate these interactions by ensuring that the flow of resources and information between businesses is effectively managed and aligned with regulatory demands. By facilitating mutual adaptation in products and processes, economic exchanges enable businesses to strengthen relationships and maintain competitiveness. Therefore, the following hypotheses are proposed:

H3: Exchanges mediate the positive effect of entitlements (H3a), mobilisation (H3b), and exploitation (H3c) on customer adaptation.

H4: Exchanges mediate the positive effect of entitlements (H4a), mobilisation (H4b), and exploitation (H4c) on supplier adaptation.

Business relationships within networks are foundational to the adaptive responses of businesses to climate change regulations. Business relationships serve as structured mechanisms that link resources and activities within networks supporting businesses alignment with their adaptation strategies (Håkansson & Snehota, 1995; Mouzas, 2022a). Furthermore, Prenkert et al. (2019) highlight that resources become useful when applied through business interaction, supporting the role of relationships in enabling interfirm adaptation. By fostering trust, commitment, and collaboration, business relationships mediate the effects of resource entitlements, mobilisation, and exploitation on customer and supplier adaptation. In high-quality relationships, trust and fairness facilitate cooperation, enabling businesses to navigate regulatory challenges collectively (Johnson, 1999; Abosag, 2015). The strength and quality of these relationships determine how effectively businesses can align their strategies and resources to meet regulatory

demands. This is particularly relevant in Saudi Arabia, where trust-based business relationships enhance coordination and adaptation in responding to external pressure like climate change regulations (Abosag, 2015).

The qualitative findings underscore the role of resource entitlements in structuring relationships. Dealers rely on entitlements, such as rights to manufacturers' brands, to strengthen their ties with suppliers and enhance their adaptation efforts. These entitlements formalise mutual obligations, ensuring alignment with evolving environmental standards. Resource mobilisation further supports these relationships by facilitating access to critical capabilities and technologies through collaboration. For instance, manufacturers and dealers coordinate their efforts to introduce fuel-efficient and compliant vehicles to the market. Additionally, resource exploitation strengthens relationships by maximising the value of shared resources, such as advanced technologies and refined processes, enabling mutual benefits and sustained interaction.

Relationships mediate these interactions by serving as a foundation for trust and cooperation, ensuring that resources are effectively aligned to achieve customer and supplier adaptation. Strong relationships enable businesses to navigate regulatory challenges collaboratively, maintaining competitiveness and compliance. Therefore, the following hypotheses are proposed:

H5: Relationships mediate the positive effect of entitlements (H5a), mobilisation (H5b), and exploitation (H5c) on customer adaptation.

H6: Relationships mediate the positive effect of entitlements (H6a), mobilisation (H6b), and exploitation (H6c) on supplier adaptation.

Business responses to climate change regulations are shaped by their ability to manage interactions within business networks. Contracts, as an important guidance in these interactions, expected to mediate the negative effect of the constructs namely loss aversion, present bias, and reference points on customer and supplier adaptation. Contracts serve as governance mechanisms that formalise expectations, align incentives, and reduce uncertainty in business interactions (Cannon et al., 2000; Mouzas, 2022a). However, businesses affected by behavioural biases, such as present bias, may avoid committing to formal agreements, preferring immediate gains over structured long-term obligations (Thaler, 2016). This unwillingness to establish contracts may weakens coordination and predictability, ultimately hindering interfirm adaptation to climate change regulations. Similarly, loss aversion may lead businesses to avoid perceived risks associated with long-term contractual commitments, prioritising short-term revenue over structured agreements that support interfirm adaptation (Kim and Kankanhalli, 2009; Kahneman et al., 1991). Likewise, reference points can reinforce businesses' reluctance to establish well-defined contracts by anchoring them to prior contractual norms, making them hesitant to adopt detailed agreements that clearly outline obligations and responsibilities in response to evolving regulatory requirements. Consequently, the absence of well-structured contracts weakens coordination, reduces predictability, and thus hinders interfirm adaptation in response to climate change regulations.

Contracts expected to mediate the negative effect of loss aversion, present bias, and reference points on interfirm adaptation to climate change regulations. Therefore, the following hypotheses are proposed:

H7: Contracts mediate the negative effect of loss aversion (H7a), present bias (H7b), and reference points (H7c) on customer adaptation.

H8: Contracts mediate the negative effect of loss aversion (H8a), present bias (H8b), and reference points (H8c) on supplier adaptation.

Behavioural biases expected to negatively influence businesses' ability to engage in economic exchanges, which in turn affects negatively their interfirm adaptation. Loss aversion, present bias, and reference points create decision-making barriers that reduce businesses' willingness to engage in economic exchanges. Consequently, a decline in economic exchanges negatively influences interfirm adaptation. Loss aversion reflects businesses' tendency to prioritise avoiding losses over getting equivalent gains (Kahneman et al., 1991). This bias may lead businesses to resist economic exchanges due to concerns about financial risks. Businesses hesitate to enter new agreements or modify existing economic exchanges out of fear of uncertain outcomes regarding efficient cars. As a result, exchanges are constrained can reduce opportunities for business collaboration (Guo et al., 2017; Mouzas, 2022a). A reduction in exchanges may limits businesses' ability to adapt to external pressures such as climate change regulations (Håkansson and Snehota, 1995).

Present bias causes businesses to favour immediate rewards over long-term benefits (Thaler, 1981). This short-term focus discourages businesses from economic exchanges that require sustained commitment. For example, businesses may avoid contractual agreements involving long-term cost-sharing or delayed benefits, weakening exchange relationships (Guo et al., 2017; Ting and Ahn, 2023). A reduction in exchanges further hinder interfirm adaptation.

Reference points shape how businesses evaluate changes relative to their current position (Kahneman and Tversky, 1979). Firms often compare potential exchanges to existing relationships, making them reluctant to adjust transaction structures or enter new

agreements if perceived changes deviate significantly. This reluctance reduces exchange activities, weakening businesses to coordinate adaptation strategies (Möller and Halinen, 2018; Veal and Mouzas, 2010). A decline in exchanges may hinders interfirm adaptation, preventing businesses from adjusting products and processes effectively.

Economic exchanges play a critical role in enabling businesses to adapt by facilitating resource sharing, aligning incentives, and reducing uncertainty (Möller and Halinen, 2018). However, when biases reduce exchanges, businesses may face limitations in coordinating adaptation efforts. Fewer exchanges mean fewer opportunities to adjust to regulatory changes, ultimately hindering interfirm adaptation. Thus, behavioural biases expected to negatively affect economic exchanges, and in turn, economic exchanges negatively affect interfirm adaptation. Therefore, the following hypotheses are proposed:

H9: Exchanges mediate the negative effect of loss aversion (H9a), present bias (H9b), and reference points (H9c) on customer adaptation.

H10: Exchanges mediate the negative effect of loss aversion (H10a), present bias (H10b), and reference points (H10c) on supplier adaptation.

Behavioural biases are expected to negatively influence business relationships, which in turn negatively affect interfirm adaptation. Loss aversion, present bias, and reference points create decision-making barriers that reduce businesses' willingness to engage in and maintain high-quality relationships. Consequently, business relationship quality can negatively affect interfirm adaptation. Loss aversion leads businesses to prioritise avoiding losses over seeking potential gains (Kahneman et al., 1991). This may reduce willingness to maintain relationships due to perceived uncertainties in returns. Businesses may resist collaborative agreements that require trust and commitment, weakening

relationship quality (Johnson,1999). A decline in strong business relationships may reduce interfirm adaptation.

Present bias may cause businesses to prioritise immediate benefits, discouraging long-term relationship investments (Thaler, 1981). This short-term focus leads businesses to avoid forming deep, trust-based relationships that facilitate interfirm adaptation (Guo et al., 2017; Ting and Ahn, 2023). Without strong relationships, businesses might struggle to coordinate adaptation efforts, particularly in response to climate change regulations (Möller and Halinen, 2018).

Business relationships are essential for businesses to coordinate activities, combine resources, and adapt to external pressures. When these relationships weaken due to behavioural biases, businesses may struggle to collaborate effectively, making adaptation more difficult. A decline in trust and cooperation reduces businesses' ability to adjust their activities in response to climate change regulations. Therefore, behavioural biases negatively impact business relationships, which in turn hinder interfirm adaptation. Therefore, the following hypotheses are proposed:

H11: Relationships mediate the negative effect of loss aversion (H11a), present bias (H11b), and reference points (H11c) on customer adaptation.

H12: Relationships mediate the negative effect of loss aversion (H12a), present bias (H12b), and reference points (H12c) on supplier adaptation.

In summary, the proposed hypotheses provide a framework for understanding the mediating role of contracts, exchanges, and relationships in addressing the effects of resource enablers and behavioural biases on interfirm adaptation. These hypotheses

bridge the qualitative findings and quantitative analysis, illustrating how businesses navigate complex interactions to comply with climate change regulations.

## 6.3 Data preparation

As discussed previously in the methodology chapter (Chapter 3, section 3.7.5.1) the rationale of data preparation is to address data accuracy and derive value from raw data for subsequent analysis (Tabachnick and Fidell, 2019; Pallant, 2020). Six issues were addressed before proceeding with preliminary analyses. These issues are data validation, editing and coding, error detection, outliers, normality, and common method variance (CMV).

### 6.3.1 Data validation

119 participants aimed at completing the online survey. The researcher checked for any uncompleted survey within the given time window. In total, twenty participants were removed as they did not complete the survey. After deleting these invalid responses, 99 participants were retained for subsequent analysis.

### 6.3.2 Data editing and coding

Following data validation, the subsequent step in data preparation involved data editing. A "force response requirement" was implemented for all questions to mitigate issues with missing data and facilitate editing and coding. Nevertheless, reverse-coded items were employed in the present survey to ensure participants' engagement with each item. The SPSS transformation tool was utilised to recode items and ensure uniform direction across all items in the survey.

### 6.3.3 Error detection

The SPSS software facilitated error detection routines. Error detection was implemented in all previous steps to identify and correct any inaccurate data before it was used for

further analysis. Aligned with Pallant's (2020) recommendations, data errors were examined using simple descriptive statistics such as mean, minimum, and maximum. The researcher utilised these straightforward checks to identify if items were falling out of the 7-point scale ordinary range. No issues were found as all items were within the ordinal range with the correct values assigned to each item.

### 6.3.4 Outliers

The process of data preparation included looking for outliers in the study dataset. A standardised score (z-score) was obtained by converting all the variable scores using the univariate detection method (Hair et al., 2019). Potential outliers include any z-scores that are greater than +3.29 or less than -3.29 (Tabachnick and Fidell, 2019). The 7-point Likert-scale items used to measure the study variables were averaged utilising the SPSS transformation tool to form composite measures of these items before calculating z-scores. Table 6.1 presents the standardised score (z-score) for all these variables. The researcher did not find any outliers cases in the current dataset.

Table 6. 1 Standardised score (z-score)

| z-score | N | Minimum | Maximum |
|---|---|---|---|
| Customer adaptation | 99 | -2.43 | 1.46 |
| Supplier adaptation | 99 | -2.24 | 1.46 |
| Resource entitlements | 99 | -2.35 | 1.56 |
| Resource mobilisation | 99 | -2.06 | 1.46 |
| Resource exploitation | 99 | -2.40 | 1.24 |
| Business relationships | 99 | -2.36 | 1.49 |
| Economic exchanges | 99 | -2.56 | 1.44 |
| Legal contracts | 99 | -2.06 | 1.22 |
| Reference points | 99 | -2.40 | 1.87 |

### 6.3.5 Normality

The researcher checked the current data for normality. As mentioned previously in the methodology chapter (section 3.7.5), the researcher employed both subjective graphical plots (Q–Q plots) and objective statistical tests (Kolmogorov–Smirnov and Shapiro–Wilk tests, and the values of skewness and kurtosis) to evaluate whether the data are normally distributed (Hair et al., 2019).

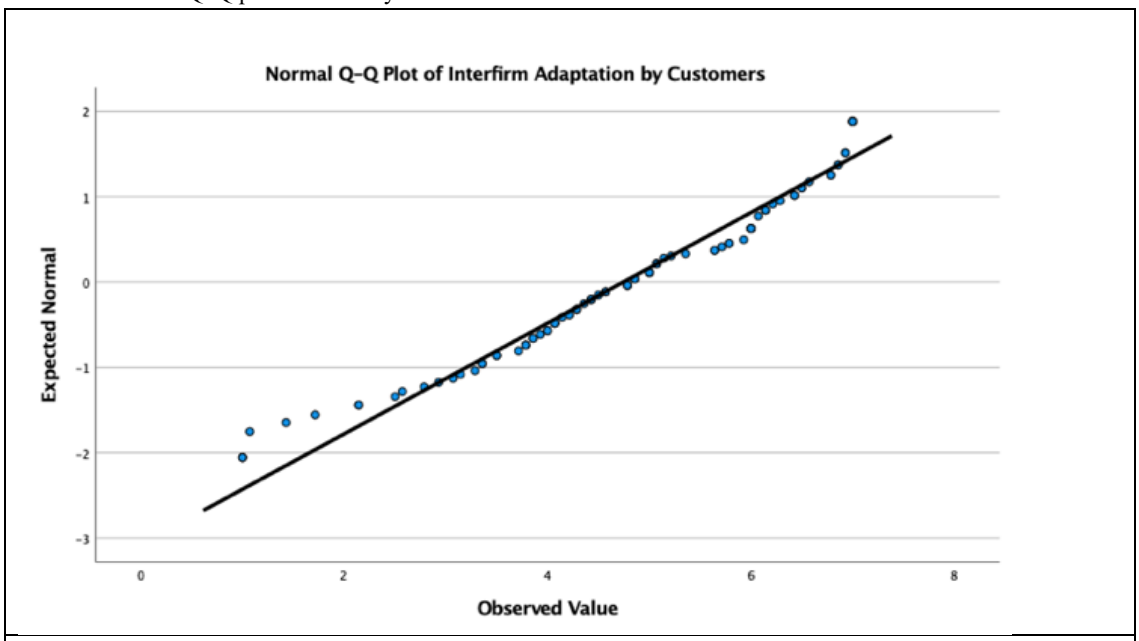
Firstly, Table 6.2 displays the normal Q–Q plot of the study variables, revealing deviations from normality for all variables. Secondly, Table 6.3 presents the results of the Kolmogorov–Smirnov and Shapiro–Wilk tests. Both tests indicate significant deviations from normality for all variables at ($p < 0.05$). Thus, it is important to interpret normality using skewness and kurtosis values alongside Q–Q plots, Kolmogorov–Smirnov and Shapiro–Wilk tests (Hair et al., 2023).

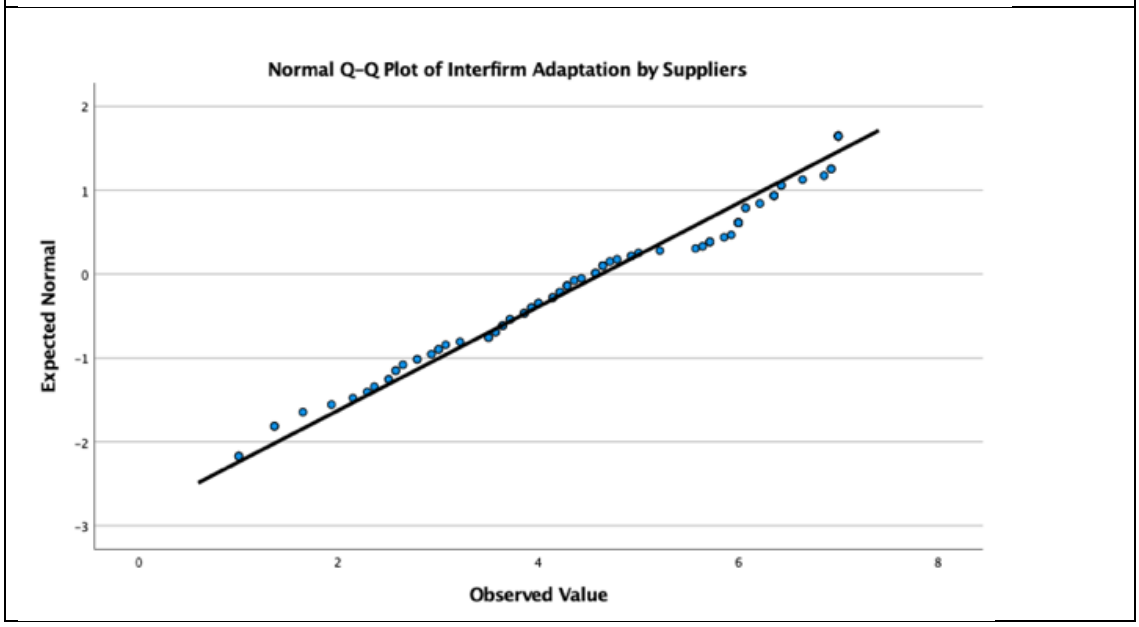
Thirdly, Table 6.4 illustrates the skewness and kurtosis values of the study variables. Skewness indicates the departure from balanced distribution while kurtosis indicates the peakiness of distribution (Hair et al., 2023). Skewness and kurtosis values ideally fall within the range of ±1.0 (Hair et al., 2023), indicating whether a distribution's tails are heavier or lighter compared to a normal distribution. The present study's skewness values ranged from -0.252 to -0.819, and kurtosis values ranged from -0.120 to -0.846. These results suggest that the data follows a normal distribution, given that the skewness and kurtosis values fall within the acceptable range.

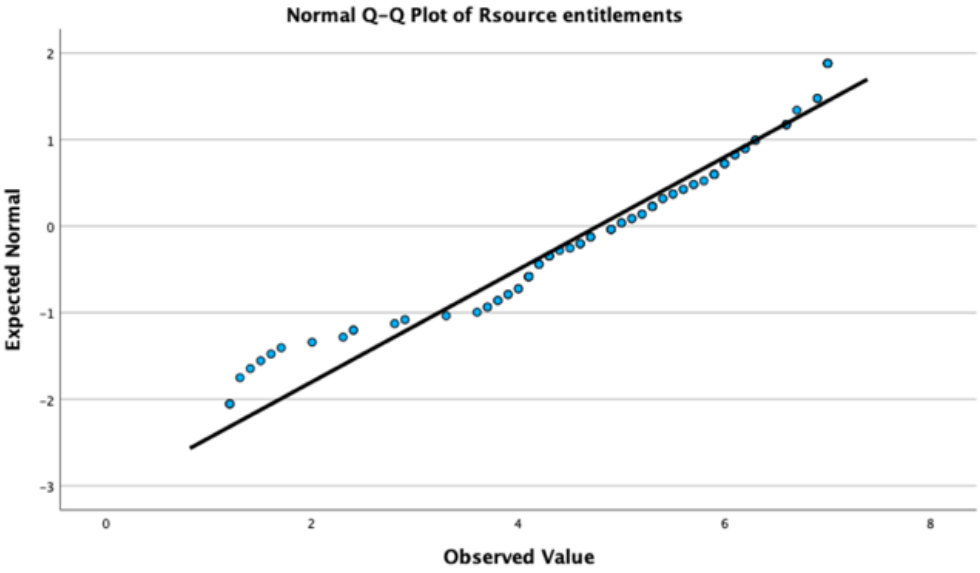
In summary, normality was assessed in the current data. Results from the Q–Q plot and statistical tests suggest deviations from normality. However, skewness and kurtosis values fall within acceptable ranges for the study variables. Thus, it can be said that the

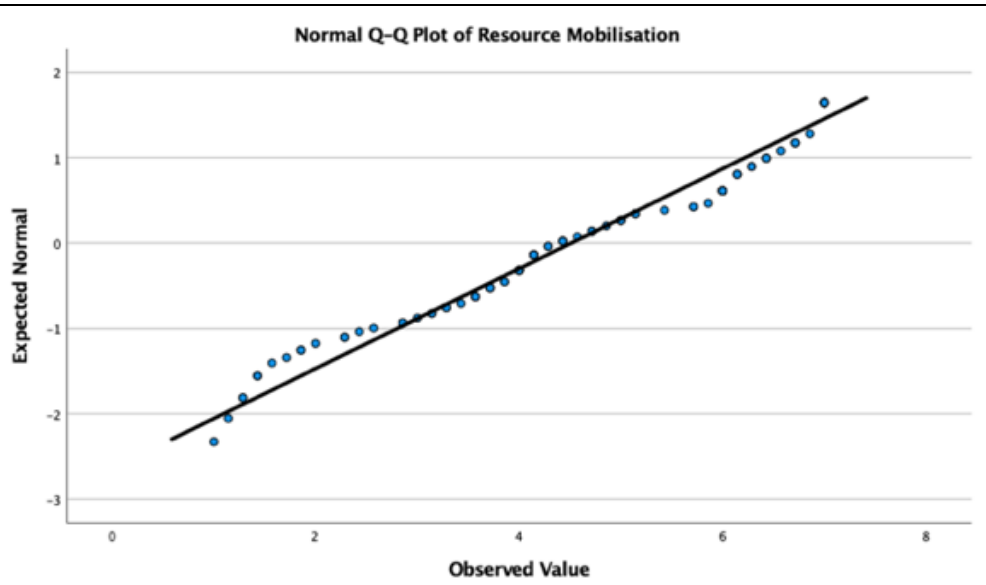
data follow a normal distribution. The subsequent section presents the findings of Harman's one-factor test, employed to mitigate method biases.

