The Moderating Effect of Responsible Leadership in the Relationship Between Agility and Sustainability: The Case of the Egyptian Petroleum Sector

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Abstract

In a volatile global environment with increasing pressure for sustainable development, organizations must balance adaptability with long-term responsibility. This study examines the impact of organizational agility on company sustainability and investigates the moderating role of responsible leadership in the Egyptian petroleum sector. Organizational agility is assessed through three key dimensions: sensing agility, decision-making agility, and acting agility. Responsible leadership is conceptualized as a leadership style rooted in ethics, stakeholder engagement, and long-term orientation. company sustainability is defined through the triple bottom line approach, encompassing economic viability, environmental responsibility, and social well-being.

Using a quantitative approach, data were collected via structured questionnaires from employees across four major petroleum companies in Egypt. The results reveal that company agility significantly enhances sustainability outcomes, with decision-making agility showing the strongest direct effect. Responsible leadership was found to significantly moderate the relationship between overall agility and sustainability and specifically strengthened the effects of sensing and decision-making agility. However, acting agility did not show a significant direct or moderated effect.

These findings underscore the importance of cultivating responsible leadership to maximize the sustainability benefits of agility. The study contributes to theoretical advancements by positioning responsible leadership as a critical contextual enabler and provides practical guidance for organizations seeking to align rapid responsiveness with ethical and sustainable performance in high-risk industries.

Keywords: Oganizational Agility,Responsible Leadership, Company Sustainability, Triple Bottom Line, Sensing Agility, Decision-Making Agility, Acting Agility

الملخص

في ظل بيئة عالمية متقلبة تتزايد فيها الضغوط لتحقيق التنمية المستدامة، يتعين على المنظمات الموازنة بين القدرة على التكيف والمسؤولية طويلة الأمد. تهدف هذه الدراسة إلى تحليل تأثير الرشاقة التنظيمية على استدامة الشركات، وتدرس الدور التعديلي للقيادة المسؤولة في قطاع البترول المصري. تم تقييم الرشاقة التنظيمية من خلال ثلاثة

أبعاد رئيسية: رشاقة الاستشعار، رشاقة اتخاذ القرار، ورشاقة التنفيذ. كما تم تعريف القيادة المسؤولة بأنها أسلوب قيادي قائم على الأخلاقيات، ومشاركة أصحاب المصلحة، والتوجه طويل الأجل. وتم تعريف استدامة الشركات وفقًا لمنهجية الأبعاد الثلاثة، التي تشمل الجدوى الاقتصادية، والمسؤولية البيئية، والرفاه الاجتماعي.

اعتمدت الدراسة على منهج كمي، حيث تم جمع البيانات باستخدام استبيانات مهيكلة من موظفين في أربع شركات بترول رئيسية في مصر. أظهرت النتائج أن الرشاقة التنظيمية تعزز بشكل كبير من نتائج الاستدامة، حيث كانت لرشاقة اتخاذ القرار أقوى تأثير مباشر. كما تبين أن القيادة المسؤولة تُعدّل بشكل كبير العلاقة بين الرشاقة والاستدامة، وتعزز تحديدًا تأثير كل من رشاقة الاستشعار ورشاقة اتخاذ القرار. ومع ذلك، لم تُظهر رشاقة التنفيذ تأثيرًا مباشرًا أو تعديليًا ذا دلالة إحصائية.

وتؤكد هذه النتائج على أهمية تطوير القيادة المسؤولة لتعظيم الفوائد المستدامة للرشاقة التنظيمية. وتُسهم الدراسة في إثراء الجانب النظري من خلال إبراز القيادة المسؤولة كعامل سياقي حاسم، كما تقدم إرشادات عملية للمنظمات التي تسعى إلى مواءمة الاستجابة السريعة مع الأداء الأخلاقي والمستدام، لا سيما في القطاعات عالية المخاطرa.

1 Introduction

1.1 Background of the Study

In today’s volatile and complex business environment, organizations are increasingly compelled to respond rapidly to external pressures while also meeting growing expectations for social and environmental responsibility. The petroleum industry, particularly in emerging economies such as Egypt, faces mounting challenges due to market volatility, regulatory changes, environmental scrutiny, and the global push for sustainability. Within this context, the ability to remain adaptive, future-focused, and ethically responsible is more important than ever.

Organizational agility has emerged as a vital strategic capability that enables firms to sense environmental changes, make rapid and informed decisions, and execute timely actions in response to emerging challenges (Baškarada & Koronios, 2018; Guoet al., 2023). This ability is particularly critical in high-risk sectors like petroleum, where geopolitical developments, price fluctuations, and technological disruptions frequently reshape the competitive landscape. Agility is typically conceptualized across three interrelated dimensions: sensing agility, decision-making agility, and acting agility (Ofoeda et al., 2024). Firms that excel in these areas are better positioned to navigate uncertainty and achieve strategic flexibility.

However, while agility provides a mechanism for responding to change, it does not inherently guarantee responsible or sustainable outcomes. In some cases, agile organizations may prioritize speed over long-term value, leading to unintended consequences such as ethical oversights, short-termism, or misalignment with stakeholder expectations (C. Cheng et al., 2020). Therefore, it is essential to examine how agility can be aligned with broader organizational commitments to sustainability.

Sustainability, once viewed as a peripheral or regulatory concern, has become a central strategic imperative across industries. Anchored in the triple bottom line framework—economic, social, and environmental performance—sustainability

emphasizes the need for organizations to create long-term value while minimizing harm to society and the planet (Gupta & Gupta, 2020). Companies in the petroleum sector face particular scrutiny due to their environmental footprint, safety risks, and influence on national economies. Thus, aligning business operations with sustainable development goals has become not only a matter of compliance but a critical factor for competitive advantage and societal legitimacy.

In the Egyptian context, the petroleum industry is a cornerstone of the national economy, contributing significantly to GDP, foreign investment, and employment. However, it also faces growing expectations to operate transparently, mitigate environmental risks, and contribute to national sustainability efforts. Egyptian petroleum companies are increasingly under pressure to modernize their practices, improve energy efficiency, and align with global and regional sustainability standards.

Despite the increasing adoption of sustainability practices, achieving meaningful and consistent progress requires not only systems and strategies but also leadership that prioritizes ethics, inclusivity, and long-term impact. This brings responsible leadership into focus as a key moderating force that connects agility with sustainability in a coherent, values-driven approach.

Responsible leadership is defined as a leadership approach that integrates ethical decision-making, stakeholder engagement, and a long-term perspective (Voegtlin et al., 2020; Huoet al.,

2023). It goes beyond traditional managerial functions by fostering trust, transparency, and moral accountability. Unlike conventional leadership models that often emphasize efficiency and authority, responsible leadership emphasizes the relational and societal impact of leadership actions.

Leaders who adopt this approach act as facilitators of ethical behavior and as agents of sustainable change. They play a crucial role in aligning organizational agility with sustainable practices, ensuring that rapid decisions and responses are made with consideration for stakeholder interests and environmental consequences (Cyfert et al., 2022; Younas et al., 2023). This form of leadership is especially critical in the petroleum sector, where the risks of ethical missteps and environmental degradation are high and where organizations must strike a delicate balance between profitability and social responsibility.

In Egypt, where the petroleum sector comprises a diverse mix of public entities, joint ventures, and private investment companies, responsible leadership is essential for harmonizing organizational responsiveness with sustainable development goals. By fostering ethical cultures, promoting participatory decision-making, and managing stakeholder relationships effectively, responsible leaders can help organizations thrive in complexity while maintaining long-term legitimacy.

This study investigates the moderating effect of responsible leadership on the relationship between organizational

agility and sustainability in the Egyptian petroleum sector. By focusing on key firms within this strategic industry, the research aims to provide practical insights and theoretical contributions regarding how leadership can shape agile and sustainable organizational outcomes in emerging economies.

1.2 Research Problem

The Egyptian petroleum sector operates in a complex, rapidly changing environment shaped by economic volatility, technological advancement, and increasing demands for sustainability. While organizational agility is essential for responding to such challenges, agility alone may lead to short-term responsiveness that neglects ethical considerations or long-term sustainability goals.

Responsible leadership, which emphasizes ethical conduct, stakeholder engagement, and long-term impact, may play a critical role in aligning agility with sustainability. However, despite growing global attention to these concepts, limited empirical research has explored their interrelationship, particularly in the context of emerging economies and resource-intensive industries like Egypt's petroleum sector.

This study addresses this gap by examining the moderating role of responsible leadership in the relationship between organizational agility and sustainability. By focusing on selected Egyptian petroleum companies, the research seeks to provide

insight into how leadership practices can support both adaptive performance and sustainable development.

1.3 Research significance

The findings of this study will contribute to the existing literature on responsible leadership, organizational agility, and sustainability in the petroleum industry. Specifically, the study will:

1. Improve understanding of how organizational agility and company sustainability are interrelated, with a particular focus on the Egyptian petroleum sector, which has received limited attention in empirical research.
2. Explore and elaborate on the moderating role of responsible leadership in the relationship between agility and sustainability, thus enriching the theoretical framework and extending the application of responsible leadership theory to a new industrial and geographical context.
3. Provide practical insights and recommendations for petroleum companies in Egypt on how to balance agile operations with sustainable practices by promoting responsible leadership behaviors that support long-term value creation

1.4 Research Objectives

The main objective of this study is to investigate and test the effects and relationships among the following variables: organizational agility, responsible leadership**,** and company

sustainability in the context of the Egyptian petroleum sector. Specifically, the study aims to:

1. Examine the relationship between organizational agility and company sustainability.
2. Assess the moderating role of responsible leadership in the relationship between organizational agility and sustainability.
3. Examine the individual effects of sensing agility, decision-making agility, and acting agility on company sustainability.
4. Explore whether responsible leadership moderates the relationship between each agility dimension (sensing, decision-making, acting) and company sustainability.

1.5 Research Questions

Based on the research objectives, the following main research questions are formulated:

1. What is the relationship between Company Agility and Company Sustainability in the Egyptian petroleum sector?
2. How does each dimension of Company Agility (sensing Agility, Decision-Making Agility, and Acting Agility) individually influence Company Sustainability?
3. To what extent does Responsible Leadership moderate the relationship between overall Company Agility and Company Sustainability?
4. To what extent does Responsible Leadership moderate the relationship between each dimension of Agility and Company Sustainability**?**

2 Literature Review

2.1 Introduction

This chapter provides a comprehensive review of the key constructs underpinning this study: agility, sustainability, and responsible leadership. Each concept is explored in depth individually, followed by a discussion of the interrelationships between them. This foundation supports the development of the research model and hypotheses.

2.2 Agility

2.2.1 Introduction

In the face of growing volatility, uncertainty, and complexity, organizational agility has emerged as a critical capability for navigating dynamic environments. Agility enables firms to adapt rapidly by reallocating resources, innovating operations, and proactively responding to internal and external changes. As such, it is increasingly recognized as a fundamental driver of competitive advantage, resilience, and long-term sustainability
(Guo et al., 2023); (Almazrouei et al., 2024); (Cheng et al., 2020).

2.2.2 Agility Definition

Organizational agility is a dynamic capability that enables firms to swiftly and creatively adapt to changing business environments (Guo et al., 2023). It encompasses flexible resource reallocation, proactive strategic alignment, and responsive actions to new opportunities and threats (Almazrouei et al.,

2024). Cheng et al. (2020) note that agility allows firms to quickly adjust to market changes, ensuring survival and competitive advantage, while Ciampi et al. (2022) emphasize its importance in identifying and seizing new business opportunities to improve financial performance and market positioning. Agility necessitates a culture of change, strategic planning, and a framework for managing uncertainty (Khalil et al., 2023). Successful firms must anticipate shifts, redesign processes, and reallocate resources efficiently. Researchers highlight that agility involves responding to external shocks,

2.2.3 Dimensions of Agility

Introduction

Organizational agility is a complex construct essential for firms to navigate dynamic environments. Recent research suggests breaking it down into key dimensions: sensing agility, decision-making agility, and acting agility (Baškarada & Koronios, 2018); (Ofoeda et al., 2024). Analyzing these dimensions individually provides organizations with insights to develop specific capabilities for better responses to environmental uncertainty. This section will further explore each dimension, backed by academic evidence.

