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Dedication

It is our pleasure and great privilege to present the sixtieth-first issue of the Academic Journal of Research and Scientific Publishing to all researchers and doctors who published their research in the issue, and we thanks and appreciate to all contributors and supporters of the academic journal and those involved in the production of this scientific knowledge edifice.

Academic Journal of Research and Scientific Publishing

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Greenwashing Risk and Its Mitigation for Sustainable Finance

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Abstract

Greenwashing presents a significant risk to sustainable financing, prompting researchers to investigate its impact on investors. In response to the urgency of combating this deceptive practice, financial market regulators have increasingly adopted ESG (environmental, social, governance) criteria. This study aims to comprehensively understand the effects of greenwashing by employing a mixed-method approach. Initially, a survey was conducted among participants to analyze their perspectives. The findings reveal a prevailing trend among individuals who seek to optimize investment returns, with a remarkable 50% of respondents demonstrating familiarity with greenwashing tactics. Notably, upon becoming aware of greenwashing practices, a substantial proportion of participants express a strong inclination to revise their investment strategies accordingly. Further exploration into the phenomenon uncovers a combination of factors contributing to greenwashing, including ambiguous legislation, stakeholder pressures, organizational qualities, and individual mindsets. Respondents emphasize the critical importance of enhanced transparency, a heightened emphasis on quality standards, and the enforcement of stringent regulations as key measures to mitigate the prevalence of greenwashing. This study sheds light on investors' sentiments regarding greenwashing, providing valuable insights into the impacts of this unethical practice on sustainable financing. Additionally, it offers practical recommendations to effectively combat greenwashing. By implementing suggested measures such as promoting transparency, prioritizing quality, and enforcing robust regulations.

Keywords: Investors, Sustainable investments, Corporate Finance, Corporate Greenwashing.

1. Introduction

In China, the environmental pollution of water is more prominent (Guo et al., 2014)). India faces high levels of air pollution, loss of food security, and waste problems and is the most polluted country after China (Fernando et al., 2014). Consequently, upon public awareness and environmental issues, the stakeholders became aware of the environment (Chen and Chang, 2012). Governments, corporate customers, and other consumers are exerting pressure on companies to disclose information about their environmental activities and performance (Kim and Lyon, 2015) and the environment-friendly products that have been developed. More pressure is being exerted on the energy sector, and consumers have agreed to pay more for environmentally friendly products. Corporate Social responsibility is gaining more importance among the business communities for responding to this issue (Porter and Kramer, 2006).

The firms exploited the environmental pressure to incentivize their stakeholder that they are working environment-friendly (Berrone et al., 2017). To improve its environmental reputation, the firm adopted green communication, corporate financial performance, and legitimacy (Kim, 2019). However, the media and scholars noted that firms have adopted greenwashing to communicate with their stakeholders (Torelli et al., 2020). Greenwashing was considered a better strategy for sustainability communication. Rather than improving its environmental and social performance, the firm considered this strategy a sustainable business achievement (Kim and Lyon, 2015). The public understood the reality of greenwashing as a misleading concept, and scholars expressed that greenwashing is a negative signal for stakeholders (Walker and Wan, 2012). Recently, washing was reviewed, and only a few studies reported a relationship between greenwashing and corporate finance performance (CFP), which emphasizes the need for more careful and thorough research on the impact of greenwashing (Lyon and Montgomery, 2015).

The four main stakeholders directly impacted by corporate greenwashing are government, corporate management, consumers, and investors. There is a growing trend of corporations engaging in greenwashing practices or misrepresenting themselves as engaging in green or sustainable practices (Andreoli et al., 2022). The ongoing existence of greenwashing may be attributed to a limited comprehension of stakeholders' perspectives and the significance they attach to their encounters with greenwashing. Earlier studies focused on consumers' perceptions from UAE, America, China, and India in different sectors such as health, tourism, fashion, and financial services (Sensharma et al., 2022).

Several studies discussed corporate greenwashing practices and their impacts on employees, strategies to avoid disseminating ESG information, and the causes of greenwashing and its effects on corporate reputations (Li et al., 2022). At present, businesses have a responsibility beyond meeting customers' needs. Sustainability became a significant success factor for a company to claim market advantage and beat its competitors in the industry (Dusik and Bond, 2022). Sustainable businesses are future-oriented regarding environmental, social, and economic concerns and related issues.

Consequently, tremendous pressure would be on green businesses as they must allocate or raise capital to support green and social responsibilities activities and initiatives. Using ESG metrics and substantiating ESG commitments increases capital-raising potential as investors actively screen investment prospects that prioritize ESG factors (Eng et al., 2022). In 2021, 42% of global organizations increased their ESG focus, conveying academic and real-world evidence showing the positive relationship between the corporate ESG score and financial performance. In addition to getting access to capital, there are other vital reasons for ESG reporting, such as enhancing corporate-public relations, increasing accountability, and building trust among the stakeholders (Ramaswamy, 2001). However, the information regarding the relationship between greenwashing and corporate financial performance (CFP) and their underlying mechanism still needs to be improved, and some studies expressed contradictory conclusions. The present investigation was proposed to explore the investor perceptions of greenwashing practices, identify driving factors, and offer effective prevention methods.

2. Literature Review

2.1. Green Washing

Greenwashing is disseminating misleading or deceptive claims that may be ambiguous or incorrect, omitting crucial information, or a combination of these factors (Carlson, 2013). Globally, the concerns surrounding greenwashing have grown because of the need for internationally recognized standards about the taxonomy of ESG-related practices. Retail investors have the right to be confident in their sustainable investments. Corporations may devote time and cash to claim to project an environmentally friendly image through marketing and advertising tactics to earn consumers' trust (Ottman, 2017). However, the corporation did not implement business practices to reduce the negative impact on the environment, society, or the economy (Seele and Schultz, 2022).

When it comes to specific products, the claims made are often overly general, or the third-party certification needs to account for the entire product lifecycle. This is because, in many cases, companies have a vested interest in concealing their subpar environmental performance from customers (Gergely et al., 2014). The main reasons for corporations to participate in greenwashing are the pressure to meet the stakeholders' expectations, being less ethical and more financially motivated, creating environmental targets, and advertising that the company is green before meeting those targets (Magali and Vanessa, 2011).

Since ESG disclosure has recently influenced consumer behavior and investors' investment decisions, some companies and management are incentivized to provide the company with the wrong ESG activities. Shrewd management has discovered that lying about their ESG activities makes it easier to capitalize on the sustainability trend and consumer and investor behavior when interacting with firms that report higher sustainability scores. This action is referred to as greenwashing (Sanseverino et al., 2023).

Companies today achieve greenwashing in several ways. Using images is one such technique, as companies use environmental imagery to make consumers believe that the company is environmentally conscious. These images depict animals, leaves, and even the use of green packaging (Netto et al., 2020). The imagery may lead the consumer to believe the company is concerned about sustainability. Another greenwashing technique businesses may employ is misleading labels like "100% organic." However, there are no ways to determine whether the product is truly 100% organic, and the company needs to provide more information to back up its claims. The company could have self-created such labels to capitalize on the green movement (Nancy, 2010).

2.2. Greenwashing Drivers

The primary driver of greenwashing is the disconnection between integrity and capitalism. With adequate laws to regulate corporate greenwashing, corporations engage in greenwashing practices with little oversight (Delmas and Burbano, 2011). According to Devinney (2009), a corporation's claim of being environmentally committed aims to satisfy the consumers' demand in the market rather than genuinely commit to the environment. Chen (2010) reached the same conclusion when he found that companies were pressured by consumer demands and marketing trends, which forced them to enter the market even when they were not ready. Within this context, Boccia and Sarno (2013) discovered that corporations actively manipulate unsuspecting consumers through deceptive advertising practices. Marketing manipulation arises from strategically using marketing tactics to shape consumer behavior in favor of the corporate entity ultimately. Greenwashing drivers could be at the macro, corporate, and individual levels (Jhamb and Fiegl, 2022).

Looking at the macro level, Delmas and Burbano (2011) found that the regulatory system is one of the leading facilitators of greenwashing practices. The study focused on the European investment funds where the European Commission represents the regulatory environment. The study found that the need for more clarity about what stakeholders understand as sustainable and what is not and the lack of auditing by independent bodies contributes to corporate greenwashing. Other studies agreed with what was found by Delmas and Burbano (2011). The increased number of new regulations, lack of clarity, limited discipline, and lack of external audit are all associated with regulating the business environment, contributing to corporate greenwashing. The individual level drivers include several confusion aspects due to the individual financial literacy, lack of knowledge about the impact of sustainable investments, and optimistic bias (Magali and Vanessa, 2011). The confusing regulatory environment, uncertainty, and limited information significantly impact individual investment decisions. Klapper and Lusardi (2019) studied financial literacy and found that one in three adults is financially literate and needs to gain knowledge of the main concepts in financial decision-making. In addition, individual investors need more time to consider sustainable investments Delmas and Burbano (2011).

2.3. Greenwashing Regulations

Greenwashing regulation focuses on government regulations, green certification, and ESG ratings. Many companies are trying to pressure the government to enforce more rules to control competitors' greenwashing behavior (Kirchhoff, 2000). Even though procedures such as green labels and ESG rankings can prevent such behavior, environmental regulation is still needed to fight to greenwash (Smith and Font, 2014). Worldwide, governments have framed laws and policies to manage the corporate greenwashing issue better and prohibit any false or misleading representations. The United States FTC published the Environmental Marketing Guidelines in 1988. The European Union disseminated the EU Unfair Business Practices Directive in 1988. China's State Environmental Protection Administration issued the Measures for Disclosure of Environmental Information in 2007 (Bünger, 2011). China's Guidelines for Environmental Information Disclosure of Listed Companies were published in 2010, and China's Environmental Protection Law in 2015.

The United Kingdom CMA published its Green Claims Code and accompanying guidance in 2021. Canadian Federal Competition Act in 1985 and the Consumer Packaging and Labelling Act were amended in 2019. Some scholars have gathered empirical evidence by examining information disclosure and analyzing the correlation between the environmental performance of public and private firms concerning greenwashing (Buchetti and Arduino, 2022; Kasapi, 2022; Seele and Schultz, 2022). In response to heightened pressure to disclose environmental impacts, certain firms adopt a selective approach by disclosing relatively less harmful impacts.

2.4. Stakeholders' Perception

The increasing quantity of green claims made by corporations presents a challenge for stakeholders in discerning between genuinely positive business performance and companies that merely present an outward appearance of embracing sustainable development principles (Laszlo, 2008). Companies accomplish a range of objectives by employing distinct communication strategies linked to diverse organizational and decision-making processes. Given its significant role in magnifying the impact of greenwashing levels on stakeholders' responses, industry environmental sensitivity should be thoroughly considered in all communication aspects (Nyilasy et al., 2014). In this context, Torelli et al. (2020) assessed the distinct effects of deceptive communications regarding environmental matters on stakeholders' perceptions of corporate sustainability and greenwashing. The study revealed that varying degrees of greenwashing have an impact on stakeholders' perceptions of corporate environmental responsibility, as well as their responses to environmental scandals. Organizations must pay attention to the stakeholder's approach as history reveals that the firms who understand the priority concerns of stakeholders are performing well compared to other firms who do not consider stakeholders' interests (Huang et al., 2022). Approaching stakeholders' expectations regarding the business's sustainable strategies and social and environmental initiatives might lead to greenwashing.

2.5. Consumers

Based on the psychological contract theory, Sun and Shi (2022) studied the consumer perception of companies engaging in greenwashing. The study collected data by distributing surveys among 220 consumers and found that the consumers' perception of greenwashing has a significant negative effect on consumers' green purchasing intentions. As the perception of greenwashing increases, the intention to engage in green purchasing decreases. Consumers' diminished inclination to purchase green products is frequently attributed to their belief that the company has violated their psychological agreement following the detection of greenwashing practices. As the green economy continues to expand and consumer awareness of sustainable consumption grows, companies are increasingly recognizing the importance of green marketing in enhancing brand performance (Fillippi, 2022). Nevertheless, it is undeniable that numerous companies exploit the information asymmetry and conceal the unsustainable aspects of their business operations through deceptive green marketing campaigns to attract a larger pool of potential consumers.

In their research, Bulut et al. (2021) introduced the concept of greenwashing perception as a moderating factor in the connection between environmental concern and the purchasing behavior of post-millennials in Turkey. By collecting 174 survey responses, the researcher discovered that the environmental concern characteristic of post-millennials catalyzes their engagement in green purchasing behavior. When there is a strong emphasis on green products, the awareness regarding whether a product is genuinely green or falsely claiming to be green becomes heightened. In the presence of greenwashing perception, the impact of environmental concern on the green behavior of post-millennials diminishes. The moderating influence of greenwashing on the relationship between environmental concern and green purchasing behavior is evident, as greenwashing perception attenuates the effects of environmental concern on green behavior (Alyahia et al., 2024).

2.6. Management

The demand for enhanced corporate governance has prompted numerous listed companies to overhaul their boards and enhance their effectiveness. This is achieved by implementing policies that promote board independence, gender diversity, and various other factors. The increasing emphasis on corporate sustainability has resulted in a growing gap between environmental practices and communications, leading to "greenwashing" in the corporate world (Bowen and Aragon-Correa, 2014).

Jhamb and Fiegl (2022) suggested that cooperation between corporate management and government is necessary for achieving sustainable development goals (SDGs), and greenwashing will remain. Companies are trying to create sustainable competitive advantages by building climate action leadership, protecting biodiversity, and shepherding sustainability to stay ahead of competitors. In general, this may encompass activities such as feigning to be an environmentally conscious company to enhance public perception or utilizing inexpensive and inferior raw materials to reduce expenses and maximize profits.

Some of these actionable methods are very radical, potentially negatively influencing climate change. Therefore, governments and organizations must stop harmful environmental issues and push for a better climate and healthier earth (Esty and Winston, 2009).

2.7. Investors

Greenwashing is investors' highest concern, and integration into investment strategies has become a priority. Grprioritying is the top concern for 44% of ESG investors, according to a study done by Quilter. The study found that greenwashing is a global challenge for 750 industry professionals in asset management when making sustainable investment decisions (Yang et al., 2020). Recently, there has been a significant increase in sustainable products and services due to the tremendous pressure on firms from investors who consider the firm's ESG performance in their investment decisions. Therefore, some firms need to be more fully transparent and mislead the public about their sustainable strategy to attract investors for raising capital (Ramirez et al., 2023).

The main challenge of sustainable investing is the need for more transparency and accuracy of disseminated ESG data by corporates. Thus, Regulators designed the European Union Taxonomy for Sustainable Activities (EUT) to deter greenwashing (Bradford, 2022). It is a green classification system that defines *qualified investments* as sustainable and discourages the greenwashing of sustainable financial products. However, this tool did not prevent greenwashing since corporations can still mislead the public and follow a tick-the-box approach to presenting their projects as sustainable (Crossey, 2022). This issue challenges investors to rank and compare investment opportunities reliably. Investors' limitations while using ESG performance are mainly related to inconsistent metrics and definitions, lack of standardized reporting, variable rating systems, and complex communications. Consequently, this study aims to dig deeper and explore the investors' perception of corporate greenwashing and evaluate the practices adopted by investors to deter the greenwashing risk.

2.8. Link between Green Businesses and Investors

Many researchers have studied the impact of corporate social responsibility on corporate financial performance in different contexts, and these studies have had differing views on the relationship between these two variables. Some researchers, such as Platonova et al. (2018) and Al-Malkawi and Javaid (2018), have conducted the research and concluded that a significant positive relationship exists between the implementation and disclosure of corporate social responsibility and an organization's financial performance.

If the customer base is large, the company will enjoy economies of scale, more sales, reduced costs per unit of production, and improved revenue (Jain and Singh, 2002). Corporate Social responsibility helps attract customers since it improves the organization's image and reputation and acts as a positive public relation. This ability to attract new customers will improve the size of the organization's customer base (Ahn and Kwon, 2020). ESG activities help retain customers by cultivating a positive image for the organization and adhering to the customers' norms and values. If the organizations go against the value systems of the customers, then the customers are likely to boycott the organization and look for substitutes (Saeidi et al., 2015). The case of Nike and Apple losing customers due to the involvement of child labor in their sweatshops in East Asia is an example of how organizations can lose customers if they do not adhere to the values and norms of the customers.

3. Methodology

A sample of 100 US investors was surveyed using basic random sampling for the quantitative phase. The research explored broad impressions of business greenwashing among U.S. investors using this strategy. SurveyMonkey connected FINRA-Registered Investors by gender, geography, income, and occupation, providing customised selection. Non-probability sampling was used to choose participants for in-depth interviews. Purposeful sampling targeted capital markets, financial laws, greenwashing, and sustainable finance experts. Participants have the expertise to debate regulatory frameworks and greenwashing risk mitigation techniques according to eligibility criteria. Invited fifteen skilled financial experts via LinkedIn was the main source of participation. Six experts participated in Zoom video-based 40–60-minute semi-structured interviews. Non-probability sampling was used to identify in-depth interviewees for the qualitative investigation. Instead of statistical representation across populations, non-probability sampling strategies target particular groups or phenomena (Rossi et al., 2013). This research used purposive sampling to interview a well-chosen and competent group of capital market professionals on financial market rules, greenwashing, and sustainable finance. These experts sought to understand corporate greenwashing. To choose suitable candidates, inclusion criteria were set. FINRA registration verified participants' knowledge of applicable regulations and laws. Participants were also evaluated on their regulatory expertise and greenwashing mitigation techniques. Participants must have ten years of capital market asset management or advising experience to debate regulatory changes and sustainable financing. LinkedIn was the leading interviewee-finding site.