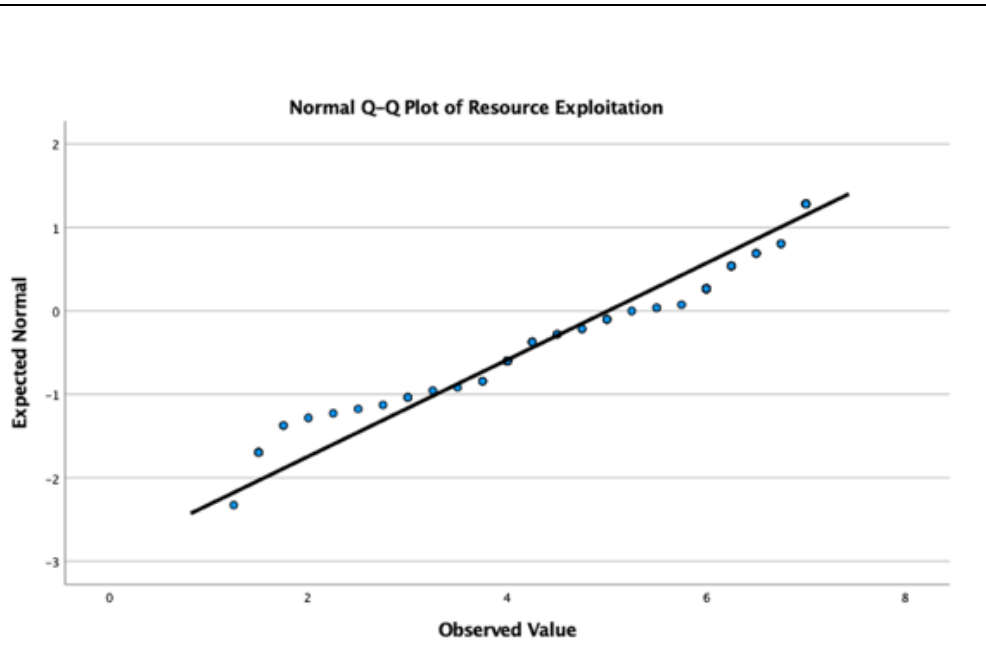
Table 6. 2 Normal Q–Q plot of the study variables

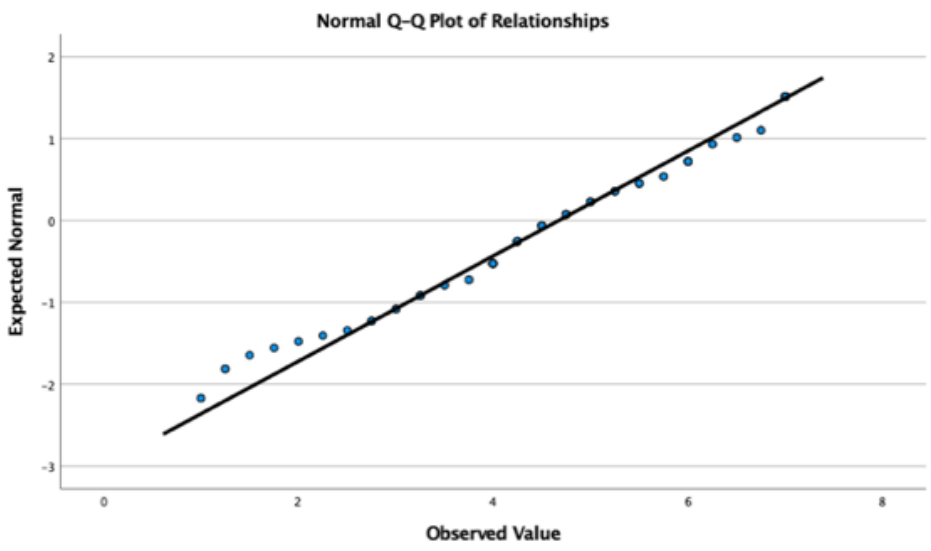


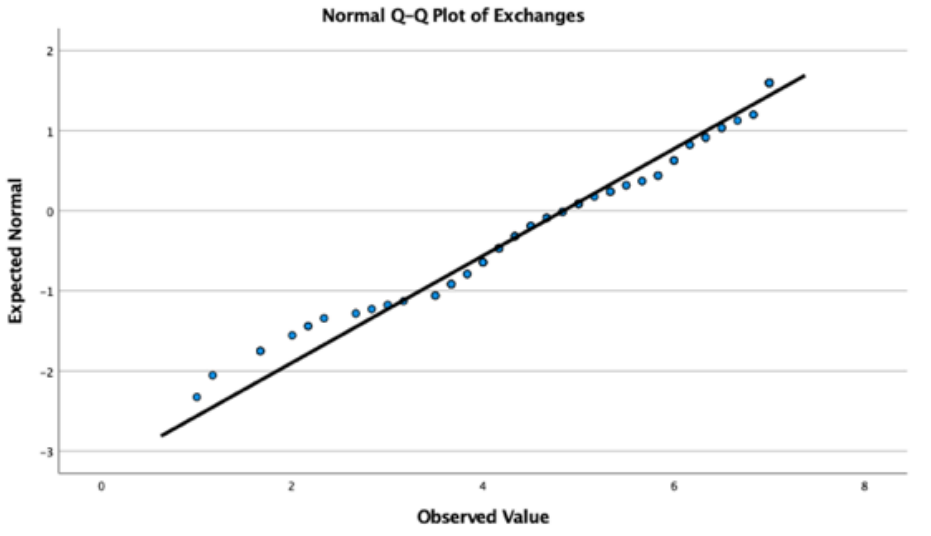



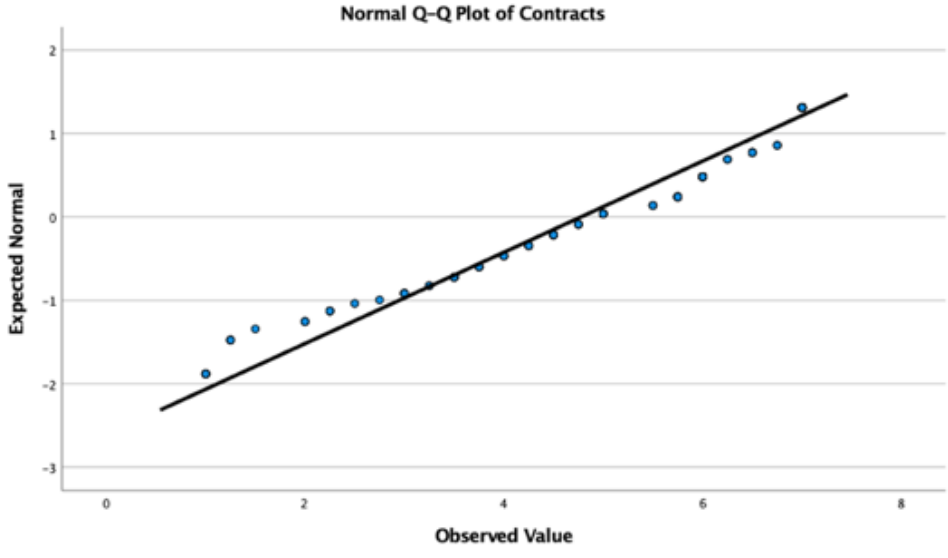

Normal Q-Q Plot of Rsource entitlements
Expected Normal
Observed Value
2
1
0
-1
-2
-3
0
2
4
6
8


Normal Q-Q Plot of Resource Mobilisation
Expected Normal
Observed Value
2
1
0
-1
-2
-3
0
2
4
6
8


Normal Q-Q Plot of Resource Exploitation
Expected Normal
Observed Value
2
1
0
-1
-2
-3
0
2
4
6
8


Normal Q–Q Plot of Relationships
Expected Normal
Observed Value
2
1
0
-1
-2
-3
0
2
4
6
8


Normal Q–Q Plot of Exchanges
Expected Normal
Observed Value
2
1
0
-1
-2
-3
0
2
4
6
8


Normal Q–Q Plot of Contracts
Expected Normal
Observed Value
2
1
0
-1
-2
-3
0
2
4
6
8

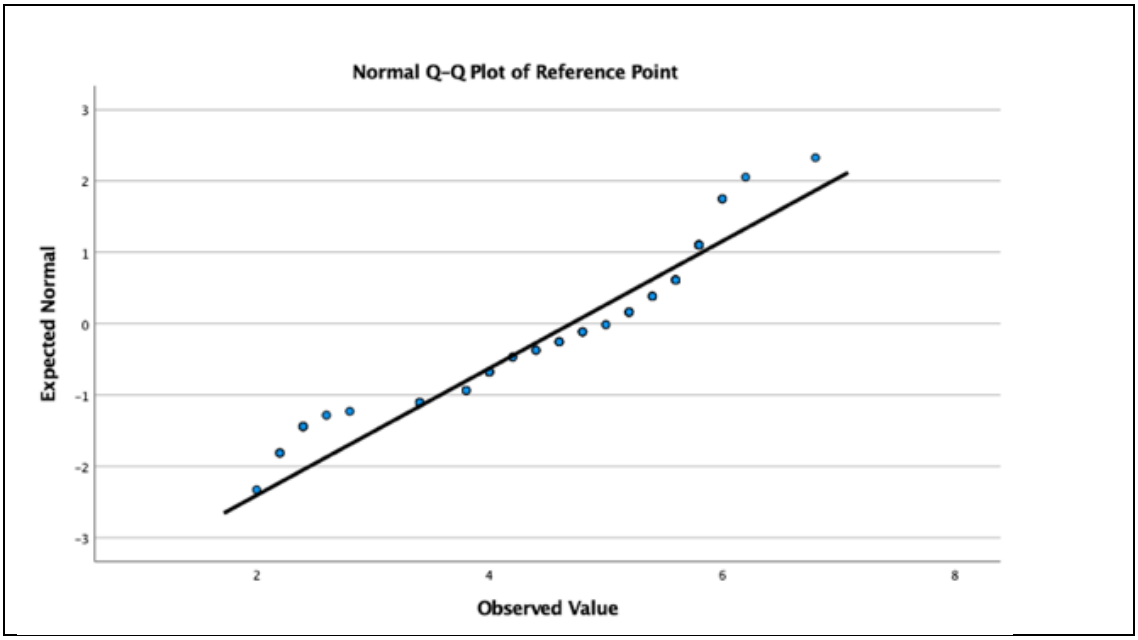



Table 6. 3 The Kolmogorov–Smirnov and Shapiro–Wilk tests

| Variable | Kolmogorov–Smirnov | | | Shapiro–Wilk | | |
|---|---|---|---|---|---|---|
| | Statistic | df | Sig. | Statistic | df | Sig. |
| Customer adaptation | 0.095 | 99 | 0.027 | 0.954 | 99 | 0.002 |
| Supplier adaptation | 0.144 | 99 | 0.003 | 0.956 | 99 | 0.002 |
| Resource entitlements | 0.089 | 99 | 0.05 | 0.939 | 99 | < 0.001 |
| Resource mobilisation | 0.122 | 99 | 0.001 | 0.950 | 99 | < 0.001 |
| Resource exploitation | 0.108 | 99 | 0.006 | 0.932 | 99 | < 0.001 |
| Business relationships | 0.090 | 99 | 0.047 | 0.960 | 99 | 0.004 |
| Economic exchanges | 0.094 | 99 | 0.032 | 0.955 | 99 | 0.002 |
| Legal contracts | 0.137 | 99 | < 0.001 | 0.920 | 99 | < 0.001 |
| Reference points | 0.166 | 99 | < 0.001 | 0.908 | 99 | < 0.001 |

Table 6. 4 Skewness and kurtosis values

| Variable | N | Mean | Median | Std. Deviation | Skewness | Kurtosis |
|---|---|---|---|---|---|---|
| Customer adaptation | 99 | 4.74 | 4.79 | 1.54 | -0.55 | -0.167 |
| Supplier adaptation | 99 | 4.63 | 4.57 | 1.62 | -0.252 | -0.806 |

| | | | | | | |
|---|---|---|---|---|---|---|
| Resource entitlements | 99 | 4.77 | 4.9 | 1.54 | -0.687 | -0.069 |
| Resource mobilisation | 99 | 4.51 | 4.43 | 1.70 | -0.270 | -0.846 |
| Resource exploitation | 99 | 4.96 | 5.00 | 1.65 | -0.521 | -0.587 |
| Business relationships | 99 | 4.67 | 4.50 | 1.56 | -0.335 | -0.367 |
| Economic exchanges | 99 | 4.84 | 4.83 | 1.50 | -0.488 | -0.261 |
| Legal contracts | 99 | 4.77 | 5.00 | 1.83 | -0.549 | -0.691 |
| Reference points | 99 | 4.70 | 5.00 | 1.12 | -0.819 | -0.120 |

### 6.3.6 Common method variance (CMV)

In the methodology chapter, section 3.7.4, various strategies were discussed that were applied to mitigate potential method biases. Additionally, one of the recommended statistical techniques to control these biases is Harman's one-factor test (Podsakoff et al., 2003). According to this test, if one factor accounts for more than 50% of the total variance extracted, it suggests the presence of common method bias (Fuller et al., 2016). In this study, the researcher applied the one-factor test, which resulted in a total variance of 48.2%. This result suggested that CMV is not an issue in the design of the questionnaire.

To conclude the data preparation section, all the steps taken aimed to address data accuracy and derive value from raw data for subsequent analysis. Six issues were addressed before proceeding with preliminary analyses. These issues are data validation, editing and coding, error detection, outliers, normality, and CMV. The results indicate that 99 participants were retained for further analysis. The next section of this chapter will discuss and present all the steps in the preliminary analyses.

## 6.4 The preliminary analyses

As discussed previously in the methodology chapter, section 3.7.2. Qualtrics software was used as a tool to design the online survey. After dealing with the issues mentioned in the data preparation stage, a total of 99 valid responses were considered for subsequent analysis. Preliminary analyses cover presenting the participants' descriptive statistics, examining convergent and discernment validity, and evaluating reliability. After covering these aspects, the researcher moves to hypothesis testing and provides results in great detail as the last stage of the quantitative data analysis.

### 6.4.1 Demographic profile

The data was collected online from December 2023 to February 2024. The demographic profile of the usable 99 surveys is detailed using descriptive statistics. A demographic summary is presented in Table 6.5.

In the quantitative study's sample, 36.4% of participants represent car dealers, while 63.6% represent car retailers in the Saudi automobile industry. The higher percentage of car retailers in the sample might be attributed to the relatively higher number of car retailers compared to car dealers, as discussed in the study context chapter, section 4.5. The sample represents an almost equal percentage of firm types, as defined in the study context chapter, section 4.5, with 51.5% exclusive representatives of automobile brands and 48.5% non-exclusive.

Compared to the qualitative study, which included 17 dealers (65.4%), 8 retailers (30.8%), and 3 regulatory bodies (11.5%), the quantitative sample consisted only of dealers and retailers. A possible justification for the higher number of interviewed car dealers in the qualitative phase could be their greater cooperation in providing referrals compared to car retailers. In addition, regarding the inclusion of regulatory bodies, the

qualitative phase incorporated regulators to capture their perspectives on compliance and policy implementation. In contrast, the quantitative phase focused solely on business actors, as it aimed to measure interfirm adaptation and its influencing factors, which are specific to dealers and retailers, as discussed previously in the sampling section (3.7.2).

Regarding firms' size, the majority of the study sample falls into small or large firms, while only a few firms fall into the middle category. 50.5% of the sample are small firms with 50 employees or below, and 37.4% are firms with 251 employees or more. On the other hand, the firms' ages vary across the categories, ranging from below 5 years to 46 years and more. Last, the participants hold positions in the automobile firms nearly 50% are general managers, sales managers, purchase managers, and marketing consultants, while the rest are senior employees and others in the automobile industry.

Table 6. 5 participants' demographic summary

| | N | (%) | | N | (%) |
|---|---|---|---|---|---|
| ***Firm position*** | | | ***Firm age*** | | |
| Car dealer | 36 | 36.4 | 5 years or less | 14 | 14.1 |
| Car retailer | 63 | 63.6 | 6-15 years | 23 | 23.2 |
| ***Firm type*** | | | 16-25 years | 17 | 17.2 |
| Exclusive | 51 | 51.5 | 26-35 years | 14 | 14.1 |
| Non-exclusive | 48 | 48.5 | 36-45 years | 11 | 11.1 |
| ***Firm size*** | | | 46 years or more | 20 | 20.2 |
| 50 employees or less | 50 | 50.5 | ***Participant position*** | | |
| 51-250 employees | 12 | 12.1 | General manager | 7 | 7.1 |
| 251 or more | 37 | 37.4 | Sales manager | 18 | 18.2 |
| | | | Purchase manager | 13 | 13.1 |
| | | | Senior employee | 54 | 54.4 |
| | | | other | 7 | 7.1 |

### 6.4.2 Convergent and discriminant validity

As discussed in the methodology chapter, section 3.8.5, the researcher conducted partial least square structure equation modelling (PLS-SEM) algorithm using SmartPLS software version 4.1 to assess the measurement convergent and discriminant validity. Before assessing the measurement validity, it was necessary to ensure that the items of each construct were significantly loading onto their respective constructs. According to Hair et al. (2021), items should be considered for removal only when deleting the item leads to an increase in internal consistency reliability or convergent validity. Therefore, the researcher deleted items Ent_4, Ent_5, Ent_7, Ent_10, Mob_2, Mob_4, and Mob_6 due to cross-loading, and item RP_5 due to low loading as shown in table 6.6. All the deleted items were generated based on the qualitative findings and were not adapted from previous studies. After purifying the items, the remaining items were retained for subsequent analysis.

Convergent validity was evaluated through three criteria: (1) factor loadings exceeding the recommended threshold of 0.5; (2) average variance extracted (AVE) values surpassing 0.5; and (3) composite reliability (CR) values equal to or higher than 0.60.

The average variance extracted (AVE) is calculated by summing the squares of all standardized factor loadings (squared multiple correlations) and dividing the total by the number of items, as demonstrated in the equation below:

$$\mathrm{AVE} = \frac{\sum_{i=1}^{n} Li^2}{n}$$

L$i$ symbolizes the standardized factor loading, where $i$ signifies the item number. Hence, for $n$ items, CR is derived by squaring the sum of factor loadings (L$i$) for each construct

and adding the total error variance terms for that construct ($ei$), as depicted in the equation provided (Hair et al., 2019):

$$\mathrm{CR} = \frac{\left(\sum_{i=1}^{n} Li\right)^2}{\left(\sum_{i=1}^{n} Li\right)^2 + \left(\sum_{i=1}^{n} ei\right)}$$

Table 6.6 demonstrates the confirmation of convergent validity, with all items displaying standardised factor loadings surpassing the suggested threshold of 0.5. Moreover, the AVE for each construct surpassed the 0.5 level. Additionally, the CR values significantly exceeded the minimum requirement of 0.60.

Table 6. 6 Scale items, factor loading, AVE, CR, and Cronbach's alpha

| Construct | Item's code | Scale item description | Factor loading | AVE | CR | Cronbach's Alpha (α) |
|---|---|---|---|---|---|---|
| **Customer adaptation** | | Since the implementation of fuel efficiency regulations in 2016 (e.g., fuel labels), our firm has made adaptations to meet our suppliers' needs and wants, particularly in the adaptation of… | | 0.749 | 0.977 | 0.974 |
| | CA_1 | 1. product types. | 0.819 | | | |
| | CA_2 | 2. product features. | 0.863 | | | |
| | CA_3 | 3. product design. | 0.875 | | | |
| | CA_4 | 4. product technologies (e.g., hybrid, turbo). | 0.860 | | | |
| | CA_5 | 5. product quantity. | 0.872 | | | |
| | CA_6 | 6. new car model. | 0.881 | | | |
| | CA_7 | 7. administrative procedures. | 0.887 | | | |
| | CA_8 | 8. delivery. | 0.866 | | | |
| | CA_9 | 9. stock. | 0.875 | | | |
| | CA_10 | 10. distribution processes. | 0.875 | | | |
| | CA_11 | 11. planning. | 0.875 | | | |
| | CA_12 | 12. financial procedures. | 0.849 | | | |
| | CA_13 | 13. information exchange. | 0.870 | | | |
| | CA_14 | 14. marketing | 0.888 | | | |
| **Supplier adaptation** | | Since the implementation of fuel efficiency regulations in 2016 (e.g., fuel labels), our suppliers have made adaptations to meet our firm's needs and wants, particularly in the adaptation of… | | 0.801 | 0.983 | 0.981 |
| | SA_1 | 1. product types. | 0.896 | | | |
| | SA_2 | 2. product features. | 0.899 | | | |
| | SA_3 | 3. product design. | 0.881 | | | |
| | SA_4 | 4. product technologies (e.g., hybrid, turbo). | 0.851 | | | |
| | SA_5 | 5. product quantity. | 0.834 | | | |
| | SA_6 | 6. new car models. | 0.885 | | | |
| | SA_7 | 7. administrative procedures. | 0.926 | | | |
| | SA_8 | 8. delivery. | 0.915 | | | |
| | SA_9 | 9. stock. | 0.908 | | | |
| | SA_10 | 10. distribution processes. | 0.914 | | | |
| | SA_11 | 11. planning. | 0.895 | | | |
| | SA_12 | 12. financial procedures. | 0.897 | | | |
| | SA_13 | 13. information exchange. | 0.917 | | | |
| | SA_14 | 14. marketing. | 0.906 | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| **Resource entitlements** | | Our firm has the right to … | | 0.787 | 0.957 | 0.946 |
| | Ent_1 | 1. select car models from supplier/suppliers. | 0.874 | | | |
| | Ent_2 | 2. choose the distribution channels for supplier/suppliers. | 0.860 | | | |
| | Ent_3 | 3. order cars from supplier/suppliers at any time. | 0.887 | | | |
| | Ent_4 | 4. reduce cars prices. | n/a | | | |
| | | Our firm has the duties to … | | | | |
| | Ent_5 | 5. achieve an annual target for supplier/suppliers. | n/a | | | |
| | Ent_6 | 6. promote suppliers' fuel-efficient cars. | 0.845 | | | |
| | Ent_7 | 7. meet the end consumers' needs on behalf of the supplier/ suppliers. | n/a | | | |
| | | Our firm has the capabilities to … | | | | |
| | Ent_8 | 8. promote new cars. | 0.927 | | | |
| | Ent_9 | 9. generate creative marketing strategies. | 0.926 | | | |
| | Ent_10 | 10. conduct research and development. | n/a | | | |
| **Resource mobilisation** | | Our firm has access to supplier/suppliers … | | 0.846 | 0.956 | 0.939 |
| | Mob_1 | 1. sales information. | 0.927 | | | |
| | Mob_2 | 2. long-term goals. | n/a | | | |
| | Mob_3 | 3. pricing strategies. | 0.907 | | | |
| | Mob_4 | 4. new car models. | n/a | | | |
| | Mob_5 | 5. administrative procedure. | 0.930 | | | |
| | Mob_6 | 6. stock level. | n/a | | | |
| | Mob_7 | 7. distribution processes and strategies. | 0.914 | | | |
| **Resource exploitations** | | To market new cars, our firm… | | 0.908 | 0.983 | 0.980 |
| | Exp_1 | 1. refined existing pricing processes. | 0.929 | | | |
| | Exp_2 | 2. improved existing sales and distribution channels. | 0.954 | | | |
| | Exp_3 | 3. refined existing advertising processes. | 0.965 | | | |
| | Exp_4 | 4. refined existing promotion processes. | 0.950 | | | |
| | Exp_5 | 5. improved existing marketing processes. | 0.959 | | | |
| | Exp_6 | 6. improve existing marketing strategies. | 0.962 | | | |
| **Business relationships** | Rel_1 | 1. A strong spirit of fairness exists in our relationship with our suppliers. | 0.916 | 0.859 | 0.961 | 0.945 |
| | Rel_2 | 2. We usually get fair share of the rewards in our supplier relationships. | 0.932 | | | |
| | Rel_3 | 3. There is a high level of trust between us and our suppliers. | 0.921 | | | |
| | Rel_4 | 4. The suppliers do not feel the need to monitor every aspect of their transactions with us. | 0.939 | | | |
| **Economic exchanges** | Exc_1 | 1. As long as our suppliers and our firm fulfil our responsibilities to each other, we will do business with each other. | 0.914 | 0.808 | 0.962 | 0.952 |
| | Exc_2 | 2. As long as good-quality products are provided, we will stay in business with our suppliers. | 0.944 | | | |
| | Exc_3 | 3. As long as reasonable prices are offered, we will stay in business with our suppliers. | 0.916 | | | |
| | Exc_4 | 4. What suppliers and our firm expect from each other is clearly specified. | 0.902 | | | |
| | Exc_5 | 5. The most accurate way to describe our purchase situation with our suppliers is to say that we give a fair payment for a fairly good products. | 0.838 | | | |
| | Exc_6 | 6. The price we pay for the products is comparable to the level of products we get. | 0.876 | | | |
| **Legal contracts** | | Our firm has… | | 0.935 | 0.983 | 0.977 |
| | Con_1 | 1. Specific, well-detailed agreements with our suppliers. | 0.963 | | | |
| | Con_2 | 2. Formal agreements that detail the obligations of both parties. | 0.972 | | | |
| | Con_3 | 3. Detailed contractual agreements with our suppliers. | 0.985 | | | |
| | Con_4 | 4. Clearly defined legal contracts that outline the right and responsibilities of both our firm and our suppliers. | 0.948 | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| **Reference points** | | Imagine your firm considers adding 10 new car models to your current fleet. To what extent the following statements are true. | | 0.842 | 0.955 | 0.939 |
| | RP_1 | 1. We compare the profit margin of the new cars to the current profit margin of the existing cars. | 0.859 | | | |
| | RP_2 | 2. We assess the fuel efficiency of the new cars versus the existing cars. | 0.949 | | | |
| | RP_3 | 3. We assess how customers would value the new cars relative to the existing cars. | 0.954 | | | |
| | RP_4 | 4. We use current cars as benchmarks to evaluate the overall advantages and disadvantages of the new cars. | 0.908 | | | |
| | RP_5 | 5. We generally value new cars more than existing cars (reversed). | n/a | | | |
| Note: n/a = not acceptable item due to low-loading or cross-loading. | | | | | | |

Discriminant validity was assessed using two approaches. First, the Fornell–Larcker criterion (Fornell and Larcker, 1981). The second approach for assessing discriminant validity was the Heterotrait-monotrait ratio of correlations (HTMT) (Henseler et al., 2015). Below are details of the application and results of the two utilised approaches for assessing discriminant validity.