Sensing Agility

Sensing agility is an organization's ability to proactively monitor and interpret environmental changes, allowing for early

detection of potential opportunities or threats (Baškarada & Koronios, 2018). Organizations with high sensing agility continuously monitor their environments, utilize big data and AI tools (Khalil et al., 2023), foster open communication, and promote a culture of vigilance and curiosity. This agility enables them to anticipate changes and develop adaptive strategies, giving them a competitive edge (Hagen et al., 2024). Literature examples include (Ofoeda et al., 2024), who argue that proactive sensing enhances the ability to seize opportunities in digital markets, and (Ciampi et al., 2022), who note that firms with strong sensing capabilities internationalize faster.

Decision-Making Agility

Decision-making agility involves quickly interpreting information and making timely, high-quality decisions in response to changes, bridging the gap between sensing and acting ((Baškarada & Koronios, 2018). Key characteristics include decentralized decision-making, reduced bureaucracy, cross-functional teams, and real-time data analytics (Zhu & Li, 2023). It requires balancing speed with quality, with responsible leadership ensuring alignment with stakeholder interests (Javed et al., 2020). Literature examples include (Atienza-Barba et al., 2024), who highlight AI-powered decision-making processes that enhance innovation, and (Bek Yağmur & Aydıntuğ Myrvang, 2023), who found decision-making speed crucial for resilience during crises.

Acting Agility

Acting agility refers to the ability to mobilize resources and implement decisions effectively (Baškarada & Koronios, 2018). Key aspects include flexible resource allocation, agile project management, dynamic supply chain adjustments, and rapid adaptation of strategies (Schöck et al., 2023). Challenges to acting agility include rigid hierarchies and cultural resistance, which can be overcome through empowered leadership and a culture that rewards initiative. Literature examples include (Chwiłkowska-Kubala et al., 2023), who found that strong acting agility aids in implementing strategic CSR initiatives, and (Almazrouei et al., 2024), who demonstrated its impact on innovation performance in public services.

2.2.4 The Importance of Organizational Agility

Organizational agility is essential for maintaining competitiveness, resilience, and innovation, particularly in dynamic sectors like energy and technology. It allows firms to swiftly adapt to market changes and crises, such as the COVID-19 pandemic (Chwiłkowska-Kubala et al., 2023); (Almazrouei et al., 2024) Agile organizations are more capable of continuous innovation, ensuring their offerings remain relevant (Schöck et al., 2023) and can respond quickly to market demands, providing a competitive edge ((S. Zhang & Suntrayuth, 2024). High agility also enhances crisis management, minimizing disruptions (Bek Yağmur & Aydıntuğ Myrvang, 2023)) and supports long-term

sustainability by adapting to various expectations ((S. Zhang & Suntrayuth, 2024). Furthermore, agile firms improve customer satisfaction through iterative development (Schöck et al., 2023)

2.2.5 Organizational Agility Models

To develop agility, several models exist, such as the 5S Model, which includes capabilities like sensing and seizing opportunities (Baškarada & Koronios, 2018), and McKinsey's 10 Agile Management Practices, which emphasize role clarity and knowledge sharing. Other frameworks link agility to organizational outcomes (Margherita et al., n.d.).

2.2.6 How to Build an Agile Organization

Building an agile organization involves strategies like integrating corporate social responsibility, fostering a proactive culture, simplifying structures, investing in talent, leveraging digital technologies, promoting innovation, and engaging stakeholders (Chwiłkowska-Kubala et al., 2023); (Atienza-Barba et al., 2024); (Almazrouei et al., 2024)

2.2.7 How to Measure Organizational Agility

Measuring organizational agility requires a comprehensive approach, including quantitative indicators (decision-making speed), qualitative assessments (employee empowerment), environmental responsiveness (Jalal et al., 2017), process agility, and knowledge management (Amine Marhraoui & El Manouar,

2017). Effective measurement captures both behavioral traits and performance outcomes.

2.3 Sustainability

2.3.1 introduction

Sustainability is crucial for addressing economic development, environmental stewardship, and social equity, especially in light of challenges like climate change and resource scarcity. In business, it requires a focus on long-term strategies that balance ecological, social, and economic factors rather than prioritizing short-term profits. This is particularly vital in the energy and petroleum sectors, where incorporating sustainability into corporate practices is essential for resilience and long-term value creation

2.3.2 sustainability definition

Sustainability is defined as the ability to meet current needs without compromising future generations' ability to meet theirs, a concept originating from the Brundtland Commission's 1987 report, which emphasizes intergenerational equity and long-term responsibility (WCED, 1987). Modern interpretations focus on the economic, environmental, and social outcomes of organizational actions, often assessed through Sustainability Performance Evaluation (SPE) frameworks (Büyüközkan & Karabulut, 2018). Scholars further elaborate that sustainability encompasses coherence, continuity, and perseverance, ensuring the viability of ecosystems, societies, and economies while

promoting human well-being within the natural ecosystem's carrying capacity (Gupta & Gupta, 2020).

2.3.3 Dimensions of Corporate Sustainability

Sustainability in corporate contexts is framed by the triple bottom line (TBL) approach, encompassing environmental, social, and economic dimensions, which collectively promote a balanced value creation strategy that extends beyond mere financial outcomes ((Ricci et al., 2020)

The social dimension emphasizes the effects of business practices on human communities, focusing on corporate social responsibility (CSR), ethical labor, diversity, employee well-being, and community engagement. Companies, especially in sensitive sectors like oil and gas, are urged to foster inclusive workplaces and build trust with stakeholders

The environmental dimension involves businesses' interactions with the natural environment, advocating for reduced emissions, pollution control, and resource conservation. In the petroleum sector, addressing environmental sustainability is crucial due to the industry's high carbon emissions and ecological risks, necessitating compliance with regulations and a shift towards green innovation (Ricci et al., 2020) (Jha & Rangarajan, 2020); (X. Cheng et al., 2023).

The economic dimension ensures profitability while achieving social and environmental objectives, focusing on efficient resource use and long-term value creation. For oil and

gas firms, this includes adapting to market trends and balancing short-term profits with sustainability investments (Gupta & Gupta, 2020)

2.3.4 Sustainability Concept

Sustainability transcends operational goals, serving as a comprehensive philosophical and systemic framework aimed at fostering social justice, economic health, and ecological balance (Ruggerio, 2021). In the oil and gas sector, this entails integrating sustainability into supply chain management, procurement policies, and innovative business models. The circular economy (CE) concept is particularly pertinent, promoting the reuse and regeneration of materials to reduce waste and environmental impact (Basile et al., 2021). Sustainable business models seek to create shared value by harmonizing profitability with positive environmental and social outcomes. Consequently, oil and gas companies are increasingly required to assess suppliers based on their sustainability practices, support local economies, and adhere to sustainability mandates like In-Country Value (ICV) initiatives (Rentizelas et al., 2020), focusing

2.3.5 How to Measure Organizational Sustainability

Measuring sustainability necessitates a comprehensive, multi-method approach that includes both quantitative and qualitative methods. Quantitative methods involve indicators and metrics such as emissions data, resource usage, employee diversity, and financial ratios (Zimek et al., 2017), as well as

regression and structural equation modeling (SEM) to explore the relationships between leadership styles, HR practices, and sustainability outcomes (Nakra & Kashyap, 2024). Qualitative methods encompass content analysis of company reports, stakeholder engagement through interviews and surveys, and case studies of specific sustainability initiatives. Integrated frameworks like the Triple Bottom Line, Global Reporting

2.4 Responsible Leadership

2.4.1 Introduction to Responsible Leadership

In today's interconnected world, responsible leadership is vital for organizational and societal well-being. Increased scrutiny demands transparency, accountability, and sustainable impact (Abraham, 2024) shifting leadership from pure shareholder value to a broader, stakeholder-inclusive focus (Nakra & Kashyap, 2024). Responsible leaders must balance profitability with positive social and environmental outcomes for long-term success.

2.4.2 The Relational and Ethical Nature of Responsible Leadership

Responsible leaders build trust through integrity, transparency, and honoring commitments (Shaaban, n.d.). They engage stakeholders in decision-making to integrate diverse perspectives and foster shared ownership (Voegtlin et al., 2020) Accountability is maintained through clear ethical standards and reporting systems (Kandasamy, 2024) Ultimately, responsible

leadership is defined by awareness of actions' consequences for all stakeholders and active dialogue (Abraham, 2024); (Huo et al., 2023)

2.4.3 Core Traits and Behavioral Expectations

Responsible leaders, as per (Haider et al., 2022) exhibit integrity, empower employees, foster collaboration, act as ethical role models, prioritize respect, and promote knowledge sharing without relying solely on authority.

2.4.4 Definitional Perspectives and Conceptual Models

Common themes in responsible leadership include ethical decision-making, stakeholder inclusion, and long-term vision (Sarwar et al., 2024); (J. Zhang et al., 2021). (Voegtlin et al., 2020) propose a model with three roles:

- **The Expert:** Focuses on performance and efficiency.
- **The Facilitator:** Supports employee motivation and well-being.
- **The Citizen:** Considers social and environmental responsibility.

2.4.5 Responsible Leadership as a Driver of Agility and Sustainability

Responsible leadership enhances organizational agility by fostering trust and employee participation (Cyfert et al., 2022). It also drives sustainability by promoting environmentally

conscious behaviors and community involvement, boosting reputation and stakeholder trust.

2.4.6 The Petroleum Sector Context

In the global and Egyptian petroleum sector, responsible leadership is critical due to its environmental impact and economic role. Leaders must balance ethical, sustainable practices with economic performance (Siddiqui et al., 2023), navigating increased expectations for transparent corporate behavior (Abraham, 2024). (Huo et al., 2023)This holistic approach, balancing values, culture, and stakeholder interests, fosters trust and improves reputation (Shaaban, n.d.); (Huo et al., 2023); (Thomas et al., n.d.)

2.4.7 Conclusion

Responsible leadership is a fundamental paradigm integrating ethics, stakeholder inclusion, and societal impact into organizational practice. Through trust-building and ethical conduct, it fosters transparent and collaborative cultures. Models like Voegtlin et al.'s highlight its multifaceted nature, balancing efficiency, empowerment, and social responsibility, particularly crucial in sectors like petroleum. It's a strategic necessity for organizations to align with expectations and drive lasting impact.

2.5 The Relationship Between Responsible Leadership and Agility

2.5.1 Introduction

Responsible leadership is key to organizational agility, enabling rapid adaptation while upholding ethics and stakeholder value, through empowerment, ethical adaptability, engagement, and learning.

2.5.2 Responsible Leadership as a Driver of Workforce Agility

Responsible leaders enhance workforce agility, especially in dynamic sectors (Zhou & Zheng, 2023), by fostering psychological empowerment, agile culture, and strong relationships (Cyfert et al., 2022).

2.5.3 Responsible Leadership as an Enabler of Organizational Agility

Responsible leadership indirectly enables organizational agility through customer focus (Gligor et al., 2019), streamlined processes, operational flexibility, and proactive environmental scanning (Baškarada & Koronios, 2018), fostering an anticipatory mindset.

2.5.4 Responsible Leadership as a Driver of Agile Organizational Culture

Responsible leadership builds agile cultures by promoting openness to change, trust, psychological safety, and aligning initiatives with clear values and purpose (Carvalho et al.,

2021)Responsible Leadership as a Driver of Ethical and Stakeholder-Centered Agility

Responsible leaders ensure agile practices are ethical and stakeholder-aligned, balancing speed with accountability and engaging stakeholders for legitimate initiatives (Gokhberg et al., n.d.)