Targeted searches included "corporate greenwashing," "sustainable investment," and "ESG expert." Qualifications were carefully evaluated, including professional experience and relationships with respectable institutions or consulting businesses. Emails were sent to 15 financial experts to measure their interest in the project. After accepting the invites, six experts agreed to be interviewed. Zoom videoconferencing was used for 40–60-minute semi-structured interviews. To thoroughly examine participants' thoughts, opinions, and experiences, interviews were done in English, the common language, using a balanced combination of open-ended and closed-ended questions.

This study used quantitative data analysis to examine and interpret survey and interview data to answer research questions (Wheeldon, 2010). Qualitative data analysis focused on semi-structured interviews. Maginn et al. (2008) thematic analysis was used to categorize subjects and find themes in qualitative data. The survey and interview methods were ethical to safeguard participant rights and privacy. The survey included a permission form to notify respondents of the study goals and protect their privacy. Instead of names, respondents were given a code number to protect anonymity throughout the analysis. In the interviews, participants were given an Informed Consent Form that explained their rights, including the choice to refuse to answer questions and withdraw. The study obtained written agreement from participants to shield the researcher against insufficiently informed consent claims. The study demonstrates a commitment to data quality by implementing rigorous procedures. Various measures were employed to enhance the trustworthiness of the findings and mitigate potential biases. One crucial step was utilizing member checks, involving sharing preliminary findings and interpretations with participants to obtain their feedback and validation. By actively involving participants in the research process, their perspectives and insights were carefully considered, bolstering the credibility of the study's findings.

4. Results

4.1. Survey

Out of 100 participants, the females were 55%, while the male participants were 45% with age over 18 years. Among them, 40.5% of participants were in the age range from 30-44, while 24.7% of the participants were above 60 and 17.8% were in the age range of 18 to 29, and 16.8% fell into the 45 to 60 age range. Based on experience, 43.5% of participants have less than five years of experience as investors, 22% have 11 to 20 years of experience, and the remaining 15.8% have more than 20 years of experience as investors.

Participants were given a choice to make multiple selections for the financial market. The majority showed interest in investing in the American financial markets, namely *the New York Stock Exchange* and *NASDAQ*, with 70.6%. The remaining 29.4% was distributed among *the Tokyo Stock Exchange, Shanghai Stock Exchange, Hong Kong Stock Exchange*, and *London Stock Exchange*. For the annual investment earning range, 36% of participants earn less than $50,000, 31% receive from $50,000 to $100,000, and 26% earn more than $100,000. There were 7 participants representing 7% of the total responses who preferred not to share information about their annual investment earnings). The survey results revealed that 52% of the respondents knew corporate greenwashing practices, and the remaining 48% were unfamiliar with corporate greenwashing terminology (Figure 1A). After this question, the researcher briefly introduced corporate greenwashing for all respondents. This introduction ensured that the participants who answered "No" were straightforward about the topic. However, 48% of the respondents expressed interest in green businesses (Figure 1B), indicating that many investors prioritize environmentally sustainable investments. Additionally, more than half of the respondents (53.5%) indicated their willingness to change their investment decisions if they discovered greenwashing practices, highlighting the importance of trust and transparency in investment choices. Regarding the main reasons behind corporate greenwashing, 34% of the respondents identified the lack of standard definitions of sustainable green investments as the primary cause.

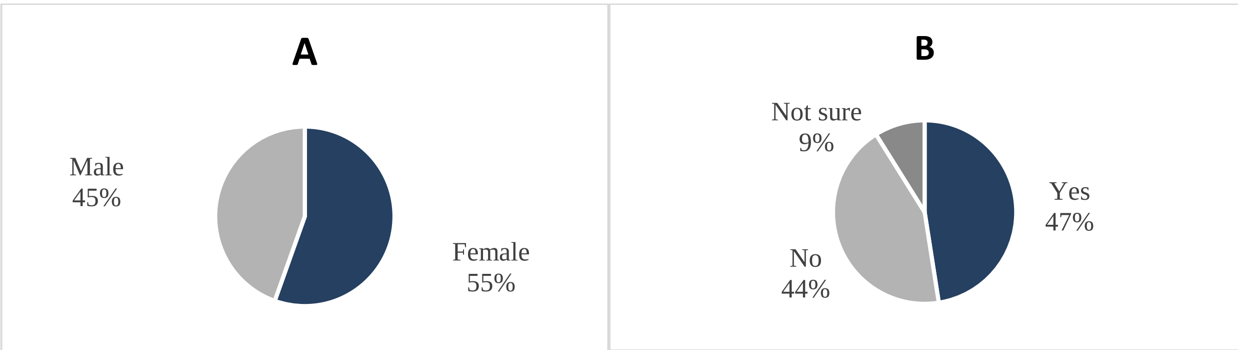

Figure 1 (A & B). Familiarity with greenwashing and interest in investment (A) Fifty-two percent of respondents were familiar with greenwashing and 48% were unfamiliar (B). Forty-eight percent of respondents were interested in investment and 53% were not interested.

Thirty-four percent of the respondents believe that the lack of standard definitions of sustainable green investments is the leading cause of corporate greenwashing. Lack of rules and regulations comes as a second cause, with 23% of responses. 18% voted that the increased demand for green investments put corporations seeking to raise their capital under tremendous pressure (Figure 2).

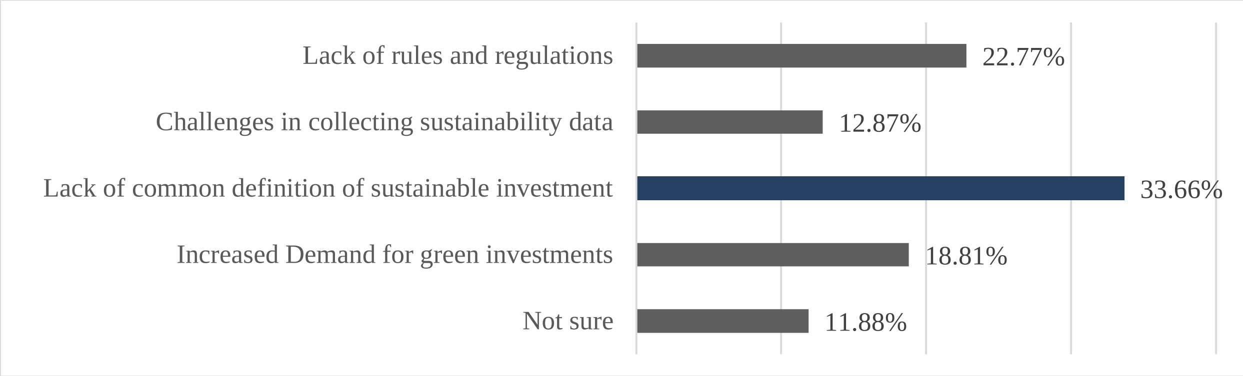

Figure 2. The main driver causing Corporate Greenwashing

Furthermore, the survey findings strongly support specific strategies to reduce corporate greenwashing. Most respondents (80%) believed that improving regulatory enforcement would be a practical approach. Additionally, increasing the quality and transparency of fund reporting (79%) and enhancing transparency regarding how fund managers invest (78%) were identified as essential measures to address corporate greenwashing practices (Figure 3).

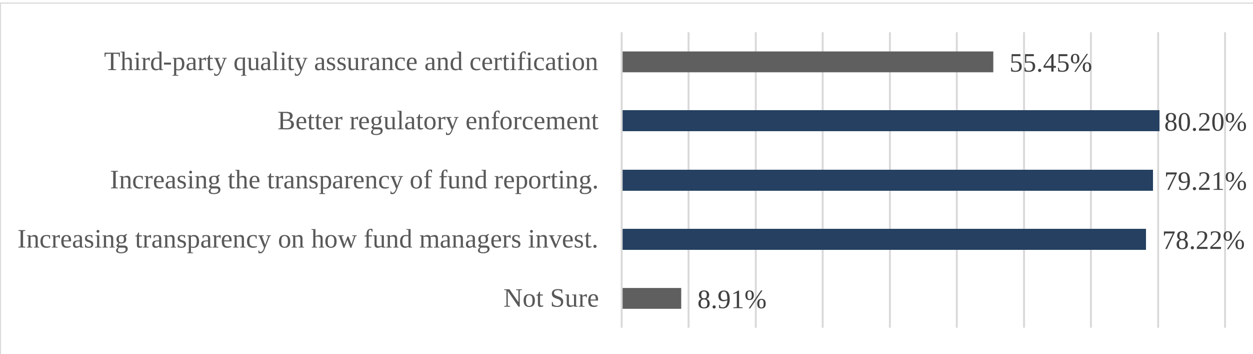

Figure 3. The best way to deter corporate greenwashing.

4.2. Interviews

The main goal of the interview method was to know the responses about greenwashing drivers in investors' opinions. The semi-structured interviews were conducted via Zoom call after sending an invitation to the participants via email and receiving the signed letter of informed consent. Thematic analysis was the most appropriate method to make sense of the data collected from interviews, as it allows the researcher to examine qualitative data by categorizing topics and identifying patterns (Saldana, 2018). Data analysis started after the researcher transcribed the audio-recorded interviews and then identified the codes from repeated key points that answered the main research questions during the interviews. For instance, most participants mentioned that corporations claim their products are green because of consumers' strong demand for healthy and environmentally friendly products.

This finding can be coded as Consumer Pressure under the drivers of corporate greenwashing. Next, themes were established based on association with the research objectives by combining codes into broader clusters. For example, all corporate consumers, management, and investors codes were combined under the theme of Corporate Stakeholders. The analysis process involved a data reduction step concentrating only on the relevant findings to the research objectives and questions.

After coding all interview transcripts, the researcher utilized an Excel sheet to tally the frequency of each coded theme manually. This process involved counting how many times a particular theme was mentioned to assess the level of agreement among the interviewees regarding specific ideas and concepts. For instance, the coded theme "stakeholders' pressure" was mentioned by all six participants, resulting in a score of 100%. This approach aimed to gain a quantitative understanding of the extent to which participants concurred on specific themes. By quantifying the occurrence of each theme, the researcher aimed to provide a more objective measure of the consensus among the interviews. This method facilitated the identification of prominent and recurrent themes within the data, enabling a comprehensive analysis of the research findings. This approach is called "coding consensus analysis" or "intercoder agreement analysis." It involves quantifying the level of agreement among coders or interviews on specific themes or codes.

This approach is widely recognized in academic research and has been utilized in various disciplines. It helps ensure the reliability and validity of the coding process by assessing the level of agreement among different coders or individuals involved in the study (Richards and Hemphill, 2018). By quantifying the frequency or occurrence of specific themes or codes, researchers can evaluate the consistency of the coding process and determine the degree of consensus among participants (Cascio et al., 2019). The results related to the greenwashing drivers in investors' opinions revealed that drivers of greenwashing can be clustered into two main groups: external-level and internal-level drivers. Both levels were further clustered in themes, as summarized in (Figure 4).

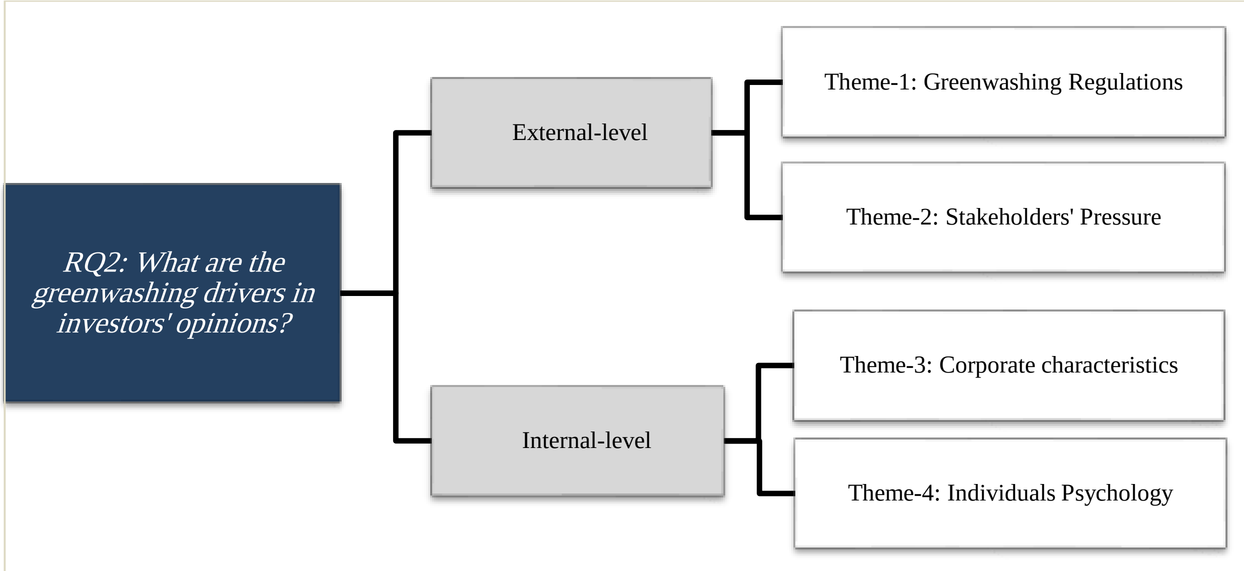

Figure 4. Themes of the Greenwashing Drivers

4.2.1. Theme-1: Greenwashing Regulations

Based on greenwashing regulations all participants expressed a negative response towards corporate greenwashing practices. The participants believe that one of the main reasons is that the regulation of greenwashing is very inadequate, and the implementation methodology of such regulation needs to be clarified. From 1990 to 2023, the FTC reported only 42 environmental cases and Regulations exist but enforcement has been limited. At the level of the state, for example, California, have their own environmental advertising claims regulations, but states still need to put out regulations stricter than that of the FTC. Greenwashing regulations differ between countries, particularly in developing nations. Specifically, in some developing countries, there is a lack of regulations governing environmental claims made by businesses. This absence of regulation can create confusion for business management and complicate their environmental practices. It suggests that without clear guidelines or standards in place, businesses may face challenges in accurately communicating

4.2.2. Theme-2: Stakeholders' Pressure

Another theme emerged from participant responses for Interview Questions 1 and 2, 100% of the participants. The impact of primary stakeholders' pressure (such as consumer demand and investors' demand) and secondary stakeholders' pressure (such as competitors) can make a corporate change from regular to green business.

> **P1:** "*Brown firms face pressure from consumers and investors to be environmentally friendly and thus face incentives to communicate positively about their environmental performance.*"

The finding here is that brown firms, which typically operate in industries associated with high environmental impact, experience pressure from consumers and investors to adopt environmentally friendly practices. As a result, these firms have incentives to communicate positively about their environmental performance. It suggests that consumer and investor demand for sustainability can influence the behavior of brown firms and drive them to present themselves in a more environmentally friendly light.

> **P2:** *"There was a recent study by Jacob Vos about Greenwashing in American corporates, and he concluded that the greater the pressure from the stakeholders for sustainable business, the more likely a brown firm that is not ready financially and operationally might greenwash."*

In the context of American corporations, when there is significant pressure from stakeholders for sustainable business practices, brown firms that are financially and operationally unprepared may be more likely to engage in greenwashing. This suggests that when faced with high expectations for sustainability, financially and operationally struggling companies may resort to deceptive or misleading practices to create an appearance of environmental responsibility.

> **P3:** *"Just as rampant, unchecked greenwashing could erode the consumer market for green practices and services in the future, and it could also erode the capital market for socially responsible investing."*

The finding here is that if greenwashing remains widespread and unaddressed, it has the potential to negatively impact both the consumer market for green practices and services and the capital market for socially responsible investing. This implies that if consumers and investors lose trust in the authenticity of sustainability claims made by companies, it could undermine the growth and credibility of green markets and socially responsible investment.

> **P4:** *"The pressure to go green to seduce consumers led companies to make claims that may be deceptive or misleading, if not outright false. It is tempting to use words such as "sustainable," "green," "eco-friendly," "good for the planet," "better for the environment" in advertising marketing campaigns without having to support these claims."*

The pressure to attract consumers by appearing environmentally friendly can lead companies to make deceptive or misleading claims, sometimes even falsifying their sustainability credentials. It suggests that the desire to appeal to consumers' growing environmental consciousness can create temptations to use terms associated with sustainability without genuinely supporting these claims. This finding highlights the potential ethical concerns and risks associated with greenwashing practices in marketing and advertising.

Moreover, the analysis revealed that market competitors pressure corporations' marketing and communication decisions. The sustainable activities of competitors are forcing organizations to change their marketing activities since firms tend to follow similar firms in their industry.

> **P6:** *"Very often, companies watch their competitors promoting their environmental behaviors and try to follow this behavior."*

This statement suggests that companies often observe their competitors' environmental practices and efforts and attempt to mimic or imitate them. The finding highlights the influence of competitive behavior in shaping companies' environmental actions. It indicates that companies may engage in environmental initiatives because of their intrinsic motivations and desire to keep up with or gain a competitive edge in the market.