Table 6.7 illustrates the application of the Fornell-Larcker criterion, a traditional metric used to evaluate discriminant validity. The square root of AVE demonstrates this criterion for each construct (highlighted), which has to be higher than the correlations among the other constructs (Fornell and Larcker, 1981). The study constructs meet the Fornell-Larcker criterion.

Table 6. 7 Correlations and squared AVE

| | Con | CA | Ent | Exc | Exp | Mob | RP | Rel | SA |
|---|---|---|---|---|---|---|---|---|---|
| Legal contracts (Con) | 0.967 | | | | | | | | |
| Customer adaptation (CA) | 0.634 | 0.866 | | | | | | | |
| Resource entitlements (Ent) | 0.776 | 0.641 | 0.887 | | | | | | |
| Economic exchanges (Exc) | 0.788 | 0.62 | 0.841 | 0.899 | | | | | |
| Resource exploitations (Exp) | 0.715 | 0.602 | 0.839 | 0.837 | 0.953 | | | | |
| Resource mobilisations (Mob) | 0.728 | 0.597 | 0.836 | 0.758 | 0.829 | 0.92 | | | |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Reference points (RP) | 0.248 | 0.264 | 0.249 | 0.308 | 0.319 | 0.272 | 0.918 | | |
| Relationships (Rel) | 0.82 | 0.625 | 0.809 | 0.816 | 0.788 | 0.818 | 0.337 | 0.927 | |
| Supplier adaptation (SA) | 0.614 | 0.846 | 0.70 | 0.657 | 0.67 | 0.61 | 0.203 | 0.63 | 0.895 |
| Note. *n*= 99 | | | | | | | | | |
| Note. Off-diagonal values are correlation coefficients and on-diagonal values are the square root of AVE | | | | | | | | | |

The second approach for assessing discriminant validity was the heterotrait-monotrait ratio of correlations (HTMT). Hair et al. (2021) recommended the use of the HTMT of correlation as a precise metric to assess constructs distinct from other constructs in the structural model. This criterion indicates that the items correlation across different constructs is smaller than the average items correlation within the constructs at a threshold of 0.90 or below (Henseler et al., 2015). Table 6.8 shows that the study constructs meet the HTMT ratio of correlation criteria.

Table 6. 8 Heterotrait-monotrait ratio of correlations (HTMT)

| | Con | CA | Ent | Exc | Expl | Mob | RP | Rel | SA |
|---|---|---|---|---|---|---|---|---|---|
| Legal contracts (Con) | | | | | | | | | |
| Customer adaptation (CA) | 0.648 | | | | | | | | |
| Resource entitlements (Ent) | 0.804 | 0.665 | | | | | | | |
| Economic exchanges (Exc) | 0.817 | 0.641 | 0.88 | | | | | | |
| Resource exploitation (Expl) | 0.73 | 0.614 | 0.868 | 0.865 | | | | | |
| Resource mobilisation (Mob) | 0.759 | 0.622 | 0.886 | 0.799 | 0.863 | | | | |
| Reference points (RP) | 0.245 | 0.265 | 0.25 | 0.31 | 0.317 | 0.276 | | | |
| Business relationships (Rel) | 0.853 | 0.65 | 0.854 | 0.858 | 0.818 | 0.867 | 0.344 | | |
| Supplier adaptation (SA) | 0.624 | 0.866 | 0.724 | 0.676 | 0.681 | 0.633 | 0.201 | 0.653 | |

### 6.4.3 Reliability

After confirming the validity of the current study measurements and ensuring they accurately assess the intended concepts, the internal construct reliability was assessed using Cronbach's alpha. Nunnally (1978) suggested a minimum acceptable Cronbach's alpha value of 0.80. Table 7.6 displays Cronbach's alpha coefficients ranging from 0.910 for entitlements to 0.978 for supplier adaptation. These results indicate a strong level of consistency in the constructs used in this study.

After assessing the internal construct reliability, variance inflation factor (VIF) values were utilised to examine potential collinearity issues. VIF values indicate the constructs are correlated in the structural model if the VIF value is 5 or above (Hair et al., 2021). In this study, the VIF results for the independent variables range from 1.2 to 6, indicating multicollinearity. The presence of multicollinearity may falsely affect the path coefficient in the structural model or even the significance of relationships suggesting the absence of mediation (Hair et al., 2021). Therefore, the proposed hypotheses will be tested individually as suggested by Zhao et al. (2010). The following section of this chapter moves on to test the proposed hypotheses and present the results in greater detail.

## 6.5 Hypotheses testing

As was pointed out in the introduction to this chapter, the third part of this chapter focuses on hypothesis testing. Figure 6.1 presents the conceptual framework of the quantitative study. The evaluation of hypotheses included examining path coefficients and determining their significance levels. The proposed hypotheses are as follows:

**H1:** Contracts mediate the positive effect of entitlements (H1a) mobilisation (H1b) and exploitation (H1c) on customer adaptation.

**H2:** Contracts mediate the positive effect of entitlements (H2a) mobilisation (H2b) and exploitation (H2c) on supplier adaptation.

**H3:** Exchanges mediate the positive effect of entitlements (H3a) mobilisation (H3b) and exploitation (H3c) on customer adaptation.

**H4:** Exchanges mediate the positive effect of entitlements (H4a) mobilisation (H4b) and exploitation (H4c) on supplier adaptation.

**H5:** Relationships mediate the positive effect of entitlements (H5a) mobilisation (H5b) and exploitation (H5c) on customer adaptation.

**H6:** Relationships mediate the positive effect of entitlements (H6a) mobilisation (H6b) and exploitation (H6c) on supplier adaptation.

**H7:** Contracts mediate the negative effect of loss aversion (H7a) present bias (H7b) and reference points (H7c) on customer adaptation.

**H8:** Contracts mediate the negative effect of loss aversion (H8a) present bias (H8b) and reference points (H8c) on supplier adaptation.

**H9:** Exchanges mediate the negative effect of loss aversion (H9a) present bias (H9b) and reference points (H9c) on customer adaptation.

**H10:** Exchanges mediate the negative effect of loss aversion (H10a) present bias (H10b) and reference points (H10c) on supplier adaptation.

**H11:** Relationships mediate the negative effect of loss aversion (H11a) present bias (H11b) and reference points (H11c) on customer adaptation.

**H12:** Relationships mediate the negative effect of loss aversion (H12a) present bias (H12b) and reference points (H12c) on supplier adaptation.

For hypotheses 1-6, the mediation analysis was performed to assess the mediating role of activities (relationships, exchanges, and contracts) in the positive relationships between resources (entitlements, mobilisation, and exploitation) and interfirm adaptation (customer adaptation and supplier adaptation). For hypotheses 7-12, the mediation analysis was performed to assess the mediating role of activities (relationships, exchanges, and contracts) in the negative relationships between actors' biases (loss aversion, present bias, and reference points) and interfirm adaptation (customer adaptation and supplier adaptation).

The statistical results of the study hypotheses are reported in Table 6.9. The results were conducted through PLS-SEM analysis using SmartPLS version 4.1 software as discussed in section 3.8.5 of the methodology chapter. The strength and statistical significance of all direct and indirect path coefficients were tested using 5000 subsamples, bias-corrected and accelerated (BCa) bootstrap procedure, with a 5% significance level corresponding to a 95% confidence interval (two-tailed) where the value zero does not fall into the 95% confidence interval as recommended by (Hair et al., 2021).

Regarding mediation types, the researcher followed Hair et al. (2021) and Zhao et al. (2010) typologies of mediation. First, full mediation is present when the relationship between the independent variable and the dependent variable is only significant through mediation. Second, partial mediation occurs when the relationship between the independent variable and the dependent variable is significant through the mediation and directly significant in the presence of the mediation. Lastly, direct-only results occur when only the direct effect from the independent variable to the dependent variable is

significant but the indirect effect through the mediation is not statistically significant. Therefore, there is no mediation role in the case of direct-only relationships.

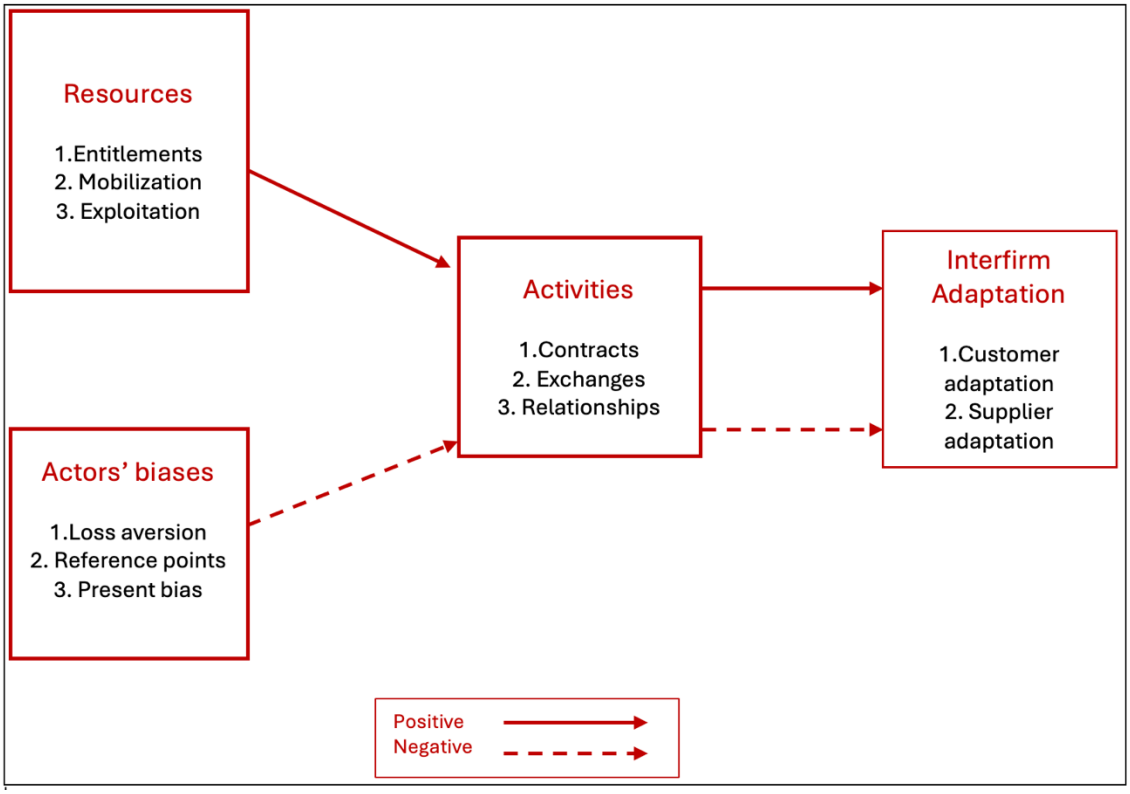



Figure 6. 1 Conceptual framework

Table 6. 9 Hypotheses results

| Hypotheses and mediating paths | Indirect effect | | | | | Direct effect | Total effect | Type of mediation | Supported/ Rejected |
|---|---|---|---|---|---|---|---|---|---|
| | Coefficient | SD | T-test | Confidence intervals bias corrected | | | | | |
| | | | | 2.5% | 97.5% | | | | |
| H1a: entitlements > contracts > customer adaptation | 0.265** | 0.070 | 3.786 | 0.162 | 0.588 | 0.377** | 0.642** | Partial mediation | Supported |
| H1b: mobilisation > contracts > customer adaptation | 0.309** | 0.072 | 4.304 | 0.010 | 0.090 | 0.289** | 0.598** | Partial mediation | Supported |
| H1c: exploitation > contracts > customer adaptation | 0.297** | 0.073 | 4.080 | 0.117 | 0.488 | 0.305** | 0.602** | Partial mediation | Supported |
| H2a: entitlements > contracts > supplier adaptation | 0.136ns | 0.095 | 1.432 | 0.329 | 0.787 | 0565** | 0.705** | Direct-only | Rejected |
| H2b: mobilisation > contracts > supplier adaptation | 0.263** | 0.068 | 3.899 | 0.131 | 0.554 | 0.347** | 0.611** | Partial mediation | Supported |
| H2c: exploitation > contracts > supplier adaptation | 0.197** | 0.070 | 2.794 | 0.281 | 0.650 | 0.474** | 0.672** | Partial mediation | Supported |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| H3a: entitlements > exchanges > customer adaptation | 0.230* | 0.101 | 2.264 | 0.035 | 0.511 | 0.272* | 0.642** | Partial mediation | Supported |
| H3b: mobilisation > exchanges > customer adaptation | 0.300** | 0.093 | 3.219 | 0.609 | 0.851 | 0.298** | 0.598** | Partial mediation | Supported |
| H3c: exploitation > exchanges > customer adaptation | 0.325** | 0.110 | 2.950 | 0.753 | 0.895 | 0.279** | 0.604** | Partial mediation | Supported |
| H4a: entitlements > exchanges > supplier adaptation | 0.191ns | 0.118 | 1.624 | -0.045 | 0.504 | 0.510** | 0.700** | Direct-only | Rejected |
| H4b: mobilisation > exchanges > supplier adaptation | 0.346** | 0.078 | 4.462 | 0.065 | 0.483 | 0.264* | 0.610** | Partial mediation | Supported |
| H4c: exploitation > exchanges > supplier adaptation | 0.267* | 0.111 | 2.402 | 0.182 | 0.629 | 0.403** | 0.670** | Partial mediation | Supported |
| H5a: entitlements > relationships > customer adaptation | 0.247* | 0.104 | 2.367 | 0.056 | 0.546 | 0.395** | 0.642** | Partial mediation | Supported |
| H5b: mobilisation > relationships > customer adaptation | 0.337** | 0.116 | 2.908 | 0.099 | 0.556 | 0.261ns | 0.598** | Full mediation | Supported |
| H5c: exploitation > relationships > customer adaptation | 0.313** | 0094 | 3.325 | 0.109 | 0.480 | 0.290** | 0.603** | Partial mediation | Supported |
| H6a: entitlements > relationships > supplier adaptation | 0.148ns | 0.110 | 1.343 | -0.058 | 0.379 | 0.552** | 0.700** | Direct-only | Rejected |
| H6b: mobilisation > relationships > supplier adaptation | 0.326** | 0.104 | 3.136 | 0.117 | 0.525 | 0.285* | 0.611** | Partial mediation | Supported |
| H6c: exploitation > relationships > supplier adaptation | 0.213* | 0.098 | 2.165 | 0.020 | 0.408 | 0.457** | 0.670** | Partial mediation | Supported |
| H7a: loss aversion > contracts > customer adaptation | -0.246** | 0.078 | 3.158 | -0.409 | -0.109 | -0.308** | -0.554** | Partial mediation | Supported |
| H7b: present bias > contracts > customer adaptation | -0.288* | 0.135 | 2.137 | -0.568 | -0.036 | -0.138 ns | -0.426* | Full mediation | Supported |
| H7c: reference points > contracts > customer adaptation | 0.154* | 0.070 | 2.183 | 0.023 | 0.292 | 0.111ns | 0.264* | Full mediation | Rejected |
| H8a: loss aversion > contracts > supplier adaptation | -0.270** | 0.064 | 4.246 | -0.398 | -0.151 | -0.186* | -0.456** | Partial mediation | Supported |
| H8b: present bias > contracts > supplier adaptation | -0.283* | 0.132 | 2.142 | -0.546 | -0.031 | -0.070 ns | -0.352 ns | Full mediation | Supported |
| H8c: reference points > contracts > supplier adaptation | 0.153* | 0.68 | 2.256 | 0.011 | 0.279 | 0.052ns | 0.205ns | Full mediation | Rejected |
| H9a: loss aversion > exchanges > customer adaptation | -0.259** | 0.090 | 2.872 | -0.443 | -0.086 | -0.297** | -0.556** | partial mediation | Supported |
| H9b: present bias > exchanges > customer adaptation | -0.276* | 0.128 | 2.158 | -0.537 | -0.021 | -0.149 ns | -0.425* | Full mediation | Supported |
| H9c: reference points > exchanges > customer adaptation | 0.186* | 0.077 | 2.420 | 0.058 | 0.354 | 0.077ns | 0.262* | Full mediation | Rejected |
| H10a: loss aversion > exchanges > supplier adaptation | -0.339** | 0.067 | 5.051 | -0.470 | -0.207 | -0.117 ns | -0.456** | Full mediation | Supported |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| H10b: present bias > exchanges > supplier adaptation | -0.296* | 0.134 | 2.203 | -0.552 | -0.018 | -0.057 ns | -0.353 ns | Full mediation | Supported |
| H10c: reference points > exchanges > supplier adaptation | 0.205** | 0.076 | 2.704 | 0.076 | 0.358 | -0.002 ns | 0.203ns | Full mediation | Rejected |
| H11a: loss aversion > relationships > customer adaptation | -0.254** | 0.081 | 3.119 | -0.414 | -0.094 | -0.301** | -0.555** | Partial mediation | Supported |
| H11b: present bias > relationships > customer adaptation | -0.305* | 0.132 | 2.317 | -0.578 | -0.055 | -0.123 ns | -0.429* | Full mediation | Supported |
| H11c: reference points > relationships>customer adaptation | 0.206** | 0.068 | 3.010 | 0.088 | 0.349 | 0.058ns | 0.263* | Full mediation | Rejected |
| H12a: loss aversion > relationships > supplier adaptation | -0.303** | 0.069 | 4.376 | -0.432 | -0.163 | -0.154 ns | -0.456** | Full mediation | Supported |
| H12b: present bias > relationships > supplier adaptation | -0.315* | 0.135 | 2.324 | -0.575 | -0.053 | -0.040 ns | -0.355 ns | Full mediation | Supported |
| H12c: reference points > relationships > supplier adaptation | 0.216** | 0.070 | 3.084 | 0.095 | 0.359 | -0.014 ns | 0.202 ns | Full mediation | Rejected |
| Note: **p < 0,01 *p < 0,05 ns- non-significant. SD: standard deviation | | | | | | | | | |

**H1a** proposed that legal contracts mediate the positive effect of resource entitlements on customer adaptation. The results show a significant positive indirect effect of resource entitlements on customer adaptation through legal contracts as mediator (H1a: $\beta = 0.265$, $t = 3.786$, $p < 0.01$). The total effect of resource entitlements on customer adaptation was significant ($\beta = 0.642$, $p < 0.01$), and with the inclusion of the mediator the effect of entitlements on customer adaptation was still significant positively ($\beta = 0.377$, $p < 0.01$). This shows that contracts partially mediate the relationship between entitlements and customer adaptation. Hence, H1a was supported. This finding aligns with the definition of partial mediation, where both direct and indirect effects are significant in the presence of the mediator (Hair et al., 2021; Zhao et al., 2010). Partial mediation, as adopted in this study, is widely accepted in business marketing research (e.g., Gangwani, and Bhatia, 2024; Schulze et al., 2022).

**H1b** proposed that contracts mediate the positive effect of mobilisation on customer adaptation. The results show a significant positive indirect effect of mobilisation on customer adaptation through contracts as a mediator (H1b: $\beta = 0.309$, $t = 4.304$, $p < 0.01$).

The total effect of mobilisation on customer adaptation was significant positively ($\beta = 0.598$, $p < 0.01$), with the inclusion of the mediator the effect of mobilisation on customer adaptation was still significant positively ($\beta = 0.289$, $p < 0.01$). This shows that contracts partially mediate the relationship between mobilisation and customer adaptation. Hence, H1b was supported.

**H1c** proposed that contracts mediate the positive effect of exploitation on customer adaptation. The results show a positive significant indirect effect of exploitation on customer adaptation through contracts as a mediator (H1c: $\beta = 0.297$, $t = 4.080$, $p < 0.01$). The total effect of exploitation on customer adaptation was significant ($\beta = 0.602$, $p < 0.01$), with the inclusion of the mediator the effect of exploitation on customer adaptation was still significant positively ($\beta = 0.305$, $p < 0.001$). This shows that contracts partially mediate the relationship between exploitation and customer adaptation. Hence, H1c was supported.

**H2a** proposed that contracts mediate the positive effect of entitlements on supplier adaptation. The results show a non-significant indirect effect of entitlements on supplier adaptation through contracts as mediator (H2a: $\beta = 0.136$, $t = 1.432$, $p > 0.05$). The total effect of entitlements on supplier adaptation was significant positively ($\beta = 0.705$, $p < 0.01$), with the inclusion of the mediator the effect of entitlements on supplier adaptation was still significant positively ($\beta = 0.565$, $p < 0.01$). This shows that entitlements only affect positively supplier adaptation directly. However, contracts do not mediate the relationship between entitlements and supplier adaptation. Hence, H2a was rejected.

**H2b** proposed that contracts mediate the positive effect of mobilisation on supplier adaptation. The results show a significant and positive indirect effect of mobilisation on supplier adaptation through contracts as a mediator (H2b: $\beta = 0.263$, $t = 3.899$, $p < 0.01$).

The total effect of mobilisation on supplier adaptation was significant positively ($\beta = 0.611$, $p < 0.01$), with the inclusion of the mediator the effect of mobilisation on supplier adaptation was still significant positively ($\beta = 0.347$, $p < 0.01$). This shows that contracts partially mediate the relationship between mobilisation and supplier adaptation. Hence, H2b was supported.

**H2c** proposed that contracts mediate the positive effect of exploitation on supplier adaptation. The results show a significant and positive indirect effect of exploitation on supplier adaptation through contracts as a mediator (H2c: $\beta = 0.197$, $t = 2.794$, $p < 0.01$). The total effect of exploitation on supplier adaptation was significant positively ($\beta = 0.672$, $p < 0.01$), with the inclusion of the mediator the effect of exploitation on supplier adaptation was still significant positively ($\beta = 0.474$, $p < 0.01$). This shows that contracts partially mediate the relationship between exploitation and supplier adaptation. Hence, H2c was supported.

**H3a** proposed that exchanges mediate the positive effect of entitlements on customer adaptation. The results show a significant and positive indirect effect of entitlements on customer adaptation through exchanges (H3a: $\beta = 0.230$, $t = 2.264$, $p < 0.05$). The total effect of entitlements on customer adaptation was significant positively ($\beta = 0.642$, $p < 0.01$), and the direct effect of entitlements on customer adaptation remained positively significant when exchanges were included ($\beta = 0.272$, $p < 0.05$). These results suggest that exchanges partially mediate the relationship between entitlements and customer adaptation. Based on these findings, hypothesis H3a is supported.

**H3b** posited that exchanges mediate the positive effect of mobilisation on customer adaptation. The findings reveal a significant and positive indirect effect of mobilisation on customer adaptation through exchanges (H3b: $\beta = 0.300$, $t = 3.219$, $p < 0.01$). The

total effect of mobilisation on customer adaptation was significant positively ($\beta = 0.598$, $p < 0.01$), and the direct effect of mobilisation on customer adaptation also remained significant positively with the inclusion of exchanges as a mediator ($\beta = 0.298$, $p < 0.01$). This indicates that exchanges partially mediate the relationship between mobilisation and customer adaptation. Therefore, hypothesis H3b is supported.

**H3c** proposed that exchanges mediate the positive effect of exploitation on customer adaptation. The results demonstrate a significant and positive indirect effect of exploitation on customer adaptation through exchanges (H3c: $\beta = 0.325$, $t = 2.950$, $p < 0.01$). The total effect of exploitation on customer adaptation was significant positively ($\beta = 0.604$, $p < 0.01$), and the direct effect of exploitation on customer adaptation remained significant positively with the inclusion of exchanges as mediator ($\beta = 0.279$, $p < 0.01$). These findings indicate that exchanges partially mediate the relationship between exploitation and customer adaptation. Thus, hypothesis H3c is supported.