2.5.5 Conclusion

Responsible leadership profoundly enables organizational agility by fostering trust, empowerment, ethical responsiveness, and strategic flexibility. In complex industries like Egyptian petroleum, it's a strategic necessity for firms to be fast, fair, resilient, and responsible.

2.6 The Relationship Between Agility and Sustainability

Agility and sustainability are crucial, interconnected imperatives for modern organizations, particularly in dynamic sectors like the Egyptian petroleum industry.

2.6.1 Synergistic Alignment: Agility as a Driver of Sustainability

Agility enables rapid response to sustainability opportunities and threats, driving eco-innovation, real-time stakeholder engagement, and lean processes (Pereira et al., 2019).

2.6.2 Strategic Agility and Sustainable Business Models

Strategic agility allows firms to integrate ESG criteria, build resilient value chains, and pivot to green innovations, creating sustainable competitive advantages (Cha & Park, 2023); (Rawashdeh et al., 2024); (Battour et al., 2021).

2.6.3 Navigating the Tensions Between Agility and Sustainability

1. Core Tensions: Agility's speed can conflict with sustainability's long-term focus (e.g., rapid drilling vs. environmental protection).
2. Responsible Leadership's Role in Resolving Tensions: Responsible leaders mitigate these by embedding ethics, setting guardrails, promoting safe experimentation, and balancing short/long-term goals.
3. Sector-Specific Insights (Petroleum Industry): Leaders balance cost-cutting with green investment.

2.6.4 Sectoral Evidence of Agility–Sustainability Integration

Studies show integrating agility with sustainability benefits supply chain (Geyi et al., 2020), manufacturing, public administration, and knowledge-based organizations (Marjerison et al., 2022).

2.6.5 Resilience and Organizational Maturity

Agility and sustainability combine in organizational resilience. Mature organizations integrate both, recognizing that one without the other leads to vulnerability or irrelevance (Prieto & Talukder, 2023).

2.6.6 Empirical Evidence of the Performance Impact

Integrating agility and sustainability improves financial results, customer satisfaction, and reputation. Sustainability

enhances agile responses (Zieba et al., 2022), boosting overall performance (Ur Rehman et al., 2020)

Agility and sustainability are mutually reinforcing. Strategic alignment enables faster innovation, responsible adaptation, and lasting value through purpose-driven agility, sustainable innovation, resilient systems, and responsible leadership.

2.7 The Relationship Between Responsible Leadership and Sustainability

Responsible leadership, with its ethical and stakeholder-inclusive approach, is crucial for embedding sustainability in organizations, balancing economic, social, and environmental goals.1

2.7.1 Defining Responsible Leadership in the Context of Sustainability

Responsible leadership builds trust with broad stakeholders (Liao, 2022), integrating ethical decision-making and social responsibility into strategy.2 It extends beyond traditional leadership by focusing on systemic thinking and ethical stewardship, aligning with long-term shared value creation.3

2.7.2 Mechanisms Linking Responsible Leadership to Sustainability

Responsible leadership fosters sustainability through:

- Ethical Decision-Making and Accountability: Prioritizing ethical standards and transparency beyond mere compliance (Filho et al., 2020)
- Stakeholder Engagement and Inclusivity: Engaging diverse stakeholders for legitimacy, trust, and addressing challenges (Javed et al., 2020).
- Systemic Thinking and Future Orientation: Recognizing interdependencies and championing sustainable innovation for long-term viability (Filho et al., 2020)
- Fostering a Culture of Sustainability: Encouraging innovation, CSR, and aligning values with social/environmental goals.

2.7.3 Empirical Evidence of the Relationship

Studies confirm responsible leadership:

- Positive Impact on Sustainability Practices: Significantly enhances sustainability efforts (Siddiqui et al., 2023).
- Influence on Corporate Social Responsibility (CSR): Fosters CSR and moderates its link to reputation (Javed et al., 2020).
- Support for Sustainable Development Goals (SDGs): Advances organizational contributions to global sustainability (Filho et al., 2020).

2.7.4 Balancing Competing Demands: Responsible Leadership as a Mediator

Responsible leadership mediates conflicting stakeholder interests by facilitating dialogues, implementing win-win

strategies, and prioritizing shared value, ensuring sustainable growth without sacrificing ethics or trust (Javed et al., 2020).

2.7.5 Conclusion

Responsible leadership is pivotal for embedding sustainability into organizations.7 By promoting ethics, inclusive engagement, and long-term thinking, it drives sustainable development, aligning performance with well-being. This is critical for competitiveness and sustainability in complex sectors like the Egyptian petroleum industry

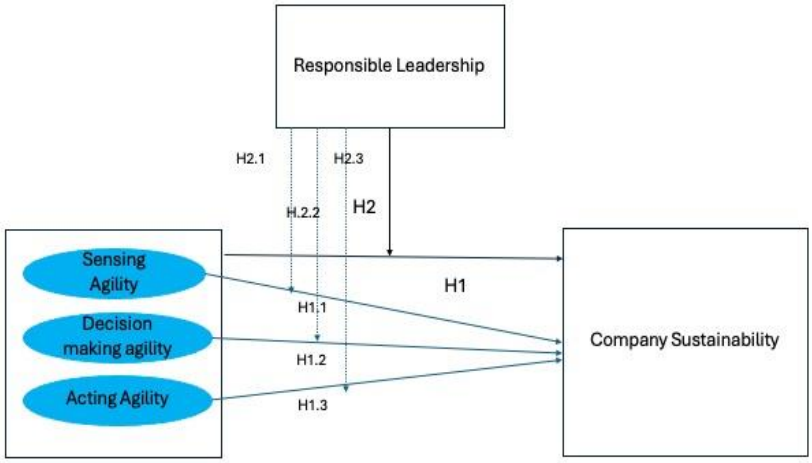
2.8 Conclusion

This review highlights the critical, interdependent roles of agility, sustainability, and responsible leadership. Agility enables navigation of uncertainty, sustainability demands ethical long-term impact, and responsible leadership integrates both by fostering ethics, engagement, and shared value. These constructs are mutually reinforcing: responsible leadership guides agile organizations toward sustainability, while sustainability drives agility. Developing these capabilities is crucial for firms to thrive, ensuring long-term viability and resilient growth. These insights form the basis for the next chapter's conceptual model and hypotheses.

2.9 Hypothesis

- **H1:** There is a statistically significant relationship between Company Agility (CA) and Company Sustainability (CS)**.**

- H1.1: There is a statistically significant relationship between Sensing Agility (SA) and Company Sustainability (CS)**.**
- H1.2**:** There is a statistically significant relationship between Decision-Making Agility (DMA) and Company Sustainability (CS)**.**
- H1.3**:** There is a statistically significant relationship between Acting Agility (AA) and Company Sustainability (CS)**.**
- H2: Responsible Leadership (RL) moderates the relationship between Company Agility (CA) and Company Sustainability (CS)**,**
- H2.1: Responsible Leadership (RL) moderates the relationship between Sensing Agility (SA) and Company Sustainability (CS)**.**
- H2.2: Responsible Leadership (RL) moderates the relationship between Decision-Making Agility (DMA**)** and Company Sustainability (CS)**.**
- H2.3: Responsible Leadership (RL) moderates the relationship between Acting Agility (AA) and Company Sustainability (CS)**.**



Research Proposed Conceptual Model

3 Research Methodology

3.1 Introduction

This chapter delineates the research design, methodology, and data collection procedures employed in this study. It outlines the specific methods used to gather relevant data, including the data collection timeframe, questionnaire development, and the operationalization of key constructs. Additionally, the chapter addresses critical sampling considerations such as the sampling frame, sample size, and sampling techniques.

3.2 Research Philosophy

A positivist research philosophy was adopted for this study. This approach, rooted in the natural sciences, emphasizes empirical evidence and objective measurement (Alharahsheh & Pius, 2020). By prioritizing quantitative data and minimizing subjective interpretation, positivism is well-suited for the rigorous investigation of the research questions.

3.3 Research Approach

This research employed a deductive approach, a common method in social science research (Saunders et al., n.d.). This approach involves formulating hypotheses, operationalizing variables, collecting quantitative data, and testing the hypotheses against empirical evidence (Robson, 2002). As noted by (Bell, n.d.), the deductive approach is closely linked to quantitative research methods. By examining the relationship between variables and describing patterns, this approach contributes to a deeper understanding of the research phenomenon

3.4 Research Methods

This research employs a quantitative research approach, a widely used method in social sciences. This approach involves collecting numerical data through techniques such as surveys and experiments. By formulating hypotheses, measuring variables, and analyzing data statistically, this method aims to identify patterns and test theories (Nardi, 2018). As (Shan, 2022)) explains, quantitative research differs from qualitative research in

its focus on numerical data and its use of statistical analysis to draw conclusions. Quantitative research is well-suited for this study as it allows for the collection of large amounts of data that can be analyzed statistically to identify trends and relationships between variables

3.5 Research Design

Based on its goal, research is classified into three types: descriptive, exploratory, and explanatory (Saunders et al., n.d.). The current study is explanatory in nature, attempting to explain the causal relationship between the research variables.

3.6 Ethical and Legal Considerations

Given the in-depth nature of qualitative research, ethical considerations are paramount (Roshaidai & Arifin, 2018). To ensure ethical conduct, the following measures were implemented:

- Informed Consent: Participants were provided with clear information about the study's purpose, procedures, and potential risks, and their informed consent was obtained.
- Privacy and Confidentiality: Personal information of participants was not collected, and all data was kept confidential.
- Data Security: Data was collected electronically using Google Forms to ensure secure storage and minimize the risk of unauthorized access.

- Software Licensing: All software and tools used in this study were legally licensed.

3.7 Research Data

- **Types of Data** This study employed both primary and secondary data sources. Primary data was collected through an online questionnaire distributed via social media platforms. Secondary data was sourced from academic literature, reports, and online databases.
- **Data Collection Techniques** A questionnaire survey was the primary data collection method employed in this study. As Taherdoost (2021) notes, questionnaires are structured instruments designed to gather specific information from a target population.
- **Time Horizon of Data Collection** This study adopted a cross-sectional research design. As (Saunders et al., n.d.) explain, cross-sectional research involves collecting data at a specific point in time, providing a snapshot of the research phenomenon.

3.8 Questionnaire Design

A structured questionnaire with closed-ended questions was employed in this study. The questionnaire consisted of the following sections:

Introduction: A brief introduction explaining the purpose of the study and assuring confidentiality**.**

Section 1: Demographic Information: section collecting demographic data such as company name, current position, and work experience.
Section 2: Company Agility: A series of 15 Likert-scale questions measuring various dimensions of company agility
Section 3: Company Sustainability: A series of 22 Likert-scale questions measuring various dimensions of company sustainability
Section 4: Responsible Leadership: A series of 11 Likert-scale questions
A 5-point Likert scale was used for the rating questions, with 1 indicating "Strongly Disagree" and 5 indicating "Strongly Agree."

3.9 Sector, Population and Sampling

About the Study sector

The study was conducted in Egypt and focused on the Egyptian petroleum sector. The first independent Department of Petroleum was established in March 1973 to manage the political role of petroleum resources. Given the strategic importance of the Department's existence as a political body that is reshaping overall petroleum strategies to meet the needs of the country at this stage. At the top of the list of priorities is the supply of local market needs for petroleum products, petrochemicals and mineral resources, as well as the contribution to achieving the targeted growth rates of the national economy. The Egyptian Ministry of

Petroleum consists of 6 state holding companies, Egyptian General Petroleum Corporation (EGPC), Egyptian Natural Gas Holding Company (EGAS), Egyptian Petrochemicals Holding Company (ECHEM), Ganoub El Wadi Petroleum Holding Company (GANOPE) and Egyptian General Mineral Resources Authority.