> **P4:** *"Some brown firms decide to positively communicate about their business sustainable performance including environmental performance to increased access to green consumers and investors."*

This statement indicates that certain companies operating in traditionally polluting industries (often called "brown" firms) choose to communicate their sustainable performance, including their environmental practices, to target green consumers and investors. The finding suggests that these firms recognize the potential benefits of appealing to environmentally conscious stakeholders and may strategically engage in positive communication to access this market segment. It implies that there can be economic incentives for brown firms to adopt and promote sustainable practices, potentially leading to a shift towards more environmentally responsible behaviors in these industries.

4.2.3. Theme-3: Corporate characteristics

Many characteristics of the corporation, such as industry, size, and stage of the business lifecycle, influence the firm strategies and actions linked to greenwashing. Consumer products firms are expected to face higher consumer pressure to be green than those in non-consumer industries.

Moreover, companies operating in the industrial sector, such as oil and gas, face more significant pressure from regulators where carbon emissions, as mentioned in the SDGs, are what most countries try to follow.

> **P1:** *"From my experience and what we read in the financial news, oil and utility firms usually are the top in the Green washers list."*

Large publicly traded companies tend to be under the spotlight by the sustainable investment community; therefore, they face greater investor pressure than Small and medium-sized enterprises (SMEs). In addition, public companies usually disseminate their annual reports and communicate with the public.

> **P5:** *"Because they attract more public attention, large corporations are more possibly to be subjected to activist and media scrutiny."*

Moreover, the business life cycle stage influences greenwashing behavior as startup firms have lower reputation risk than mature firms. Accordingly, the participants believe that mature firms with well-established reputations avoid greenwashing, which will undermine their brand image. Many growing firms were caught greenwashing, negatively affecting their reputation and sales. Accordingly, risk management considers that seriously when making decisions.

> **P2:** *"over claiming or misleading wording can lead to criticisms which will damage the company's reputation and lead to losing customers and investors."*

When companies engage in overclaiming or use misleading wording regarding their environmental performance or sustainability practices, it can result in criticisms that have negative consequences. Specifically, these criticisms can damage the company's reputation, losing customers and investors. It suggests that when companies make exaggerated or false claims about their environmental efforts, stakeholders may react negatively and question the company's credibility and trustworthiness. As a result, customers may choose to discontinue their patronage, and investors may withdraw their financial support. This finding emphasizes greenwashing practices' potential risks and repercussions, highlighting the importance of accurate and transparent communication in maintaining a positive reputation and stakeholder relationships.

4.2.4. Theme-4: Individual psychology

The analysis showed that 67% of the participants think that individuals, such as employees and managers, play an essential role in explaining firm behavior.

Individuals have limited data and information to assess corporate greenwashing practices. Decision makers have the potential to overestimate the probability of favorable outcomes resulting from greenwashing practices, such as achieving a larger share of the green market and attracting investment capital. On the other hand, the adverse outcomes might be underestimated, like being punished by the FTC, facing consumer lawsuits, or destroying the business image. Consequently, the probability that firm leaders will choose to communicate positively about the firm's environmental performance is high, resulting in greenwashing.

> **P2:** "Some firms' management may decide to disseminate information about their green products without planning properly, resulting in unsuccessful implementation which leading to greenwashing to cover the failure."
>
> **P4:** "Corporate leader may focus on the short-term gains from greenwashing without adequately weighing the long-term potential negative effects on loss of reputation."

Best Practices to reduce greenwashing

The results related to *RQ3: What practices are suggested by investors to the market regulators to reduce greenwashing in the ESG field?* Found that the participants' suggestions fall under three themes: transparency, quality assurance, and market government regulations (Figure 5).

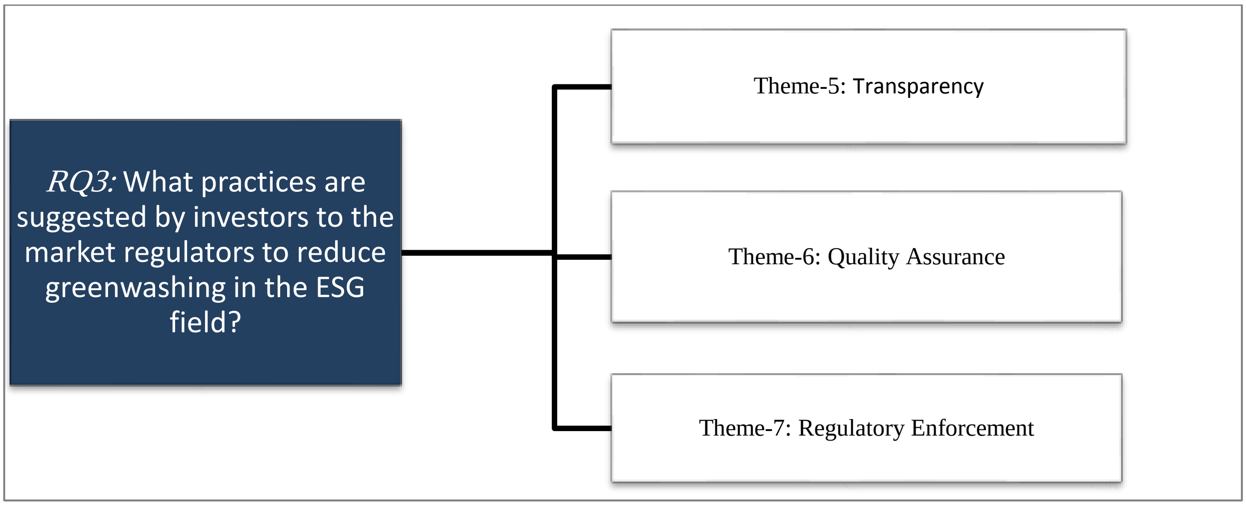

Figure 5. Themes of the investors' suggestions to deter greenwashing

4.2.5. Theme-5: Transparency

According to responses to Interview Questions 5 and 6, which focused on the best practices and recommendations to reduce greenwashing practices, based on the analysis, it was determined that all participants share the belief that addressing greenwashing requires enhanced transparency in fund managers' investment practices. This includes disclosing track records of holding companies, strategies, and information about the investment team. Additionally, participants emphasized the importance of improving the quality and transparency of fund reporting, specifically regarding ESG investments and their monitoring. Integration of corporate financial disclosure and sustainability reporting was also highlighted as a crucial step in combating greenwashing.

> **P6:** *"transparency is a good way for companies to avoid greenwashing, it is not the only solution, but Brands must also ensure that they are consistently communicating with transparency on all levels and topics."*

Transparency is considered a practical approach for companies to avoid greenwashing. However, it is not the sole solution. In addition to transparency, brands need to communicate consistently across all levels and topics. This suggests that while transparency plays a crucial role in addressing greenwashing concerns, it should be accompanied by consistent and comprehensive communication practices. It implies that companies should provide transparent information about their environmental practices and ensure that transparency extends to all aspects of their operations and messaging. Through upholding consistent transparency, companies can establish trust, showcase their dedication to sustainability, and minimize the risk of making misleading or deceptive claims.

4.2.6. Theme-6: Quality Assurance

The analysis showed that 83% of the participants stated that increasing quality assurance is crucial for reducing greenwashing. Assuring quality by harmonizing global standards and matrices, improving local ESG labels, and having a third-party certificate will reduce greenwashing practices.

> **P1:** *"If a company wants to avoid greenwashing, it should rely on data, embrace credible third-party certification, and resist stretching the truth about the eco-achievements they are making."*

The finding here is that companies should base their environmental claims on reliable and verifiable data to prevent greenwashing. By relying on accurate and transparent data, companies can ensure the credibility of their sustainability claims. Additionally, embracing credible third-party certifications can independently verify a company's environmental performance and help establish stakeholder trust.

Lastly, the statement emphasizes the importance of avoiding exaggerated or misleading claims about environmental achievements. Companies can maintain their integrity and reputation by resisting the temptation to stretch the truth.

> **P4:** *"some certificates such as IECQ are used as a tool to monitor and control the manufacturing supply chain, thus helping to eliminate the need for multiple re-assessments of suppliers and avoid the temptation of greenwashing."*

The finding from this statement is that certain certifications, such as IECQ, serve as tools to monitor and control the manufacturing supply chain. These certifications help streamline the assessment process for suppliers, reducing the need for repetitive evaluations and enabling better control over the supply chain. By implementing such certifications, companies can mitigate the risk of greenwashing by ensuring consistent adherence to environmental standards throughout their supply chain. This finding suggests that certifications can play a crucial role in promoting transparency and avoiding deceptive sustainability practices.

4.2.7. Theme-7: Regulatory Enforcement

All participants' responses showed that better regulatory enforcement is the best way to deter greenwashing practices. Moreover, establishing minimum regulatory standards for investment products and services to meet sustainability criteria, minimizing frequent regulatory modifications, transitioning from local to global standards, and ensuring alignment and harmony among policymakers are essential in addressing and mitigating greenwashing practices. The qualitative component of the study involved interviews with six selected participants, providing in-depth insights into their experiences and perceptions of greenwashing. The analysis of these interviews led to identifying themes that helped define the core aspects of investors' experiences with greenwashing. The identified themes were categorized into external-level drivers, including greenwashing regulations and stakeholders, and internal-level drivers, encompassing corporate characteristics and individual psychology. According to the participants, transparency, quality assurance, and regulation enforcement emerged as the priority areas for policymakers to address greenwashing effectively. These findings highlight the significance of establishing transparent practices, ensuring quality standards, and enforcing regulations to build investor trust and combat deceptive corporate practices.

5. Discussion

The global community is aware of the effect of human activities on the environment, and consumers are interested in products and services that are environmentally friendly. Hence, many companies introduced and disseminated green marketing strategies in their advertisements to promote eco-friendly products. However, some companies mislead consumers by their engagement in greenwashing to get environmental benefits from their products. Currently, market regulations fail to protect investors from corporate greenwashing due to limited research exploring the investors' perception of this kind of non-financial risk.

Our survey revealed that 48% of the respondents expressed interest in investing in Green Businesses, indicating a substantial portion of investors prioritize environmentally sustainable investments. The finding that 48% of the survey respondents were interested in green investments is a promising result suggesting a significant market for environmentally responsible investments. However, the fact that 53% of respondents were not interested or unsure about their decision regarding this question indicates that some investors may need help with adoption. In addition, it supports Bradford's findings (Bradford, 2022), stating that the lack of transparency and accuracy of disseminated ESG reports by corporations is the main challenge of sustainable investments. In contrast, the current study results oppose what was concluded from the literature review, which recently confirmed a significant increase in sustainable products and services due to the tremendous pressure on firms from investors.

Societies appreciate environmental practices that pressure firms to conform to such demands from stakeholders (Kim et al., 2017). The firm realizes its reputation or legitimacy is endangered and misleads its communications about its environmental actions to get a favorable reputation (Chen et al., 2014). The firm pretends to have positive green communication and works under environment-friendly approaches, but the actual firm communication could differ (De Jong et al. 2018). Hence, the firm misled society about its environmental practices to get maximum benefit from its product (Gatti et al., 2021).

Regarding the main reasons behind corporate greenwashing, 34% of the respondents identified the lack of standard definitions of sustainable green investments as the primary cause. When ambiguous sustainability claims are floated, the main confusion is created about sustainable and environment-friendly products. Without independent verification, the claims of eco-friendliness have no meaning.

Companies exploit this ambiguity, and customers lack the expertise to evaluate this claim. It becomes very difficult for a commoner to differentiate sustainability from greenwashing due to a lack of standard definitions. Many stakeholders are aware of environmental considerations due to ecological problems (Chen and Chang, 2021). Corporate customers, stakeholders like investors, and consumers pressure companies like energy sectors to disclose accurate information (Guo et al., 2014) and produce sustainable products. The awareness of societies is growing now (Antunes et al., 2015).

Reports indicated that 66% of consumers globally are willing to pay more for environmentally friendly products (Elkington, 1994). Several dictionaries have defined greenwashing as promoting environment-friendly programs to express companies' shortcomings in working environment-friendly manners. There is no rigid definition of greenwashing due to its numerous approaches. In 1999, the term was added to the Concise Oxford English Dictionary, which defined it as: "Disinformation disseminated by an organization to present an environmentally responsible public image; a public image of environmental responsibility promulgated by or for an organization, etc., but perceived as being unfounded or intentionally misleading." According to Lyon and Montgomery (Lyon and Montgomery, 2015), greenwashing has no rigid definition due to its multifaceted nature. Above, we describe the different main approaches we found in defining the phenomenon of greenwashing.

In the present study, most respondents (80%) believe that improving regulatory enforcement would be a practical approach to greenwashing. Similar results have been reported by Li et al. (2017), demonstrating tapping firms' behavior and monitoring; the firm's government plays an essential regulatory role in exerting pressure that will impact enterpriser activities. Economic and political institutions influence firms' behaviors. Firms could improve environmental performance if more significant regulatory pressures were exerted on innovation, production, and green management (Berrone et al., 2013). According to the participants, transparency, quality assurance, and regulation enforcement emerged as the priority areas for policymakers to address greenwashing effectively. The regulatory system is one of the leading facilitators of greenwashing practices. The increased number of new regulations, lack of clarity, limited discipline, and lack of external audit are all associated with regulating the business environment, contributing to corporate greenwashing (Giudice and Rigamonti, 2020). Sustainable finance regulations have grown 96% due to the significant increase in the creation of new sustainable products in the market from 2000 to 2021. Currently, the European Union has the highest number of policies and interventions in the financial market.

6. Conclusion

Investors are increasingly becoming turned off by "greenwashing" and are prepared to adjust their investment strategy regarding environmental regulations. However, to reduce the danger of greenwashing, companies need to be more open, and regulators need to use quality assurance policies and land regulatory enforcement. Investors' relative aversion to "greenwashing" and their readiness to adjust investing strategies in line with environmental policy changes are rising. All investors, businesses, regulators, and anyone with a stake in sustainable investment should know these significant findings. Companies should establish comprehensive quality assurance systems and be transparent about social and environmental impacts. Regulators should establish transparent policies and consequences for greenwashing. Public educational strategies may help to inform people about the causes of greenwashing. Investors need to educate themselves before investing. Prospective research may strive to investigate the following question: How can corporate governance strategies avoid greenwashing? How is shareholder value impacted by greenwashing, and how does investor attitude change? How the quality assurance system can be improved would be paramount to allow for a better understanding of the aversion factor of investors to greenwashing and reducing it. It is concluded that this survey will provide better insight into how investors perceive greenwashing and how greenwashing can be prevented.

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Striking a Balance by Exploring the Impact of Duty Time on Life Harmony in Saudi Arabia's Manufacturing Sector

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Abstract

This study aimed to analyze the impact of duty time on the employees' life harmony in the Saudi Manufacturing Sector. Having a proper working time policy is vital to attract and retain talented individuals. However, the unfavorable increase in duty time creates a significant challenge to individual and family in this sector. In particular, the researcher observed the impact of duty time on employees' family needs and how it relates to the employee's satisfaction. In this context, quantitative and qualitative analyses approaches were used to address the research objectives. Accordingly, 578 employees from this sector had participated in the survey questionnaires. Moreover, 30 employees working in panel boards manufacturing factory were purposely selected to participate in face-to-face interviews for the qualitative part. Findings showed that majority of the participants believed that duty time and working hours policy are significantly impact their ability to satisfy their family needs. The increase in duty time is responsible for nearly 13.12 percent of the negative impact on employees' life harmony. Callously, increasing one-hour in daily working hours causes a negative impact on employee life harmony could reach to three hours daily which is roughly 37 percent from the employee's income. Moreover, the Company revenue might be impacted negatively by 11.152 percent. However, findings highlight the importance of balancing employee well-being with productivity and financial considerations within organizations.

Keywords: Duty time, working hour's policy, Life harmony, Work-life balance

1. Introduction

Manufacturing organizations encounter difficulty in preparing proper working time policy. Various factors need to be considered in the duty time setting strategy, like work-life balance, employee satisfaction, company operation requirement, and county regulation. Many manufacturing jobs involve physical and repetitive tasks, such as lifting heavy objects, operating machinery, or standing for long periods for assembly job. By understanding and addressing these factors, organizations can develop effective working time policy that can attract and retain talented individuals. Hence, manufacturing organizations require advance infrastructure and flexible workflow that helps firm's management in Saudi manufacturing sector to evaluate the duty time frequently and analyze its impact on employees' satisfaction and company operation.

1.1. Problem Statement

Organizations in the Saudi manufacturing sector are facing significant challenges to set the appropriate working hours that can satisfy employees but not impacting company operation. Physically demanding tasks in manufacturing operations typically follow strict schedules and production targets. That reduces employees' control over their work hours which causes challenges to balance personal and professional responsibilities. These challenges hamper the sector's ability to attract and retain talented individuals and affecting companies' affordability.

1.2. Research Objective

The main objective of this study is to analyze the impact of the duty time on employees' satisfaction and life harmony.

1.3. Research Questions

Based on the above problem statement, the following questions were raised:

1) Is there significant relationship between duty time and the employees' performance in Saudi manufacturing sector?
2) Dose the working time policy significantly impacts the employees' satisfaction in Saudi manufacturing sector?