**H4a** posited that exchanges mediate the positive effect of entitlements on supplier adaptation. The analysis revealed a non-significant indirect effect of entitlements on supplier adaptation through exchanges ($\beta = 0.191$, $t = 1.624$, $p > 0.05$). The total effect of entitlements on supplier adaptation was significant positively ($\beta = 0.700$, $p < 0.01$), and the direct effect of entitlements on supplier adaptation remained significant positively when exchanges were included ($\beta = 0.510$, $p < 0.01$). This indicates that the entitlements only affect positively supplier adaptation directly. However, exchanges do not mediate the relationship between entitlements and supplier adaptation. Consequently, hypothesis H4a is rejected.

**H4b** proposed that exchanges mediate the positive effect of mobilisation on supplier adaptation. The findings indicate a significant and positive indirect effect of mobilisation

on supplier adaptation through exchanges (β = 0.346, t = 4.462, p < 0.01). The total effect of mobilisation on supplier adaptation was significant positively (β = 0.610, p < 0.01), and the direct effect of mobilisation on supplier adaptation remained significant positively when exchanges were included (β = 0.264, p < 0.05). These results suggest that exchanges partially mediate the relationship between mobilisation and supplier adaptation. Therefore, hypothesis H4b is supported.

**H4c** hypothesised that exchanges mediate the positive effect of exploitation on supplier adaptation. The results show a positive significant indirect effect of exploitation on supplier adaptation through exchanges (β = 0.267, t = 2.402, p < 0.05). The total effect of exploitation on supplier adaptation was significant positively (β = 0.670, p < 0.01), and the direct effect of exploitation on supplier adaptation remained significant positively when exchanges were included (β = 0.403, p < 0.01). This demonstrates that exchanges partially mediate the relationship between exploitation and supplier adaptation. Thus, hypothesis H4c is supported.

**H5a** proposed that business relationships mediate the positive effect of resource entitlements on customer adaptation. The results reveal a significant and positive indirect effect of resource entitlements on customer adaptation through business relationships (β = 0.247, t = 2.367, p < 0.05). The total effect of resource entitlements on customer adaptation was significant positively (β = 0.642, p < 0.01), and the direct effect of resource entitlements on customer adaptation remained significant positively when business relationships was included (β = 0.395, p < 0.01). These findings indicate that business relationships partially mediate the relationship between resource entitlements and customer adaptation. Therefore, hypothesis H5a is supported.

**H5b** posited that business relationships mediate the positive effect of resource mobilisation on customer adaptation. The analysis shows a significant and positive indirect effect of resource mobilisation on customer adaptation through business relationships ($\beta = 0.337$, $t = 2.908$, $p < 0.01$). The total effect of resource mobilisation on customer adaptation was significant positively ($\beta = 0.598$, $p < 0.01$), but the direct effect of resource mobilisation on customer adaptation was not significant when business relationships were included ($\beta = 0.261$, $p > 0.05$). This indicates that business relationships fully mediate the relationship between resource mobilisation and customer adaptation. Thus, hypothesis H5b is supported.

**H5c** hypothesised that business relationships mediate the positive effect of resource exploitation on customer adaptation. The findings demonstrate a significant and positive indirect effect of resource exploitation on customer adaptation through business relationships ($\beta = 0.313$, $t = 3.325$, $p < 0.01$). The total effect of resource exploitation on customer adaptation was significant positively ($\beta = 0.603$, $p < 0.01$), and the direct effect of resource exploitation on customer adaptation remained significant and positive when business relationships were included ($\beta = 0.290$, $p < 0.01$). These results suggest that business relationships partially mediate the relationship between resource exploitation and customer adaptation. Consequently, hypothesis H5c is supported.

**H6a** proposed that business relationships mediate the positive effect of resource entitlements on supplier adaptation. The results show a non-significant indirect effect of resource entitlements on supplier adaptation through business relationships ($\beta = 0.148$, $t = 1.343$, $p > 0.05$). The total effect of resource entitlements on supplier adaptation was significant positively ($\beta = 0.700$, $p < 0.01$), and the direct effect of resource entitlements on supplier adaptation remained significant positively when business relationships were

included ($\beta = 0.552$, $p < 0.01$). These findings indicate that the relationship between entitlements and supplier adaptation is direct-only, as the mediator (business relationships) did not significantly mediate this relationship. Hence, hypothesis H6a is rejected.

**H6b** posited that business relationships mediate the positive effect of resource mobilisation on supplier adaptation. The analysis reveals a significant and positive indirect effect of resource mobilisation on supplier adaptation through business relationships ($\beta = 0.326$, $t = 3.136$, $p < 0.01$). The total effect of resource mobilisation on supplier adaptation was significant positively ($\beta = 0.611$, $p < 0.01$), and the direct effect of resource mobilisation on supplier adaptation remained significant positively when business relationships were included ($\beta = 0.285$, $p < 0.05$). This suggests that business relationships partially mediate the relationship between resource mobilisation and supplier adaptation. Thus, hypothesis H6b is supported.

**H6c** hypothesised that business relationships mediate the positive effect of resource exploitation on supplier adaptation. The findings show a significant and positive indirect effect of resource exploitation on supplier adaptation through business relationships ($\beta = 0.213$, $t = 2.165$, $p < 0.05$). The total effect of resource exploitation on supplier adaptation was significant positively ($\beta = 0.670$, $p < 0.01$), and the direct effect of resource exploitation on supplier adaptation remained significant positively when business relationships was included ($\beta = 0.457$, $p < 0.01$). These results suggest that business relationships partially mediate the relationship between resource exploitation and supplier adaptation. Consequently, hypothesis H6c is supported.

**H7a** posited that legal contracts mediate the negative effect of loss aversion on customer adaptation. The results show a significant and negative indirect effect of loss aversion on

customer adaptation through legal contracts (β = -0.246, t = 3.158, p < 0.01). The total effect of loss aversion on customer adaptation was significant negatively (β = -0.554, p < 0.01), and the direct effect of loss aversion on customer adaptation remained significant negatively when legal contracts were included (β = -0.308, p < 0.01). These findings suggest that legal contracts partially mediate the relationship between loss aversion and customer adaptation. Hence, hypothesis H7a is supported.

**H7b** hypothesised that legal contracts mediate the negative effect of present bias on customer adaptation. The analysis reveals a significant and negative indirect effect of present bias on customer adaptation through legal contracts (β = -0.288, t = 2.137, p < 0.05). The total effect of present bias on customer adaptation was significant negatively (β = -0.426, p < 0.05), and the direct effect of present bias on customer adaptation was not significant when legal contracts were included (β = -0.138, p > 0.05). This suggests that legal contracts fully mediate the relationship between present bias and customer adaptation. Thus, hypothesis H7b is supported.

**H7c** proposed that legal contracts mediate the negative effect of reference points on customer adaptation. The findings show a significant and positive indirect effect of reference points on customer adaptation through legal contracts (β = 0.154, t = 2.183, p < 0.05). The total effect of reference points on customer adaptation was significant positively (β = 0.264, p < 0.05), but the direct effect of reference points on customer adaptation was not significant when legal contracts were included (β = 0.111, p > 0.05). These results suggest that legal contracts fully mediate the relationship between reference points and customer adaptation. However, since the observed positive relationship is contrary to the hypothesised negative relationship, hypothesis H7c is rejected.

**H8a** suggested that legal contracts mediate the negative effect of loss aversion on supplier adaptation. The findings reveal a significant and negative indirect effect of loss aversion on supplier adaptation through legal contracts ($\beta = -0.270$, $t = 4.246$, $p < 0.01$). The total effect of loss aversion on supplier adaptation was also significant negatively ($\beta = -0.456$, $p < 0.01$), and the direct effect of loss aversion on supplier adaptation remained significant negatively when legal contracts were included ($\beta = -0.186$, $p < 0.05$). These results indicate that legal contracts partially mediate the relationship between loss aversion and supplier adaptation. Based on these results, hypothesis H8a is supported.

**H8b** proposed that legal contracts mediate the negative effect of present bias on supplier adaptation. The findings indicate a significant and negative indirect effect of present bias on supplier adaptation through legal contracts ($\beta = -0.283$, $t = 2.142$, $p < 0.05$). The total effect of present bias on supplier adaptation was not significant ($\beta = -0.352$, $p > 0.05$), and the direct effect of present bias on supplier adaptation was also not significant when legal contracts were included ($\beta = -0.070$, $p > 0.05$). These results suggest that contracts fully mediate the relationship between present bias and supplier adaptation. Based on these results, hypothesis H8b is supported.

**H8c** suggested that legal contracts mediate the negative effect of reference points on supplier adaptation. The findings reveal a significant and positive indirect effect of reference points on supplier adaptation through legal contracts ($\beta = 0.153$, $t = 2.256$, $p < 0.05$). The total effect of reference points on supplier adaptation was not significant ($\beta = 0.205$, $p > 0.05$), and the direct effect of reference points on supplier adaptation was also not significant when legal contracts were included ($\beta = 0.052$, $p > 0.05$). These results suggest that contracts fully mediate the relationship between reference points and supplier

adaptation. However, since the observed positive relationship is contrary to the hypothesised negative relationship, hypothesis H8c is rejected.

**H9a** suggested that economic exchanges mediate the negative effect of loss aversion on customer adaptation. The findings show a significant and negative indirect effect of loss aversion on customer adaptation through economic exchanges ($\beta = -0.259$, $t = 2.872$, $p < 0.01$). The total effect of loss aversion on customer adaptation was also significant negatively ($\beta = -0.556$, $p < 0.01$), and the direct effect of loss aversion on customer adaptation remained negatively significant when economic exchanges were included ($\beta = -0.297$, $p < 0.01$). These results indicate that economic exchanges partially mediate the relationship between loss aversion and customer adaptation. Based on these results, hypothesis H9a is supported.

**H9b** proposed that economic exchanges mediate the negative effect of present bias on customer adaptation. The findings indicate a significant and negative indirect effect of present bias on customer adaptation through economic exchanges ($\beta = -0.276$, $t = 2.158$, $p < 0.05$). The total effect of present bias on customer adaptation was significant negatively ($\beta = -0.425$, $p < 0.05$), but the direct effect of present bias on customer adaptation was not significant when economic exchanges were included ($\beta = -0.149$, $p > 0.05$). These results suggest that economic exchanges fully mediate the relationship between present bias and customer adaptation. Based on these results, hypothesis H9b is supported.

**H9c** suggested that economic exchanges mediate the negative effect of reference points on customer adaptation. The findings reveal a significant and positive indirect effect of reference points on customer adaptation through economic exchanges ($\beta = 0.186$, $t = 2.420$, $p < 0.05$). The total effect of reference points on customer adaptation was

significant positively (β = 0.262, p < 0.05), but the direct effect of reference points on customer adaptation was not significant when economic exchanges were included (β = 0.077, p > 0.05). These results suggest that economic exchanges fully mediate the relationship between reference points and customer adaptation. However, since the observed positive relationship is contrary to the hypothesised negative relationship, hypothesis H9c is rejected.

**H10a** proposed that economic exchanges mediate the negative effect of loss aversion on supplier adaptation. The findings reveal a significant and negative indirect effect of loss aversion on supplier adaptation through economic exchanges (β = -0.339, t = 5.051, p < 0.01). The total effect of loss aversion on supplier adaptation was significant negatively (β = -0.456, p < 0.01), but the direct effect of loss aversion on supplier adaptation was not significant when economic exchanges were included (β = -0.117, p > 0.05). These results suggest that economic exchanges fully mediate the relationship between loss aversion and supplier adaptation. Based on these results, hypothesis H10a is supported.

**H10b** proposed that economic exchanges mediate the negative effect of present bias on supplier adaptation. The findings indicate a significant and negative indirect effect of present bias on supplier adaptation through economic exchanges (β = -0.296, t = 2.203, p < 0.05). The total effect of present bias on supplier adaptation was not significant (β = -0.353, p > 0.05), and the direct effect of present bias on supplier adaptation was also not significant when economic exchanges were included (β = -0.057, p > 0.05). These results suggest that economic exchanges fully mediate the relationship between present bias and supplier adaptation. Based on these results, hypothesis H10b is supported.

**H10c** suggested that economic exchanges mediate the negative effect of reference points on supplier adaptation. The findings reveal a significant and positive indirect effect of

reference points on supplier adaptation through economic exchanges (β = 0.205, t = 2.704, p < 0.01). The total effect of reference points on supplier adaptation was not significant (β = 0.203, p > 0.05), and the direct effect of reference points on supplier adaptation was also not significant when economic exchanges were included (β = -0.002, p > 0.05). These results suggest that economic exchanges fully mediate relationship between reference points and supplier adaptation. However, since the observed positive relationship is contrary to the hypothesised negative relationship, hypothesis H10c is rejected.

**H11a** proposed that business relationships mediate the negative effect of loss aversion on customer adaptation. The findings reveal a significant and negative indirect effect of loss aversion on customer adaptation through business relationships (β = -0.254, t = 3.119, p < 0.01). The total effect of loss aversion on customer adaptation was significant negatively (β = -0.555, p < 0.01), and the direct effect of loss aversion on customer adaptation remained significant negatively when business relationships were included (β = -0.301, p < 0.01). These results suggest that business relationships partially mediate the relationship between loss aversion and customer adaptation. Therefore, hypothesis H11a is supported.

**H11b** hypothesised that business relationships mediate the negative effect of present bias on customer adaptation. The findings indicate a significant and negative indirect effect of present bias on customer adaptation through business relationships (β = -0.305, t = 2.317, p < 0.05). The total effect of present bias on customer adaptation was significant negatively (β = -0.429, p < 0.05), but the direct effect of present bias on customer adaptation was not significant when business relationships were included (β = -0.123, p > 0.05). These results suggest that business relationships fully mediate the relationship

between present bias and customer adaptation. Based on these results, hypothesis H11b is supported.

**H11c** posited that business relationships mediate the negative effect of reference points on customer adaptation. The findings show a significant and positive indirect effect of reference points on customer adaptation through business relationships ($\beta = 0.206$, $t = 3.010$, $p < 0.01$). The total effect of reference points on customer adaptation was positively significant ($\beta = 0.263$, $p < 0.05$), but the direct effect of reference points on customer adaptation was not significant when business relationships were included ($\beta = 0.058$, $p > 0.05$). These results suggest that business relationships fully mediate the relationship between reference points and customer adaptation. However, since the observed positive relationship is contrary to the hypothesised negative relationship, hypothesis H11c is rejected.

**H12a** proposed that business relationships mediate the negative effect of loss aversion on supplier adaptation. The findings reveal a significant and negative indirect effect of loss aversion on supplier adaptation through business relationships ($\beta = -0.303$, $t = 4.376$, $p < 0.01$). The total effect of loss aversion on supplier adaptation was significant negatively ($\beta = -0.456$, $p < 0.01$), but the direct effect of loss aversion on supplier adaptation was not significant when business relationships were included ($\beta = -0.154$, $p > 0.05$). These results suggest that business relationships fully mediate the relationship between loss aversion and supplier adaptation. Based on these results, hypothesis H12a is supported.

**H12b** proposed that business relationships mediate the negative effect of present bias on supplier adaptation. The findings indicate a significant and negative indirect effect of present bias on supplier adaptation through business relationships ($\beta = -0.315$, $t = 2.324$, $p < 0.05$). The total effect of present bias on supplier adaptation was not significant ($\beta =$

-0.355, $p > 0.05$), and the direct effect of present bias on supplier adaptation was not significant when business relationships were included ($\beta = -0.040$, $p > 0.05$). These results suggest that business relationships fully mediate the relationship between present bias and supplier adaptation. Based on these results, hypothesis H12b is supported.

**H12c** suggested that business relationships mediate the negative effect of reference points on supplier adaptation. The findings show a significant and positive indirect effect of reference points on supplier adaptation through business relationships ($\beta = 0.216$, $t = 3.084$, $p < 0.01$). The total effect of reference points on supplier adaptation was not significant ($\beta = 0.202$, $p > 0.05$), and the direct effect of reference points on supplier adaptation was not significant when business relationships were included ($\beta = -0.014$, $p > 0.05$). These results suggest that business relationships fully mediate the relationship between reference points and supplier adaptation. However, since the observed positive relationship is contrary to the hypothesised negative relationship, hypothesis H12c is rejected.

## 6.6 Conclusion

This chapter reported the quantitative analysis under three sections which are data preparation, preliminary analysis and hypotheses testing. Data preparation dealt with six issues which are data validation, editing and coding, error detection, outliers, normality, and common method variance (CMV). Preliminary analysis ensures measurement fit by conducting a PLS algorithm to assure validity and reliability for subsequent hypotheses testing. The last section covers the study's proposed hypotheses and statistical analysis in great detail. Table 6.10 below summarises the supported and rejected hypotheses of the current study.

Table 6. 10 Summary of hypotheses results

| Independent variable | Mediator | Dependent variable | Type of mediation | Supported/ Rejected |
|---|---|---|---|---|
| H1a: Entitlements | Contracts | Customer adaptation | Partial mediation | Supported |
| H1b: Mobilisation | | | Partial mediation | Supported |
| H1c: Exploitation | | | Partial mediation | Supported |
| H7a: Loss aversion | | | Partial mediation | Supported |
| H7b: Present bias | | | Full mediation | Supported |
| H7c: Reference points | | | Full mediation | Rejected |
| H2a: Entitlements | | Supplier adaptation | Direct-only | Rejected |
| H2b: Mobilisation | | | Partial mediation | Supported |
| H2c: Exploitation | | | Partial mediation | Supported |
| H8a: Loss aversion | | | Partial mediation | Supported |
| H8b: Present bias | | | Full mediation | Supported |
| H8c: Reference points | | | Full mediation | Rejected |
| H3a: Entitlements | Exchanges | Customer adaptation | Partial mediation | Supported |
| H3b: Mobilisation | | | Partial mediation | Supported |
| H3c: Exploitation | | | Partial mediation | Supported |
| H9a: Loss aversion | | | Partial mediation | Supported |
| H9b: Present bias | | | Full mediation | Supported |
| H9c: Reference points | | | Full mediation | Rejected |
| H4a: Entitlements | | Supplier adaptation | Direct-only | Rejected |
| H4b: Mobilisation | | | Partial mediation | Supported |
| H4c: Exploitation | | | Partial mediation | Supported |
| H10a: Loss aversion | | | Full mediation | Supported |
| H10b: Present bias | | | Full mediation | Supported |
| H10c: Reference points | | | Full mediation | Rejected |
| H5a: Entitlements | Relationships | Customer adaptation | Partial mediation | Supported |
| H5b: Mobilisation | | | Full mediation | Supported |
| H5c: Exploitation | | | Partial mediation | Supported |
| H11a: Loss aversion | | | Partial mediation | Supported |
| H11b: Present bias | | | Full mediation | Supported |
| H11c: Reference points | | | Full mediation | Rejected |
| H6a: Entitlements | | Supplier adaptation | Direct-only | Rejected |
| H6b: Mobilisation | | | Partial mediation | Supported |
| H6c: Exploitation | | | Partial mediation | Supported |
| H12a: Loss aversion | | | Full mediation | Supported |
| H12b: Present bias | | | Full mediation | Supported |
| H12c: Reference points | | | Full mediation | Rejected |

# Chapter 7: Analysis and discussion of findings

## 7.1 Introduction

This chapter aims to discuss the empirical findings from the qualitative and quantitative phases presented in chapters five and six. Analysing the empirical evidence, this chapter discusses the research questions "RQ1: How do businesses respond to climate change regulations", "RQ2: What factors enable and hinder interfirm adaptation in responding to climate change regulations?" and "RQ3: How do business interactions affect interfirm adaptation in response to climate change regulations?"

This chapter is divided into three main sections. Sections 7.2 and 7.3 cover the qualitative findings from chapter five which address RQ1 and RQ2 respectively. Section 7.4 covers the quantitative findings from chapter six which address RQ3. In addressing RQ1 in section 7.2, this section refines our understanding of businesses' responses to external pressure emanating from climate change regulations by adopting the network approach. Building on the empirical evidence from the thematic analysis in chapter five, interfirm adaptation at product and process levels emerges as an observed outcome of interacting businesses in responding to climate change regulations. Building on this understanding of adaptive responses, section 7.3 addresses RQ2 by discussing the exploration of enablers and barriers of such interfirm adaptation in responding to climate change regulations. Consequently, building on the quantitative findings from chapter six, section 7.4 addresses RQ3 by examining the relationships between the explored behavioural and interactional aspects that enable or hinder interfirm adaptation in responding to climate change regulations in the Saudi automobile industry. Collectively, this analysis results in a novel conceptual framework of adaptive responses to climate change regulations that expand the Activities-Resource-Actors (ARA) model as presented in Figure 7.1.

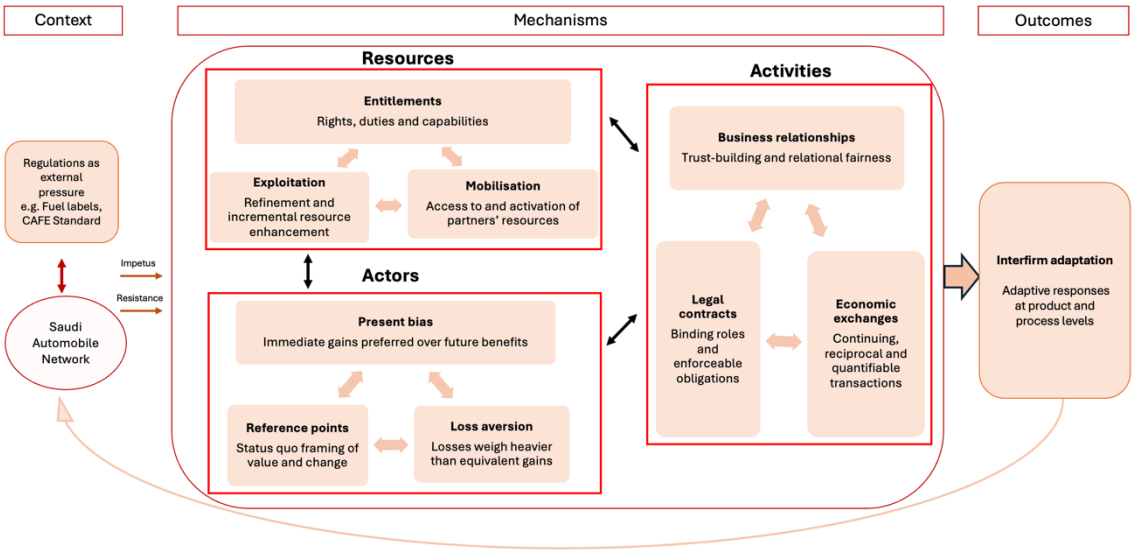



Figure 7. 1 A conceptual framework of adaptive responses to climate change regulations

## 7.2 How do businesses respond to climate change regulations?

The qualitative findings show that businesses respond to climate change regulations through repeated interactions that drive adaptations across business networks. These repeated interactions involve multiple actors, resources, and activities, leading to adaptive outcomes at both the product and process levels.

By addressing the first research question—*how businesses respond to climate change regulations*—this thesis fulfills the research objective of deepening our understanding of businesses' adaptive responses to external regulatory pressures. Following prior literature, interfirm adaptation refers to the change or adjustment in products or processes by one firm to meet the needs or requirements of another firm in business relationships (Håkansson, 1982; Hallen et al., 1991; Yu and Fang, 2023; Mouzas, 2024).

The empirical findings from the qualitative phase illustrate that the explanation of business responses to climate change regulations can be found within business networks. Indeed, external regulatory pressure trigger both impetus and resistance among

networked firms, prompting repeated interactions and exchanges involving actors, resources, and activities. Consequently, these network-driven interactions result in the observed outcome of interfirm adaptation at product and process levels.