The holding companies managed about 147 companies divided into 5 main sectors. 1. the public sector companies (12 companies), 2. the joint venture sector (84 companies), 3. the investment sector (41 companies), 4. the petroleum services sector (10 companies). The total number of people employed in the Egyptian petroleum sector is about (283,000).

Population and Sampling Size

In this research design, the population of the current research is all employees in the Egyptian oil and gas sector. In the same context, the individual employee within the Egyptian oil and gas sector, irrespective of their specific role or hierarchical position, constitutes the unit of analysis for sampling purposes. To ensure the generalizability of the study's findings to the broader population of employees within this sector, an adequately large sample size is required. Following the guidelines proposed by (Saunders et al., n.d.), a minimum sample size of 384 is deemed necessary to achieve a 5% margin of error and a 95% confidence level, particularly given a large population (exceeding 1,000,000) and the absence of a sampling frame.

Sampling Technique

The study employed a convenience sampling technique to collect data. The researcher used Google Form to construct an electronic version of the questionnaire. The use of Google Forms as the data collection tool offers several practical advantages:

- Efficiency and Cost-Effectiveness: Eliminates costs associated with physical questionnaires.
- Broad Reach: Facilitates distribution to a potentially large and geographically dispersed workforce within the Egyptian oil and gas sector.
- Data Accuracy and Organization: Reduces data entry errors and automatically organizes responses in a digital format.
- Speed of Data Collection: Allows for relatively quick collection of responses.
- Anonymity and Confidentiality: Can enhance the willingness of participants to provide honest answers

4 Data Analysis, Results (Findings) & Discussion

4.1 Sample Description

Table [4-1] presents the demographic characteristics of the surveyed sample, offering insights into the composition of the participant pool across several key dimensions.

The gender distribution reveals a significant majority of male respondents (65.7%) compared to female participants (34.3%).

Table (4-1) Demographic characteristics

Characteristic		Frequency	Percent
Gender	Male	253	65.7
	Female	132	34.3
Age	30 or less	57	14.8
	31:40	155	40.3
	41:50	131	34.0
	above 50	42	10.9
Education	Bachelor's Degree	318	82.6
	Graduate Degree (Masters, Ph.D.)	67	17.4
Company	GASCO	153	39.7
	PETROJET	109	28.3
	ENPPI	65	16.9
	PETROBEL	58	15.1
Experience	Less than 5 years	38	9.9
	5-10 years	172	44.7
	11-15 years	126	32.7
	More than 15 years	49	12.7

Source: prepared by the researcher

Regarding age, the largest proportion of the sample falls within the 31-40 years category (40.3%), suggesting a concentration of participants in their early to mid-career stages. The "30 or less" age group constitutes 14.8%, while the 41-50 years category accounts for 34.0%. The smallest age group is those "above 50" years (10.9%).

The educational attainment of the sample is notably high, with a substantial majority holding a Bachelor's Degree (82.6%). A smaller proportion has attained a Graduate Degree (Masters, Ph.D.) at 17.4%. This suggests a highly educated respondent pool.

Examining the distribution across the four represented companies—GASCO, PETROJET, ENPPI, and PETROBEL—indicates that GASCO comprises the largest segment of the

sample (39.7%), followed by PETROJET (28.3%). ENPPI (16.9%) and PETROBEL (15.1%) represent smaller proportions.

Finally, in terms of professional experience, the largest group consists of individuals with 5-10 years of experience (44.7%), indicating a significant representation of mid-career professionals. Those with 11-15 years of experience account for 32.7%, while those with more than 15 years represent 12.7%. The smallest group reports having less than 5 years of experience (9.9%).

In summary, this demographic profile depicts a sample that is predominantly male, concentrated in the 31-40 age range, highly educated with a majority holding Bachelor's degrees, with the largest representation from GASCO, and a significant portion possessing 5-10 years of professional experience.

4.2 Exploratory Factor Analysis (EFA)

An Exploratory Factor Analysis (EFA) was conducted to investigate the underlying factor structure of the measurement items. Utilizing SPSS V25, the Principal Components Method was employed for factor extraction, followed by Varimax rotation for optimal factor interpretability. A minimum factor loading of 0.3 was established as the criterion for item inclusion. Importantly, all items met this criterion, with the lowest factor loading observed for item SA10 at 0.507 indicating a strong relationship between the items and their respective factors. The factor loadings for each item are presented in Table [4-11]

Table (4-11): Loadings and Reliability

Variable	Dimensions	Items	Loading	Cronbach's alpha (α)
Company Agility (α = 0.969)	Sensing Agility	SA1	.507	0.926
		SA2	.602	
		SA3	.574	
	Decision-Making Agility	DMA1	.745	0.963
		DMA2	.743	
		DMA3	.757	
		DMA4	.725	
		DMA5	.699	
	Acting Agility	AA1	.814	0.967
		AA2	.780	
		AA3	.811	
		AA4	.805	
		AA5	.821	
		AA6	.801	
		AA7	.763	
Responsible Leadership		RL1	.656	0.976
		RL2	.618	
		RL3	.661	
		RL4	.684	
		RL5	.656	
		RL6	.667	
		RL7	.663	
		RL8	.649	
		RL9	.739	
		RL10	.704	
		RL11	.728	
Company Sustainability (α = 0.990)	Environmental Sustainability	ES1	.739	0.984
		ES2	.729	
		ES3	.736	
		ES4	.725	
		ES5	.704	
		ES6	.750	
		ES7	.741	
		ES8	.718	
		ES9	.771	
		ES10	.765	
		ES11	.743	
		ES12	.747	
		ES13	.779	
	Social Sustainability	SS1	.767	0.969
		SS2	.753	
		SS3	.784	
		SS4	.759	
		SS5	.806	
		SS6	.773	
	Economic Sustainability	ECS1	.795	0.957
		ECS2	.795	
		ECS3	.756	

Source: prepared by the researcher

The Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy yielded a value of 0.979, signifying a meritorious sampling level according to the criteria established by Kaiser and Rice (1974). Furthermore, Bartlett's test of sphericity produced a statistically significant result ($\chi^2 = 28880.270$, $p < 0.001$), upholding the suitability of factor analysis for the data.

4.3 Overall Construct Validity

This section presents a comprehensive Pearson correlation matrix (Table (4-17)) that serves as crucial evidence for the construct validity of the key measures in the study's questionnaire. It details the interrelationships among the core constructs: Sensing Agility (SA), Decision-Making Agility (DMA), Acting Agility (AA) – sub-factors of Company Agility (CA); Responsible Leadership (RL); Environmental Sustainability (ES), Social Sustainability (SS), Economic Sustainability (ECS) – sub-factors of Company Sustainability (CS); and the overall total scores for Company Agility (CA), Responsible Leadership (RL), and Company Sustainability (CS). All correlations reported are statistically significant ($p < .01$), indicated by **, affirming the robust nature of these observed relationships.

Table (4-17): Inter-Construct Pearson Correlation Matrix

Factor	SA	DMA	AA	CA	RL	ES	SS	ECS	CS
SA	1								
DMA	.846**	1							
AA	.788**	.603**	1						
CA	.945**	.873**	.907**	1					
RL	.754**	.702**	.767**	.821**	1				
ES	.804**	.810**	.678**	.830**	.835**	1			
SS	.775**	.795**	.653**	.805**	.815**	.952**	1		
ECS	.751**	.775**	.622**	.776**	.766**	.907**	.944**	1	
CS	.797**	.809**	.678**	.828**	.836**	.990**	.977**	.945**	1

Note: **p < .01. Source: Prepared by the researcher based on statistical analysis results.

The matrix provides insights into both convergent and discriminant validity at the construct level:

- Evidence for Convergent Validity: The continued high correlations of factors with their respective total scale scores, as observed within this matrix (e.g., SA with CA: .945; ES with CS: .990; SS with CS: .977; ECS with CS: .945), strongly reaffirm the convergent validity of the underlying dimensions. These high values demonstrate that the sub-factors are indeed measuring aspects of their intended overarching constructs, and that items within each factor are closely related.
- Evidence for Discriminant Validity and Distinctness of Constructs: While all correlations among the main constructs are positive and significant, indicating theoretical relatedness,

the pattern of correlations also provides evidence for their discriminant validity.

- The correlations between the three main constructs (Company Agility, Responsible Leadership, and Company Sustainability) are notably strong, ranging from .821 (CA-RL) to .836 (RL-CS). These values suggest substantial shared variance, consistent with theoretical frameworks that posit interdependencies among these organizational constructs.
- However, critically, these inter-construct correlations are generally lower than the correlations between a factor and its own total scale score (e.g., CA-RL at .821 is lower than SA-CA at .945). This pattern, where within-construct correlations are higher than between-construct correlations, is a key indicator of discriminant validity, suggesting that while these constructs are related, they are nevertheless distinct and separable entities in measurement. For example, while Responsible Leadership is strongly associated with Company Agility, it is not merely a redundant measure of agility.

- Overall Construct Validity: The consistent pattern of strong, theoretically meaningful relationships observed across the entire matrix contributes significantly to the overall construct validity of all measures. It indicates that the scales are behaving as expected in relation to each other, reinforcing confidence in their ability to accurately capture the intended theoretical constructs.

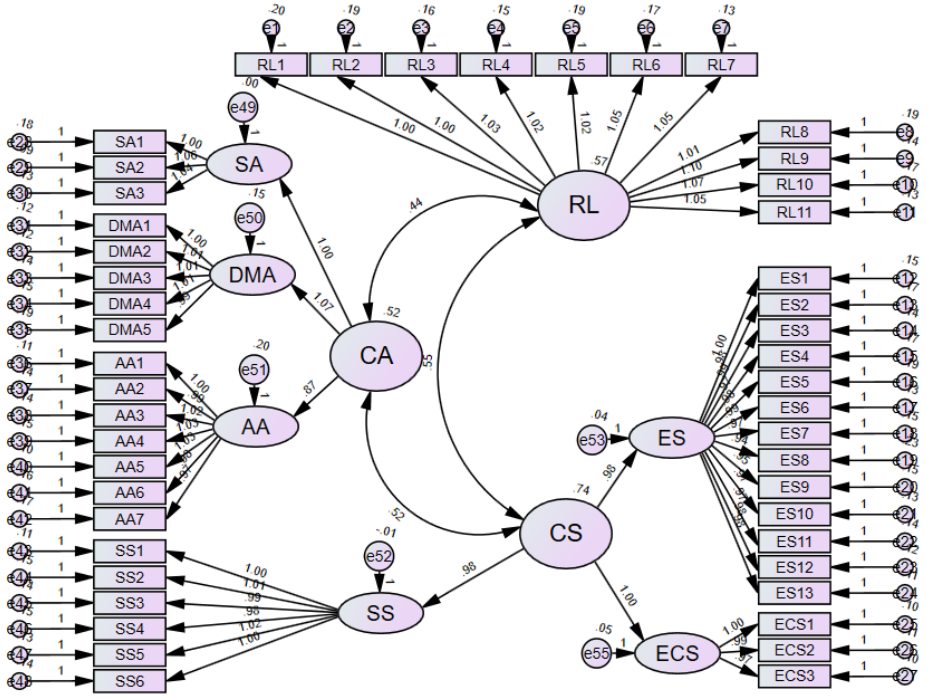
In summary, the Pearson correlation matrix provides compelling validity evidence for the constructs measured in this study. The pattern of correlations supports both the convergent validity of individual scale components and the discriminant validity of the distinct constructs, demonstrating that while interrelated, they remain empirically separable. This robust correlational structure affirms the psychometric soundness of the questionnaire in measuring key aspects of company agility, responsible leadership, and company sustainability within the organizational context.

4.4 Confirmatory Factor Analysis (CFA)

To iteratively assess and refine the measurement models, two Confirmatory Factor Analyses (CFAs) were conducted using AMOS version 26.