2. Literature Review

2.1. Employees' Satisfaction

Hoppok & Spielgler (1938) had define the employees' satisfaction as the integrated set of psychological, physiological and environmental conditions that encourage employees to admit their gratifications and acceptance (Raziq and Maulabakhsh 2015).

Subsequently, employee's well-being, personal growth and organization's outcomes have significant impact on employees' satisfaction (Strauss and Parker 2014). Moreover, work life balance is significantly related to employees' job satisfaction (Mendis and Weerakkody 2017). Thus, employees' satisfaction considered as significant factors that noticeably impact individual performance.

2.2. Employees' performance

In the literature, employee performance is explained as the evaluation of employees job-related responsibilities and the degree to which they effectively fulfil them (Maina 2015). Accordingly, the prevailing corporations are focused on creating attainable and realistic objectives for appraising their employees (Strauss and Parker 2014).

2.3. Duty Time

The working hours can be defined as the period of time that a person spends for paid job (Siddiqui 2013). The impact of working hours on the employees' work-life balance and on employees' job satisfaction were analyzed by several researchers in the last decade. For instance, working hours has a significant impact on the employee's job satisfaction in the commercial banks sector in Sri Lanka (Adikaram and Jayatilake 2016). Similarly, working hours are negatively associated with the employee productivity (Ansari et al. 2015). Moreover, shifts timing and number of working hours are considered by organizations in Saudi Arabia that give more attention to work-life balance of their employees (Siddiqui 2013).

2.4. Life Harmony

Previous researchers had defined the life harmony and work-life balance as the appropriate separation of time and focus between work and family (Adikaram and Jayatilake 2016). For example, association between work-life balance and gender differences was noticed within the manufacturing sector in Mumbai, India (Kshirsagar 2015). Moreover, positive relationship between life harmony and employee productivity was noticed in Pakistani banking sector (Ansari et al. 2015). Parallelly in Nigeria, work-life balance practice is an important factor in increasing employees' performance in selected commercial banks in Lagos state (Obiageli, Uzochukwu, and Ngozi 2015). Similarly, work-life balance has a significant impact on employee job satisfaction in private sector commercial banks of Sri Lanka (Adikaram and Jayatilake 2016). Moreover, doctors' satisfaction in the Saudi Arabia southern area hospitals has negatively impacted by unstable doctors' life harmony which sometimes causing family conflicts (Al-shahrani 2015).

2.5. Conceptual Model

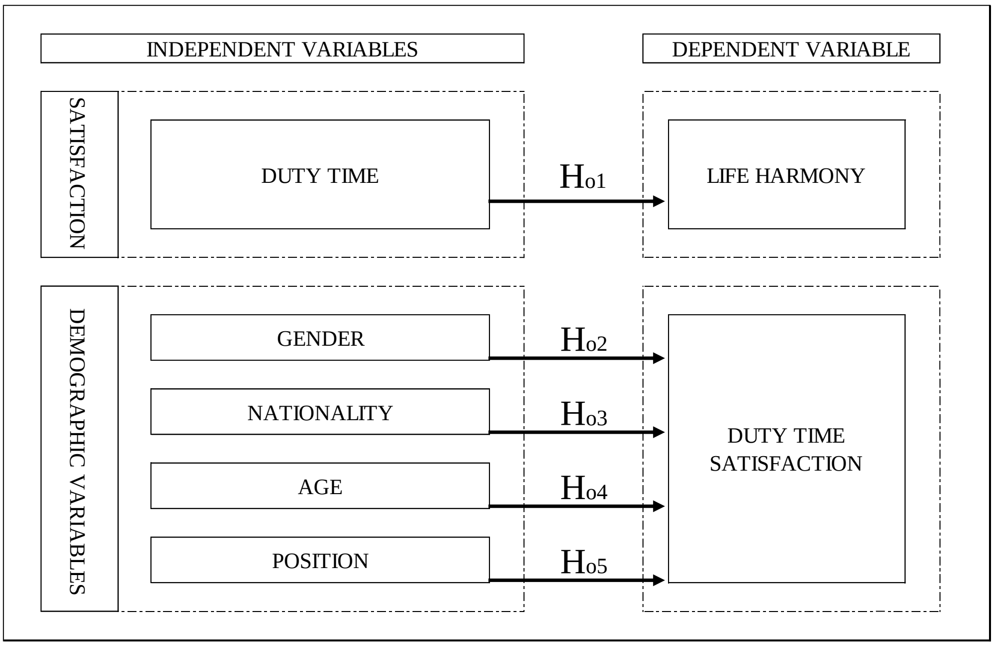

Figure 1: Conceptual diagram

2.5.1. Hypothesis Statement

- Hypothesis 1

  Null Hypothesis (H_{01}): Duty time is not significantly related to the employees' life harmony in Saudi Arabian manufacturing sector.

  Alternative Hypothesis (Ha_1): Duty time is significantly related to the employees' life harmony in Saudi Arabian manufacturing sector.

- Hypothesis 2

  Null Hypothesis (H_{02}): Employees' gender is not significantly moderating the duty time satisfaction in Saudi Arabian manufacturing sector.

  Alternative Hypothesis (Ha_2): Employees' gender is significantly moderating the duty time satisfaction in Saudi Arabian manufacturing sector.

- Hypothesis 3

  Null Hypothesis (H_{03}): There is no significant relationship between employees' nationality and duty time satisfaction in the Saudi manufacturing sector.

  Alternative Hypothesis (Ha_3): There is significant relationship between employees' nationality and duty time satisfaction in the Saudi manufacturing sector.

- Hypothesis 4

  Null Hypothesis (H_{04}): The association between employee's age and duty time satisfaction is not significant in Saudi Arabian manufacturing sector.

  Alternative Hypothesis (Ha_4): The association between employee's age and duty time satisfaction is significant in Saudi Arabian manufacturing sector.

- Hypothesis 5

  Null Hypothesis (H_{05}): Employees' position is not significantly moderating the duty time satisfaction in Saudi Arabian manufacturing sector.

  Alternative Hypothesis (Ha_5): Employees' position is not significantly moderating the duty time satisfaction in Saudi Arabian manufacturing sector.

3. Methodology

Both quantitative and qualitative research methods were used by the researcher who conducted independent observations and collected primary data randomly to test the hypotheses using a deductive research approach. Quantitative primary data was gathered through a survey questionnaire, while qualitative primary data was obtained through face-to-face interviews. The survey design was cross-sectional. The questionnaire survey collected data was analyzed statistically using a five-point Likert scale. The quantitative survey responses report was extracted from Surveymonky.com at the end of April 2019. While the face-to-face interviews were conducted at the end of May 2019.

3.1. Population and sample

Table 1: Saudi Arabian Manufacturing Sector Labour Force Summary

GOSI-Table (3-8)	**Nationality**		
Manufacturing	Saudi	Non-Saudi	Total
Male	210,562	851,315	1,061,877
Female	113,778	8,896	122,674
Total	324,340	860,211	1,184,551

Source: (GOSI 2023)

According to Saudi General Authority of Statistics (2023), there are 1,184,551 employees working in the manufacturing sector in Saudi Arabia as shown in Table (1). Moreover, this sector consists of diverse types of industries and multinational employees.

The industrial establishments in this sector covered different economic activities like manufacturing of food products, manufacturing of clothes, manufacturing of fabricated metal products, transformative industries, etc. (GOSI 2023).

Table 2: Collected Primary Data Summary

Total number of responders	Category		Frequency	Percentage
566	**Gender**	Female	36	6.36%
		Male	530	93.64%
574	**Nationality**	Saudi	476	82.93%
		Non-Saudi	98	17.07%
569	**Age**	Below 25 years	19	3.34%
		25-40 years	303	53.25%
		41-50 years	189	33.22%
		51-65 years	58	10.19%
564	**Position**	Production and Site Technicians	179	31.74%
		Administrations and Engineering	235	41.67%
		Middle Management	114	20.21%
		Top Management	36	6.38%
Total number of participants			**578**	**100%**

Source: Primary Data

The population for the quantitative phase is all employees who are working in Saudi Arabian Manufacturing Sector. Since population size is known, by using simple random sampling method, the sample size required for this study was estimated under confidence level of 95 percent and 5 percent margin of error as 384 participants as indicated in the sample size table issued by (The Research Advisors Web 2006). As shown in Table (2), the total participants in the shared questionnaire were 578 employees.

Additionally, for the qualitative phase, the selected Factory population is 200 employees. Specifically, purposive sampling technique was used to select the required employees for the face-to-face interviews.

The researcher selected this sampling method due to the respondents knowledgeable and experience in make to order manufacturing industry. This sampling technique was followed to ensure that all population categories had equal chance to provide their feedback. Moreover, as indicated by Fridlund and Hildingh (2000), one to thirty interviewees were common sample size in qualitative studies (Bengtsson 2016). Thus, 30 employees were selected to participate in this research face-to-face interviews.

The researcher used simple and clear English to design the interview questions. This made it possible for the respondents to provide their feedback comfortably. Furthermore, the researcher clarified the questions to the respondents for easy comprehension. The researcher also controlled the data collection through flexible dialogue and discussion sessions. Specifically, structured interview guide was provided by the researcher to enhance the discussion about the employee's retention. The following questions were used to evaluate the impact of duty time on employee's life harmony in that factory.

a) How can the management improve working time and breaktime?
b) How is factory working time policy impacting your work-life balance?

3.2. Analysis Techniques

In the quantitative analysis, statistical analysis was performed using Microsoft Excel 2016. Descriptive analysis was applied to analyze the collected primary data for demographic variables. Additionally, research questions and findings were evaluated using Regression test, Chi-Square Test, Spearman's r, Independent Sample t-test, and ANOVA test. In the qualitative analysis, the researcher utilized a content analysis approach to analyze the gathered data.

4. Analysis and Discussion

4.1. Hypothesis 1: Duty time effect

The objective of this study is to identify the impact of duty time on employees' satisfaction and life harmony in Saudi Arabian manufacturing sector. That was tested in the first null hypothesis which is (H_{01}) "Duty time is not significantly related to the employees' life harmony in Saudi Arabian manufacturing sector". In this section, researcher analyzed the employees' opinions for the five statements regarding the impact of duty time on their satisfaction.

Table 1: Showing the results of working hours survey items

Items (37 to 41)		TR	SD	D	N	A	SA
37- My company working hours and duty timing are adequate.	F	467	49	55	88	205	70
	P	80.80	10.49	11.78	18.84	43.90	14.99
		M= 3.41		Mo= 4		Md= 4	
38- The flexible working time will Improve my life harmony.	F	467	4	20	41	222	180
	P	80.80	0.86	4.28	8.78	47.54	38.54
		M= 4.19		Mo= 4		Md= 4	
39- The current shift timing does not sufficiently support a healthy work-life balance.	F	466	17	34	89	229	97
	P	80.62	3.65	7.30	19.10	49.14	20.82
		M= 3.76		Mo= 4		Md= 4	
40- Additional break time Improves my performance.	F	465	12	55	100	191	107
	P	80.45	2.58	11.83	21.51	41.08	23.01
		M= 3.7		Mo= 4		Md= 4	
41- Increasing daily working hours is negatively impacting my family.	F	467	13	42	88	173	151
	P	80.80	2.78	8.99	18.84	37.04	32.33
		M= 3.87		Mo= 4		Md= 4	

NOTE: M=Mean, Mo=Mode, Md=Median, TR=Total number of responders per item, SD=Strongly Disagreed, D=Disagreed, N=Neutral, A=Agreed, SA=Strongly Agreed, F=Frequency and P=Percentage)

Source: Primary Data

The study findings in Table (3) show that the working hours is significantly related to the employees' performance (cumulative mean = 3.56) and to the employees' life harmony (cumulative mean = 3.94). A comparison on these items showed that the total participants' feedbacks are 2332. Namly, 301 of the were opposed, 406 of them were neutral and 1625 of them were believed in the impact of duty time on performance and life harmony.

The percentage of employees who opposed was 12.9 percent, while the percentage of those who were neutral was 17.4 percent. However, the percentage of those who concurred was 69.7 percent. Hence, the range of percentages of the opposed employees' group and the undecided employees' group were lower compared to the concurred employees' group.

Consequently, the respondents noted that they are not sure if the working hours are adequate (mean = 3.41). They also partially agreed that the shift time is not comfortable and not sufficient to have stable work-life balance (mean = 3.76). Moreover, they were barely expected negative impact on their family if company increase the working hours (mean = 3.87). In addition, to some extent, they anticipated that additional break time improves the employees' performance (mean = 3.70). However, they believed that their life harmony will be better if the company allow them to work under flexible working hours (mean = 4.19).

Table 2: Showing the results of working hours t-test

	Item 37	**Item 40**
Mean	3.4111	3.7011
Standard deviation	1.1874	1.0312
Variance	1.41	1.0634
Sample	467	465
Probability P-Value	7.46E-05	
t Stat	-3.980	
t Critical two-tail	1.9626	
(t[930]=-3.9803,p<0.05)		

Moreover, to test if there is significant difference between the means of the responses about the effect of duty time on the employees' performance, t-test was conducted as shown in Table (4). After comparing the responses between Item 37 and Item 40 about working hours timing, the P-Value from t-test was (7.46E-05) less than 0.05 and the absolute value of t-stat was (3.98) greater than t-Critical (1.9625); (t[930]= -3.9803, $p<0.05$). Hence, there was significant difference between the data collected in Item 37 and Item 40 which was most likely reflecting the real intrinsic differences in the population, and they were not by chance.

Table 3: Showing the results of working hours ANOVA test

	Item 38	Item 39	Item 41
Mean	4.1863	3.7618	3.8715
Standard deviation	0.8297	0.9822	1.0526
Variance	0.6884	0.9646	1.1079
Sample	467	466	467
	Probability P-Value	3.10083E-11	
	F Value	24.621	
	F Critical	3.0022	
(F[2, 1397]=24.621, p<0.05)			

Additionally, ANOVA test was conducted to compare the differences between the means of Item 38, Item 39 and Item 41 as shown in Table (5) to test if there are significant difference between the means of the responses about the effect of duty time on the employees' life harmony. After comparing the responses, the P-Value from ANOVA test was almost zero (3.10083E-11) which is less than 0.05 and F-value was (24.621) greater than F-Critical (3.0022); (F[2, 1397]=24.621,p<0.05). Hence, there was significant difference between the data collected in Item 38, Item 39 and Item 41. The responses were most likely reflecting the real intrinsic differences in the population, and they were not by chance.

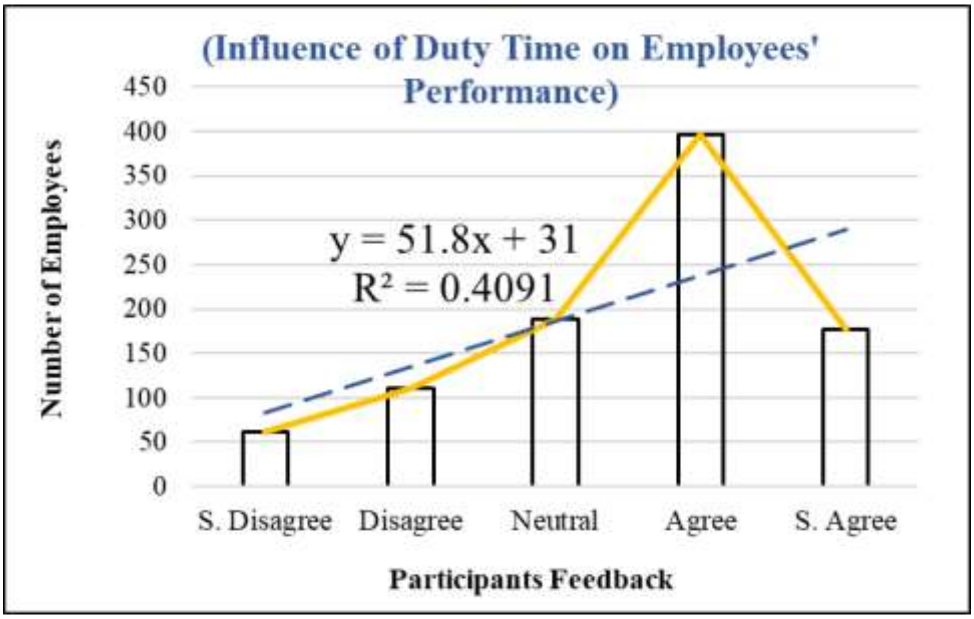

Figure 2: Responses analysis between duty time and employee's performance

Furthermore, to determine the influence of working hours on employee's performance and life harmony, several regression analyses were conducted. The first test was compering the relationship between the respondents' feedback about performance and number of respondents (items 37, 40). Clear trend was observed as shown in Figure (2). Specifically, when respondents' feedback changed from strongly disagree toward strongly agreed, number of employees who are considering the working hours as important factor that impact employees' performance were increased.