Despite the efforts of previous studies to explain business responses to climate change regulations (e.g., Kolk and Pinkse, 2004; Böttcher and Müller, 2015; Wahyuni and Ratnatunga, 2015; Shevchenko et al., 2016; Wright and Nyberg, 2017; Goworek et al., 2018; Shevchenko 2021; Shui et al., 2025), little attention has been given to the crucial role that business interactions play in shaping these responses. Thus, by applying the network approach (Håkansson and Snehota, 1995; Ritter, 2000; Araujo et al., 2003; Möller et al., 2005; Ford and Håkansson, 2013; Waluszewski et al., 2019), this thesis makes a meaningful contribution to the broader business and management literature by illuminating how adaptive responses emerge through interconnected relationships rather than from isolated firm actions. Specifically, the findings indicate that business responses to climate change regulations are not atomistic initiatives undertaken by individual businesses. Rather, they are driven by repeated interactions that involve exchange processes among actors, resources and activities, which lead to adaptive responses at product and process levels.

At the product level, adaptation emerges as a central response to climate change regulations. Adaptations of products through continuous interaction within the business network are evidenced in changes to product types, features, designs, and technologies. In the context of automobile industry in Saudi Arabia, new car models were introduced to align with environmental regulations. Dealers had to increase fuel-efficient car models and collaborate closely with manufacturers to meet the stringent CAFE standard requirements. This collaborative effort highlights that meeting regulatory requirements is

not feasible through isolated actions; instead, ongoing interaction across business networks drives necessary product adaptations. Moreover, manufacturers play a key role in product adaptation by introducing models with smaller, more efficient, and advanced technologies. These fuel efficiency innovations enable dealers to comply with climate change regulations and simultaneously respond to evolving consumer preferences.

At the process level, adaptation emerges as a key component of businesses' response to climate change regulations. Process adaptations typically involve adjustments in administrative procedures, delivery, inventory, production processes, planning, financial procedures, information exchange and marketing. For instance, manufacturers' integration of fuel-saving technologies, such as turbocharged engines and advanced transmissions, compels dealers to adapt their training and maintenance processes to support these innovations effectively. Dealers must ensure their staff are well-informed about the latest technologies and provide adequate customer support. Simultaneously, these advancements require retailers to adjust their marketing strategies. Car retailers must educate consumers on the benefits of new technologies and promote vehicles that adhere to climate change regulations.

Notably, the findings indicate strategic adaptations in retailers' financial practices, including accepting lower profit margins – or even losses – on smaller, fuel-efficient models to meet sales targets and maintain regulatory compliance. This strategic decision demonstrates how businesses adapt to navigate the tension between regulatory requirements and market expectations, demonstrating the importance of coordinated adjustments within the broader business network. This implies that successful adaptation to climate change regulations extends beyond the actions of individual firms; it depends

fundamentally on integrated and collaborative efforts to adapt processes within business networks.

These findings align with existing research indicating that automobile businesses make strategic changes to their products and processes in response to climate change regulations (e.g., Damert and Baumgartner, 2018). However, this thesis adds a novel insight: businesses within the automobile industry respond to climate change regulations not only by internal adjustments but also by interacting within the business network. These network-based interactions facilitate interfirm adaptation, enabling businesses to more effectively respond to climate change regulations.

Furthermore, this thesis extends the application the network approach (Håkansson and Snehota, 1995; Araujo et al., 2003; Möller et al., 2005; Mouzas and Ford, 2018; Baraldi et al., 2024) on interfirm adaptation (e.g., Håkansson, 1982; Hallen et al., 1991; Håkansson and Snehota, 1995; Brennan and Turnbull, 1996; Fang, 2001; Hagberg-Andersson and Grønhaug, 2010; Mouzas, 2024). Specifically, it empirically demonstrates how interfirm adaptation emerges interactively among businesses facing climate change regulations. By highlighting such interactive dimension, this thesis advances previous research in business responses to climate change regulations, which often view business responses as isolated and atomistic practices (e.g., Kolk and Pinkse, 2004; Böttcher and Müller, 2015; Wahyuni and Ratnatunga, 2015; Shevchenko et al., 2016; Wright and Nyberg, 2017; Goworek et al., 2018; Shevchenko 2021; Shui et al., 2025).

Conversely, this research shows that manufacturers, dealers, and retailers engage in continuous negotiations and collaborations to align their strategies and operations with regulatory requirements. For example, meeting the CAFE standards necessitates

coordinated efforts between dealers and manufacturers, ensuring their combined fleet meets the average fuel economy standards through joint planning and adaptation. Manufacturers also adjust their production and supply based on feedback from dealers regarding evolving market demands and regulatory constraints. This adjustment reflects a strategic response to regulatory pressures and market competition, emphasising the interactive coordination between businesses. These interactions facilitate significant changes in products and processes, driven by recurrent negotiations and collaborations within the business network.

This study extends Guercini et al.'s (2022) work by providing empirical evidence on how interactive decision-making unfolds in response to climate change regulations. While Guercini et al. (2022) highlight that decision-making in business relationships is inherently interactive and shaped by adaptive rationality, empirical validation of this theory remains limited. The findings of this thesis offer further support for their argument by demonstrating how manufacturers and dealers make contingent choices in response to regulatory and market pressures. These findings contribute to the broader discussion on interfirm adaptation by highlighting how regulatory constraints drive real-time adjustments through continuous business interactions rather than through isolated strategic decisions. This evidence underscores the interconnected and adaptive nature of interfirm adaptation in responding to climate change regulations.

In conclusion, this section addresses the first research objective by providing empirical evidence of adaptive business responses at both the product and process levels. However, businesses vary in their levels of their adaptive responses to climate change regulations within business networks, which necessitates further exploration of enablers and barriers of such adaptive responses to climate change regulations. Therefore, the next section

addresses the second research question by exploring the interactional and behavioural aspects of interfirm adaptation in responding to climate change regulations.

## 7.3 What factors enable and hinder interfirm adaptation in responding to climate change regulations?

The qualitative findings of this research show that resource entitlements, resource mobilisation, resource exploitation, business relationships, economic exchanges, and legal contracts enable interfirm adaptation to climate change regulations. Further, it finds that present bias, loss aversion, and reference points hinder interfirm adaptation to climate change regulations.

By utilising the Activities-Resources-Actors (ARA) model (Håkansson and Johanson, 1992; Håkansson and Snehota, 1995), this thesis addresses its objective of exploring the interactional and behavioural aspects of interfirm adaptation in response to climate change regulations. Specifically, this research responds to calls in the literature (e.g., Mouzas, 2024) to investigate the mechanisms and processes driving interfirm adaptation, particularly when they take place under external pressures, such as climate change regulations. While extant studies have provided a comprehensive foundation for understanding interfirm adaptation (e.g., Håkansson, 1982; Hallen et al., 1991; Brennan and Turnbull, 1996; Hagberg-Andersson and Grønhaug, 2010; Ahmed et al., 2022; Yu and Fang, 2023), this research extends the literature by integrating behavioural lens (e.g., Simon, 1955; Kahneman and Tversky, 1979; Thaler, 2016) into the network approach (e.g., Håkansson, 1982; Ford and Håkansson, 2006).

Moreover, this thesis contributes by providing evidence that business activities in response to climate change are governed by three normative systems, which encompasses business relationships, economic exchanges, and legal contracts. It further advances understanding of how businesses connect with resources, demonstrating the role of

resource entitlements, mobilisation, and exploitation in driving interfirm adaptation to climate change regulations. Additionally, the research highlights how behavioural biases, including present bias, loss aversion, and reference points, can hinder interfirm adaptation by influencing how managers perceive and respond to external pressure arising from climate change regulations.

The findings address the second research objective, which is to explore the interactional and behavioural aspects of interfirm adaptation in responding to climate change regulations. Specifically, it advances existing literature in interfirm adaptation (e.g., Håkansson, 1982; Hallen et al., 1991; Brennan and Turnbull, 1996; Hagberg-Andersson and Grønhaug, 2010; Ahmed et al., 2022; Yu and Fang, 2023) by identifying the enablers (i.e., resource entitlements, resource mobilisation, resource exploitation, business relationships, economic exchanges, and legal contracts) and barriers (i.e., present bias, loss aversion, and reference points) of interfirm adaptation in response to climate change regulations.

The following sub-sections discuss the explored enablers and barriers of interfirm adaptation in responding to climate change regulations. These aspects are located in the middle of the conceptual framework (Figure 7.1) under mechanisms which lead to the observed outcomes of adaptive business responses at product and process levels within business networks

### 7.3.1 Resource entitlements

The qualitative findings show that resource entitlements are a crucial enabler of interfirm adaptation to climate change regulations within the Saudi automobile industry. Resource entitlements refer to the rights, duties, and capabilities that businesses possess, acquire, or transfer to others (Morris, 1992). Resource entitlements create a link between actors

and resources, enabling businesses to secure and reconfigure the resources necessary for adaptation. This aligns with the literature, which highlights entitlements as the *currency* that guides interactions, which speak to their ability to achieve consent and manage resource interdependencies (Mouzas and Ford, 2018; Mouzas, 2024).

The findings further demonstrate how resource entitlements allows businesses to adapt effectively by providing a framework for negotiating and acquiring the resources required to comply with climate change regulations. For instance, manufacturers grant dealers the right to represent their brands and sell specific car models while also specifying duties such as meeting sales targets. Specifically, dealers exercise their entitlements to access manufacturers' brand portfolios and introduce fuel-efficient car models, enabling them to meet regulatory requirements. In turn, manufacturers rely on these entitlements to motivate dealers' compliance with regulatory standards. This interplay of rights, duties, and capabilities ensures that dealers align their product offerings and operational capabilities with evolving regulatory demands. These findings are consistent with Mouzas' (2024) assertion that entitlements define ownership and control over resources, shaping how businesses combine and reconfigure resources to adapt to external pressures.

Conversely, the findings also highlights that a lack of entitlements, such as technical expertise or rights to specific resources, may significantly hinder interfirm adaptation. For example, dealers lacking sufficient inventory, trained technicians, or maintenance know-how struggle to effectively introduce or support environmentally friendly vehicle models, demonstrating how inadequate entitlements restrict adaptation efforts. Accordingly, the lack of entitlements constrains interfirm adaptation at both product and process levels in responding to the evolving climate change regulations in the Saudi automobile industry. This finding resonates with existing literature on resource

entitlements, which underscores their role in helping businesses navigate resource dependencies and adapt to environmental changes (Leach et al., 1999; Mouzas, 2022b).

Overall, this thesis contributes to the broader literature business networks and interfirm adaptation within the context of climate change regulations. While previous research has explored entitlements as drivers of business transformation (Mouzas, 2022b) and bases of interfirm adaptation (Mouzas, 2024), this study highlights the role of resource entitlements in the Saudi automobile industry, where they guide businesses on how to negotiate, combine, and reconfigure resources to comply with external pressures emanating from climate change regulations. By defining ownership and control over resources, entitlements act as a means to structuring interactions, reaching consensus, and ensuring the alignment of activities within business networks. Conversely, a scarcity of resource entitlements, such as capability gaps or limited access to tangible and intangible resources may constrain interfirm adaptation. This finding emphasises the need for businesses to strategically leverage their entitlements to respond effectively to regulatory challenges.

### 7.3.2 Resource mobilisation

The qualitative results indicate that resource mobilisation enables interfirm adaptation in responding to climate change regulations. Resource mobilisation, defined as firms' ability to access and use the resources of other businesses within business networks (Mouzas and Naudé, 2007; La Rocca and Snehota, 2021), emerged in this thesis through efforts to leverage suppliers' strategic assets, such as their brand's long-term goals, pricing strategy, new car models, administrative procedures, stock level, distribution processes and strategies. Accessing these diverse resources through interaction within the business network is crucial, as it enables firms to plan and strategically adapt their operations and offerings in response to evolving regulations. Indeed, businesses need to

plan for the future of their businesses and operations, and without access to suppliers' resources, businesses may not attempt to adapt to their counter partners.

For instance, the manufacturer discontinued high-consumption models and redirected resources toward developing electric vehicles. Dealers, by aligning their strategies with these shifts, gained critical access to manufacturers' evolving product portfolios, positioning themselves effectively for future market requirements and regulatory compliance in the Saudi market. This finding supports previous studies, which demonstrate that resource mobilisation facilitates new product development (Mouzas and Naudé, 2007; Ellegaard and Koch, 2012; Thornton et al., 2019). Additionally, the research advances existing research by illustrating the unexplored role of resource mobilisation in businesses' adaptive responses to climate change regulations within business networks.

Conversely, limited resource mobilisation significantly constrains firms' adaptive capacity. For example, when manufacturers discontinue car models without adequate consultation or coordination with dealers, it disrupts planning processes and generates uncertainty. This lack of collaborative engagement restricts dealers' access to essential resources and undermines their ability to effectively respond to regulatory changes and market demands. Consequently, this lack of collaborative engagement restricts their ability to respond effectively to climate change regulations and market demands. Overall, these findings support the strategic importance of resource mobilisation, aligning with Mouzas and Naudé's (2007) and Thornton et al.'s (2019) research. Furthermore, the findings advance theoretical understanding of resource mobilisation in business networks by illustrating its critical role in enabling businesses to adapt to climate change regulations within business networks.

### 7.3.3 Resource exploitation

The qualitative results indicate that resource exploitation is a critical enabler of interfirm adaptation in responding to climate change regulations. Businesses exploit resources refining pricing, advertising, and sales strategies, and by enhancing technological enhancements to car models. For instance, manufacturers improve existing car models by introducing fuel-efficient technologies, which enables dealers to meet regulations without the risks and costs associated with introducing entirely new car models. This way, dealers can exploit their existing resources, such as a stock of car parts for the same car model equipped with improved fuel efficiency technology to meet regulatory requirements and satisfy consumer demand for reputable automobile brands. These findings align with prior studies, which demonstrate that resource exploitation is less risky and costly compared to radical innovations, providing businesses with efficiency and productivity gains in the short term (March, 1991; Auh and Menguc, 2005).

Furthermore, resource exploitation strengthens business relationships and economic exchanges, enabling interfirm adaptation. Dealers refine pricing and warranty strategies to support retailers, ensuring profitability and collaboration. For example, setting a price floor reduces the risk of price undercutting. This prevents relationship conflicts and inefficiencies in economic exchanges. Dealers also exploit existing resources, such as extending warranty periods, to maximise their value. By ensuring lower prices, dealers enable retailers to adapt to fuel-efficient car models. In doing so, retailers optimise their resources, such as flexible financing and instalment options, to increase sales and support the adoption of new models.

This finding aligns with the IMP perspective, which highlights how businesses reconfigure and enhance resources through interactions (Håkansson and Snehota, 1995; Baraldi et al., 2012a). By refining and exploiting resources, businesses within networks

optimise their use and collectively address climate change regulations. These efforts also help maintain strong economic exchanges and relationships.

Previous research has called for further exploration of how resource exploitation operates at the industrial network level (Baraldi and Strömsten, 2024). This study addresses that call by focusing on businesses in the Saudi automobile industry. It demonstrates how they exploit resources through interaction. Examples include refining fuel efficiency technologies and improving warranties to achieve interfirm adaptation in responding to climate change regulations. Overall, the findings illustrate that resource exploitation not only enhances interfirm adaptation but also highlights its importance as a cost-efficient and collaborative approach to responding to climate change regulations. This study builds on prior literature by extending the understanding of resource exploitation's role in enabling interfirm adaptation within a highly regulated industry context.

### 7.3.4 Business relationships

Strong business relationships are a critical enabler of interfirm adaptation in responding to climate change regulations. Business relationships are foundational in the IMP approach and serve as the core of interaction that links activities between businesses (Håkansson and Snehota, 1995). In the Saudi automobile industry, recurring interactions like trade negotiations and performance reviews, helps to ensure collaboration and adaptability. This finding aligns with previous studies emphasising that business relationships are instrumental in linking activities through interaction and influencing activity structure within business networks (Håkansson and Snehota, 1995; Mouzas, 2022b).

Trust and fairness in business relationships are also significant enablers of interfirm adaptation. Trust fosters collaboration and ensures that businesses align their activities

effectively, such as through joint promotional campaigns. In this research, the negotiation about a fuel-efficient car campaign among dealers representing the same brand demonstrates the value of business relationships in adapting toward climate change regulations. Interaction with competitors who represent the same brand highlights how trust and fairness in business relationships that can lead to overcoming challenges like the new climate change regulations. This is consistent with Johnson's (1999) observation that trust and fairness are vital components of high-quality business relationships, contributing to synergy in activities.

Conversely, weak business relationships characterised by a lack of trust and fairness hinder interfirm adaptation. For example, discrepancies in pricing practices and unfair practices among dealers and retailers disrupt coordination and negatively affect adaptation efforts. This finding is in line with Abosag's (2015) argument that trust enhances cooperation and mitigates competitive tensions, enabling businesses to respond more effectively to external pressures.

In addition, this study advances existing research by providing empirical insights into the role of business relationships in facilitating interfirm adaptation in the context of climate change regulations within the Saudi automobile industry. While previous studies have recognised the importance of trust and fairness in linking activities (Håkansson and Snehota, 1995; Johnson, 1999), this research extends the understanding by illustrating their specific contribution to addressing regulatory challenges in a region where such studies remain relatively scarce (Abosag, 2015). Overall, the findings underscore that high-quality business relationships, built on trust and fairness, are essential enablers of interfirm adaptation. These relationships facilitate the alignment and coordination of

activities, ensuring that businesses can adapt to climate change regulations within the Saudi automobile industry.

### 7.3.5 Economic exchanges

The qualitative results indicate that economic exchanges are a key enabler of interfirm adaptation in responding to climate change regulations. Economic exchanges involve quantifiable, short-term transactions that go beyond isolated interactions. They create mutual value through collaborative give-and-take processes, enabling businesses to adapt their activities to meet external pressures. Within the Saudi automobile industry, economic exchanges guide and structure activities such as pricing strategies, promotions, and purchasing decisions, aligning with prior research highlighting their critical role for linking and structuring business activities, particularly under regulatory pressures (Veal and Mouzas, 2012; Mouzas, 2022a).

Economic exchanges enable adaptation by facilitating collaboration between dealers and retailers. For example, structured pricing agreements and competitive offers on low-consumption vehicles promote the adoption of fuel-efficient models, which are essential for meeting climate change regulations. Similarly, dealers' promotional strategies, such as offering free fuel with the purchase of fuel-efficient cars, incentivise consumer demand and support environmental compliance. These findings are consistent with the view that value in economic exchanges emerges from collaborative interactions, guiding business activities toward mutual benefit and adaptation (Möllera and Halinen, 2018; Ting and Ahn, 2023).

Conversely, the absence of effective economic exchanges can hinder interfirm adaptation. For instance, misaligned pricing strategies or insufficient incentives discourage retailers from promoting fuel-efficient vehicles, thereby impeding compliance

with regulatory requirements. This is in line with Håkansson and Snehota's (1995) argument that economic exchanges are essential for business survival, particularly in contexts requiring cooperation and adaptation to external challenges.

This study advances the existing literature by illustrating the specific role of economic exchanges in facilitating interfirm adaptation within business networks under climate change regulations. While previous research has emphasised the role of economic exchanges in creating mutual value and linking activities (Möllera and Halinen, 2018; Mouzas, 2022a), this study extends these insights by providing empirical evidence from the Saudi automobile industry. These insights show how structured pricing strategies and promotional activities enable businesses to adapt to environmental regulations.

Overall, the findings emphasise that economic exchanges, through collaborative and structured transactions, act as a crucial enabler of interfirm adaptation. By linking and aligning activities, economic exchanges help businesses within the Saudi automobile industry network respond effectively to climate change regulations while maintaining competitiveness.

### 7.3.6 Legal contracts

Legal contracts are important in enabling interfirm adaptation to climate change regulations. Contracts specify roles, obligations, and expectations, providing a structured framework for aligning activities and ensuring compliance. Agreements between manufacturers and dealers, for instance, establish sales targets, car ordering requirements, and promotional obligations, which help businesses adjust their operations to meet regulatory standards. This finding supports the literature which highlights that contracts are the primary means of linking activities in business interactions (Mouzas and Ford,

2012) because they enhance expectations, predictability, and certainty between contracting businesses (Cannon et al., 2000; Mouzas, 2022a).

Contracts also support collaboration and operational alignment. For example, agreements with regulatory authorities require manufacturers to meet specific standards and impose penalties for non-compliance, ensuring accountability. Contracts between dealers and manufacturers further guide activity alignment by setting clear terms for promoting fuel-efficient cars and planning investments in technologies. These results align with the literature, which views contracts as both formal tools for ensuring compliance and relational mechanisms that strengthen business relationships and adaptability (Mouzas and Ford, 2012; Mouzas, 2022a).

In contrast, poorly designed contracts can hinder interfirm adaptation. Contracts focused merely on formalities, such as delivery arrangements, fail to guide activities effectively when they lack clear obligations or incentives within their business relationships. This extends the argument that contracts provide the formal framework enabling modifications in response to unanticipated contingencies (Cannon et al., 2000), as demonstrated in the evolving climate change regulations context.

This study extends existing research by illustrating the specific role of legal contracts in responding to climate change regulations within the Saudi automobile industry. While previous studies highlight their importance in increasing predictability and facilitating interactions (Cannon et al., 2000; Mouzas, 2022a), this research provides empirical evidence showing how contracts align activities and enable compliance in a highly regulated context.

In conclusion, the findings emphasise the importance of comprehensive legal contracts in supporting interfirm adaptation. By specifying obligations, fostering collaboration, and

increasing predictability, contracts enable businesses to adapt to regulatory requirements within networks. On the other hand, contracts that lack detailed terms may hinder interfirm adaptation, highlighting the need for well-structured agreements.

### 7.3.7 Present bias

Present bias acts as a significant behavioural error that hinders interfirm adaptation in responding to climate change regulations. Present bias is the tendency to settle for a smaller reward immediately instead of waiting longer for a larger reward in the future (Mouzas, 2022a). Within the Saudi automobile industry, businesses present a propensity towards quick sales of well-known, high-consumption cars rather than investing in fuel-efficient car models that align with climate change regulations. This tendency aligns with the literature, which suggests that present bias delays decisions requiring immediate sacrifices, such as transitioning to environmentally friendly products (Gifford, 2011; Mouzas, 2022a).

The findings illustrate that the emergence of present bias affects business interactions. For example, some dealers prioritise immediate profits by focusing on high-demand car models with high fuel consumption, often at the expense of their collaboration with retailers. This approach limits the willingness of businesses to work together to promote fuel-efficient cars and hinders the alignment of activities necessary for adaptation. This reflects the literature's argument that present bias leads decision-makers to avoid immediate costs, such as investments in new technologies, even when long-term benefits arise (O'Donoghue and Rabin, 1999).

In contrast, businesses that overcome present bias show greater alignment in their interactions and activities. For instance, manufacturers and dealers collaborate to offer promotions, such as free fuel for a year, to encourage customers to purchase fuel-efficient

models. These collaborative efforts, even at an initial cost to the business, demonstrate how businesses can adapt their activities to meet climate change regulations. This supports the idea that overcoming present bias requires forward-looking strategies and coordinated activities to achieve long-term benefits (Thaler, 2016).

This study extends existing research by providing empirical evidence of how present bias hinders decision-making and disrupts interactions within business networks. While prior literature has identified present bias as a barrier to climate change responses (Gifford, 2011), this thesis highlights how present bias manifests in business interactions and the strategies businesses use to address it, such as collaborative promotions and activity alignment.

In summary, the findings underscore that present bias can hinder businesses from responding to climate change regulations by disrupting collaborative interactions and prioritising immediate gains. However, businesses that address present bias through coordinated activities and forward-looking strategies demonstrate interfirm adaptation in responding to climate change regulations.

### 7.3.8 Reference points

Reference points serve as a barrier to interfirm adaptation in responding to climate change regulations. Reference points serve as the ‘status quo’ against which businesses evaluate potential outcomes. Businesses anchored to reference points are more likely to resist changes that involve perceived losses, even if the changes could result in long-term gains. This aligns with behavioural science, which highlights that gains and losses are perceived differently by actors. When it comes to prospective gains, actors tend to be risk averse but when it comes to prospective losses, actors appear to be risk takers (Kahneman and Tversky, 1979; Kahneman, 1992).