In the first CFA, the hypothesized model was specified and tested. This model posited Company Agility (CA) as a second-order latent construct, comprised of the first-order factors: Sensing Agility (SA), Decision-Making Agility (DMA), and Acting Agility (AA). Additionally, Company Sustainability (CS) (the dependent variable) was modeled as a second-order latent construct, encompassing the first-order factors: Environmental Sustainability (ES), Social Sustainability (SS), and Economic Sustainability (ECS). Notably, Responsible Leadership (RL) (the mediator variable) was introduced as a distinct first-order latent construct, measured by its respective observed indicators (items).

Figure (4-1): Start of the first model CFA



Source: prepared by the researcher

The initial, unadjusted first measurement model confirmatory factor analysis of the measurement model revealed a lack of adequate fit to the data, as many of the obtained fit indices failed to meet conventional thresholds for acceptable model fit (CMIN/DF = 3.598, CFI = 0.904, IFI = 0.٩٠٤ , NFI = 0.872, TLI = 0.899, RFI = 0.866, and RMSEA = 0.082). based on the guidelines of Hu and Bentler (1999) and Browne and Cudeck (1992).

Table (4-18): First Measurement Model Modifications and Fit Measures

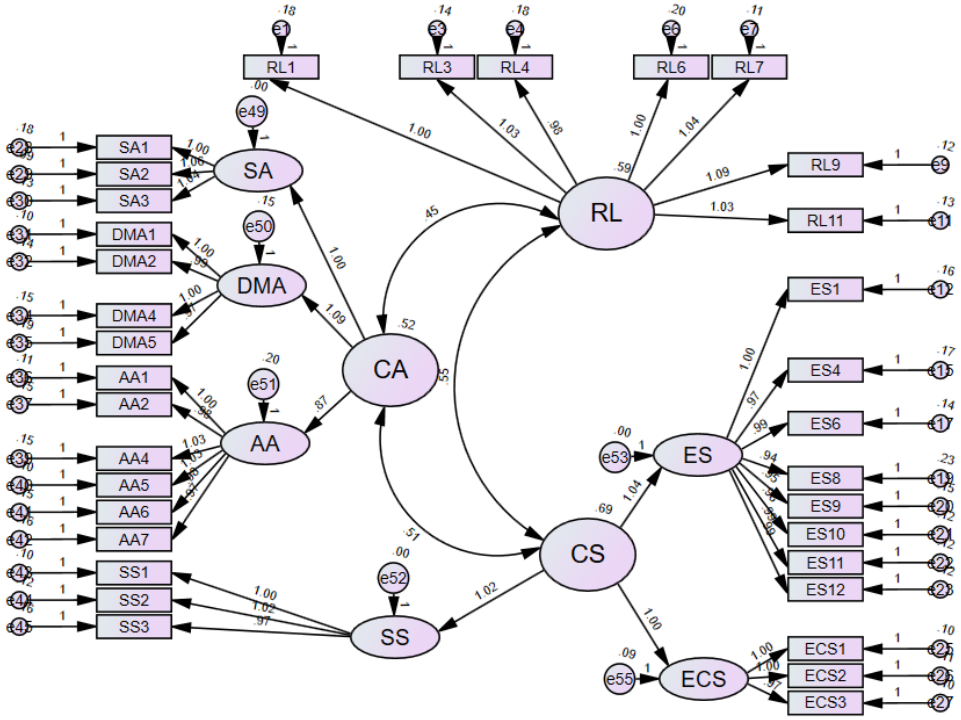
Model Modifications	CMIN/DF	NFI	RFI	IFI	TLI	CFI	RMSEA
	< 3	≥ 0.9	≥ 0.9	≥ 0.9	≥ 0.9	≥ 0.9	< 0.08
NO modifications	3.598	.872	.866	.904	.899	.904	.082
eliminating (RL2&ES5)	3.526	.880	.873	.911	.906	.911	.081
+ eliminating (DMA3&RL5)	3.468	.886	.879	.916	.911	.916	.080
+ eliminating (ES2&ES3)	3.450	.891	.884	.920	.915	.920	.080
+ eliminating (AA3&ES7)	3.453	.895	.888	.923	.918	.923	.080
+ eliminating (ES13&SS4)	3.517	.898	.890	.925	.919	.924	081
+ eliminating (SS6&RL8)	3.300	.908	.901	.934	.929	.934	.077
+ eliminating (RL10&SS5)	2.842	.924	.918	.949	.945	.949	.069

Notes: CMIN/DF = discrepancy divided by degree of freedom; CFI = Comparative Fit Index; IFI = Incremental Fit Index; NFI = Normed Fit Index; TLI = Tucker-Lewis coefficient; RFI = Relative Fit Index; RMSEA = Root Mean Square Error of Approximation

Source: prepared by the researcher

To improve model fit, modification indices were consulted, and a series of adjustments were implemented (detailed in Table(4-18)). These modifications primarily involved removing specific items. Following these refinements, the revised model achieved satisfactory fit indices (CMIN/DF = 2.842, CFI = 0.949, IFI = 0.949, NFI = 0.924, TLI = 0.945, RFI = 0.918, and RMSEA = 0.069).

Figure (4-2): End of the first model CFA

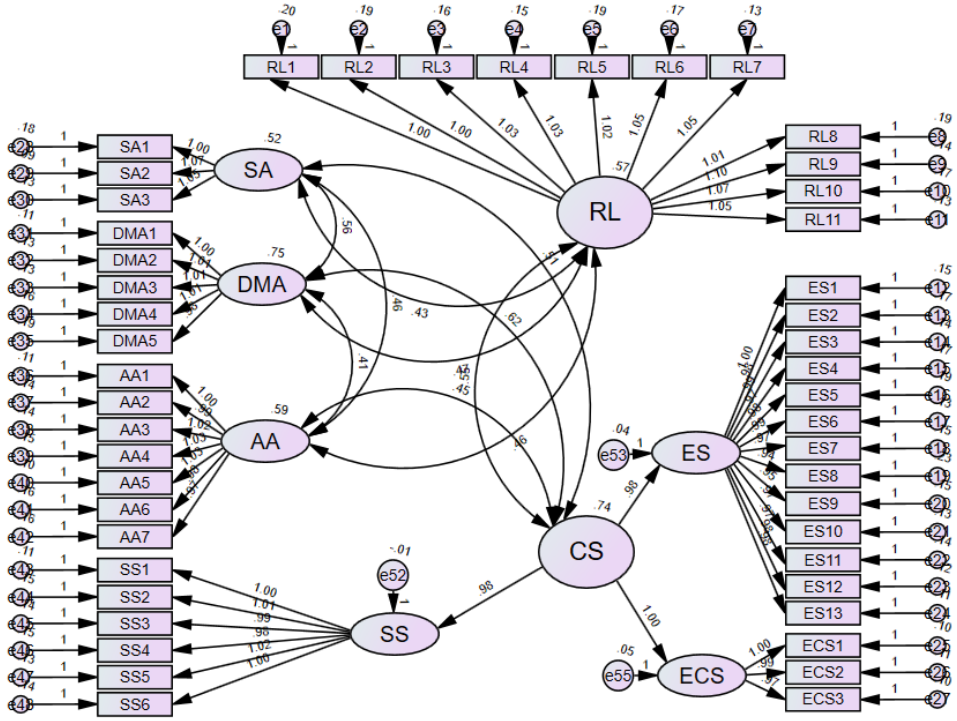


Source: prepared by the researcher

In the subsequent CFA, the model was specified and tested. Within this model, each dimension of Company Agility – specifically, Sensing Agility (SA), Decision-Making Agility (DMA), and Acting Agility (AA) – and the mediating variable, Responsible Leadership (RL), were operationalized as distinct first-order latent constructs, each measured by their respective observed indicators (items). Conversely, Company Sustainability (CS) (the dependent variable) was modeled as a second-order latent construct, encompassing the first-order factors:

Environmental Sustainability (ES), Social Sustainability (SS), and Economic Sustainability (ECS).

Figure (4-3): Start of the second model CFA



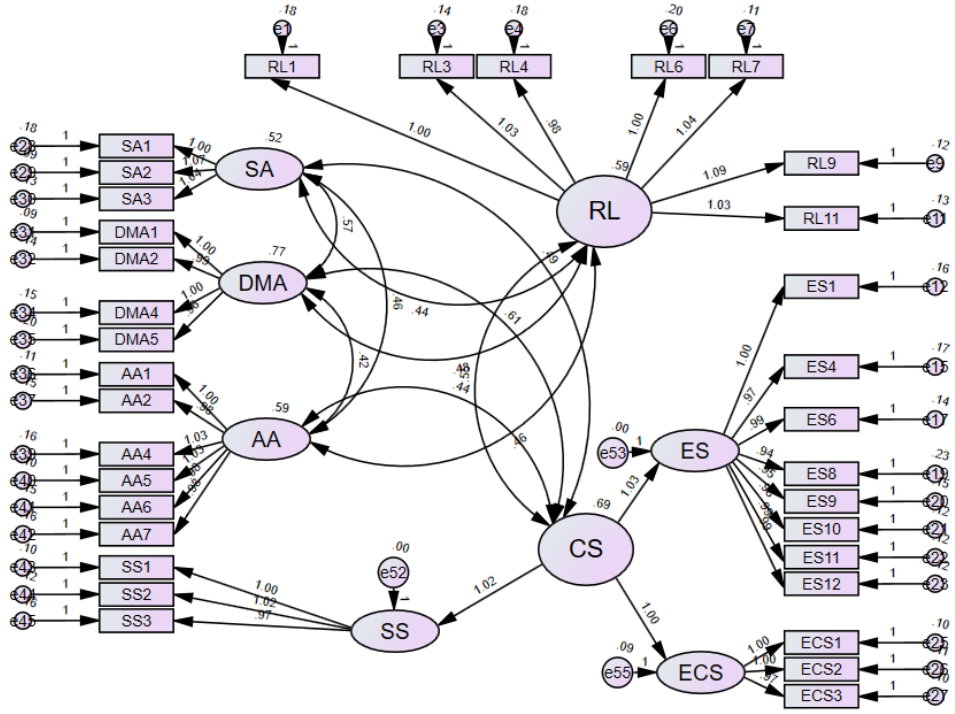
Source: prepared by the researcher

The initial, unadjusted second confirmatory factor analysis of the second measurement model revealed a lack of adequate fit to the data, as some of the obtained fit indices failed to meet conventional thresholds for acceptable model fit (CMIN/DF = 3.418, CFI = 0.911, IFI = 0.911, NFI = 0.879, TLI = 0.906, RFI = 0.872, and RMSEA = 0.079). based on the guidelines of Hu and

Bentler (1999) and Browne and Cudeck (1992).and a series of adjustments were implemented.

To improve model fit, modification indices were consulted, and a series of adjustments were implemented. These modifications primarily involved removing specific items.

Figure (4-4): End of the second model CFA



Source: prepared by the researcher

Following these refinements, The second confirmatory factor analysis (CFA) yielded results consistent with the first CFA. In both, a set of items (DMA3, AA3, RL2, RL5, RL8, RL10, ES2, ES3, ES5, ES7, ES13, SS4, SS5, SS6) were

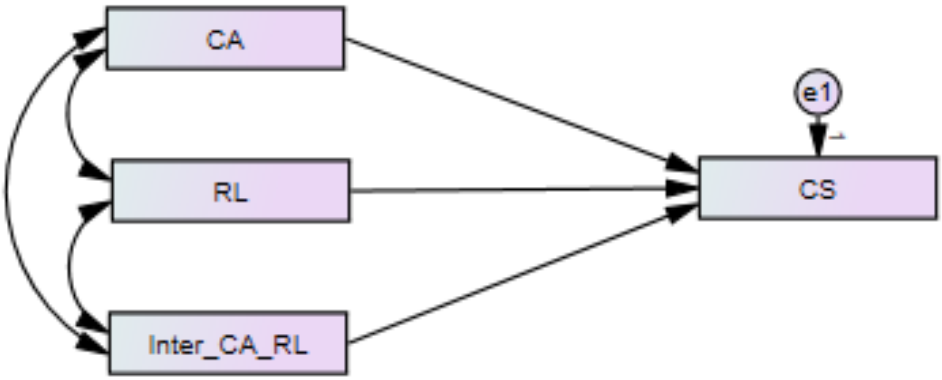
eliminated from the model to achieve satisfactory fit indices. Following the exclusion of these items from the second model confirmatory factor analysis, the fit indices achieved acceptable values (CMIN/DF = 2.530, CFI = 0.958, IFI = 0.958, NFI = 0.933, TLI = 0.954, RFI = 0.927, and RMSEA = 0.063).