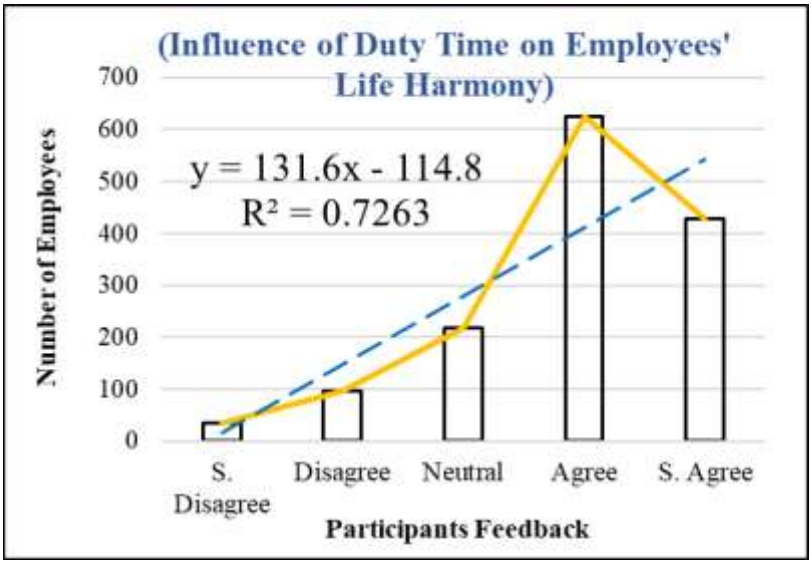

Figure 3: Responses analysis between duty time and employees' life harmony

The second regression test was compering the association between the respondents' feedback about life harmony and number of respondents (items 38, 39, 41). Clear trend was observed as shown in Figure (3). Specifically, when respondents' feedback changed from strongly disagree toward strongly agreed, number of employees who are considering the working hours as important factor that impact their life harmony were increased.

Table 6: Showing the results of duty time and life harmony regression test

Duty time and Life Harmony Regression Statistics (Means)				
Multiple R	0.3622		t-Stat	8.3792
R Square	0.1312		F-Value	70.2118
P-value	6.36319E-16		Lower 95%	0.2158
Observations	467		Upper 95%	0.3479
Linear Equation		Y = 0.2819 X + 2.9376		
(r=0.3622, F[1, 465]=70.2118,p<0.05)				

The third regression test was conducted to evaluate the relationship between the increase in duty time and the negative impact on employees' life harmony. That was tested by comparing the relationship between the mean of the respondents' feedback about Duty time (items 37, 40) and the mean of their feedback about life harmony (items 38, 39, 41). According to the regression test results summarized in Table (6), researcher noticed that duty time had significant effect on employees' life harmony. The p-value (6.36E-16) is smaller than 0.05 which presents solid evidence to reject the null hypothesis and indicates the existence of significant relationship. The multiple correlation coefficient (R= 0.3622) represents positive direction correlation. Moreover, the coefficient of determination (R Square = 0.1312) explains that nearly 13.12 percent of the variability in the negative impact on life harmony can be explained by the increase in duty time. The remaining 86.88 percent may be influenced by other factors not included in this regression model. Hence, when duty time increases, the negative impact on life harmony tends to increase as well.

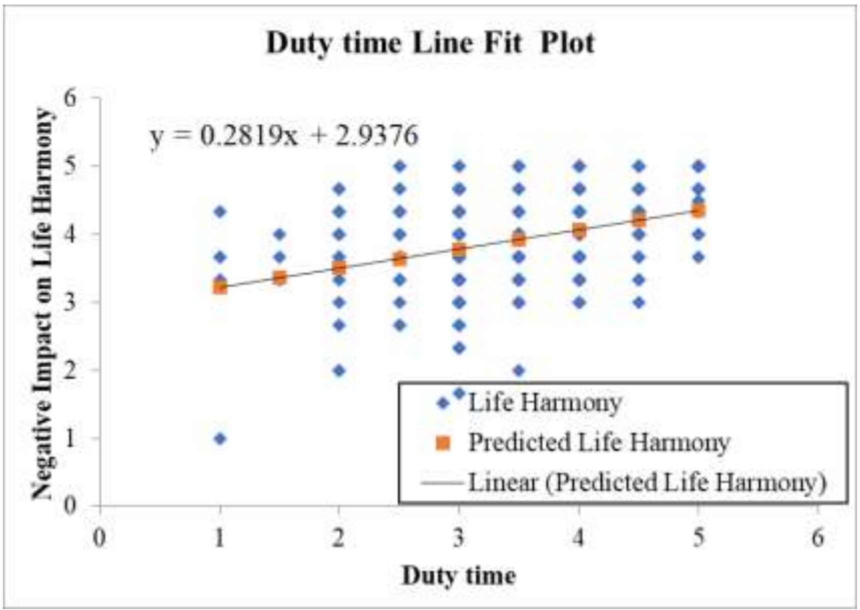

Figure 4: Regression analysis – Duty Time Line Fit Plot

Accordingly, the relationship plot is shown in Figure (4) indicates linear relationship between duty time and the negative impact on employees' life harmony. That is explained by the linear equation ($Y = 0.2819X + 2.9376$) which represents the estimated relationship between duty time (X) and the negative impact on life harmony (Y). For every unit increase in duty time, the negative impact on life harmony is expected to increase by 0.2819 units. The intercept term (2.9376) represents the estimated impact on life harmony value when the increase in duty time is zero.

Therefore, the null hypothesis (H_{01}) “Duty time is not significantly related to the employees’ life harmony in Saudi Arabian manufacturing sector.” was rejected.

4.2. The employees’ demography impact

In this section, the author evaluated the possibility if employees’ demography moderates the employees’ satisfaction about duty time. Firstly, researcher compares between the mean of the respondents’ feedback about the duty time and the specific respondent’s demography (Gender, Nationality, Age and Position). Secondly, Chi Square test was conducted to test if this demography is moderating the duty time satisfaction.

4.2.1. Hypothesis 3: Employees’ gender effect

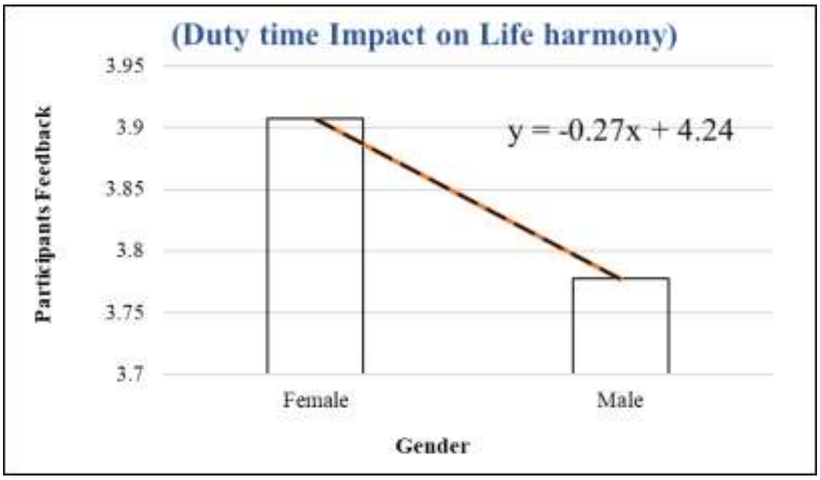

Figure 5: Responses analysis by Gender

As depicted in Figure (5), after analyzing the gender distribution of the participants, it is evident that all feedbacks are consistently expressed average responses ranging from 3.77 to 3.91. This indicates an agreement among the participants regarding the correlation between duty time and their life harmony. Hence, gender is not moderating the duty time satisfaction.

Table 7: Observation data to test if Employee's gender moderates the relationship between Duty time and Employees' life harmony

Gender	Opposed Employees	Undecided Employees	Concurred Employees	SUM
Female	12	24	65	***101***
Male	285	378	952	***1615***
SUM	***297***	***402***	***1017***	***1716***

Furthermore, Chi Square test was conducted to test if Employee's Gender is significantly moderate the relationship between Duty time and Employees' life harmony. Using the observed data in Table (7), the calculated X^2 value was 2.3003 which is less than the critical value which is 5.991 (X^2=[2,N=1716]=2.3003,p<0.05). Hence, Employee's Gender is not significantly moderate the relationship between Duty time and Employees' life harmony. Therefore, the null hypothesis (H_{02}) "Employees' gender is not significantly moderating the duty time satisfaction in Saudi Arabian manufacturing sector" shall be NOT rejected.

4.2.2. Hypothesis 4: Nationality effect

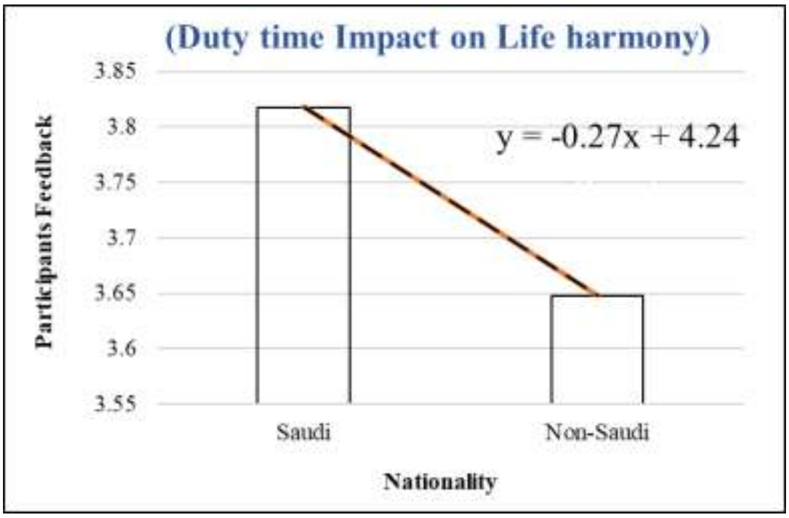

Figure 6: Responses analysis by Nationality

As showed in Figure (6), after evaluating the nationality distribution of the participants, it is evident that all feedbacks are consistently expressed average responses ranging from 3.65 to 3.82. This indicates an agreement among the participants regarding the correlation between duty time and their life harmony. Hence, nationality is not moderating the duty time satisfaction.

Table 8: Observation data to test if Employee's gender moderates the relationship between Duty time and Employees' life harmony

Nationality	Opposed Employees	Undecided Employees	Concurred Employees	SUM
Saudi	237	318	855	***1410***
Non-Saudi	62	84	165	***311***
SUM	***299***	***402***	***1020***	***1721***

Additionally, Chi Square test was conducted to test if Employee's Nationality is significantly moderate the relationship between Duty time and Employees' life harmony. Using the studied data in Table (8), the calculated X^2 value was 6.0731 which is greater than the critical value which is 5.991 (X^2=[2,N=1721]=6.0731,$p<0.05$). Hence, Employee's Nationality is significantly moderate the relationship between Duty time and Employees' life harmony. Therefore, the null hypothesis (H_{03}) "There is no significant relationship between employees' nationality and duty time satisfaction in the Saudi manufacturing sector" shall be rejected.

4.2.3. Hypothesis 5: Employees' age effect

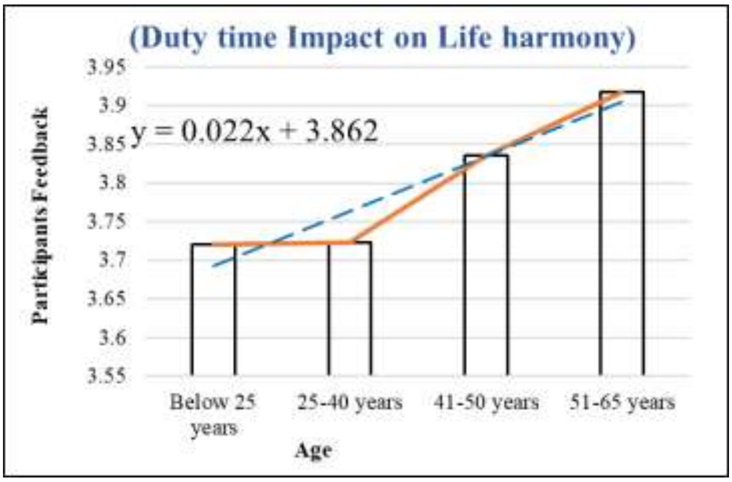

Figure 7: Responses analysis by Age

As represented in Figure (7), after examining the age distribution of the participants, it is evident that all feedbacks are consistently expressed average responses ranging from 3.72 to 3.92. This indicates an agreement among the participants regarding the correlation between duty time and their life harmony. Hence, age is not moderating the duty time satisfaction.

Table 9: Observation data to test if Employee's age moderates the relationship between Duty time and Employees' life harmony

Age	Opposed Employees	Undecided Employees	Concurred Employees	SUM
Below 25 years	14	11	37	***62***
25-40 years	190	195	511	***896***
41-50 years	81	147	349	***577***
51-65 years	14	48	114	***176***
SUM	***299***	***401***	***1011***	***1711***

Likewise, Chi Square test was conducted to test if Employee's Age is significantly moderate the relationship between Duty time and Employees' life harmony. Using the observed data in Table (9), the calculated X^2 value was 26.9448 which is greater than the critical value which is 12.592 ($X^2=[6,N=1711]=26.9448, p<0.05$). Hence, Employee's Age is significantly moderate the relationship between Duty time and Employees' life harmony. Therefore, the null hypothesis (H_{04}) "The association between employee's age and duty time satisfaction is not significant in Saudi Arabian manufacturing sector" shall be rejected.

4.2.4. Hypothesis 5: Employees' position effect

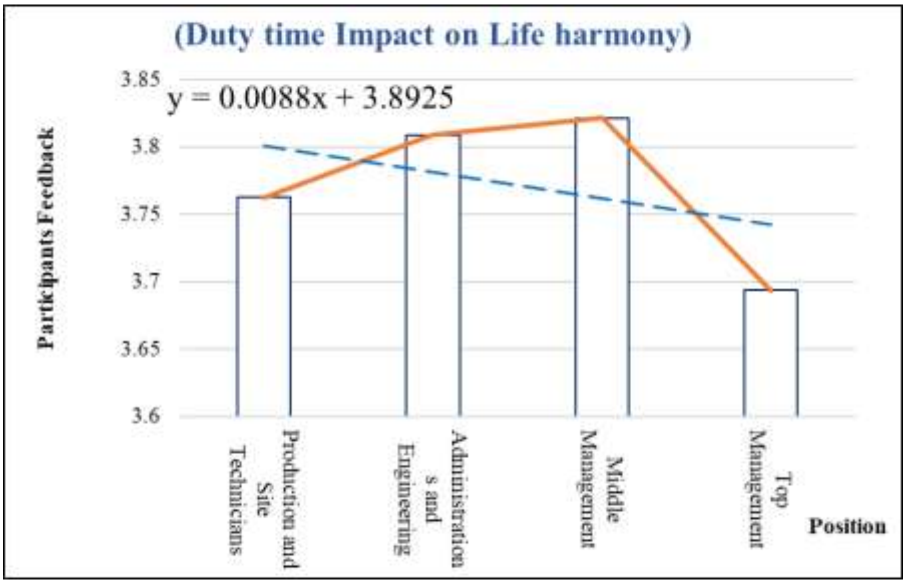

Figure 8: Responses analysis by Position

As illustrated in Figure (8), after investigating the position distribution of the participants, it is evident that all feedbacks are consistently expressed average responses ranging from 3.69 to 3.82. This indicates an agreement among the participants regarding the correlation between duty time and their life harmony. Hence, position is not moderating the duty time satisfaction.

Table 10: Observation data to test if Employee's position moderates the relationship between Duty time and Employees' life harmony

Position	Opposed Employees	Undecided Employees	Concurred Employees	SUM
Production and Site Technicians	88	116	293	***497***
Administrations and Engineering	128	172	436	***736***
Middle Management	59	77	216	***352***

Top Management	22	32	71	***125***
SUM	***297***	***397***	***1016***	***1710***

Finally, Chi Square test was conducted to test if Employee's Position is significantly moderate the relationship between Duty time and Employees' life harmony. Using the observed data in Table (10), the calculated X^2 value was 1.0913 which is less than the critical value which is 12.592 (X^2=[6,N=1710]=1.0913,$p<0.05$). Hence, Employee's Position is not significantly moderate the relationship between Duty time and Employees' life harmony. Hence, the null hypothesis (H05) “Employees’ position is not significantly moderating the duty time satisfaction in Saudi Arabian manufacturing sector” should be rejected.

4.3. Findings

Author tested the null hypotheses to analyze the correlation between the impact of increasing the daily working hours on the employees’ life harmony in the Saudi Arabia’s manufacturing sector. The study found that when respondents’ feedback changed from strongly disagree toward strongly agreed, number of employees who are believing in this relationship were increased. Moreover, the working hours is significantly related to the employees’ performance and satisfaction even though they are not sure if the current working hours in their organizations are adequate. Considerably, they anticipated that additional break time might positively impact their performance. They also partially agreed that the shift time is not comfortable and not sufficient to have stable work-life balance and barely expected negative impact on their family if company increase the working hours. However, they believed that their life harmony will be better if the company allow them to work under flexible working hours. Furthermore, the conducted regression test result showed significant relationship between duty time and life harmony (P-value = 6.36E-16). The increase in daily working hours held to be 13.12 percent of the changeability in the negative impact on life harmony.

Obviously, the research interrogated to investigate whether there is a meaningful connection between the duration of working hours and the performance and satisfaction of employees in the manufacturing sector of Saudi Arabia. That is evident with the existence of significant relationship between the duty time and both. Additionally, findings show that the relationship between the increase of daily working hours and the negative impact on the employees’ life harmony is moderated by Age and nationality but neither by gender nor position.