The findings indicate that businesses treating their existing car models and sales strategies as reference points often resist adapting to new environmentally friendly cars or processes introduced by their counterparts. For example, retailers prioritising familiar models with proven demand avoid the perceived risks associated with promoting less familiar, eco-friendly alternatives. This supports the notion that actors appear risk averse when it comes to potential gains from moving away from the status quo, as described in prospect theory (Kwon and Lee, 2009).

However, the findings also highlight that businesses willing to challenge their reference points are better positioned to adapt effectively. For instance, some dealers recognised that maintaining the same product mix was no longer sustainable and collaborated with manufacturers to introduce smaller engine and hybrid models. This willingness to abandon the status quo aligns with regulatory demands. It reflects how businesses can overcome reference point biases by recognising the need for change and embracing collaborative adaptation efforts.

This study builds on existing research by demonstrating how reference points influence interfirm interactions and adaptation in the context of climate change regulations. While prior studies have focused on reference points as individual decision-making biases (Kahneman and Tversky, 1979; Dowling et al., 2020), this research provides empirical evidence of how these biases manifest in business networks, particularly in resisting or enabling adaptation efforts.

In summary, the findings highlight that reference points significantly influence businesses' responses to climate change regulations. Businesses anchored to existing models and strategies are more likely to resist necessary changes, hindering interfirm adaptation. On the other hand, those willing to adjust or abandon their reference points

demonstrate greater adaptability and collaboration. Addressing reference point biases is essential for fostering innovation and aligning business activities with regulatory demands in the Saudi automobile industry.

### 7.3.9 Loss aversion

Loss aversion is as a significant hindrance to interfirm adaptation in responding to climate change regulations within the Saudi automobile industry. Loss aversion refers to the tendency for businesses to weigh potential losses more heavily than equivalent gains, as described in prospect theory (Kahneman and Tversky, 1979). Loss aversion leads businesses to prioritise preserving current revenue and avoiding risks, even if it means rejecting opportunities for compliance or future growth. This aligns with the literature, which highlights that loss aversion often results in resistance to change due to the perceived magnitude of potential losses compared to potential gains (Kahneman et al., 1991; Kim and Kankanhalli, 2009).

The findings illustrate that businesses exhibiting high loss aversion tend to avoid engaging with new, fuel-efficient models or processes due to fears of immediate financial losses or unsold inventory. For example, retailers prioritise short-term market predictability over stocking fuel-efficient cars, which could support compliance with climate change regulations. This behaviour reflects prior research suggesting that businesses with high loss aversion prefer maintaining the status quo over adopting sustainable practices, even when these practices offer long-term benefits (Aljughaiman and Chebbi, 2022).

In contrast, businesses that overcome loss aversion tend to reframe adaptation as a way to achieve long-term competitiveness and market sustainability. For instance, some dealers collaborate with manufacturers to introduce new car models that align with fuel

economy standards, recognising the risks of not adapting. By focusing on the broader benefits of compliance, such as increased market share, strengthened relationships, and enhanced long-term performance, these businesses shift their perspective from short-term losses to strategic gains. This aligns with the literature's emphasis on how reframing adaptation efforts can mitigate the effects of loss aversion and encourage businesses to respond proactively to external pressures like climate change regulations (Wahyuni and Ratnatunga, 2015).

This study contributes to the existing literature by demonstrating how loss aversion manifests in business networks and impacts interfirm adaptation in the Saudi automobile industry. While previous research has established the negative effects of loss aversion on market performance (Aljughaiman and Chebbi, 2022), this study provides empirical evidence of how businesses can overcome this bias through collaborative strategies and a forward-looking approach.

Loss aversion can significantly hinder interfirm adaptation by leading businesses to avoid immediate risks, even when long-term gains are evident. However, businesses that reframe adaptation as a strategic opportunity demonstrate greater adaptability by shifting their focus from preserving the status quo to embracing collaborative efforts for compliance and competitiveness. Addressing loss aversion is essential for enabling interfirm adaptation in response to climate change regulations within the Saudi automobile industry.

In summary, the second research objective of exploring the interactional and behavioural aspects of interfirm adaptation in responding to climate change regulations is achieved in section 7.3. It provides a discussion of the empirical evidence and the related literature of enablers and barriers of interfirm adaptation guided by the ARA model. Accordingly,

resource entitlements, resource mobilisation, resource exploitation, business relationships, economic exchange, legal contracts, present bias, reference points, and loss aversion are witnesses to underpin businesses' interfirm adaptation in responding to climate change regulations. Therefore, the next section addresses the third research question aiming to meet the thesis's third objective which is examining the relationships between businesses' behavioural and interactional aspects and interfirm adaptation in responding to climate change regulations.

## 7.4 How do business interactions affect interfirm adaptation in response to climate change regulations?

The hypotheses proposed in this thesis are generally supported, highlighting the role played by resources (i.e., resource entitlements, resource mobilisation, resource exploitation) and actors' biases (i.e., present bias, reference points, and loss aversion) in influencing activities (i.e., business relationships, economic exchange, and legal contracts) and in turn interfirm adaptation (i.e. supplier adaptation and customer adaptation).

Answering the research question about the influence of network interactions and behaviours on interfirm adaptation in response to climate change regulations addresses a key research objective. This objective is to examine the relationships between businesses' behavioural and interactional aspects and interfirm adaptation in responding to climate change regulations in the Saudi automobile industry. As pointed out previously in section 6.2, the proposed hypotheses aim to explain how activity aspects (i.e., business relationships, economic exchange, and legal contracts) mediate the effects of resources (i.e., resource entitlements, resource mobilisation, resource exploitation) and actors' biases (i.e., present bias, reference points, and loss aversion) on interfirm adaptation.

This thesis contributes to existing knowledge of network approach (e.g., Håkansson and Snehota, 1995; Ritter, 2000; Araujo et al., 2003; Möller et al., 2005; Ford and Håkansson, 2013; Waluszewski et al., 2019 ) and the literature in business and management literature in responding to climate change regulations (e.g., Kolk and Pinkse, 2004; Böttcher and Müller, 2015; Wahyuni and Ratnatunga, 2015; Shevchenko et al., 2016; Wright and Nyberg, 2017; Goworek et al., 2018; Shevchenko 2021; Shui et al., 2025) by developing and testing a conceptual framework of adaptive business response to climate change regulations within business networks (Figure 7.2). The conceptual framework highlights the role played by resources (i.e., resource entitlements, resource mobilisation, resource exploitation) and actors' biases (i.e., present bias, reference points, and loss aversion) in influencing activities (i.e., business relationships, economic exchange, and legal contracts) and in turn interfirm adaptation (i.e. supplier adaptation and customer adaptation). Table 7.1. summarise the hypotheses results. The following sub-section (7.4.1) discusses resource aspects hypotheses followed by sub-section (7.4.2) which discusses actors' cognitive biases hypotheses.

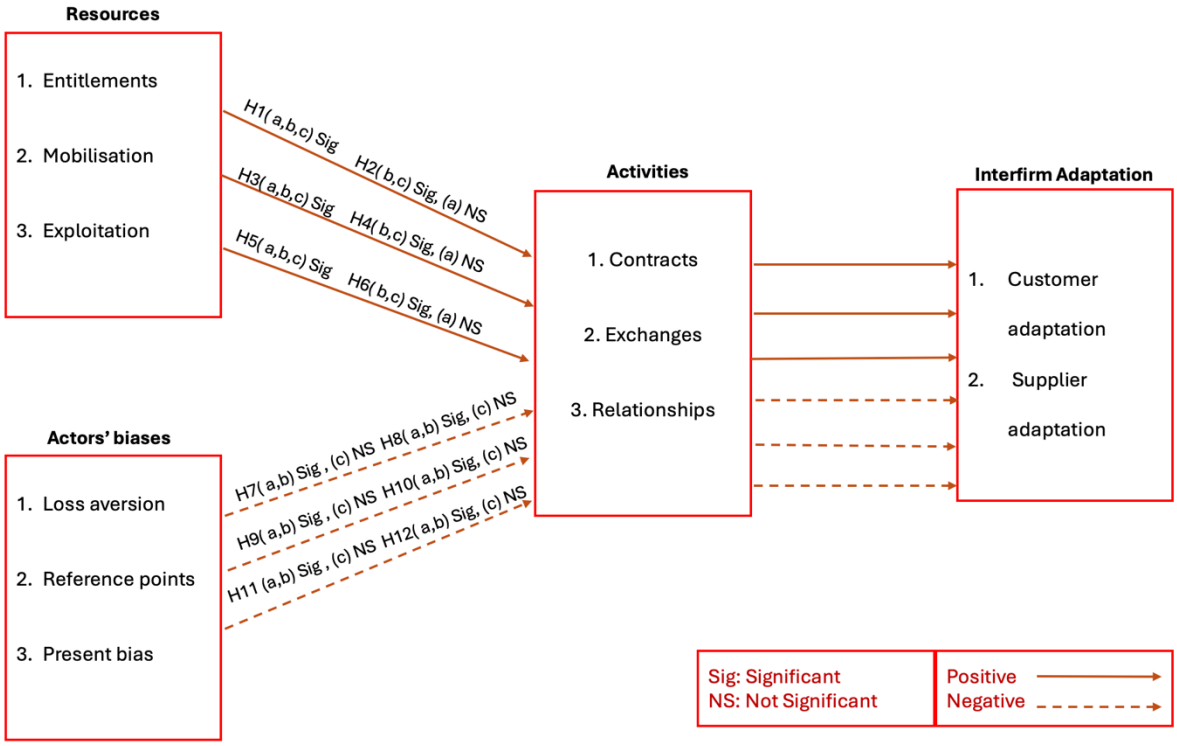



Figure 7. 2 Conceptual framework

Table 7. 1 Summary of hypotheses results

| Independent variable | Mediator | Dependent variable | Type of mediation | Supported/ Rejected |
|---|---|---|---|---|
| H1a: Entitlements | Contracts | Customer adaptation | Partial mediation | Supported |
| H1b: Mobilisation | | | Partial mediation | Supported |
| H1c: Exploitation | | | Partial mediation | Supported |
| H7a: Loss aversion | | | Partial mediation | Supported |
| H7b: Present bias | | | Full mediation | Supported |
| H7c: Reference points | | | Full mediation | Rejected |
| H2a: Entitlements | | Supplier adaptation | Direct-only | Rejected |
| H2b: Mobilisation | | | Partial mediation | Supported |
| H2c: Exploitation | | | Partial mediation | Supported |
| H8a: Loss aversion | | | Partial mediation | Supported |
| H8b: Present bias | | | Full mediation | Supported |
| H8c: Reference points | | | Full mediation | Rejected |
| H3a: Entitlements | Exchanges | Customer adaptation | Partial mediation | Supported |
| H3b: Mobilisation | | | Partial mediation | Supported |
| H3c: Exploitation | | | Partial mediation | Supported |
| H9a: Loss aversion | | | Partial mediation | Supported |
| H9b: Present bias | | | Full mediation | Supported |
| H9c: Reference points | | | Full mediation | Rejected |
| H4a: Entitlements | | Supplier adaptation | Direct-only | Rejected |
| H4b: Mobilisation | | | Partial mediation | Supported |
| H4c: Exploitation | | | Partial mediation | Supported |
| H10a: Loss aversion | | | Full mediation | Supported |
| H10b: Present bias | | | Full mediation | Supported |
| H10c: Reference points | | | Full mediation | Rejected |
| H5a: Entitlements | Relationships | Customer adaptation | Partial mediation | Supported |
| H5b: Mobilisation | | | Full mediation | Supported |
| H5c: Exploitation | | | Partial mediation | Supported |

| | | | | |
|---|---|---|---|---|
| H11a: Loss aversion | | | Partial mediation | Supported |
| H11b: Present bias | | | Full mediation | Supported |
| H11c: Reference points | | | Full mediation | Rejected |
| H6a: Entitlements | | Supplier adaptation | Direct-only | Rejected |
| H6b: Mobilisation | | | Partial mediation | Supported |
| H6c: Exploitation | | | Partial mediation | Supported |
| H12a: Loss aversion | | | Full mediation | Supported |
| H12b: Present bias | | | Full mediation | Supported |
| H12c: Reference points | | | Full mediation | Rejected |

### 7.4.1 Resources

This section discusses the quantitative results of the resource aspects of business interaction in responding to climate change regulations in the Saudi automobile industry. As pointed out previously in section 6.2, the proposed hypotheses aim to explain how activity aspects (i.e., business relationships, economic exchange, and legal contracts) mediate the effects of resources (i.e., resource entitlements, resource mobilisation, resource exploitation) on interfirm adaptation. This thesis contributes to existing knowledge of business interaction in responding to climate change within networks (e.g., Veal and Mouzas, 2010, 2011, 2012; Finke et al., 2016). In addition, this thesis responds to Baraldi and Strömsten's (2024) call for further studies on resources at the industrial network level by testing the resource aspect effect on adaptive business response to climate change regulations within business relationships and networks. The following sub-sections discuss resource entitlements, resource mobilisation and resource exploitation respectively.

#### 7.4.1.1 Resource entitlements

First, the thesis's findings highlight the positive effect of resource entitlements on customer adaptation mediated through activity aspects (i.e., business relationships, economic exchanges, and legal contracts). Most of the studies are conceptual and qualitatively explore resource entitlements (e.g., Mouzas, 2022b; Mouzas, 2024). Furthermore, based on the qualitative findings of this thesis, resource entitlements

establish a foundation for structuring interactions and linking activities to customer and supplier adaptation in the Saudi automobile industry.

Hypotheses H1a, H3a, and H5a suggest that activity aspects (i.e., business relationships, economic exchanges, and legal contracts) mediate the positive effect of entitlements on customer adaptation. Consistent with the thesis's hypothesis, the results confirm that there is a positive and statistically significant effect of resource entitlement on customer adaptation through activities.

This indicates, for instance, that dealers' right to select car models from suppliers and reduce prices coordinates business activities by establishing well-detailed legal contracts (Mouzas, 2022a). These contracts increase expectations, predictability, and certainty in business interactions between contracting businesses (Mouzas, 2022a; Cannon et al., 2000). This leads to dealers' adaptation of car technologies (e.g., hybrid and electric cars) and inventory management in response to climate change regulations (Walter et al., 2003; Hagberg-Andersson and Grønhaug, 2010).

Second, although the thesis predicted a positive effect of resource entitlements on supplier adaptation mediated through the activity aspects (i.e., business relationships, economic exchanges, and legal contracts) (H2a, H4a, H6a), the findings did not support this relationship. Specifically, there was no significant effect of resource entitlements on supplier adaptation. This finding suggests that customers (i.e., retailers and dealers) may not view resource entitlements as enablers of supplier adaptation to climate change regulations through activity aspects (i.e., business relationships, economic exchanges, and legal contracts). One possible justification could relate to asymmetric power (Hallén et al., 1991). Asymmetric power occurs when one business holds more resources than the other party depends on, giving it a stronger market position and reducing its need to adapt

(Hallén et al., 1991). This suggests that suppliers, who often control critical resources such as car models, production capabilities, and supply chains, may not perceive customers' resource entitlements as strong enough to drive interfirm adaptation. Therefore, while resource entitlements establish a foundation for structuring interactions, they may not directly translate into supplier adaptation.

In brief, findings from the quantitative phase show that activity aspects (i.e., business relationships, economic exchanges, and legal contracts) mediate the positive effect of entitlements on customer adaptation. This supports the qualitative findings, which highlight the role of resource entitlements in structuring interactions and coordinating activities to achieve customer adaptation. In contrast, activity aspects (i.e., business relationships, economic exchanges, and legal contracts) did not significantly mediate the effect of resource entitlements on supplier adaptation. This contradicts the qualitative findings, which suggested that resource entitlements would also influence supplier adaptation. As discussed, one possible explanation for this difference is asymmetric power. Specifically, suppliers often control critical resources such as car models, production capabilities, and supply chains. This gives them a stronger market position, reducing their need to adapt in response to customer entitlements (Hallén et al., 1991). Consequently, resource entitlements may not be perceived as strong enough to drive supplier adaptation. Therefore, while resource entitlements enable customer adaptation, they may not directly lead to supplier adaptation due to differences in power dynamics.

#### 7.4.1.2 Resource mobilisation

First, this thesis demonstrates that resource mobilisation positively impacts customer adaptation by influencing business relationships, economic exchanges, and legal contracts. Previous studies examined the resource mobilisation effect on new product development in the United Kingdom service context (e.g., Thornton, et al., 2019). In

addition, this thesis examines resource mobilisation in the context of interfirm adaptation in responding to climate change regulations in the Saudi automobile industry. Based on the qualitative, this thesis argues that resource mobilisation provides access to heterogeneous resources and integrates activities to customer and supplier adaptation.

Hypotheses H1b, H3b, and H5b suggest that activity aspects (e.g., business relationships, economic exchanges, and legal contracts) mediate the positive effect of resource mobilisation on customer adaptation. Consistent with the thesis's hypothesis, the results suggest that resource mobilisation has a positive and statistically significant effect on customer adaptation through activities.

The findings of this study indicate that resource mobilisation (e.g., gaining access to suppliers' long-term goals) significantly influences core business activities, including relationships, economic exchanges, and legal contracts. In turn, this affects positive customer adaptation in responding to climate change regulations at both product and process levels. This implies that the customers' (i.e., retailers' and dealers') access to suppliers' resources, such as long-term brand goals, enhances their ability to link business activities using legal contracts. Consequently, these legally binding obligations of contracts support business predictability and planning. This, in turn, facilitates interfirm adaptation of products and processes in the face of external pressure emanating from climate change regulations (Cannon et al., 2000; Mouzas, 2022a).

Second, the positive effect of resource mobilisation on supplier adaptation mediated through activity aspects (i.e., business relationships, economic exchanges, and legal contracts) is in line with this thesis's prediction (H2b, H4b, H6b). The findings show that resource mobilisation has a significant and positive effect on supplier adaptation through activities (i.e., business relationships, economic exchanges, and legal contracts).

Therefore, dealers' access to the pricing strategies of suppliers allows them to enhance the fairness of transactions and maintain mutually beneficial business relationships by aligning their activities with anticipated rewards driven by surplus income (Guo et al., 2017; Ting and Ahn, 2023). This alignment between dealer and supplier activities through improved transactional fairness and collaboration can drive supplier adaptation, such as developing and supplying fuel-efficient car models that comply with climate change regulations (Hagberg-Andersson and Grønhaug, 2010; Yu and Fang, 2023).

In brief, findings from the quantitative phase show that resource mobilisation has a positive and significant effect on interfirm adaptation (i.e., customer adaptation and supplier adaptation) through activity aspects (i.e., business relationships, economic exchanges, and legal contracts), providing further empirical support for the qualitative findings.

#### 7.4.1.3 Resource exploitation

First, the thesis's findings highlight the positive effect of resource exploitation on customer adaptation, mediated by business relationships, economic exchanges, and legal contracts. Previous research examined the resource exploitation effect on new product success in technology-intensive industrial businesses (e.g., O'Cass, et al., 2019). In addition, this thesis examines resource exploitation in the context of interfirm adaptation in responding to climate change regulations in the Saudi automobile industry. Qualitative findings indicate that resource exploitation involves the refinement and incremental improvement of existing resources. This links business activities such as economic exchanges and process improvements, enabling customer and supplier adaptation.

Hypotheses H1c, H3c, and H5c suggest that activities (e.g., business relationships, economic exchange, and legal contracts) mediate the positive effect of resource

exploitation on customer adaptation. Consistent with the thesis's hypotheses, the results confirm that resource exploitation has a positive and statistically significant effect on customer adaptation through activities.

This finding implies that retailers' efforts to refine existing pricing processes (e.g., offering fair payments for good-quality cars) and improve promotion processes (e.g., enhancing advertising strategies for regulatory-compliant cars) strengthen their business relationships with suppliers (O'Cass et al., 2014). Such strengthened relationships increase cooperation by creating more synergy between activities (Abosag, 2015) and foster trust and fairness, which outweigh in the interaction and activities between businesses (Johnson, 1999). These stronger relationships, in turn, enable retailers to adopt car features, improve car delivery processes, and align their car offerings with climate change regulations.

Second, the positive effect of resource exploitation on supplier adaptation mediated through activity aspects (i.e., business relationships, economic exchange, and legal contracts), is in line with the thesis's prediction (i.e. H2c, H4c, H6c). The findings show there are significant relationship between resource exploitation on supplier adaptation through activities (i.e., business relationships, economic exchange, and legal contracts).

As an application of this finding, it can be observed that dealers' refinement of distribution and stock processes (e.g., ensuring efficient allocation of inventory and timely deliveries) enhances their economic exchanges with suppliers. These refinements ensure that both parties fulfil their responsibilities and maintain fair transactions, strengthening trust and fairness in the relationship (Guo et al., 2017; Ting and Ahn, 2023). Such strengthened economic exchanges enable suppliers to adapt by improving their

production processes, enhancing the quality of car features, and aligning their offerings with climate change regulations (Brennan et al., 2003).

In brief, findings from the quantitative phase show that resource exploitation has a positive and significant effect on interfirm adaptation (i.e., customer adaptation and supplier adaptation) through activities (i.e., business relationships, economic exchange, and legal contracts), supporting the patterns identified in the qualitative phase.

### 7.4.2 Actors' Biases

This section discusses the quantitative results of the behavioural biases that emerge when businesses respond to climate change regulations in the Saudi automobile industry. As pointed out previously in section 6.2, the proposed hypotheses aim to explain how activity aspects (i.e., business relationships, economic exchange, and legal contracts) mediate the effects of behavioural biases (i.e., present bias, reference points, and loss aversion) on interfirm adaptation. This thesis contributes to existing knowledge of behaviours in business networks when responding to climate change (e.g., Veal and Mouzas, 2010, 2011, 2012; Finke et al., 2016). In addition, this thesis responds to Guercini et al.'s (2014, 2022) call for additional research on interaction and behaviour within business relationships by testing the behavioural biases effect on adaptive business response to climate change regulations within business relationships and networks. The following sub-sections discuss present bias, reference points, and loss aversion, respectively.

#### 7.4.2.1 Present bias

First, the thesis's findings highlight the negative effect of present bias on customer adaptation mediated through activity aspects (i.e., business relationships, economic exchange, and legal contracts). Based on the qualitative findings of this thesis, present bias reflects the tendency of businesses to prioritise immediate rewards, such as quick

sales of well-known high-consumption models, over long-term strategies. This tendency is in line with the literature, which indicates that present bias postpones decisions that require immediate sacrifices, such as transitioning to environmentally friendly products (Mouzas, 2022a; Gifford, 2011). Such behaviour affects business activities, including economic exchanges by focusing on short-term profits. These activities are essential for enabling customer and supplier adaptation in responding to climate change regulations within the Saudi automobile industry.

Hypotheses H7b, H9b, and H11b suggest that activities (i.e., business relationships, economic exchange, and legal contracts) mediate the negative effect of present bias on customer adaptation. Consistent with the thesis's hypothesis, the results confirm that there is a negative and statistically significant effect of present bias on customer adaptation through activities.

These findings suggest that retailers' tendency to prioritise immediate profit from high-consumption cars (Mouzas, 2022a). This tendency disrupts the fairness and trust essential for maintaining strong business relationships with suppliers. Additionally, delaying the sacrifices needed to promote environmentally efficient cars (Gifford, 2011; Böttcher and Müller, 2015) further weakens these relationships. Such weakened relationships hinder retailers' ability to engage in interfirm adaptation, such as adopting new technologies like hybrid and electric vehicles or adjusting planning processes to align with climate change regulations (Hallen et al., 1991; Mouzas, 2024).

Second, the negative effect of present bias on supplier adaptation mediated through activity aspects (i.e., business relationships, economic exchange, and legal contracts), is in line with the thesis's prediction (i.e. H8b, H10b, and H12b). The findings show there

is a negative and statistically significant effect of present bias on supplier adaptation through activities (i.e., business relationships, economic exchange, and legal contracts).