4.5 Hypothesis testing

This section outlines the hypothesis testing procedures employed to examine the proposed relationships within the theoretical model. Path analysis, utilizing Amos 26, was selected as the primary analytical technique. This method was chosen due to its statistical efficiency and comprehensive ability to evaluate relationships (Hair et al., 2006).

Prior to conducting the path analysis, all latent variables—comprising the independent variable, dependent variable, and moderator variable—were operationalized as observed variables by calculating their mean scores in SPSS 26, following the results of the Confirmatory Factor Analysis (CFA). Subsequently, for the moderation analysis, the independent and moderator variables underwent mean centering (subtracting each variable's mean from its scores) to mitigate multicollinearity and enhance interpretability. Following this, an interaction term was computed by multiplying the mean-centered independent and moderator variables. The hypotheses were then tested by evaluating the significance of the path coefficients within the specified model using these prepared variables.

Figure (4-5): Path analysis NO.1.



Source: prepared by the researcher

H1: There is a statistically significant relationship between Company Agility (CA) and Company Sustainability (CS).

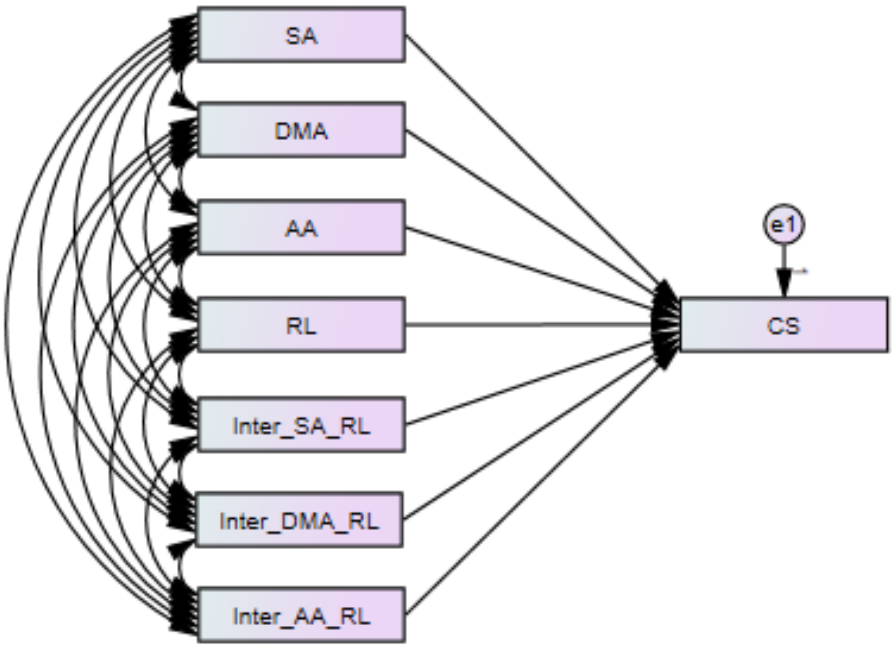
Result: The empirical findings strongly support H1, indicating a statistically significant positive relationship between Company Agility (CA) and Company Sustainability (CS). As presented from the regression analysis, the unstandardized estimate for the direct path from CA to CS is 0.396, suggesting that for every one-unit increase in Company Agility (CA), Company Sustainability (CS) increases by 0.396 units. This estimate is accompanied by a critical ratio (C.R.) of 7.628 and a p-value of less than 0.001 (***), underscoring the strong statistical significance of this association. Furthermore, the

standardized regression values reveal an estimate of 0.344, further affirming the considerable positive impact of CA on CS.

H2: Responsible Leadership (RL) moderates the relationship between Company Agility (CA) and Company Sustainability (CS).

Result: The analysis also provides compelling evidence in favor of H2, demonstrating that Responsible Leadership (RL) significantly moderates the relationship between Company Agility (CA) and Company Sustainability (CS). The interaction term, denoted as "Inter_CA_RL," was found to have a statistically significant effect on CS. Specifically, the unstandardized values indicate an estimate of 0.434 for the interaction term, suggesting that as Responsible Leadership (RL) increases, the positive relationship between Company Agility (CA) and Company Sustainability (CS) is strengthened by 0.434 for each unit increase in the CA-RL interaction. This estimate is accompanied by a C.R. of 5.543 and a p-value of less than 0.001 (***). This robust statistical significance highlights the pivotal moderating role of RL. Moreover, the standardized values show an estimate of 0.398 for this interaction. The positive sign of the moderation effect implies that Responsible Leadership strengthens the positive influence of Company Agility on Company Sustainability, suggesting that the advantages of agility for sustainability are amplified when effective responsible leadership practices are in place.

Figure (4-6): Path analysis NO.2



Source: prepared by the researcher

H1.1: There is a statistically significant relationship between Sensing Agility (SA) and Company Sustainability (CS).

Result: The empirical findings strongly support H1.1, indicating a statistically significant positive relationship between Sensing Agility (SA) and Company Sustainability (CS). As presented from the regression analysis, the unstandardized estimate for the direct path from SA to CS is 0.119, suggesting that for every one-unit increase in Sensing Agility (SA), Company Sustainability (CS) increases by 0.119 units. This

estimate is accompanied by a critical ratio (C.R.) of 6.009 and a p-value of 0.015. This robust statistical significance underscores the positive association. Furthermore, the standardized regression values reveal an estimate of 0.109, further affirming the positive impact of SA on CS.

H1.2: There is a statistically significant relationship between Decision-Making Agility (DMA) and Company Sustainability (CS).

Result: The analysis robustly supports H1.2, demonstrating a highly statistically significant positive relationship between Decision-Making Agility (DMA) and Company Sustainability (CS). The unstandardized estimate for the direct path from DMA to CS is 0.307, indicating that for every one-unit increase in Decision-Making Agility (DMA), Company Sustainability (CS) increases by 0.307 units. This estimate presents a critical ratio (C.R.) of 7.346 and a p-value of less than 0.001 (***). This robust statistical significance highlights the strong positive association. Furthermore, the standardized regression values further corroborate this with an estimate of 0.292, affirming the strong positive impact of DMA on CS.

H1.3: There is a statistically significant relationship between Acting Agility (AA) and Company Sustainability (CS).

Result: The findings do not support H1.3, as there is no statistically significant relationship between Acting Agility (AA) and Company Sustainability (CS). The unstandardized estimate

for the direct path from AA to CS is -0.079, with a critical ratio (C.R.) of -1.755 and a p-value of 0.077. This p-value is greater than the conventional 0.05 significance level, indicating that the observed relationship is not statistically significant.

H2.1: Responsible Leadership (RL) moderates the relationship between Sensing Agility (SA) and Company Sustainability (CS).

Result: The analysis supports H2.1, providing compelling evidence that Responsible Leadership (RL) significantly moderates the relationship between Sensing Agility (SA) and Company Sustainability (CS). The interaction term, denoted as "Inter_SA_RL," was found to have a statistically significant effect on CS. Specifically, the unstandardized values indicate an estimate of 0.279 for the interaction term, suggesting that as Responsible Leadership (RL) increases, the positive relationship between Sensing Agility (SA) and Company Sustainability (CS) is strengthened by 0.279 for each unit increase in the SA-RL interaction. This estimate is accompanied by a C.R. of 3.630 and a p-value of 0.041. This robust statistical significance highlights the pivotal moderating role of RL. Moreover, the standardized values show a corresponding estimate of 0.215, further affirming the moderating effect of RL on the SA-CS relationship. The positive sign of the moderation effect implies that Responsible Leadership strengthens the positive influence of Sensing Agility on Company Sustainability, suggesting that the advantages of

agility for sustainability are amplified when effective responsible leadership practices are in place.

H2.2: Responsible Leadership (RL) moderates the relationship between Decision-Making Agility (DMA) and Company Sustainability (CS).

Result: The analysis strongly supports H2.2, demonstrating that Responsible Leadership (RL) significantly moderates the relationship between Decision-Making Agility (DMA) and Company Sustainability (CS). The interaction term, "Inter_DMA_RL," exhibits a statistically significant effect on CS. The unstandardized values indicate an estimate of 0.356 for the interaction term, implying that as Responsible Leadership (RL) increases, the positive relationship between Decision-Making Agility (DMA) and Company Sustainability (CS) is strengthened by 0.356 for each unit increase in the DMA-RL interaction. This estimate is supported by a C.R. of 5.772 and a p-value of 0.028. This robust statistical significance highlights the pivotal moderating role of RL. Moreover, the standardized values further corroborate this with an estimate of 0.329, affirming the strong moderating effect of RL on the DMA-CS relationship. The positive sign of the moderation effect implies that Responsible Leadership strengthens the positive influence of Decision-Making Agility on Company Sustainability, suggesting that the advantages of agility for sustainability are amplified when effective responsible leadership practices are in place.

H2.3: Responsible Leadership (RL) moderates the relationship between Acting Agility (AA) and Company Sustainability (CS).

Result: The analysis does not support H2.3, as no statistically significant moderating effect of Responsible Leadership (RL) on the relationship between Acting Agility (AA) and Company Sustainability (CS) was found. The interaction term, "Inter_AA_RL," was found to have a negligible unstandardized estimate of 0.004, with a C.R. of 0.061 and a p-value of 0.951. This p-value is considerably higher than the conventional 0.05 significance level, indicating a lack of a statistically significant moderating effect of Responsible Leadership (RL) on the relationship between Acting Agility (AA) and Company Sustainability (CS).

Table (4-19): Results of Hypothesis testing

H. No	Hypothesis	Estimate	P	Remarks
H1	There is a statistically significant relationship between Company Agility (CA) and Company Sustainability (CS).	.396	***	Supported
H2	Responsible Leadership (RL) moderates the relationship between Company Agility (CA) and Company Sustainability (CS).	.434	***	Supported
H1.1	There is a statistically significant relationship between Sensing Agility (SA) and Company Sustainability (CS).	.119	.015	Supported
H1.2	There is a statistically significant relationship between Decision-Making Agility (DMA) and Company Sustainability (CS).	.307	***	Supported
H1.3	There is a statistically significant relationship between Acting Agility (AA) and Company Sustainability (CS).	-.079	.077	Not Supported
H2.1	Responsible Leadership (RL) moderates the relationship between Sensing Agility (SA) and Company Sustainability (CS).	.279	.041	Supported
H2.2	Responsible Leadership (RL) moderates the relationship between Decision-Making Agility (DMA) and Company Sustainability (CS).	.356	.028	Supported
H2.3	Responsible Leadership (RL) moderates the relationship between Acting Agility (AA) and Company Sustainability (CS).	.004	.951	Not Supported

Source: prepared by the researcher

5 Discussion and Conclusion

5.1 Discussion and conclusion

The findings of this study offer meaningful insights into the dynamic relationships among organizational agility, responsible leadership, and company sustainability in the Egyptian petroleum sector.