4.4. Example and calculation

This is practical example that represents how this research findings can be used to estimate the potential financial impact of increasing daily working hours on employee life harmony. Let us assume that an employee named Zahra working at ABC Company. The example considers Zahra's job satisfaction, performance, and the financial implications for both Zahra and the ABC Company. Below are key assumptions:

- Zahra's monthly salary: SAR 10,000.
- Zahra's satisfaction with her duty time was reported to be 80 percent.
- Zahra's performance was rated at 85 percent.
- ABC Company's daily revenue: SAR 500,000.
- Total production staff, including Zahra: 50 employees.
- Production output: 500 pieces per day.
- Sales price per product: SAR 1,000.
- ABC works 8 hours daily for 22 days monthly.
- The study's researcher discovered a linear correlation between increased daily working hours and the negative impact on employee life harmony. The correlation equation derived was $Y = 0.2819 X + 2.9376$, where Y represents the negative impact and X represents the increased units in daily duty time.
- Additionally, the researcher found that increasing one unit of daily working hours led to a 13.12 percent negative impact on employee life harmony.

Using above assumptions and findings, the impact on Zahra's Satisfaction, Performance and life harmony can be estimated as follows:

First: Impact on Zahra's Satisfaction:

If Zahra's satisfaction with her ABC company duty time was initially 80 percent, we can calculate the expected impact as follows:

Expected decrease in satisfaction = 80% * 13.12% = 10.496%

Therefore, Zahra's satisfaction is expected to decrease by approximately 10.496 percent due to the increase in daily duty time.

New satisfaction level = 80% - 10.496% = 69.504%

Second: Impact on Zahra's Performance:

New performance level considering Zahra's initial performance of 85 percent is:

Expected decrease in performance = 85% * 13.12% = 11.152%

Therefore, Zahra's performance is expected to decrease by approximately 11.152 percent due to the increase in daily duty time.

New performance level = 85% - 11.152% = 73.848%

Hence, after increasing the daily duty time, Zahra's expected performance level would be approximately 73.848 percent.

Third: Negative Impact on Life Harmony (Y):

Using the correlation equation and the research findings, we can calculate the negative impact on Zahra's life harmony.

X = 1 hour * (13.12% / 100) = 0.1312 hour

Y = 0.2819 * 0.1312 + 2.9376 ≈ 2.9746 hours

That means, after increasing the daily duty time by one hour, Zahra's life harmony is expected to be impacted by approximately three hours.

Fourth: Daily Financial Impact on Zahra (F):

Considering Zahra's monthly salary, performance, and the estimated negative impact on life harmony, we can calculate the daily financial impact on Zahra, assuming 8 hours daily duty time for 22 working days in a month.

F = (Zahra's monthly salary / Total working hours in a month) * (Y)

F ≈ (SAR 10,000 / (8 * 22)) * (2.9746) ≈ SAR 169

Hence, Zahra is estimated to be impacted financially with SAR 169 daily (SAR 3,718.25 monthly) if ABC Company increase the daily working hours by one hours. That will devalue Zahra monthly salary by 37.18 percent.

Fifth: Daily Financial Impact on ABC Company (D):

Considering the decrease in production output due to the negative impact caused by the decrease in employees' performance, we can calculate the daily financial impact on ABC Company (D).

Decrease in production output = Decrease percentage in employees Performance * Current daily production output = (11.152% / 100) * 500 pieces = 55.76 pieces

D = Decrease in production output * Sales price per product

= 55.76 pieces * SAR 1000 = SAR 55,760

Clearly, the Daily revenue of ABC Company will be impacted negatively by SAR 55,760 if the company increased the daily working hours by one hour.

In conclusion, based on the research findings and the example calculations, it is estimated that increasing daily working hours by one-hour results in a negative impact on employee life harmony could reach to three hours. In the case of Zahra, the impact was estimated to be approximately 37.18 percent from her salary. Moreover, the Company revenue is estimated to be impacted negatively by 11.152 percent. These figures highlight the importance of balancing employee well-being with productivity and financial considerations within organizations. **Please note** that the calculations and estimations provided are based on the given information, research findings, and assumptions made. The actual impact may vary depending on specific factors and circumstances within each company.

5. Case Study and Implications

The case study was conducted in one of the panel board manufacturing factories in Dammam second industrial city. The factory population was 200 multinational employees, and the selected sample was 30 employees from deferent career level. The researcher analyzed the face-to-face interviews data using content analysis and regression test. The following questions were used to evaluate the impact of increasing duty time on employee's life harmony in that factory.

a) How can the management improve working time and break time?
b) How is factory working time policy impacting your work-life balance?

To evaluate the relationship between working time and employees' performance, the interviewee's feedback about "How can the management improve working time and breaks during it?" was analyzed using content analysis. In addition, the association between working time and employees' performance which impacted the Factory revenue execution was tested using regression test.

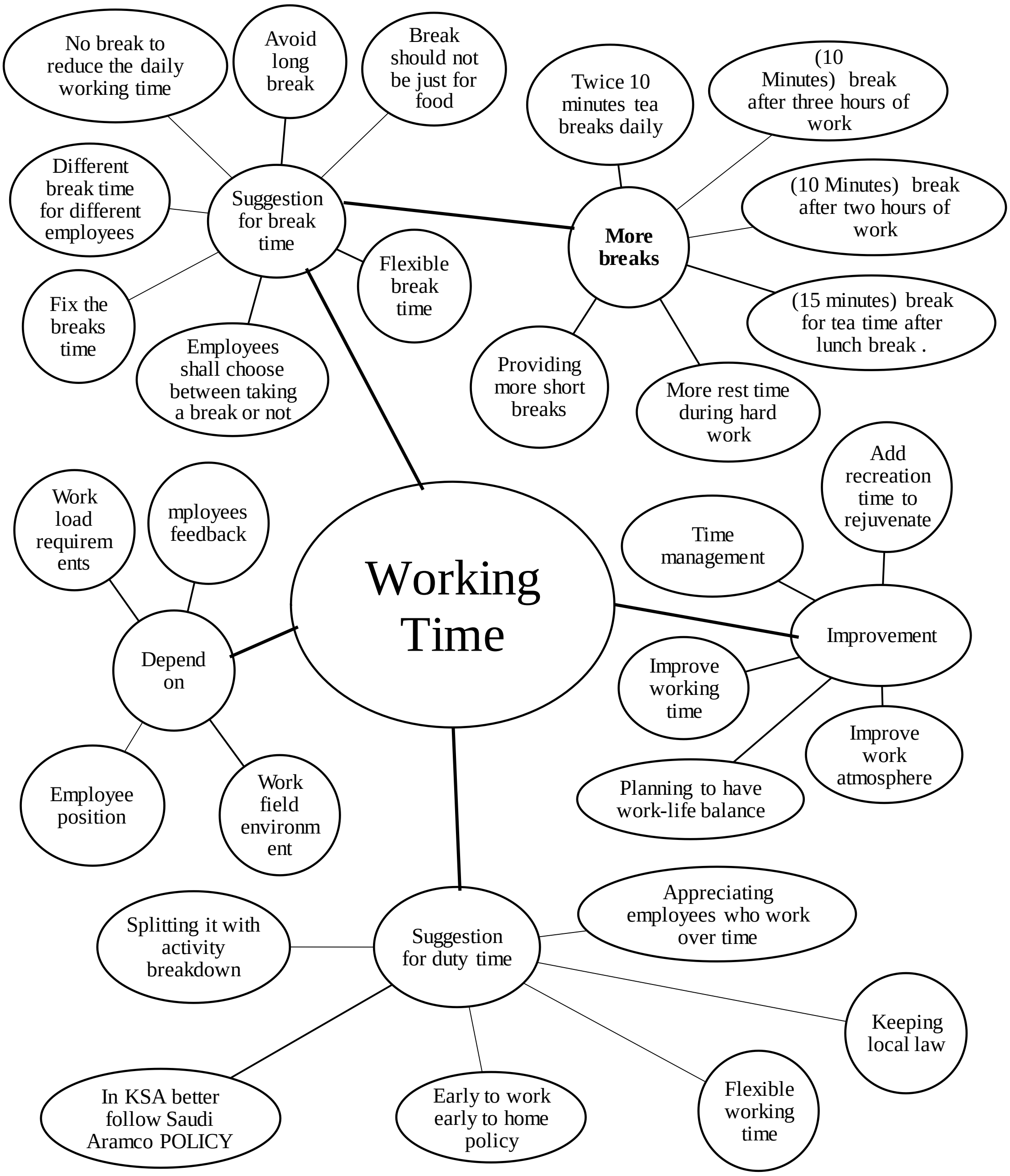

Figure 9: Code and categories conceptual map from interviewees' feedback about working time effect on employees' performance

After analyzing the participants' feedback about working time impact on their performance, codes and categories were grouped as shown the conceptual map in Figure (9). Respondents stated that flexible working time enhances target achievement and help employees to focus on strategic goals. In addition, interviewees advised to improve break time allocations by adding more breaks and adding recreation time for refreshment.

Table 11: Categories and themes from interviewees' feedback about working time effect on employees' performance

	Category	Frequency	Percentage	Themes
1	Suggestion for break time	14	39%	More breaks time are required to improve employee's performance and productivity.
2	Suggestion for duty time	13	36%	Flexible working time influences employee's life harmony.
3	Improvement	5	14%	Adding recreation time improves the work atmosphere and influence employees to rejuvenate.
4	Depend on	4	11%	Working time is dependable on employee position and type of job executed.

In addition, the results shown in Table (11) indicate that the considerable theme from interviewee's feedback was related to the significant effect of working time on employees' performance. Specifically, 39 percent of the participants believed that more breaks time are required to improve their performance and productivity. In addition, 36 percent of the interviewees stated that flexible working time influences their life harmony. Moreover, 14 percent of the participants needed recreation time to improve the work atmosphere and help employees to rejuvenate. While eleven percent of them believed that working time allocation depends on employee's position and type of job executed.

In conclusion, the researcher used content analysis to analyze the open-ended interview questions about the relationship between duty time, performance, and life harmony. Data showed that employees' performance and life harmony are significantly impacted by unfavorable working hours. Hence, case study findings were matching the descriptive and inferential analysis in section 4 of this study.

6. Conclusion

From the organizational behavior side, researcher analyzed the relationship of the duty time and employees' life harmony. Hence, to answer the research questions " 1) Is there significant relationship between duty time and the employees' performance in Saudi manufacturing sector?

And 2) Dose the working time policy significantly impacts the employees' satisfaction in Saudi manufacturing sector?", the researcher analyzed the null hypotheses which stated no significant relationships.

Accordingly, the study found significant association between duty time and life harmony. Findings showed that majority of the participants believed that duty time and working hours policy are significantly impact their ability to satisfy their family needs. The increase in duty time is responsible for nearly 13.12 percent of the negative impact on employees' life harmony. Callously, increasing one-hour in daily working hours causes a negative impact on employee life harmony could reach to three hours which is approximately 37.18 percent from the employee's income. Moreover, the Company revenue will be impacted negatively by 11.152 percent. Additionally, findings show that the relationship between the increase of daily working hours and the negative impact on the employees' life harmony is moderated by Age and nationality but neither by gender nor position.

Here are some possible impacts caused by longer working hours:

- Employees may not be able to allocate time for family, friends, hobbies, and self-care activities. That can cause stress and diminished the sense of well-being.
- Lack of time for exercise, sleep, and relaxation can lead to physical ailments such as fatigue, obesity, and increased risk of cardiovascular diseases.
- Mental strain of prolonged work hours can result in anxiety, depression, and burnout.
- As employees become fatigued, their productivity and focus tend to decline. This can result in lower quality work, increased errors, and decreased overall efficiency.
- When employees are consistently overworked, they may feel undervalued, unappreciated, and disconnected from their work, which can lead to decreased motivation and commitment.
- Employees may have less time to pursue additional education, training, or participate in activities that enhance their skills and knowledge.

In conclusion, extending daily working hours without considering the negative impacts on employees' life harmony can lead to decreased well-being, productivity, and overall job satisfaction. It is important for organizations to prioritize work-life balance and ensure that employees have sufficient time for rest, personal relationships, and self-care.

7. Recommendations

To establish a balance between work and personal life in a manufacturing facility while meeting operational requirements, here are some recommendations for duty time and working hours:

1. Establish standard working hours that are reasonable and aligned with industry norms. In many countries, the standard is around 40 hours per week.
2. Avoid excessive overtime and ensure that employees have adequate time for rest and personal activities.
3. Consider introducing flexible work schedules, such as compressed workweeks or flexible start and end times. This allows employees to adjust their work hours to better accommodate personal commitments and preferences, fostering a better work-life balance.
4. Ensure that breaks and rest periods are provided to promote relaxation and rejuvenation.
5. Limit the duration of individual shifts to prevent fatigue and burnout.
6. Implement a fair and balanced shift rotation system to distribute workload. This prevents employees from consistently working undesirable shifts, such as night shifts or weekends.
7. Encourage employees to utilize vacation days and engage in wellness activities.
8. Continuously monitor and assess the impact of working hours on employee satisfaction, productivity, and overall well-being. Collect feedback from employees through surveys or focus groups and adjust as needed to further improve work-life balance.

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Evaluating the Relationship between Corporate Social Responsibility Incentives and Financial Outcomes of Corporations Operating in the GCC Region

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Abstract

Corporate Social Responsibility (CSR) is a concept that has gained traction in strategic management over the years, and it is continuously being cited as important for both the business and the business shareholders. Although there is much research examining the general CSR-CFP relationship, there is very little, if any, research that investigates the firms operating in GCC countries, which is the main objective of this study. One of the new methods used to measure Corporate Social Responsibility engagement in any organisation is the ESG rating. The ESG rating measures the Environmental, Social and Governance (ESG) dimensions of Corporative Social Responsibility engagement. This research uses the stakeholder theory framework, together with the agency theory framework to find the impact that CSR has on the financial performance of organisations. In the research, we used annual data of ESG and financial ratios of 98 publicly listed firms operating in the Gulf Cooperation Council, from 2008 to 2018. Regression analysis was used to test the impact of ESG scores on the financial performance of organisations. According to the results, the Environmental, Social, and Governance dimensions have a significant impact on the financial performance of organisations operating in the Gulf Cooperation Council. This study contributes to the body of knowledge on the relationship between CSR performance and Financial Performance.

Keywords: Corporate social responsibility CSR, Financial performance, Environmental, Social and Governance (ESG) score, Gulf Cooperation Council Countries (GCC).

1. Introduction

Corporate Social Responsibility is the commitment of organisations to ensure that they contribute to sustainable economic development by ensuring that their activities do not affect the environment negatively and that the community in which they live can benefit from the activities of the organisations (Duong, 2024). Firms engage in different ways to ensure corporate social responsibility. Some of these ways include offering education scholarship training and developing employees, engaging in social activities such as sponsoring sports events, donating money for research and development, and even reducing wastage to ensure that the environment is not polluted (Lu et al., 2021). A firm engages in these activities, not as part of its legal responsibilities, or to follow laid down procedures, such as oil companies ensuring that their methods of oil extraction are sustainable as dictated by the government, but as a result of goodwill, such as sponsoring children from poor backgrounds and giving them scholarships to reputable universities. Since engagingin these activities requires the use of the company's finances, there is a lot of debate on why or why companies should not involve themselves in corporate social responsibilities (Zhang et al., 2020).

A study conducted by Lin et al. (2020), seeking to investigate the extent of the corporate social responsibility practices in the Gulf Cooperation Council, found that most top managers were willing to involve their organisations in Corporate Social Responsibility. The empirical result supported the use of Carroll's Pyramid of Corporate Social Responsibility constructs and the Lawrence et al charity and stewardship principles. This is further strengthened by the fact that Gulf countries are known for their charity and stewardship principles. As such, the applicability of corporate social responsibility in thosecountries is further strengthened by these facts (Issa et al., 2022).

However, very few empirical studies have been conducted to determine the benefits that the application of corporate social responsibility in the Gulf Cooperation Council has to corporations despite there being a general assumption by the academia on the benefits thatthe application of corporate social responsibility will have on a company that practices it. Most of these benefits of corporate social responsibility to corporations in the Gulf Cooperation Council stem from the findings of other studies that have been conducted on different markets, different economies, and different value systems from the Gulf Cooperation Council (Ajina et al., 2020). This is a major limitation since whatis true for other regions, economies, markets, and value systems might not apply tothe context of the GCC's value systems, market, and economy.

Corporate Social Responsibility as a source of improved corporate financial performance has gained a lot of popularity within academic society. Different studies have shown that corporate social responsibility can have a positive impact on a firm's financial performance by ensuring that the firm remains competitive in the marketplace, improving the image of the organisation, and creating the organisation's brand awareness (Koleva et al., 2021). All these will help the company to improve their market size, win the customer's loyalty, motivate the firm's employees to be part of the organisation's dream, etc. Accordingly, through such actions, the firm will create value and improve its financial performance (TSOU et al., 2021).