These findings suggest that dealers' propensity to prioritise immediate car deliveries at full price rather than waiting for discounted deliveries in the future. This propensity negatively affects the trust and fairness that underpin business relationships with suppliers (Johnson, 1999). The weakening of these relationships impedes suppliers' ability to adapt their products (e.g., incorporating hybrid or electric technologies) and processes (e.g., improving stock management or delivery procedures) to align with climate change regulations (Hallen et al., 1991; Mouzas, 2024).

In brief, findings from the quantitative phase show that present bias has a negative and significant effect on interfirm adaptation (i.e., customer adaptation and supplier adaptation) through activities (i.e., business relationships, economic exchange, and legal contracts), offering additional validation for the qualitative results.

#### 7.4.2.2 Reference points

First, the thesis's findings highlight the negative effect of reference points on customer adaptation mediated through aspects of activities (i.e., business relationships, economic exchange, and legal contracts). Based on the qualitative findings, this thesis argues that reference points anchored on the status quo lead businesses to evaluate outcomes relative to familiar practices and offerings. This often results in resistance to changes perceived as risky or involving potential losses. Such status quo bias aligns with previous research, which suggests that decision-makers tend to compare new alternatives to existing conditions, leading to a preference for familiar options and aversion to perceived losses (Kahneman and Tversky, 1979; Kahneman, 1992; Kwon and Lee, 2009; Dowling et al.,

2020). This resistance influences business activities such as economic exchanges and business relationships. In turn, this hinders customer and supplier adaptation.

Hypotheses H7c, H9c, and H11c suggest that activity aspects (i.e., business relationships, economic exchanges, and legal contracts) mediate the negative effect of reference points on customer adaptation. Unexpectedly with the thesis's hypotheses, the results show significant and positive relationships between reference points and customer adaptations through activity aspects (i.e., business relationships, economic exchanges, and legal contracts).

These findings suggest that reference points, contrary to the thesis's hypotheses, positively influence customer adaptation through activity aspects (i.e., business relationships, economic exchanges, and legal contracts). One possible justification for this unexpected result could be related to methodological limitations. For instance, the research design may not have fully captured the nuanced relationship between reference points and interfirm adaptation. As Field and Hole (2003) highlight, employing experimental methods could provide deeper insights by manipulating reference points in controlled scenarios to observe their effects on customer adaptation. This approach aligns with previous research, such as Heffetz (2021), which frequently utilises experimental designs to examine the role of reference points.

Second, the negative effect of reference points on supplier adaptation mediated through activity aspects (i.e., business relationships, economic exchange, and legal contracts), however, was different from the thesis's prediction (i.e. H8c, H10c, and H12c). The results show significant and positive relationships between reference points and supplier adaptations through activity aspects (i.e., business relationships, economic exchanges, and legal contracts).

These results indicate that reference points, contrary to the thesis's hypotheses, positively influence supplier adaptation through activity aspects (i.e., business relationships, economic exchanges, and legal contracts). One possible justification for this unexpected result could be methodological limitations. For instance, the research design may not have fully captured the complex relationship between reference points and interfirm adaptation. As Field and Hole (2003) highlight, experimental methods could offer deeper insights by manipulating reference points in controlled scenarios to observe their effects on supplier adaptation. This approach aligns with previous research, such as Heffetz (2021), which frequently employs experimental designs to examine the influence of reference points in business decision-making.

In brief, findings from the quantitative phase show that reference points have no negative and significant effect on interfirm adaptation (i.e., customer adaptation and supplier adaptation) through activities (i.e., business relationships, economic exchange, and legal contracts) but have a positive and significant effect. This contrasts with the qualitative findings, suggesting that the relationship between reference points and interfirm adaptation may be more complex than initially indicated.

#### 7.4.2.3 Loss aversion

First, the thesis's findings highlight the negative effect of loss aversion on customer adaptation mediated through activity aspects (i.e., business relationships, economic exchange, and legal contracts). Previous studies examined the negative effect of loss aversion on firms' market performance in the Saudi stock exchange context (e.g., Aljughaiman and Chebbi, 2022). In addition, this thesis examines loss aversion in the context of interfirm adaptation in responding to climate change regulations in the Saudi automobile industry. Based on the qualitative findings of this thesis, loss aversion shapes

business decisions and limits activities, hindering customer and supplier adaptation in the Saudi automobile industry.

Hypotheses H7a, H9a, and H11a suggest that activities (i.e., business relationships, economic exchange, and legal contracts) mediate the negative effect of loss aversion on customer adaptation. Consistent with the thesis's hypothesis, the results confirm that there is a negative and statistically significant effect of loss aversion on customer adaptation through activities.

Second, the negative effect of loss aversion on supplier adaptation mediated through activity aspects (i.e., business relationships, economic exchange, and legal contracts), is in line with the thesis's prediction (i.e. H8a, H10a, and H12a). The findings show there is a negative and statistically significant effect of present bias on supplier adaptation through activities (i.e., business relationships, economic exchange, and legal contracts).

Based on this finding, it can be observed that dealers make greater efforts to avoid losing profits on well-known, high-consumption car models rather than seeking profits from introducing fuel-efficient vehicles (Kahneman et al., 1991). This tendency limits their willingness to link activities with suppliers, which is crucial for adaptation to climate change regulations (Håkansson and Snehota, 1995). Since business networks function through interdependent activities such as production, delivery, and product display (Håkansson et al., 2009), unwillingness to adjust business activities weakens business relationships and disrupts coordination efforts necessary for adaptation (Håkansson and Johanson, 1992).

These loss-averse tendencies further limit economic exchanges, as dealers may resist contractual adjustments or avoid long-term commitments that require aligning operations with evolving climate change regulations (Cannon et al., 2000). The inability to

coordinate activities with suppliers restricts adaptation, making it difficult for dealers to introduce new fuel-efficient car models, adjust pricing structures, or refine marketing and distribution processes to comply with climate change regulations (O'Cass et al., 2014; Mouzas, 2024).

By resisting activity adaptations, dealers may weaken their long-term competitive position (Håkansson and Snehota, 1995). Since activities in business networks are inherently interdependent, this reluctance not only slows dealers' own adaptation but also affects suppliers' ability to modify their operations in response to climate change regulations (Veal and Mouzas, 2011). Addressing loss aversion in decision-making could encourage stronger activity linkages, more adaptable contractual agreements, and improved collaboration between dealers and suppliers, facilitating interfirm adaptation to regulatory pressures.

In brief, findings from the quantitative phase show that loss aversion has a negative and significant effect on interfirm adaptation (i.e., customer adaptation and supplier adaptation) through activities (i.e., business relationships, economic exchange, and legal contracts), confirming the qualitative insights on loss aversion.

In summary, the third research objective of examining the relationships between businesses' behavioural and interactional aspects and interfirm adaptation in responding to climate change regulations in the Saudi automobile industry is achieved in this section 7.4. The hypotheses proposed in this thesis are generally supported, highlighting the relationships between resources (i.e., resource entitlements, resource mobilisation, and resource exploitation), behavioural biases (i.e., present bias, reference points, and loss aversion), activities (i.e., business relationships, economic exchanges, and legal contracts), and interfirm adaptation (i.e., customer adaptation and supplier adaptation).

The findings contribute to existing knowledge in the network approach and business management literature by providing empirical evidence on the mediating role of activities in linking resources and behavioural biases to interfirm adaptation. This thesis also responds to calls for further research on the role of resources within industrial networks (e.g., Baraldi & Strömsten, 2024) and on the behavioural dimensions of business interactions (e.g., Guercini et al., 2014, 2022). This thesis advances our understanding of adaptive business responses to climate change regulations, offering new insights into the Saudi automobile industry while contributing to the broader literature on business network interactions and adaptation.

Additionally, this section presents how the qualitative and quantitative findings relate to one another. Throughout Section 7.4, quantitative results were continuously linked to qualitative findings to confirm or challenge emerging patterns. Overall, both sets of data clearly support one another. However, some differences have emerged. For instance, while resource entitlements were qualitatively shown to support customer and supplier adaptation, quantitative results supported this relationship only for customer adaptation. A potential explanation for this difference is the asymmetric power dynamics discussed earlier in section 7.4.1.1, which reduces suppliers' need to respond to customer entitlements. Another notable discrepancy was the influence of reference points. Although the qualitative findings suggested that reference points negatively influence interfirm adaptation, quantitative findings unexpectedly indicated a positive effect. As previously discussed in section 7.4.2.2, this difference could be attributed to methodological limitations, such as the quantitative survey design's limited ability to capture the nuanced influence of reference points, highlighting a complexity that deserves further exploration.

## 7.5 Conclusion

This chapter demonstrated that businesses respond to external pressures from climate change regulations through interfirm adaptation at product and process levels. These adaptations are not isolated efforts but result from dynamic interactions within business networks, involving collaborative adjustments in products, processes, and strategies. By adopting the network approach, the thesis extends the literature by emphasising the interconnected roles of actors, resources, and activities in facilitating adaptive responses to climate change regulations within the Saudi automobile industry.

In addressing enablers and barriers, the chapter highlights the essential roles of resources (i.e., resource entitlements, mobilisation, and exploitation), activities (i.e., business relationships, economic exchanges, and legal contracts), and behavioural biases (i.e., present bias, reference points, and loss aversion). High-quality business relationships, effective economic exchanges, and well-structured legal contracts, along with resource entitlements that structure interactions, resource mobilisation that provides access to diverse resources, and resource exploitation that ensures efficient utilisation of existing resources, collectively enable interfirm adaptation. Conversely, behavioural biases such as present bias and loss aversion hinder adaptation by prioritising immediate rewards and resisting change.

The quantitative phase further validated the hypotheses, illustrating the mediating role of activities in linking resources and behavioural biases to interfirm adaptation. This evidence supports the development of a conceptual framework, contributing to the network approach and business management literature. It also responds to calls for research on resources within industrial networks and the behavioural dimensions of business interactions.

The discussion achieves the research objectives by providing empirical evidence on adaptive business responses to climate change regulations. It underscores that interfirm adaptation is shaped by the interplay of behavioural and interactional aspects within business networks. This understanding contributes to the literature and offers practical insights for businesses navigating climate change regulations in the Saudi automobile industry.

# Chapter 8: Conclusion

## 8.1 Introduction

This chapter presents the final part of this thesis. The objectives of this chapter are fourfold. First, it synthesises the key contributions arising from the qualitative and quantitative phases of this research. Second, it highlights the managerial implications of the findings for managers and policymakers, offering valuable insights into business responses to climate change regulations. Third, it identifies the limitations of the present research. Finally, it suggests directions for future research.

## 8.2 Theoretical contributions

This research makes significant contributions to our understanding of how businesses respond to climate change regulations in several ways. This study addresses gaps in the current literature by drawing on network approach (e.g., Håkansson and Snehota, 1995; Ritter, 2000; Araujo et al., 2003; Möller et al., 2005; Ford and Håkansson, 2013; Waluszewski et al., 2019) and by complementing the network approach with behavioural insights (e.g., Simon, 1955; Kahneman and Tversky, 1979; Thaler, 2016). This research contributes to existing knowledge of business response to climate change regulations (e.g., Kolk and Pinkse, 2004; Böttcher and Müller, 2015; Wahyuni and Ratnatunga, 2015; Shevchenko et al., 2016; Wright and Nyberg, 2017; Goworek et al., 2018; Shevchenko 2021; Shui et al., 2025) by developing a novel conceptual framework of adaptive business responses to climate change regulations (Figure 7.1: p.234).

Building on the ARA framework, the developed conceptual model expands its scope by integrating behavioural insights and clarifying the internal structure of each dimension. The model deepens the actor layer by considering behavioural tendencies and biases, enriches the resource layer by identifying resource entitlements, mobilisation, and

exploitation, and advances the activity layer by showing how it is governed through business relationships, economic exchanges, and legal contracts. These refinements offer a behaviourally informed extension of the ARA framework to explain how businesses interact and adapt in response to climate change regulations.

Guided by the thesis's research objectives, the following sections elaborate on how the findings of this thesis contribute to the literature on business responses to climate change regulations.

### 8.2.1 Understanding businesses' responses to external pressure emanating from climate change regulations.

The present research contributes to the understanding of businesses' responses to external pressure emanating from climate change regulations by investigating these responses within the context of business networks in the Saudi automobile industry. Unlike previous research that treated these responses as atomistic and isolated processes undertaken by individual businesses (e.g., Kolk and Pinkse, 2004; Böttcher and Müller, 2015; Wahyuni and Ratnatunga, 2015; Shevchenko et al., 2016; Wright and Nyberg, 2017; Goworek et al., 2018; Shevchenko 2021; Shui et al., 2025), this research addresses a gap in the literature by utilising the network approach theoretical lens that emphasises the substantial role of interaction within business networks (e.g., Håkansson and Snehota, 1995; Ritter, 2000; Araujo et al., 2003; Möller et al., 2005; Ford and Håkansson, 2013; Waluszewski et al., 2019). By adopting the network approach, this thesis provides new evidence that business responses to climate change regulations are driven by repeated interactions and exchange processes that involve various actors, their resources and activities which leads to the observed outcomes of adaptive business responses at product and process levels within business networks.

At the product level, adaptation plays a crucial role in businesses' response to climate change regulations. These adaptations of products through continuous interaction within the business network involve relying on their resources and linking activities, evidenced by changes to product types, features, designs, and technologies. Additionally, new car models are introduced to align with environmental regulations. For example, dealers had to change their car types by increasing fuel-efficient car models and work with manufacturers to meet the CAFE standard requirements. This implies that manufacturers would not meet the CAFE standard individually but through continuous business interactions which results in dealers' adaptation of products. Moreover, manufacturers play a key role in product adaptation by introducing car models with smaller, more efficient, and advanced technologies. These efforts to redesign vehicles enhance fuel efficiency, enabling dealers to offer products that comply with climate change regulations and align with consumer preferences.

At the process level, adaptation acts as a key component of businesses' response to climate change regulations. These adaptations of processes through continuous interaction within the business network are shown in changes such as administrative procedures, delivery, inventory, production processes, planning, financial procedures, information exchange and marketing. For instance, Manufacturers' integration of fuel-saving technologies, such as turbocharged engines and advanced transmissions, requires dealers to adapt their training and maintenance processes to support these innovations effectively. At the same time, these advancements require retailers to adjust their marketing strategies. Car retailers need to educate consumers on the benefits of new technologies and promote vehicles that adhere to climate change regulations. Interestingly, the thesis findings evidence that retailers adjusted their financial procedures by accepting losses on smaller, fuel-efficient models to meet dealer targets and maintain

compliance with regulatory standards. This strategic decision demonstrates how businesses adapt their profit margins for specific car models to balance regulatory demands and market needs. It reflects the adaptive efforts required within the business network to respond to external pressures emanating from climate change regulations. This implies that businesses' responses to evolving climate change regulations rely on efforts that extend beyond the boundaries of individual businesses. These responses are achieved through the adaptation of processes within business networks.

In sum, by adopting the network approach, this study fills a critical gap in the literature, moving beyond the view of responses as isolated actions by individual businesses to underscore the significant role of interaction within business networks in responding to climate change regulations. The findings highlight how adaptive responses at the product and process levels are shaped through repeated interactions that involve multiple actors, their resources and activities. Building on this understanding, the next section explores the enablers and barriers of interfirm adaptation in responding to climate change regulations, addressing the second research objective.

### 8.2.2 Exploring the interactional and behavioural aspects of interfirm adaptation in responding to climate change regulations

This research responds to calls in the literature (Mouzas, 2024) to investigate the mechanisms and processes driving interfirm adaptation, particularly under external pressures such as climate change regulations. While earlier studies have provided a comprehensive foundation for understanding interfirm adaptation (e.g., Håkansson, 1982; Hallen et al., 1991; Brennan and Turnbull, 1996; Hagberg-Andersson and Grønhaug, 2010; Ahmed et al., 2022; Yu and Fang, 2023), this study expands our understanding of interfirm adaptation. In particular, the interactional and behavioural aspects in business networks that enable or hinder interfirm adaptation in responding to

external pressure emanating from climate change regulations. This thesis extends the current literature in interfirm adaptation literature by integrating behavioural lens (e.g., Simon, 1955; Kahneman and Tversky, 1979; Thaler, 2016) into the network approach (e.g., Håkansson, 1982; Ford and Håkansson, 2006).

By utilising the Activities-Resources-Actors (ARA) model (Håkansson and Johanson, 1992; Håkansson and Snehota, 1995), complemented with behavioural since lens (e.g., Simon, 1955; Kahneman and Tversky, 1979; Thaler, 2016), the present research provides evidence that business activities in interfirm adaptation to climate change regulations are governed by three normative systems which are business relationships, economic exchanges, and legal contracts. It further advances understanding of how businesses connect with resources, demonstrating the role of resource entitlements, mobilisation, and exploitation in driving interfirm adaptation to climate change regulations. Additionally, the thesis highlights how behavioural biases such as present bias, loss aversion, and reference points can hinder interfirm adaptation by influencing how managers perceive and respond to such external pressure arising from climate change regulations.

The insights gained from the findings of this thesis assist to understand that businesses with a high level of enablers are more likely to succeed in interfirm adaptation to climate change regulations, while those with fewer enablers tend to face challenges. Similarly, businesses with a low level of barriers are better positioned to achieve interfirm adaptation, whereas a high level of barriers reduces their likelihood of interfirm adaptation. Understanding these enablers and barriers is essential, as they explain businesses' adaptive responses to climate change regulations within business networks.

### 8.2.3 Examining the relationships between businesses' behavioural and interactional aspects and interfirm adaptation in responding to climate change regulations

This thesis contributes to existing knowledge of network approach (e.g., Håkansson and Snehota, 1995; Ritter, 2000; Araujo et al., 2003; Möller et al., 2005; Ford and Håkansson, 2013; Waluszewski et al., 2019 ) and the literature in business and management literature in responding to climate change regulations (e.g., Kolk and Pinkse, 2004; Böttcher and Müller, 2015; Wahyuni and Ratnatunga, 2015; Shevchenko et al., 2016; Wright and Nyberg, 2017; Goworek et al., 2018; Shevchenko 2021; Shui et al., 2025) by developing and testing a conceptual framework of adaptive business response to climate change regulations within business networks (Figure 7.2: p.257). The conceptual framework highlights the role played by resources (i.e., resource entitlements, resource mobilisation, resource exploitation) and actors' biases (i.e., present bias, reference points, and loss aversion) in influencing activities (i.e., business relationships, economic exchange, and legal contracts) and in turn interfirm adaptation (i.e. supplier adaptation and customer adaptation). This study advances our understanding of adaptive business responses to climate change regulations, offering new insights into the Saudi automobile industry while contributing to the broader literature on business network interactions and interfirm adaptation. The section that follows moves on to present the managerial implication of the thesis.

## 8.3 Managerial implications

The results of this research contain several important implications for managers and policymakers in the Saudi automobile industry and similar industries that implement climate change regulations, such as energy and aviation industries.

First, from the perspectives of managers, the present study provides evidence that business responses to climate change regulations are driven by repeated interactions.

These interactions involve various actors, their resources, and activities, which leads to the observed outcome of adaptive business responses at product and process levels within business networks. Businesses need to link their activities and combine necessary resources in responding to climate change regulations, emphasising the centrality of interaction in business networks.

Another important practical implication for managers is related to resource entitlements. It shows its important role in facilitating detailed contracts that outline obligations and responsibilities between businesses. These contracts are critical for advancing interaction within business networks and ensuring access to key resources such as after-sales services and showrooms. By specifying entitlements to resources, these contracts facilitate interfirm adaptation. This is particularly significant in challenging times, such as responding to climate change regulations. Although some contractual terms may appear costly or binding (e.g., discounts tied to sales targets), they ultimately stabilise economic exchanges and strengthen interaction between business partners. Managers should prioritise the development of detailed, obligating contracts that enhance resource access, promote productive interactions, and enable interfirm adaptation to climate change regulations.

The present research shows that managers can gain significant benefits from accessing resources through business relationships when responding to climate change regulations. Accessing resources enables businesses to adapt within their business network by allowing them to plan for the future and make necessary adjustments in products and processes. Furthermore, businesses' access to resources such as research and development, and sales information can support building relationships and enhancing economic exchanges. The thesis shows that businesses are better at adapting their

products and processes when they collaborate with other businesses that provide access to critical resources, such as pricing strategies, inventory facilities, and plans for upcoming products in their brand portfolio.

Moreover, the findings from the quantitative analysis offer further implications for managers, particularly in relation to supplier and customer adaptation. The results showed statistically significant relationships between interfirm adaptation and several key enablers, such as resource mobilisation, legal contracts, and economic exchanges. These findings indicate that suppliers and customers are more likely to engage in adaptive behaviours when they are part of structured, reciprocal relationships. For instance, legal contracts that clearly define roles and expectations were shown to support adaptation across product and process dimensions. Similarly, ongoing economic exchanges encourage suppliers and customers to align their practices with environmental regulations. Therefore, managers should focus on maintaining long-term, mutually beneficial arrangements that clarify entitlements and obligations, while also fostering continuous transactions that reinforce commitment to adaptation. These efforts can facilitate alignment among supplier and customer, enhancing the business's response to climate change regulations.

In addition, and for the current research context, the findings reveal that automobile managers tend to prefer high-demand, well-known car models, even if these models are not fuel-efficient. This short-term focus negatively affects economic exchanges and creates tension in relationships with manufacturers, who are under pressure to meet environmental standards (e.g., CAFE standards). Consequently, this tension weakens interfirm adaptation and leads to less effective responses to climate change regulations. Automobile managers should therefore shift their focus from short-term gains to long-

term sustainability, taking into account the broader impact on business relationships. In addition, managers can encourage adaptive responses within the network by offering incentives that address and mitigate present bias among other network players.

## 8.4 Policy implication

From the perspectives of policymakers focusing on developing and enforcing a legal framework to address climate change, the findings from this study suggest that policymakers should keep all business actors updated about the evolving climate change regulations. For example, in the case where a retailer sells a product that is not supplied by a local agency, the local agency is required by the Law of Commercial Agencies to provide the manufacturer's warranty, required parts, and maintenance as long as the product holds the same manufacturer's brand. However, these types of regulations may be amended as a result of pressure from agencies in the regulatory bodies to protect agencies' share of manufacturers' products (high-demand products). This highlights that businesses often face delays in responding due to continuously changing regulations. Therefore, policymakers should provide early notice of any changes to previously announced regulations and standards. The continuously changing legal environment further emphasises the importance for businesses to modify their strategies in response to regulatory changes, especially those impacting their ability to comply with climate change regulations.

In addition, the findings from this thesis suggest that policymakers focusing on developing and enforcing a legal framework to address climate change should take an active role in leading and launching initiatives to organise relations between business actors. Such initiatives could support businesses in responding to climate change regulations by enhancing their understanding of their rights and responsibilities. These efforts may also help businesses comply with climate change regulations and, in turn,

contribute to sustainability. The following section moves to discuss the current thesis limitations.

## 8.5 Limitations

Before proposing a future research agenda, it is essential to acknowledge certain limitations of this study that may have impacted the findings in both phases of the thesis.

First, this thesis employs a mixed-methods approach, combining interviews and questionnaires to gain a comprehensive understanding of business responses to climate change regulations in the Saudi automobile industry. The sample for the qualitative phase encompasses managers and decision-makers of dealers, retailers and regulatory bodies while the sample for the quantitative phase includes dealers and retailers of the automobile industry in Saudi Arabia. The Saudi automobile industry is spread among the regions of the northern region, southern region, eastern region, western region and middle region. Due to time limitations, the researcher conducted the interviews and questionnaire in only one region in Saudi Arabia which is the middle region. In the middle region, the capital city of the Kingdom of Saudi Arabia is Riyadh where there are all car dealers, key retailers, and all the regulatory bodies' main offices are located. This limitation might have decreased the opportunity to obtain a comprehensive understanding of how businesses respond to climate change regulations in the Saudi automobile industry. However, the important and unique economy the middle region holds in the country might represent most of the business and regulatory bodies interaction that saturates the current research aims and objectives.