The analysis confirmed that Company Agility (CA) has a statistically significant and positive effect on Company Sustainability (CS) (estimate = 0.396, $p < 0.001$). This reinforces the idea that agile firms—those capable of quickly sensing, deciding, and acting—are better equipped to meet sustainability goals by effectively adapting to changing environmental and operational conditions.

Moreover, the results strongly support the moderating role of Responsible Leadership (RL) in the relationship between Company Agility and Company Sustainability (estimate = 0.434, $p < 0.001$). This means that the impact of agility on sustainability becomes stronger in organizations where leaders demonstrate responsibility, ethical awareness, stakeholder engagement, and long-term thinking. In other words, responsible leadership amplifies the positive effect of agility on sustainable performance.

When the dimensions of agility are examined individually, Sensing Agility (SA) was found to positively and significantly influence company sustainability (estimate = 0.119, $p = 0.015$).

This suggests that the ability to proactively scan and interpret market and environmental signals supports better sustainability-related decisions. Additionally, Responsible Leadership was found to significantly moderate the SA–CS relationship (estimate = 0.279, p = 0.041), indicating that leaders who act responsibly can strengthen the benefit of environmental awareness on sustainability.

Decision-Making Agility (DMA) had the strongest direct effect on sustainability among the agility dimensions (estimate = 0.307, p < 0.001). This implies that timely and informed decision-making is crucial to achieving sustainability outcomes. Importantly, this relationship is also significantly moderated by Responsible Leadership (estimate = 0.356, p = 0.028), reinforcing that decisions made in an ethical and inclusive leadership environment are more likely to yield sustainable impacts.

In contrast, Acting Agility (AA)—the capability to quickly implement actions—did not have a statistically significant direct effect on sustainability (estimate = -0.079, p = 0.077). Furthermore, the moderation effect of Responsible Leadership on the AA–CS relationship was not supported (estimate = 0.004, p = 0.951). These results indicate that while quick action alone may not guarantee sustainability, its effectiveness may be limited in the absence of ethical leadership alignment.

Overall, the study highlights that while agility is a key driver of sustainability, its full potential is realized only when complemented by responsible leadership**.** The moderating role of leadership is especially critical for sensing and decision-making agility. This underscores the need for Egyptian petroleum companies to invest not only in agile structures and systems but also in cultivating leadership that is ethical, stakeholder-centered, and sustainability-oriented.

These findings have important theoretical and practical implications. They contribute to the growing body of research linking agility, leadership, and sustainability, particularly in emerging economies. Practically, they suggest that firms aiming to be both agile and sustainable must develop leadership capacities that prioritize responsibility and long-term impact alongside speed and adaptability.

5.1.1 Practical Implications

Based on the findings of this study, petroleum companies in Egypt should consider the following strategies to enhance sustainability, agility, and ethical leadership capabilities in a rapidly changing and high-stakes industry.

First, firms should continue investing in organizational agility, with particular emphasis on improving decision-making agility. This dimension showed the strongest direct effect on sustainability and benefited significantly from responsible leadership as a moderator**.** Building cross-functional decision

teams, streamlining approval processes, and ensuring access to real-time data can help organizations make informed, timely, and strategically sound decisions.

Second, to maximize the impact of agility on sustainability, companies must cultivate responsible leadership that emphasizes ethics, stakeholder engagement, and long-term impact. Leadership development programs should go beyond operational skills to focus on inclusive governance, values-based decision-making, and sustainability literacy. Managers must be equipped not just to act quickly, but to act responsibly in alignment with broader societal goals.

Third, organizations should align their performance management systems by integrating sustainability KPIs with agility goals. By doing so, firms ensure that every agile action from strategy formulation to operational execution reinforces both business performance and environmental or social responsibility. This alignment is especially crucial in regulated, high-risk industries like petroleum.

Importantly, while acting agility did not show a statistically significant direct or moderated relationship with sustainability, it remains vital for operational execution. The implication is that fast action alone does not guarantee sustainable outcomes, but when combined with leadership oversight, it can still support broader sustainability goals. Therefore, action-oriented processes

should be embedded within a framework of ethical leadership and accountability.

Companies should also foster a culture of "ethical agility," where adaptability and rapid response are tempered by transparency, collaboration, and long-term thinking. Regular dialogue between leadership and stakeholders particularly around high-impact decisions can help ensure agility is exercised with responsibility and foresight.

Finally, collaboration with external stakeholders is key. Petroleum firms should engage regulators, industry associations, and civil society in co-developing agile but accountable sustainability standards. Responsible leadership can serve as the critical liaison between the company and its broader environment, ensuring alignment between rapid internal decisions and long-term societal expectations.

In sum, this study underscores that responsible leadership is a vital enabling factor in transforming agility from a tactical advantage into a sustainable organizational strategy. Egyptian petroleum firms that invest in both leadership and agility are more likely to thrive in today's volatile environment while maintaining legitimacy, trust, and long-term impact.

5.2 Limitations

The research focused solely on the petroleum sector in Egypt, and as such, the findings may not be directly generalizable to other industries or geographic regions. While the

petroleum industry represents a critical and complex environment, its unique operational, regulatory, and environmental dynamics may limit the applicability of the results to other contexts.

The data were collected through a self-reported survey instrument, which may introduce common method bias or social desirability effects. Participants may have responded in ways they believe reflect positively on themselves or their organizations, potentially inflating perceived levels of agility, leadership responsibility, or sustainability.

Additionally, the cross-sectional design of the study captures a snapshot in time, which limits the ability to infer causality or observe changes over time. A longitudinal or mixed-method approach could provide deeper insights into how agility, responsible leadership, and sustainability evolve and interact in dynamic environments.

Finally, While this study specifically examined the moderating role of responsible leadership, it did not account for other potentially influential contextual variables such as organizational culture, digital transformation maturity, or institutional pressures. These factors may further shape how agility and leadership interact to influence sustainability outcomes.

5.3 Future Research Recommendations

Future research that addresses the limitations of this study will be important for gaining a deeper understanding of the relationship between organizational agility, responsible leadership, and sustainability.

First, future studies could employ qualitative methods, such as interviews or focus groups, to gather richer insights into leadership behaviors and decision-making processes in complex industries like petroleum. These methods may reveal deeper nuances about how leaders influence agile responses and sustainability-oriented strategies in real-world settings.

Researchers should also consider combining survey data with additional sources, such as interviews, observations, or company records, to improve the validity of findings. This is especially important when studying leadership behavior, where self-report bias or social desirability may distort responses.

Longitudinal studies are also recommended to examine how the relationships between agility, leadership, and sustainability evolve over time. Tracking these variables in response to regulatory changes, market shifts, or global events would offer insights into their temporal dynamics and long-term implications.

In addition, comparative studies across different sectors in Egypt or other countries in the MENA region could explore how industry and cultural contexts shape these relationships. Such

studies may uncover sector-specific challenges or leadership norms that influence agility and sustainability differently.

Finally, future research could examine additional moderating variables—such as organizational culture, digital maturity, innovation climate, or governance practices—that might strengthen or weaken the impact of agility on sustainability. This would extend the current model by exploring how contextual factors shape the effectiveness of agility under different leadership or organizational conditions.

6 References

Abraham, K. T. (2024). Responsible leadership and triple bottom line performance: imperatives for corporate sustainability. *Journal of Global Responsibility*. https://doi.org/10.1108/JGR-06-2023-0111

Alharahsheh, H. H., & Pius, A. (2020). A Review of key paradigms: positivism VS interpretivism. *Global Academic Journal of Humanities and Social Sciences*, *2*(3), 39–43. https://doi.org/10.36348/gajhss.2020.v02i03.001

Almazrouei, F., Elias Sarker, A., Zervopoulos, P., & Yousaf, S. (2024). Organizational structure, agility, and public value-driven innovation performance in the UAE public services. *Heliyon*, *10*(13). https://doi.org/10.1016/j.heliyon.2024.e33261

Amine Marhraoui, M., & El Manouar, A. (2017). Towards a New Framework Linking Knowledge Management Systems and Organizational Agility : An Empirical Study. *International Journal of Computer Science and Information Technology*, *9*(1), 21–36. https://doi.org/10.5121/ijcsit.2017.9103

Atienza-Barba, M., Río-Rama, M. de la C. del, Meseguer-Martínez, Á., & Barba-Sánchez, V. (2024). Artificial intelligence and organizational agility: An analysis of scientific production and future trends. *European Research on Management and Business Economics*, *30*(2). https://doi.org/10.1016/j.iedeen.2024.100253

Basile, V., Capobianco, N., & Vona, R. (2021). The usefulness of sustainable business models: Analysis from oil and gas industry. *Corporate Social Responsibility and Environmental Management*, *28*(6), 1801–1821. https://doi.org/10.1002/csr.2153

Baškarada, S., & Koronios, A. (2018). The 5S organizational agility framework: a dynamic capabilities perspective. *International Journal of Organizational Analysis*, *26*(2), 331–342. https://doi.org/10.1108/IJOA-05-2017-1163

Battour, M., Barahma, M., & Al-Awlaqi, M. (2021). The relationship between hrm strategies and sustainable competitive advantage: Testing the mediating role of strategic agility. *Sustainability (Switzerland)*, *13*(9). https://doi.org/10.3390/su13095315

Bek Yağmur, Ö., & Aydıntuğ Myrvang, N. (2023). The effect of organizational agility on crisis management process and organizational resilience: Health sector example. *International Journal of Disaster Risk Reduction*, *96*. https://doi.org/10.1016/j.ijdrr.2023.103955

Bell, E. , B. A. , & H. B. (2022). (n.d.). *Business research methods. Oxford University Press*.

Büyüközkan, G., & Karabulut, Y. (2018). Sustainability performance evaluation: Literature review and future directions. *Journal of Environmental Management*, *217*, 253–267. https://doi.org/10.1016/j.jenvman.2018.03.064

Carvalho, A. M., Sampaio, P., Rebentisch, E., Carvalho, J. Á., & Saraiva, P. (2021). The influence of operational excellence on the culture and agility of organizations: evidence from industry. *International Journal of Quality and Reliability Management*, *38*(7), 1520–1549. https://doi.org/10.1108/IJQRM-07-2020-0248

Cha, H., & Park, S. M. (2023). Organizational Agility and Communicative Actions for Responsible Innovation: Evidence from manufacturing firms in South Korea. *Asia Pacific Journal of Management*. https://doi.org/10.1007/s10490-023-09883-8

Cheng, C., Zhong, H., & Cao, L. (2020). Facilitating speed of internationalization: The roles of business intelligence and organizational agility. *Journal of Business Research*, *110*, 95–103. https://doi.org/10.1016/j.jbusres.2020.01.003

Cheng, X., Chen, K., & Su, Y. (2023). Green innovation in oil and gas exploration and production for meeting the sustainability goals. *Resources Policy*, *87*. https://doi.org/10.1016/j.resourpol.2023.104315

Chwiłkowska-Kubala, A., Cyfert, S., Malewska, K., Mierzejewska, K., Szumowski, W., & Prause, G. (2023). What drives organizational agility in energy sector companies? The role of strategic CSR initiatives and the dimensions of proactive CSR. *Sustainable Futures*, *6*. https://doi.org/10.1016/j.sftr.2023.100133

Ciampi, F., Faraoni, M., Ballerini, J., & Meli, F. (2022). The co-evolutionary relationship between digitalization and organizational agility: Ongoing debates, theoretical developments and future research perspectives. *Technological Forecasting and Social Change*, *176*. https://doi.org/10.1016/j.techfore.2021.121383

Cyfert, S., Szumowski, W., Dyduch, W., Zastempowski, M., & Chudziński, P. (2022). The power of moving fast: responsible

leadership, psychological empowerment and workforce agility in energy sector firms. In *Heliyon* (Vol. 8, Issue 10). Elsevier Ltd. https://doi.org/10.1016/j.heliyon.2022.e11188