Despite the studies supporting Corporate Social Responsibility as a source of competitive advantage for an organisation, some argue that engaging in CSR activities reduces the profit registered by a company which leaves a negative impact on the financial performance of the organisation and thus denies the company capital that it could have invested elsewhere to improve shareholder value (Pons et al, 2021). More so, those against the application of corporate social responsibility claim that the core purpose of any organisation is to create value for its owners, and the use of a company's finances to fund CSR activities goes against this objective. The argument is that the money used in funding the CSR activities could have been paid to the investors in terms of dividends. Furthermore, this money will eat into a company's capital base, thus reducing profitability and ultimately financial performance (Newman et al., 2020).

Given the conflicting views on the impact of CSR on the financial performance of organisations, it is therefore prudent to conduct an empirical study to determine if there is any relationship between corporate social responsibility and the financial performance of firms operating in the Gulf Cooperation Council (Le et al., 2023). No empirical investigation has been conducted in the GCC countries by using the ESG score model to determine if there is a relationship between the CSR activities through the three dimensions of the ESG score. The purpose of this study is to examine the relationship between CSR activities and corporate financial performance in the case of the GCC countries. Therefore, it intends to answer the following research question:

RQ1: What is the relationship between the environmental aspects of corporate social responsibility and the financial performance of organisations operating in the Gulf Cooperation Council countries?

RQ2: What is the relationship between social aspects of corporate social responsibility and firm financial performance of organisations operating in the Gulf Cooperation Council countries?

RQ3: What is the relationship between the governance aspects of corporate social responsibility on the financial performance of organisationsoperating in the Gulf Cooperation Council?

To investigate these research questions the research will test the following hypotheses:

H1: The environmental aspect of corporate social responsibility has a significant impact on the financial performance of organisations operating in the Gulf Cooperation Council.

H2: The social aspect of corporate social responsibility has a significant impact on the financial performance of organisations operating in the GulfCooperation Council.

H3: The governance aspect of corporate social responsibility has a significantimpact on the financial performance of organisations operating in the GulfCooperation Council.

2. Literature Review

The search for relevant literature studies led to the discovery of similar and opposing views related to CSR, financial performance, firm size, and leverage.

2.1. Stakeholder Theory

The most notable stakeholders in any organisation are the political activism goods, regulatory agencies, competitors, government, customers, and shareholders. These have been recognized as stakeholders who influence the feasibility of the organisation (Long et al., 2020). The perceptions, values and norms that the stakeholders can influence the actions of the organisation even though the organisation's actions do not directly influence their lives. A good example is the case of Nike utilizing child labour in Pakistan even though the company sells its products across the world(Naz and Bögenhold, 2020). The company's utilization of child labour caused an uproar in the United States since its actions and activities were against the norms and values of the American people (O'Sullivan, 2020). In this case, the marketing andoperations of organisations have excelled from narrow customer orientation to managing the benefits and relationships with a variety of stakeholders (Nicolaides, 2021).

For a long time, it has been assumed that the only objective of any organization is to maximise shareholders' value and make profit as much as possible in the confines of law. The organisation was seen as having no other purpose but to meet the needs of the shareholders (Mayer, 2021). However, with time, this view has changed and many people appreciate the fact that there is more to an organization than meeting the demands of the shareholders. The objectives of the organization are increasingly becoming to ensure are creation of a good relationship with stakeholders and to include a wide range of interests, the most notableone being the protection of the environment, and being socially responsible (Tetteh et al., 2024). Therefore, Corporate Social Responsibility is a way of satisfying the requirements of the stakeholder theory in an organisation. In the stakeholder theory, the success of the organisation and satisfying the needs of the shareholder are tied to the organisation and stakeholders' relationships and the needs of the shareholders cannot be met without sustaining the needs of other stakeholders (De Tommaso and Borini, 2024; Marcon Nora et al., 2023). According to this theory,organisations need to be engaged in corporate social responsibility tomeet the needs of all stakeholders (Aguilera et al., 2024).

2.2. Agency Theory

Agency theory is concerned with the relationship that exists between the managers of an organisation and the shareholders (owners). In this case, an agency is where one party (theprincipal) engages another party, (the agent), to perform certain activities on their behalf and also delegates decision-making to the agents (Góes et al., 2023). The agent on the other hand acts on behalf of the principal and makes decisions and actions that will be of benefit to the principal. In the case of organisations, the managers of the organisation act as the agents of the shareholders and whatever actions they take should benefit the shareholders (Tiwari et al., 2023). The manager's main duty is to ensure the maximisation of profits and improvement of firm value on behalf of the shareholders. If the managers make decisions that do not satisfy the objective of the shareholder which is wealth maximization, then the agency problem occurs (Chen et al., 2023). One of the main agency problems is the conflicting objectives of the shareholders and the managers. Inthe case where there is a conflict of interests, then the agent can perform activities that arenot in line with the shareholders, desires. In the case of the implementation of Corporate SocialResponsibility, the agency problem might occur (Namyenya et al., 2023).

2.3. Corporate Social Responsibility

Corporate Social Responsibility is the commitment of organisations to contribute to sustainable economic development by ensuring that their activities do not affect the environment negatively and that the community in which they live can benefit from those activities (Douglas, 2023). Corporate social responsibility actions can go further than what is required by the government and other legal entities.Corporate social responsibility can take three forms. It has a social aspect, an environmental aspect, and a governance aspect. These aspects determine how the CSR activities in the organisation are done, and they also affect the organisation differently (Jensen and Meckling, 2019; Sahasranamam et al., 2020; Hussain et al., 2020). The following is an explanation of each of these aspects of corporate social responsibility.

2.3.1. Environment

Corporations are viewed as some of the sources of the negative impacts on the environment, and there has been increasing discussion on the impact of corporations on theenvironment. The main discussion revolves around how the actions of corporations and the consumption of natural resources have resulted in the steady decline of the environment's well-being (Tamvada, 2020). Due to the increasing public concern about theactions of organisations and their impacts on the environment, organisations are becoming more aware of their actions and the consequences these actions have on the environment. This has made the organisations not only concentrate on the societal dimension of CSR but also their responsibility to the environment, thus giving rise to this dimension (Zaid et al., 2020). Since the stakeholders are increasingly becoming aware of the need for organisations to take care of the environment and to ensure that they engage in sustainable activities, organisations have to handle the environment with care to ensure that they do notreceive criticism (Velte, 2022). If the organisation shows its stakeholdersthat it is conscious of its actions and is doing everything possible to ensure that it reduces its negative impacts on the environment, then it will be able to maintain and improve itsimage. Caring for the environment is now used by firms as a strategy to attract positive publicity and thus gain reputational value and attract customers (Li et al., 2020).

2.3.2. Social Dimension of CSR

According to García-Sánchez et al. (2021), companies are receiving increasing pressure to manage their social responsibilities and are thereforetaking more time and resources and dedicating them to CSR activities so that they can meetthe expectations of their stakeholders. Since stakeholders are more aware of the CSR activities of organisations, and their assumed benefits, the firms are more willing to ensure that they engage in sustainable activities. Examples are the donation of food, donation of healthcare equipment, sponsoring vaccination programs, and even ensuring that they haveinternal control mechanisms to ensure as little as possible impact on the environment.

According to Luger et al. (2022), consumer purchasing behaviour can be partly influenced by the social responsibilities that a companydecides to engage itself in. During the social dimension of CSR, the company also indirectly creates awareness for its brand and also helps to achieve societal marketing.

Research shows that consumers are more willing to work with companies that engage in CSR activities such as donations, philanthropy and charitable giving. Ensuring that the company ensures that it meets the expectations of society about its CSR activities helps the company to generate positive long-term results (Zhang et al., 2020).

Ajina et al. (2020), conducted a study to determine how corporative social responsibility affects Chinese consumer behaviour. According to the results of this study, organisations that had a robust social responsibility had the ability to attract customers better through raising their brand awareness. These studies are consistent with those studies carried out by Tiep Le et al. (2023), Al-Swidi et al. (2021) and Prabhu and Aithal, (2023). These studies concludedthat corporate social responsibility impacted on the consumption behaviour of a significantnumber of customers through increased brand awareness.

2.3.3. Governance

Governance entails how the organisation treats its employees, the code of conduct of itsleadership, and the values, culture and norms shared by the organisation. The public and other stakeholders are increasingly becoming aware of the need for organisations to treat their employees better, to ensure that there is no discrimination of employees, to create diversity in the staff, and to also ensure that all employees are treated equally, and the compensation given is good (Le et al., 2023). Research shows that employees are more willing to go to organisations that treat the employees better and have better governance. If a company usesthe governance aspect of CSR, it will be able to attract and retain the best skills and talentsin the industry (Barauskaite and Streimikiene, 2021).

2.4. Financial Performance

In this study, the measures of financial performance that have been utilized are the Earnings before InterestRates and Taxes (EBIT), Returns on Investments (ROI), Returns on Assets (ROA), and Earnings per share (EPS). These measures have been used in the majority of literature that aims to study the relationship between corporate social responsibility and financial performance as shown by Crossley et al. (2021), an extensive literature review on this topic.

2.4.1. Returns on Assets

Returns on Assets is a financial ratio used to determine the net profit that a company gets for using a unit of assets for financial gain. It shows how profitable the activities of the organisation are relative to the total assets in the organisation.

The formula for determiningthe Returns on Assets is Choiriyah et al. (2021) and Nugraha et al. (2020) are examples of literature that have used this as a measure of financial performance while determining the relationship between CSR and financial performance.

2.4.2. Returns on Investments

Returns on Investment are used to measure the financial gains that a company gets for everyunit of investment. It shows how efficient the organisation is in maximizing the returns itreceives from its different investments in the market. If an activity is seen as good for generating returns from the investments, then it becomes easier for the organisation to engage in the activity and to make strategic decisions regarding the activity. The formula for determining Returns on Investments is by dividing the net income by the total investments made in the organisation (the original capital costs of the investment). Awaysheh et al. (2020) and Shabbir and Wisdom, (2020), are examples of literature thathave used this as a measure of financial performance while determining the relationship between CSR and financial performance.

2.4.3. Earnings before Interest Rates and Tax

Earnings before Interest Rates and Tax is a measure of financial performance used to measure the gross income that a company gets before subtracting amortization, interest rates, taxes and depreciation. This helps to determine if the company is receiving any gross returns from its activities. Tripathi and Kaur, (2020) are examples of literature that have used this as a measure of financial performance while determining the relationship between CSR and financial performance.

2.4.4. Earnings per Share

Earnings per share are used to determine how well an organisation is maximising its shareholders' value. The formula for determining the earnings per share in an organisationis subtracting preferred dividends from the net income and dividing the weighted averagecommon shares outstanding. The more the company allocates per share of the outstandingstock, the more the company is said to be performing better financially. Atz et al. (2021) and Awaysheh et al. (2020), are examples of literature that have used this as a measure of financial performance while determining the relationship between CSR and financial performance.

2.5. Link between Corporate Social Responsibility and Financial Performance

The relationship between corporate social responsibility and the financial performance of organisations has been an area of constant research (Barauskaite and Streimikiene, 2021).

Many researchers have studied the impact that corporate social responsibility has on corporate financial performance in different contexts, and these studies have had differing views on the relationship between these two variables. Some researchers such as (Barauskaite and Streimikiene, 2021), and Bustani et al. (2021), have conducted the research and concluded that there is a significant positive relationship between the implementation and disclosure of corporate social responsibility and organisation financial performance. The following are some of the waysthat the implementation of Corporate Social Responsibility may lead to improved financialperformance of the organisation.

2.5.1. Increased Ability to Attract and Retain Customers

The larger the customer base that an organisation enjoys, the better the financial performance of the organisation might be. If the customer base is large, the company will enjoy economies of scale, will have more sales, and in the process reduce costs per unit ofproduction, and improve revenue (Hernawati et al., 2021). Corporate Social Responsibility helps to attract customers since it improves the image of the organisation, improves the reputation of the organisation, and at the same time acts as a positive public relation (Mate et al., 2021). This ability to attractnew customers will improve the size of the organisation's customer base. Corporate Social Responsibility helps to retain customers by cultivating a positive image for the organisation, and also adhering to the norms and values of the customers. If the organisations go against the value systems of the customers, then the customers are likelyto boycott the organisation and look for substitutes (Lin et al., 2020). The case of Nike and Apple losing customers due to the involvement of child labourin their sweatshops in East Asia is an example of how organisations can lose customers ifthey do not adhere to the values and norms of the customers (Al-Mamary et al., 2020).

2.5.2. Better chance of attracting and retaining skilled and talented labour

According to research, the corporate social responsibility activities of an organisation are one of the factors that employees consider before working for an organisation. Employees are more willing to work for an organisation that engages in sustainable and socially responsible activities (Hazée et al., 2020). This means that a company that has corporate social responsibility has a better chance of attracting talented and skilled employees in comparison to those organisations that do not. A company that has better and more skilled employees will have a competitive advantage over its competitors, and thus be in a positionto compete better in the marketplace. This will improve productivity, and at the same time,the market share of the organisation (Pawlicki, 2022).

Corporate social responsibility actions such as offering scholarships to employees, training and educating employees, and proper working conditions are important for retaining employees (Raza et al., 2021). Retaining employees will reduce the turnover rate and thus reduce the costs associated with a high turnover rate in organisations such as the cost of recruiting, the cost of training and development, and the cost of lost productivity as the organisation searchers for new employees to replace those employees that left the organisation. Reducing these costs will give the organisation a larger revenue margin and thus consequently improve the financial performance of the organisation (Simpson et al., 2020).

Other researchers such as Malik et al. (2021) have conducted the same study and concluded that the relationship between corporate social responsibility implementation and disclosure and the financial performance of organisations is a negative relationship. Furthermore, other researchers such as Lee (2021), and Nguyen et al. (2021), have established that there is no relationship that exists between the application and disclosure of corporate social responsibility and the financial performance of organisations. The main reason for this is that engaging in CSR requires resources, and this causes the company to increase its costs, which cuts the funds available for reinvestment. Using profits for CSR also means that the company will reduce the profit margin and consequently affect the financial health of the organisation (Partalidou et al., 2020).

2.6. Conceptual Framework

To test the hypothesis, the influence of environmental, Social, and Governance aspects ofcorporate social responsibility on a firm's financial performance will be examined individually.

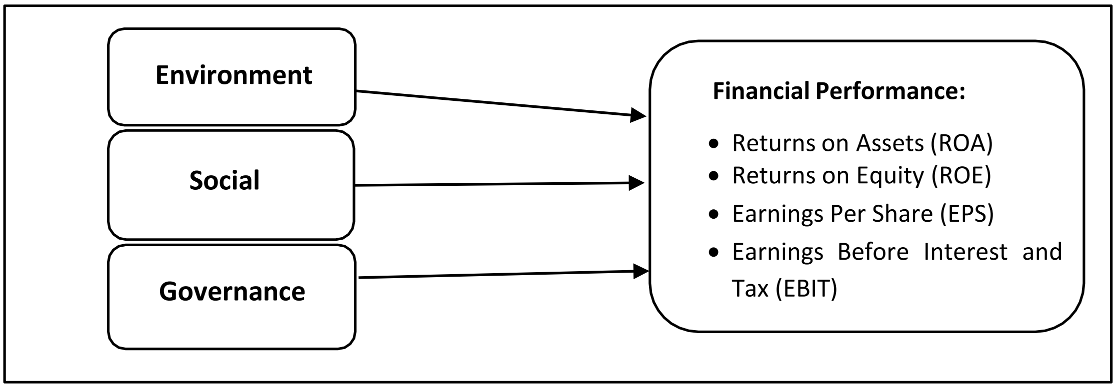

Figure 1: Conceptual Framework.

3. Methodology

The research adopted a quantitative approach (Awwad et al., 2023) to determine the relationship between corporate social responsibility and corporate financial performance in the Gulf Cooperation Council countries. ESG score was used to estimate the performance of the corporate social responsibility and the financial ratios (ROA, ROE, EPS, and EBIT) were used to estimate the financial performance. We used the Bloomberg Environmental, Social and Governance Database, which offers both the financial data and ESG information of 98 listed companies in GCC countries. Table 1 below shows the number of firms that were chosen from different sectors according to the availability of Data:

Table 1: Number of included firms by country.

Country	**Number of Firm**
BAHRAIN	6
EMIRATES	25
KUWAIT	10
OMAN	9
QATAR	19
SAUDI ARABIA	29
Total	**98**

We gathered financial data and ESG information, including the overall ESG disclosure score, components of environmental, social and governance disclosure scores and ESG activity-related data of global companies. The study examined the relationship between corporate financial performance and ESG scores. The variables for measuring corporate social responsibility are categorized into social corporate responsibility, governance cooperate social responsibility, and environment corporate social responsibility.

The researcher collected data for the dependent variables from secondary sources, from the individual organisation’s financial reports for the years between 2008 and 2018. The use of longitudinal data in the research was essential since it helped the researcher to determine any perceived changes in the financial performance of the organisations that theresearcher included in the research. The research also collected secondary data to measure the Corporate Social Responsibility of the organisations that were included in the study.

The secondary data was collected from the ESG scorecard, which is published every year,from the same period as the financial performance data. Data analysis was performed by conducting descriptive statistics to determine the spread, frequency, and distribution of the data. The inferential statistics techniques include Regression Analysis and the Analysis of Covariance.