Second, researchers collecting primary data face the decision to choose between two time frames, namely, 1) a longitudinal approach which takes a series of episodes that are representational of a phenomenon over a given period of time, and 2) a cross-sectional

which takes a snapshot of a specific time (Easterby-Smith et al., 2021; Saunders et al., 2023). Given that this research is being conducted as part of a thesis submission and considering the deadline, a cross-sectional time frame is employed in this thesis for both qualitative and quantitative phases. This approach allows for the results to be obtained more quickly than would be possible with a longitudinal time frame. As climate change regulations can continually evolve, future studies might benefit from utilising a longitudinal approach to capture businesses' responses to climate change regulations over the evolving legal environment (Easterby-Smith et al., 2021; Saunders et al., 2023).

Third, due to the time limitation, the researcher employed an interview method to collect data in the qualitative phase. The focus group data collection method might encourage interaction among participants, leading to the emergence of diverse perspectives on network interactions and responses to climate change regulations, while the observation data collection method may capture non-verbal behaviours (Silverman, 2021; Creswell and Creswell, 2023). Yet the interview data collection method enables a deep exploration of businesses' experiences and strategies in responding to regulatory pressures. In addition, interviews enable the researcher to create connections with interviewees, which may lead to additional insights specific to the Saudi automobile network (Creswell and Creswell, 2023).

The interview data collection methods allowed the researcher to manage to complete the data collection within the thesis time frame due to flexibility in interviewing participants individually at their convenience time and site. On the other hand, employing a focus group would not have been possible within the doctoral research time because of the difficulties to coordinate managers and decision-makers within the Saudi automobile industry in the same place and time for data collection.

Fourth, a potential limitation of this study is the possibility of bias in the quantitative phase. Self-reported data from questionnaire may introduce response bias (Saunders et al., 2023). To mitigate potential biases, the researcher applied reverse-coded items to some items on the questionnaire (Hinkin, 1995). The rationale for utilising this technique was to create cognitive speed bumps that may reduce the potential effect of response pattern biases (Podsakoff et al., 2003).

Despite these limitations, the thesis extends business response to climate change regulations literature by developing and testing a conceptual framework of adaptive business responses to climate change regulations by utilising the network approach theoretical lens supplemented with behavioural insights. The following part moves to discuss future research.

## 8.6 Future research

The present research adds to the body of knowledge on the business responses to climate change regulation and suggests several managerial implications. While the present research takes a novel approach in exploring the interactional and behavioural aspects of interfirm adaptation, several potential directions for future research are outlined below.

The Saudi automobile industry was chosen as a research context. Research has shown that the effect of responding to climate change varies depending on different sector groups (Orazalin et al., 2024). Future studies could replicate the current findings in different sector groups. Examining network interactions and behaviours surrounding climate change regulations could provide further insights to enhance the findings of this research. In addition, the samples in both qualitative and quantitative phases were from the Kingdom of Saudi Arabia. Even though this thesis's findings might be applied to similar region contexts, it is uncertain whether comparable results will occur in an

alternative geographic region. Future studies may replicate the current findings in different geographic regions.

Second, the results of the current quantitative study show that the reference points may affect interfirm adaptation. Future studies might apply experiments as a research method. Experiments can help researchers design several scenarios and manipulate the reference points (independent variable) to discover how changes in the reference points can result in changes in the interfirm adaptation (effect) (Field and Hole, 2003). In addition, previous studies examining reference points commonly apply experimental studies (e.g., Heffetz, 2021).

Third, data was collected from business customers during the quantitative phase. This data provides insights into the types of interfirm adaptation by suppliers and customers in responding to climate change regulations. It treated dealers and retailers equally as business customers. This allowed us to examine the relationships between the thesis constructs. While previous studies have examined interfirm adaptation from the perspective of suppliers (e.g., Brennan et al., 2003; Hagberg-Andersson, and Grønhaug, K. 2010; Ahmed et al., 2022). Future studies may conduct a comparison study of interfirm adaptation in responding to climate change regulations from both perspectives of suppliers and customers within business networks. This might advance our understanding as businesses may count their adaptation efforts while considering their counterparts' adaptation as business as usual. Furthermore, further studies might compare the interfirm adaptation between automobile dealers and retailers in responding to climate change regulations. This might advance our understanding of enablers and barriers specific to businesses' position within business networks.

Fourth, the examined relationships between the current research constructs have not covered all the possible relationships in the quantitative phase. For instance, the enforceable power among resource entitlements, resource mobilisation, and resource exploitation. This is because network studies tend to be complex and related relationships that are revealed through in-depth investigations such as qualitative case studies (e.g., Mouzas, 2022b; Veal and Mouzas, 2010). Thus, the transition from qualitative to quantitative phases necessitates the reduction of complexity (Gelo et al., 2008). However, the current quantitative phase presents valuable new insight by examining the most prominent discovered relationships between constructs that resulted from the qualitative phase. Accordingly, future research should further this thesis investigation by testing quantitatively the relationships within resource factors.

# Appendices

## Appendix 1: Interview questions

1) What is your role in the company?

2) What are the changes in environmental regulation, economy, cultural that make you worry or might affect your company?

3) Why do you think these changes might affect your company?

4) What challenges do your company face currently regarding cars fuel consumption?

5) What action did your company undertake regarding these challenges?

6) Why did your company decide to act in this particular way?

7) Is your company aware of the implementing of CAFE (Corporate Average Fuel Economy) regulation at manufacturers level in 2016?

8) What are the opportunities and threats regarding the implementation of CAFE (Corporate Average Fuel Economy) regulation to your company?

9) Who (which department) were involved in the CAFE (Corporate Average Fuel Economy) implementation?

10) Can you please describe this change? What were the results?

11) Were there initial resistances/ difficulties in your initiatives regarding fuel consumption reduction?

12) What do you think of the fuel consumption label?

13) What is the impact of fuel consumption label law in your fleets?

14) What are your companies' (rights/privileges) to resources (brand) in the current situation?

15) How do resources power serve your company in regard to fuel consumption regulations?

16) How do resources immunities your company?

17) What are your company liabilities toward the company resources?

18) What are your liabilities in saving your immunities of (the brand, other resources)?

19) What kind of cooperation have you done with manufacturers regarding fuel consumption average?

20) What are the expected benefits from this cooperation?

21) Have you required different models? Or have you been prevented from certain models?

22) What kind of cooperation have you done with dealers regarding fuel consumption average?

23) What changes in contracts have been made because of the fuel consumption average regulations?

24) What are the expected benefits from this cooperation?

25) In facing the sales drop, how is your relationship with manufacturers?

26) How is your relationships with dealers?

27) What changes have you (negotiated or required) with your partners?

28) What changes have they (negotiated or required)?

29) What is your relationship with regulation representatives (Saudi standard and Ministry of commerce)?

30) How do you look at the competitors strategies regarding market changes such as fuel consumptions, change in end consumers preference?

31) What do you think competitors think of your strategies regarding fuel consumption average?

32) What do you think of launching hybrid cars?

33) Have you launched hybrid models? Why?

34) What is the role of deasil cars in your strategy?

35) How do you measure your environmental goals?

36) What are your fleets' consumption targets?

## Appendix 2: Example of the supporting letters for data collection

جامعة الملك سعود
King Saud University
مكتب وكيل الجامعة
للدراسات العليا والبحث العلمي

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**معالي محافظ الهيئة السعودية للمواصفات والمقاييس والجودة** **حفظه الله**

**السلام عليكم ورحمة الله وبركاته**

أفيد معاليكم أن طالب الدراسات العليا بقسم العلوم الإدارية بكلية المجتمع/ عبدالمحسن بن صالح الحسون يقوم بإعداد دراسة علمية بعنوان (ردود شركات السيارات على أنظمة إستهلاك الوقود في المملكة العربية السعودية) واستكمالاً لمتطلبات الدراسة، يرغب الطالب جمع بيانات واحصائيات عامه عن نظام استهلاك الوقود المطبق في قطاع السيارات وتشمل التالي:

١- مقدار التغير باستهلاك الوقود خلال السنوات الخمس الماضيه، ٢- متوسط استهلاك الوقود حسب دولة المنشاء، ٣- مقدار مخالفات نظام استهلاك الوقود لمصنعي السيارات، ٤- عدد الاعفائات والانظمه المستحدثه لمصنعي السيارات والوكلاء، ٥- عدد الشركات المتوافقه مع نظام استهلاك الوقود.

آمل تكرم معاليكم الموافقة وتسهيل مهمته، متمنين له التوفيق.

**وكيل الجامعة**

**للدراسات العليا والبحث العلمي**

**أ.د. خالد بن إبراهيم الحميزي**

٤/٦٧/٣٧٩٤٢٦

١٤٤١/١٢/٢٧هـ

# Appendix 3: Participant information sheet

**Participant Information Sheet**

**Research title: Business Responses to Climate Change: Evidence from Saudi automobile network**

**Researcher: Abdulmohsen Alhassoun**

First of all, thank you for taking time to read this information sheet, which you have received because I believe that you could provide insightful data on Saudi automobile business interactions in responding to climate change. Before you decide whether you are willing to take part in this research or not, I would like to provide answers to some of the key questions regarding this research. If you would like to discuss this information sheet with me or have any questions, I am happy to contact you at your earliest convenience.

**What is the study about?**

The study aims to explore businesses interaction when crafting business responses to climate change. Particularly, I am interested in the challenges you are facing in the Saudi context and how you have or intend to overcome them.

**Why have I been invited?**

You have been invited to take part in this study because I require information from people who are involved in interaction surrounding business responses to climate change. This information sheet has been sent to

you either because you are the representative of a company that develops responses to climate change or

because a representative of your company promotes this study and has identified you as a potential

participant in this study.

**What will I be asked to do if I take part?**

If you agree to take a part in the study, I will contact you to schedule a face-to-face or telephone interview.

This interview will either take place at your office or at public place that is convenient for you, depending on your preference. The interview is likely to last between 45 minutes and one hour, will be audio-recorded and later typed up in full. In addition, you will be asked to complete a consent form before participating.

**What are the possible benefits from taking part?**

Although this study does not intend to provide any specific benefits to individual taking part, it is hoped that the information I gain enable more effective business responses to climate change. Eventually, this would reduce the risk of potentially devastating consequences of climate change.

**Do I have to take part?**

No. It's completely up to you to decide whether or not you take part. Your participation is voluntary.

**What if I change my mind?**

You are free to withdraw your consent without giving a reason within the first six weeks after the interview.

**What are the possible disadvantages and risks of taking part?**

I do not anticipate that you will experience any distress. However, climate change and business behaviour in this context is a political and sensitive topic. Therefore, I have put highest priority on confidentiality and

anonymity of your personal and of the organisation you represent. I believe that this study can only be truly

successful when it is ensured that you and the organisation you represent are not facing distress in any form. In case you have any doubts you can decide to end the interview at any time. In addition, I will provide extra time at the end of the interview to discuss any concern.

**Will my data be identifiable?**

Any information collected from you will be treated with confidentiality. Only the research team will have

access to any raw information that can be associated with you. Any information that is shared beyond this

team will be made anonymous. Your name and the name of the entity that you represent will be removed,

and a pseudonym will be used instead. Personal details and the research content will be stored in two

separated, encrypted and password protected files. In accordance with University guidelines, I will keep the

data securely for a minimum of ten years.

**How will we use the information you have shared with us and what will happen to the result of the**

**research study?**

As this study will form a key part of my doctoral dissertation, the results will be summarised and submitted

to Lancaster University for marking. In addition, I plan to publish the findings of this study in a reputable journal and I intend to present the findings at a conference. A brief report of the findings will be sent to you, if interested. Participants and organisations they represent will not be identifiable within any of these publications, but anonymous quotes will be included, if consent is provided.

**What if I have question or concern?**

If you have any concern about this study, I am happy to discuss this with you and I will do my best to answer your questions. Please see my contact details at the end of this information sheet. If you remain unhappy and wish to complain formally, you can do so by contacting the head of the Marketing Department at Lancaster University.

Dr. Gillian Hopkinson

Head of Marketing Department

Lancaster University Management School

Charles Carter Building, Room D

Lancaster, LA1 4YX

United Kingdom

T: +44 (0)1524 510994

E: g.hopkinson@lancaster.ac.uk

**Where can I obtain further information about the study if I need it?**

If you have any questions about the study, please contact the Principal investigator or the supervisors of this research project.

**Thank you for taking the time to read this information**

**Contact details**

The Principal investigator of this research is Mr. Abdulmohsen Alhassoun, Lancaster University.

Mr. Abdulmohsen Alhassoun

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# Appendix 4: Consent form

## CONSENT FORM

**Project Title: Business Responses to Climate Change: Evidence from Saudi automobile network**
Name of Researchers: Abdulmohsen Alhassoun
Email: a.alhassoun@lancaster.ac.uk
**Please tick each box**

| | |
|---|---|
| 1. I confirm that I have read and understand the information sheet for the above study. I have had the opportunity to consider the information, ask questions and have had these answered satisfactorily | ☐ |
| 2. I understand that my participation is voluntary and that I am free to withdraw at any time during my participation in this study and within six weeks after I took part in the study, without giving any reason. If I withdraw within six weeks of taking part in the study my data will be removed. | ☐ |
| 3. I understand that any information given by me may be used in future reports, academic articles, publications or presentations by the researcher/s, but my personal information will not be included and all reasonable steps will be taken to protect the anonymity of the participants involved in this project. | ☐ |
| 4. I understand that my name/my organisation's name will not appear in any reports, articles or presentation without my consent. | ☐ |
| 5. I understand that interviews will be audio-recorded and transcribed and that data will be protected on encrypted devices and kept secure. | ☐ |
| 6. I understand that data will be kept according to University guidelines for a minimum of 10 years after the end of the study. | ☐ |
| 7. I agree to take part in the above study. | ☐ |

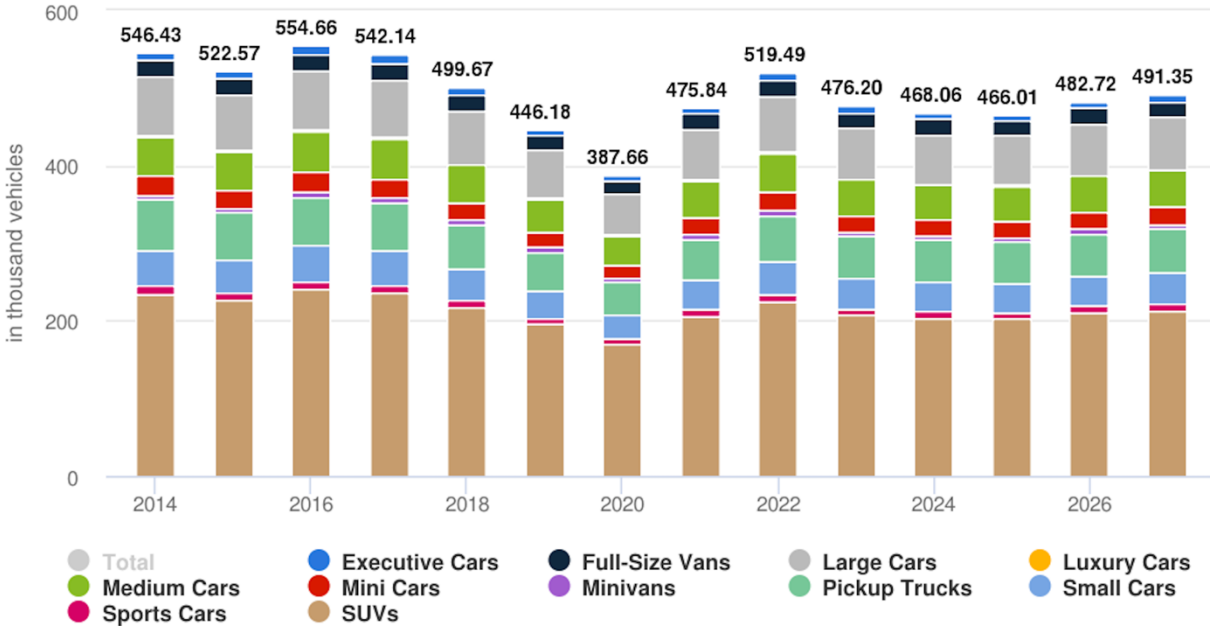
_____ _____ _____
Name of Participant Date Signature

**I confirm that the participant was given an opportunity to ask questions about the study, and all the questions asked by the participant have been answered correctly and to the best of my ability. I confirm that the individual has not been coerced into giving consent, and the consent has been given freely and voluntarily.**

**Signature of Researcher /person taking the consent**_____ **Date** _____ Day/month/year

**One copy of this form will be given to the participant and the original kept in the files of the researcher at Lancaster University**

# Appendix 5: New car sales by type




- Numbers in thousand vehicles

Source: Statista (2024b)

## Appendix 6: Petrol station in city with only gasoline 91 and 95 without diesel


Source: Almuraba (2019).

# Appendix 7: Fuel economy performance review

**2022 Year-End Credit Summary**

| OEM | PC | | | LT | | |
|---|---|---|---|---|---|---|
| | Actual FE | Target FE | Accumulated Credit | Actual FE | Target FE | Accumulated Credit |
| ANHUI JIANGHUAI AUTOMOBILE CO.,LTD | 15.4 | 19.1 | -27453 | 13.4 | 13.2 | 2666 |
| Aston Martin Lagonda Ltd | 9.3 | 10.1 | -788 | NA | NA | 0 |
| BAIC International Development Co.,Ltd | 17.0 | 17.9 | -31190 | 11.6 | 14.5 | -29692 |
| BMW Group | 16.4 | 16.4 | 445606 | 13.1 | 13.0 | 66335 |
| Brilliance Auto International Trade Corporation | NA | NA | 0 | NA | NA | -3480 |
| BYD AUTO CO., LTD | 19.1 | 17.8 | -10514 | NA | NA | 267 |
| Changan International Corporation | 17.9 | 18.7 | -547897 | 13.5 | 14.0 | -269225 |
| CHERY AUTOMOBILE CO., LTD. | 17.5 | 18.6 | -335234 | 15.2 | 14.4 | 59854 |
| China FAW Corporation Limited | 15.0 | 17.0 | -131786 | 12.3 | 12.7 | -48 |
| China Motor Corporation (CMC) | NA | NA | 0 | 12.0 | 16.2 | -8974 |
| CHTC MOTOR CO., LTD. | NA | NA | 0 | NA | NA | 0 |
| Mercedes-Benz Cars Middle East FZE | 14.9 | 16.0 | 41151 | 11.2 | 13.0 | -27699 |
| DFSK MOTOR CO., LTD. | NA | NA | 0 | NA | NA | 3960 |
| Dongfeng Motor Corporation | 16.6 | 17.9 | -23077 | NA | NA | 0 |
| Ferrari S.p.A. | 10.2 | 17.3 | -10081 | NA | NA | 0 |
| Stellantis-ME | 14.6 | 16.7 | -192615 | 15.1 | 12.9 | 357670 |
| Ford Motor Company Middle East and Africa | 16.7 | 16.5 | 417367 | 12.1 | 12.7 | 37139 |
| Foton International Trade Co.,Ltd,Beijing | NA | NA | -4201 | 12.9 | 13.2 | -12453 |
| SUBARU CORPORATION | 12.2 | 18.3 | -853 | 15.7 | 15.1 | 2677 |
| General Motors | 15.9 | 18.8 | 465073 | 11.4 | 12.9 | -758638 |
| Great Wall Motor Company Limited | 14.1 | 17.5 | -585699 | 12.5 | 13.0 | -66275 |
| GAC MOTOR CO., LTD | 15.9 | 18.4 | -320750 | 12.5 | 13.2 | -23860 |
| Honda Motor Co., Ltd. | 18.9 | 17.2 | 1264489 | 13.7 | 13.8 | 15801 |
| Hyundai Motor Company | 17.4 | 17.9 | 89632 | 13.1 | 13.3 | -15652 |
| Isuzu Motors International Operations (Thailand) Co., Ltd. | NA | NA | 0 | 14.2 | 13.5 | 945832 |
| Jaguar Land Rover Limited | 14.4 | 17.7 | 601 | 11.9 | 13.0 | -14325 |
| Jiangling Motors Co.,Group | NA | NA | 0 | 12.6 | 13.4 | -5632 |
| Kia Motors | 16.9 | 18.1 | -339984 | 12.4 | 13.1 | -9926 |
| Lifan Industry (Group) Co., Ltd. | NA | NA | -2762 | NA | NA | 0 |
| Mahindra | NA | NA | -960 | 13.5 | 14.4 | -10711 |
| Mazda Motor Corporation | 16.0 | 17.4 | -51688 | 13.4 | 13.7 | 42194 |
| McLaren | 9.2 | 17.5 | -3262 | NA | NA | 0 |
| Mitsubishi Motors Corporation | 20.5 | 19.5 | 572311 | 14.1 | 14.3 | -181658 |
| Nissan Motor Co., Ltd. | 17.4 | 19.0 | -384240 | 10.3 | 13.4 | -396740 |
| Renault Middle Esat | 15.7 | 17.9 | -193068 | 15.6 | 14.6 | 38927 |
| SAIC MOTOR CORPORATION LIMITED | 17.9 | 18.5 | -214639 | 13.2 | 13.1 | -48792 |
| Shanxi Victory Automobile Manufacturing Co., Ltd | 16.1 | 19.1 | -30 | 15.7 | 15.6 | 697 |
| SsangYong Motor Company | 14.6 | 18.7 | -51072 | 11.1 | 13.6 | -1490 |
| Suzuki Motor Corporation | 20.7 | 19.9 | 222570 | 16.5 | 16.2 | 20040 |
| TATA MOTORS LTD | NA | NA | 0 | 14.7 | 13.0 | 27734 |
| Toyota Motor Corporation | 20.2 | 17.9 | 7686803 | 12.7 | 14.1 | -3151183 |
| Volkswagen Group Saudi Arabia | 14.1 | 17.3 | -103872 | 11.3 | 13.0 | -65535 |
| Volvo Cars | 16.5 | 15.9 | 660 | NA | NA | 0 |
| Zhejiang Geely Holding Croup Co., Ltd. | 16.9 | 18.6 | -342882 | 13.9 | 14.4 | -48552 |
| ZHENGZHOU NISSAN AUTOMOBILE CO., LTD | NA | NA | 0 | 11.2 | 14.6 | -2040 |
| ZX Auto | NA | NA | 0 | 12.8 | 12.7 | 350 |
| BAIC YINXIANG AUTOMOBILE CO.,LTD. | NA | NA | -2 | NA | NA | 0 |
| Xiamen Golden Dragon Bus Co., Ltd. | NA | NA | 0 | NA | NA | 0 |
| Xiamen King Long United Automotive Industry Co Ltd | NA | NA | 0 | NA | NA | 0 |
| SAIC MAXUS Automotive Co., Ltd. | NA | NA | -20 | NA | NA | 816 |
| Beijing Borgward Automotive Co., Ltd | NA | NA | -56 | NA | NA | -273 |
| Zotye International Automobile Trading Co., LTD. | NA | NA | -13 | NA | NA | 219 |
| South East (FuJian) Motor Co.,Ltd | 14.6 | 18.3 | -10271 | NA | NA | 0 |
| Jiangxi Dorcen Automobile Co., Ltd. | NA | NA | -594 | NA | NA | 0 |
| Koenigsegg Automotive AB | 5.9 | 17.3 | -216 | NA | NA | 0 |
| Pagani Automobili S.p.A. | NA | NA | -228 | NA | NA | 0 |

- PC: passenger car. LT: Light truck. FE: Fuel economy

Source: SASO (2022).

## Appendix 8: Advertise of electric car by Aljomaih dealer


Source: Aljomaih (2024).

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