Filho, W. L., Eustachio, J. H. P. P., Caldana, A. C. F., Will, M., Salvia, A. L., Rampasso, I. S., Anholon, R., Platje, J., & Kovaleva, M. (2020). Sustainability leadership in higher education institutions: An overview of challenges. *Sustainability (Switzerland)*, *12*(9). https://doi.org/10.3390/su12093761

Geyi, D. G., Yusuf, Y., Menhat, M. S., Abubakar, T., & Ogbuke, N. J. (2020). Agile capabilities as necessary conditions for maximising sustainable supply chain performance: An empirical investigation. *International Journal of Production Economics*, *222*. https://doi.org/10.1016/j.ijpe.2019.09.022

Gligor, D., Gligor, N., Holcomb, M., & Bozkurt, S. (2019). Distinguishing between the concepts of supply chain agility and resilience: A multidisciplinary literature review. In *International Journal of Logistics Management* (Vol. 30, Issue 2, pp. 467–487). Emerald Group Holdings Ltd. https://doi.org/10.1108/IJLM-10-2017-0259

Gokhberg, L., Vice-Rector, F., del Giudice, M., Campus, L., Dirk Meissner, I., Federation Alexander Sokolov, R., Federation, R., Manager -Nataliya Gavrilicheva Literary Editors -Yakov Okhonko, D., Montgomery, C., Cagnin, C., Calof, J., Fuller, T., Gault, F., Georghiou, L., Haegeman, K., Keenan, M., Yaroslav Kuzminov, F., Federation Tatiana Kuznetsova, R., Federation Keun Lee, R., … Wilkinson, A. (n.d.). *ABOUT THE JOURNAL ABOUT THE JOURNAL EMERGING SOURCES CITATION INDEX WEB OF SCIENCE TM CORE COLLECTION FORESIGHT AND STI GOVERNANCE FORESIGHT AND STI GOVERNANCE Associate*

Editors Editorial Counsil Higher School of Economics Executive Editor-Marina Boykova (Russian print version). http://foresight-journal.hse.ru/en/

Guo, R., Yin, H., & Liu, X. (2023). Coopetition, organizational agility, and innovation performance in digital new ventures. *Industrial Marketing Management*, *111*, 143–157. https://doi.org/10.1016/j.indmarman.2023.04.003

Gupta, A. K., & Gupta, N. (2020). Effect of corporate environmental sustainability on dimensions of firm performance – Towards sustainable development: Evidence from India. *Journal of Cleaner Production*, *253*. https://doi.org/10.1016/j.jclepro.2019.119948

Hagen, B., Ghauri, P. N., & Macovei, V. (2024). The balancing act: Organizational agility in fast-growing international ventures. *Industrial Marketing Management*, *123*, 119–132. https://doi.org/10.1016/j.indmarman.2024.09.007

Haider, S. A., Akbar, A., Tehseen, S., Poulova, P., & Jaleel, F. (2022). The impact of responsible leadership on knowledge sharing behavior through the mediating role of person–organization fit and moderating role of higher educational institute culture. *Journal of Innovation and Knowledge*, *7*(4). https://doi.org/10.1016/j.jik.2022.100265

Huo, C., Safdar, M. A., & Ahmed, M. (2023). Impact of responsible leadership on sustainable performance: a moderated mediation model. *Kybernetes*. https://doi.org/10.1108/K-03-2023-0342

Jalal, S., Jehangir, M., & Ullah, Z. (2017). Organizational Agility Determinants and Performance: A Case of Pakistani Telecommunication Sector. *Global Regional Review*, *II*(I), 211–227. https://doi.org/10.31703/grr.2017(ii-i).15

Javed, M., Rashid, M. A., Hussain, G., & Ali, H. Y. (2020). The effects of corporate social responsibility on corporate reputation and firm financial performance: Moderating role of responsible leadership. *Corporate Social Responsibility and Environmental Management*, *27*(3), 1395–1409. https://doi.org/10.1002/csr.1892

Jha, M. K., & Rangarajan, K. (2020). Analysis of corporate sustainability performance and corporate financial performance causal linkage in the Indian context. *Asian Journal of Sustainability and Social Responsibility*, *5*(1). https://doi.org/10.1186/s41180-020-00038-z

Kandasamy, U. C. (2024). *Ethical Leadership in the Age of AI Challenges, Opportunities and Framework for Ethical Leadership*. http://arxiv.org/abs/2410.18095

Khalil, M. L., Aziz, N. A., Long, F., & Zhang, H. (2023). What factors affect firm performance in the hotel industry post-Covid-19 pandemic? Examining the impacts of big data analytics capability, organizational agility and innovation. *Journal of Open Innovation: Technology, Market, and Complexity*, *9*(2). https://doi.org/10.1016/j.joitmc.2023.100081

Liao, Y. (2022). Sustainable leadership: A literature review and prospects for future research. In *Frontiers in Psychology* (Vol. 13). Frontiers Media S.A. https://doi.org/10.3389/fpsyg.2022.1045570

Margherita, A., Sharifi, H., & Caforio, A. (n.d.). *A conceptual framework of strategy, action and performance dimensions of organizational agility development*.

Marjerison, R. K., Andrews, M., & Kuan, G. (2022). Creating Sustainable Organizations through Knowledge Sharing and Organizational Agility: Empirical Evidence from China.

Sustainability (Switzerland), *14*(8). https://doi.org/10.3390/su14084531

Nakra, N., & Kashyap, V. (2024). Responsible leadership and organizational sustainability performance: investigating the mediating role of sustainable HRM. *International Journal of Productivity and Performance Management*. https://doi.org/10.1108/IJPPM-03-2023-0115

Nardi, P. M. (2018). *Doing Survey Research*. Routledge. https://doi.org/10.4324/9781315172231

Ofoeda, J., Boateng, R., & Effah, J. (2024). API integration and organisational agility outcomes in digital music platforms: A qualitative case study. *Heliyon*, *10*(11). https://doi.org/10.1016/j.heliyon.2024.e31756

Pereira, C. S., Moreira, F., Durão, N., & Ferreira, M. J. (2019). Towards the Digital Transformation: Are Portuguese Organizations in This Way? *Advances in Intelligent Systems and Computing*, *930*, 326–336. https://doi.org/10.1007/978-3-030-16181-1_31

Prieto, L., & Talukder, M. F. (2023). Resilient Agility: A Necessary Condition for Employee and Organizational Sustainability. *Sustainability (Switzerland)*, *15*(2). https://doi.org/10.3390/su15021552

Rawashdeh, A., Abdallah, A. B., Alfawaeer, M., Al Dweiri, M., & Al-Jaghbeer, F. (2024). The Impact of Strategic Agility on Environmental Sustainability: The Mediating Role of Digital Transformation. *Sustainability (Switzerland)*, *16*(3). https://doi.org/10.3390/su16031338

Rentizelas, A., de Sousa Jabbour, A. B. L., Al Balushi, A. D., & Tuni, A. (2020). Social sustainability in the oil and gas industry: institutional pressure and the management of sustainable supply

chains. *Annals of Operations Research*, *290*(1–2), 279–300. https://doi.org/10.1007/s10479-018-2821-3

Ricci, F., Scafarto, V., Ferri, S., & Tron, A. (2020). Value relevance of digitalization: The moderating role of corporate sustainability. An empirical study of Italian listed companies. *Journal of Cleaner Production*, *276*. https://doi.org/10.1016/j.jclepro.2020.123282

Roshaidai, S., & Arifin, M. (2018). Ethical Considerations in Qualitative Study. In *International Journal of Care Scholars* (Vol. 1, Issue 2).

Ruggerio, C. A. (2021). Sustainability and sustainable development: A review of principles and definitions. In *Science of the Total Environment* (Vol. 786). Elsevier B.V. https://doi.org/10.1016/j.scitotenv.2021.147481

Sarwar, U., Aslam, M. K., Khan, S. A., & Shenglin, S. (2024). Optimizing human resource strategies: Investigating the dynamics of high-performance practices, psychological empowerment, and responsible leadership in a moderated-mediation framework. *Acta Psychologica*, *248*. https://doi.org/10.1016/j.actpsy.2024.104385

Saunders, M., Lewis, P., Thornhill, A., Lewis, S. •, & Thornhill, •. (n.d.). *Research methods for business students fi fth edition*. www.pearsoned.co.uk

Schöck, M., Batora, M., Müller, J., Bursac, N., & Albers, A. (2023). Influence of Agility on the Innovation Capability of Organizations - A Systematic Review of Influencing Factors. *Procedia CIRP*, *119*, 427–437. https://doi.org/10.1016/j.procir.2023.03.105

Shaaban, S. (n.d.). A Responsible Leadership Dimensional Framework Model. In *International Journal of Organizational Leadership* (Vol. 10). https://www.ijol.cikd.ca

Shan, Y. (2022). Philosophical foundations of mixed methods research. *Philosophy Compass*, *17*(1). https://doi.org/10.1111/phc3.12804

Siddiqui, S. H., Ijaz, A., & Chawla, R. N. (2023). Sustainable Business and Society in Emerging Economies Intervening Role of Sustainability Practices in the Nexuses of Responsible Leadership and Environmental, Task, and Contextual Performance. *Sustainable Business and Society in Emerging Economies*, *5*(1). www.publishing.globalcsrc.org/sbsee

Thomas, T., Schermerhorn, J. R., & Dienhart, J. W. (n.d.). *Strategic leadership of ethical behavior in business*.

Ur Rehman, A., Al-Zabidi, A., AlKahtani, M., Umer, U., & Usmani, Y. S. (2020). Assessment of supply chain agility to foster sustainability: Fuzzy-DSS for a saudi manufacturing organization. *Processes*, *8*(5). https://doi.org/10.3390/PR8050577

Voegtlin, C., Frisch, C., Walther, A., & Schwab, P. (2020). Theoretical Development and Empirical Examination of a Three-Roles Model of Responsible Leadership. *Journal of Business Ethics*, *167*(3), 411–431. https://doi.org/10.1007/s10551-019-04155-2

Younas, N., Hossain, M. B., Syed, A., Ejaz, S., Ejaz, F., Jagirani, T. S., & Dunay, A. (2023). Green shared vision: A bridge between responsible leadership and green behavior under individual green values. *Heliyon*, *9*(11). https://doi.org/10.1016/j.heliyon.2023.e21511

Zhang, J., Ul-Durar, S., Akhtar, M. N., Zhang, Y., & Lu, L. (2021). How does responsible leadership affect employees' voluntary workplace green behaviors? A multilevel dual process model of voluntary workplace green behaviors. *Journal of Environmental Management*, *296*. https://doi.org/10.1016/j.jenvman.2021.113205

Zhang, S., & Suntrayuth, S. (2024). The Synergy of Ambidextrous Leadership, Agility, and Entrepreneurial Orientation to Achieve Sustainable AI Product Innovation. *Sustainability (Switzerland)* , *16*(10). https://doi.org/10.3390/su16104248

Zhou, Q., & Zheng, X. (2023). From responsible leadership to hospitality employee's support for external CSR: Need satisfaction as a mediator and moral reflectiveness as a moderator. *Journal of Hospitality and Tourism Management*, *56*, 115–123. https://doi.org/10.1016/j.jhtm.2023.06.015

Zhu, X., & Li, Y. (2023). The use of data-driven insight in ambidextrous digital transformation: How do resource orchestration, organizational strategic decision-making, and organizational agility matter? *Technological Forecasting and Social Change*, *196*. https://doi.org/10.1016/j.techfore.2023.122851

Zieba, M., Durst, S., & Hinteregger, C. (2022). The impact of knowledge risk management on sustainability. *Journal of Knowledge Management*, *26*(11), 234–258. https://doi.org/10.1108/JKM-09-2021-0691

Zimek, M., Baumgartner, R. J., & Baumgartner, R. (2017). *Corporate sustainability activities and sustainability performance of first and second order*. https://www.researchgate.net/publication/320612163