Most literature proposes the following model for corporate social responsibility- corporatefinancial performance:

$CFP_{it} = f\ (CSR_{it}, CFP_{it-1}, X_{it}) + \varepsilon_{it}$

Where I represent firm, t represents period, CFP, corporate financial performance as a function of CSR, the previous year's financial performance is the lagged CFP_{it-1}, the X are the control variables, and ε_{it} the term error. The following is the general model derived from this:

FP = f (CSR, FirmsSize, Leverage)

So,
ROA = β0 + β1 Env. + β2 Soci. + β3 Gov. + β4 FirmSize + β5 Leverage + errorROE= β0 + β1 Env. + β2 Soci. + β3 Gov. + β4 FirmSize + β5 Leverage + error EPS= β0 + β1 Env. + β2 Soci. + β3 Gov. + β4 FirmSize + β5 Leverage + error EBIT= β0 + β1 Env. + β2 Soci. + β3 Gov. + β4 FirmSize + β5 Leverage + error

Earnings before interest rates and taxes (EBIT), Earnings per Share (EPS), Returns on Assets (ROA) and Returns on Investments (ROI), represent the financial performance of the organisation in each of these models. Firm Size, which represent total asset of the firm andLeverage ratio are the control variables. This research uses a panel data method as the variables contain data that varies over cross-sections and in the time-series dimension. Allthe regressions are run using GMM estimation technique. The GMM estimators are knownto be consistent, asymptotically normal, and efficient in the class of all estimators that do not use any extra information aside from that contained in the moment conditions. It will take care of any consistency or auto correlations in the variables.

Validity and reliability are essential principles of any scientific research. The sources of data used in the research are valid and reliable, and a systematic scientific approach has been followed when conducting research toensure reliability and validity of the research findings.

4. Results

4.1. Descriptive analysis

The data collected through the years regards the financial performance as a result of engagement in CSR activities. The data collected was from the year 2014 to the year 2018According to the mean in the descriptive statistics, the average of Environmental score is 17.8%, the Social Score is 5%, and the Governance is 11% (Table 2). The maximum and minimumshow the range of values for each variable. The standard deviation shows how far the observations are from the sample average.

Table 2. Descriptive Statistics Table.

	Env.	**Soci.**	**Gov.**	**ROA**	**ROE**	**EPS**	**LOG_EBIT**
Mean	17.86	5.09	11.84	3.28	6.88	0.617	3.67
Median	13.39	5.00	11.00	1.53	4.16	0.013	3.63
Maximum	47.32	58.33	64.28	41.25	384.07	13.95	3.90
Minimum	5.89	5.00	10.00	-39.83	-147.32	-3.50	3.09
Std. Dev.	13.35	12.44	19.22	7.40	19.16	1.73	1.03
Observations	1274	1274	1274	1274	1274	1274	1274

4.2. ANOVA Analysis

The significance value at 0.379 is higher than 0.05 for ROE, which means that the data collected is not statistically significant. On the other hand, the F statistic is lower than 2.5, which leadsto the conclusion that the data is not statistically significant. The null hypothesis for EPS is that the mean (average value of the dependent variables) is the same for all groups. The alternative hypothesis is that the average is not the same for all groups. The ANOVA analysis results in a significant level of 0.012, which is beyond the set levelof 0.05. The significance level falling within 0.05 means that the data is statistically significant. On the other hand, the F statistic is 10.264, which is higher than 2.5 thus one can reject the null hypothesis. The ANOVA test shows (Table 3) that the significance test of the data is 0.031, which is lower than 0.05 for EBIT. Therefore, the data is statistically significant, and one can rely on the results to makeconclusions. Additionally, the F-statistic results in 6.473 a number higher than 2.5, whichmeans that one can reject the null hypothesis.

Table 3. ANOVA Analysis Table.

Model	Analysis Type	Sum of Squares (Regression)	df (Regression)	Mean Square (Regression)	F-Statistic	Significance (Sig.)
1	ROA	3.261	5	0.652	3.952	0.0079
2	ROE	3115.992	5	623.198	1.337	0.379
3	EPS	114.720	5	22.944	10.264	0.012
4	EBIT	13189.378	5	2637.876	6.473	.031

4.3. Regression Analysis

This research uses a panel data method as the variables contain data that varies over cross-sections and in the time-series dimension. All the regressions are run using GMM estimation technique. GMM technique suits the panel data and was used by most of the studies in the literature because it takes care of any correlation and endogeneity between the explanatory variable which is a common issue when dealing with corporate financial data.

ROA Model

Table 4. ROA Regression Analysis

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	2.455409	0.597243	4.111238	0.0000
E	0.023091	0.016081	1.435977	*0.0513
S	-0.050397	0.023991	-2.100686	*0.0359
G	0.010936	0.017257	0.633736	*0.0526
LEVERAGE	0.009662	0.008992	1.074512	0.2828
LOG_SIZE	0.119632	0.177644	0.673436	0.5008
R-squared	0.006016	Mean dependent var		3.280293
Adjusted R-squared	0.002096	S.D. dependent var		7.406400
S.E. of regression	7.398634	Sum squared resid		69410.04
Durbin-Watson stat	0.897807	J-statistic		9.12E-27
Instrument rank	6			

*Significant level at 5%; Dependent Variable: ROA

From the return on asset regression results (Table 4), the equation is as follows:ROA = 2.455 + 0.023 Envi – 0.050 Social – 0.010 Governance.

Therefore, a unit increase in environmental factors increases ROA by 0.023 units. On the other hand, a unit increase in social activities results in a 0.050 decrease in ROA while a unit increase in governance results in 0.010 unit decrease in ROA. However, other factors represented by the constant affect ROA with a unit increase in the other factors resulting in a 2.455 decrease in ROA.

Table 5. ROE Regression Analysis

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-5.387076	1.545284	3.486140	0.0005
E	-0.091392	0.041606	-2.196583	*0.0282
S	0.076055	0.062073	2.225250	*0.0620
G	0.003161	0.044650	2.970787	*0.0543
LEVERAGE	0.007072	0.023265	0.303989	0.7612
LOG_SIZE	0.052062	0.459630	0.113270	0.9098
R-squared	0.005780	Mean dependent var		6.883989
Adjusted R-squared	0.001860	S.D. dependent var		19.16076
S.E. of regression	19.14294	Sum squared resid		464661.2
Durbin-Watson stat	1.328682	J-statistic		7.69E-27
Instrument rank	6			

*Significant level at 5%; Dependent Variable: ROE

From the returned-on earnings regression results (Table 5), the equation is as follows: ROE = -5.387076 – 0.091392Envi + 0.076055 Social + 0.003161Governance

Therefore, a unit increase in environmental factors reduces ROE by 0.091392units, whichmeans that the company should not engage in many environmental activities to minimise reduction of ROE. On the other hand, a unit increase in social activities results in a + 0.076055 increase in ROE while a unit increase in governance results in a 0.00316 units growth in ROE. However, other factors represented by the constant affect ROE, with a unitincrease in the other factors resulting in -5.387076 decrease in ROE. Therefore, the firm should focus on governance and social to increase ROE.

EPS Model

Table 6. EBIT Regression Analysis

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.207869	0.139323	1.491992	0.1359
E	-0.016271	0.003751	4.337505	*0.0000
S	0.001026	0.005597	0.183382	**0.0854
G	0.004848	0.004026	-1.204182	*0.0287
LEVERAGE	-0.000405	0.002098	-0.192997	0.8470
LOG_SIZE	0.058370	0.041440	1.408521	0.1592
R-squared	0.017780	Mean dependent var		0.612977
Adjusted R-squared	0.013907	S.D. dependent var		1.738062
S.E. of regression	1.725935	Sum squared resid		3777.182
Durbin-Watson stat	0.327616	J-statistic		4.16E-27
Instrument rank	6			

Significant level at *5% **10%; Dependent Variable: EPS

From the earning per share regression results (Table 6), the equation is as follows:EPS = 0.2078 - 0.0162 Envi + 0.001 Social + 0.0048 Governance

Therefore, a unit increase in environmental factors reduces EPS by 0.0162 units, which means that the company should not engage in many environmental activities to minimise the reduction of EPS. On the other hand, a unit increase in social activities results in a 0.001 increase in EPS while a unit increase in governance results in a 0.0048 unit growth in EPS. However, other factors represented by the constant affect EPS, with a unit increase in the other factors resulting in 0.2078 increase in EPS. Therefore, the firm should focus on governance, social and other factors more since they result in an increase in EPS.

Table 7. EBIT Regression Analysis

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.653174	0.083893	7.785804	0.0000
E	0.002785	0.002259	2.233017	*0.0217
S	-0.002106	0.003370	-2.624850	*0.0532
G	0.001135	0.002424	2.468173	*0.0639

LEVERAGE	0.000427	0.001263	0.338274	0.7352
LOG_SIZE	-0.011763	0.024953	-0.471393	0.6374
R-squared	0.001675	Mean dependent var		0.678595
Adjusted R-squared	-0.002262	S.D. dependent var		1.038090
S.E. of regression	1.039264	Sum squared resid		1369.528
Durbin-Watson stat	0.350998	J-statistic		3.89E-26
Instrument rank	6			

*Significant level at 5%; Dependent Variable: LOG_EBIT

From the earnings before interest rates and taxation regression results (Table 7), the equation is as follows:

EBIT = 0.6531+ 0.0027 Envi - 0.0021 Social + 0.0011 Governance

Therefore, a unit increase in environmental factors increases EBIT by 0.0027 units, whichmeans that the company should engage in many environmental activities to minimize the reduction of EBIT. On the other hand, a unit increase in social activities results in a 0.0021decrease in EBIT while a unit increase in governance results in a 0.0011 units growth in EBIT. However, other factors represented by the constant affect EBIT, with a unit increasein the other factors resulting in 0.6531 increase in EBIT.

5. Discussion

5.1. Objective One: The Impact of the Social Dimension of CSR on CFP

One of the objectives of this research was to determine the impacts of the social dimensionof CSR on the financial performance of the organisation. According to the results of this analysis, the social dimension of corporate social responsibility has an impact on the Returns on Assets, Returns on Equity, Earnings per Share and the Earnings before InterestRates and Taxes of an organisation. The following table shows the results of the analysis on how the social dimension of corporate social responsibility impacts on the four measures of financial performance as used in this study.

The regression analysis shows the unit increase or decrease in either, Returns on Assets, Returns on Equity, Earnings per Share, and Earnings before Interest Rates and Taxes. According to the regression analysis above, a unit increase in social activities in corporatesocial responsibility leads to an increase in Earnings per Share by 0.0162 units, increase inReturns on Equity by 0.07605 units, a decrease in Earnings before Interest Rates and Taxesby 0.0021 units, and a decrease in Returns on Assets by 0.050 units. Therefore, it can be said that the social dimension has a moderate positive impact on the financial performanceof an organisation. On the one hand, it negatively affects the Returns on Assets and Earnings before Interest Rates and taxes, but on the other hand, it helps maximise shareholder valueby improving the Returns on Equity and the Earnings per Shares that the shareholders receive. In this regard, the following conclusions can be made.

These results are consistent with those of studies such as Hernández et al. (2020). Hernández et al. (2020) used cross sectional data from Australia in order to determine the impacts of Environmental, Social and Governance dimensions of corporate social responsibility on the economic performance of organisations. The results showed that there was a moderately positive relationship between the social dimension of corporate social responsibility and the financial performance of organisations.

5.2. Objective 2: The Impact of Environmental Dimension of CSR on CFP

The second objective of this research proposal was to determine the impact that the increase in Environmental dimension of corporate social responsibility has on the financial performance of organisations that operate in the Gulf Cooperation Council. According to the results of the regression analysis, the environmental activities have an impact on the Earnings before Interest Rates, Returns on Equity, Returns on Assets, and Earnings per Share of companies that operate in the Gulf Cooperation Council. The following table shows the beta and error coefficients of the Regression analysis of each of these measuresof the Environmental dimension of corporate social responsibility against the measures of financial performance as adopted from the different regression analyses tables above. TheBeta coefficients show the decrease or increase in the Returns on Assets, the Returns on Equity, the Earnings per share, and the earnings before interest rates and taxes due to a unitincrease in the environmental dimension of corporate social responsibilities for the organisations that operate in the Gulf Cooperation Council. According to the analysis results, a unit increase in the Environmental dimension score has a positive impact on the returns on assets, and results in an increase by 0.023 units. A unit increase in Environmentalactivities has a negative impact on the returns on equity, and results in a decrease of returnson equity by 0.091392 units. A unit increase in the environmental dimension of corporatesocial responsibility results in a positive increase of earnings before interest and taxes, which is an increase of 0.0027 units. A unit increase in the environmental dimension of corporate social responsibility results in a decrease of earnings per share, which is a decrease of 0.0162 units.

From these results, it can be concluded that the environmental dimension of corporate social responsibility has a moderate impact on the financial performance of an organisation. On the one hand it has a positive impact on some measures of financial performance such as returns on assets, and earnings before interest rates and taxes, while it has a negative impact on earnings per share, and returns on equity. These results are consistent with those of studies such as Liu et al. (2021). Liu et al. (2021) used lagged data to determine the relationship that exists between ESG, and financial performance and the results showed a positive correlation between the independent and the dependent variables.

5.3. Objective three: The Impact of Governance Dimension of CSR on CFP

The third objective of this research was to determine the impacts that the governance dimension of corporate social responsibility has on the financial performance of organisations that operate in the Gulf Cooperation Council. According to the results of theregression analysis, the governance dimension of corporate social responsibility has more impact on the financial performance of organisations operating in the Gulf Cooperation Council, compared to the social and environmental dimensions. The following tables show the beta coefficients for the environmental dimension in the case of earnings per share, earnings before interest rates and taxes, returns on assets, and returns on equity. Thetable has been adopted from the four regression tables above.

The Beta coefficients show the decrease or increase in the Returns on Assets, the Returns on Equity, the Earnings per share, and the earnings before interest rates and taxes due to aunit increase in the governance dimension of corporate social responsibilities for the organisations that operate in the Gulf Cooperation Council. According to the analysis results, a unit increase in the governance dimension score has a small negative impact on the returns on assets, and results in a decrease by 0.010 units. A unit increase in governanceactivities has a positive impact on the returns on equity, and results in an increase of returnson equity by 0.00316 units. A unit increase in the governance dimension of corporate socialresponsibility results in a positive increase of earnings before interest rates and taxes, which is an increase by 0.0011 unit. A unit increase in the governance dimension of corporate social responsibility results in an increase of earnings per share, which is an increase of 0.0048 units. From these results, it can be concluded that the environmental dimension of corporate social responsibility has a moderate impact on the financial performance of an organisation. On the one hand it has a positive impact on some measures of financial performance such as returns on assets, while it has a negative impact on earnings per share, and earnings before interest rates and taxes and returns on equity. These results are consistent with those of studies such as that carried out by Tibiletti et al. (2021), which showed that the governance aspect had a higher positive impact compared to the social and environment dimensions of corporate social responsibility. Tibiletti et al. (2021), used cross sectional data in his research.The research showed a positive relationship between ESG and the financial performance of an organisation.

6. Conclusion

The results showed that Corporate Social Responsibility activities have an impact on the financial performance of organisations. It is therefore important thatorganisations in the Gulf consider implementing Corporate Social Responsibilities in theirorganisations, as strategies of improving financial performance as indicated by the resultsof this data. The regression model for earnings per shares shows that social, governance, and other factors in the environment result in an increase in EPS, while environmental dimension of corporate social responsibility leads to a decrease in the earnings per shares. Therefore, thefirms should consider investing in activities geared towards the mentioned factors to achieve a gain in EPS. The constant factors resulting in an increase in EPS means that thecompany should engage in research to identify the unknown factors that increase EPS. Engaging further in these activities will help improve the EPS of the companies.

Companies, policy makers and other interested parties can also learn from the Returns on Assets Regression Model. The regression model shows that the environmental dimension of corporate social responsibility results in an increase in ROA, while the social dimension, governance dimensions and other factors lead to a reduction in ROA. Therefore, the firm should consider more investments in environmental activities. On the other hand, the company should invest in research to identify the other unknown factors represented by theconstant that reduces Returns on Assets. Earnings before Interest Rates and taxes also have some implications for companies operating in the Gulf Council region. The regression model leads to the conclusion that environment, governance and other unconsidered factors result in an increase in EBIT, while social aspects of corporate social responsibility led to a decrease in Earnings before interest rates and taxes. Therefore, the firms should invest in their activities, especially environmental and governance actions due to the high rate if influencing EBIT increments.The company should also perform more research to determine the other factors that influence the gain in Earnings before interest rates and taxes.

The model that represents Returns on Equity is also important when it comes to making decisions regarding CSR, and the Environmental, Social and Governance aspects of CSR.According to the model, social and governance aspects of Corporate social responsibility has a positive impact on the Returns on Equity, while the Environmental dimension of Corporate social responsibility has a negative impact on the returns on equity. Therefore, if a firm wishes to improve its returns on equities, it should involve itself more with the social and governance dimensions of corporate social responsibility. In addition, the company should conduct more research to determine the negative factors that influence returns on assets. Acting on these factors would help to improve the returns on assets evenfurther.

A limitation of the research was finding comprehensive data for all companies that have been listed and operating in the gulf cooperation council. Some of the companies lacked data and have not been included in this research. Nonetheless, the sampling design was randomly stratified and therefore, thedata collected was representative of the entire region under study. Further research should be conducted to determine the barriers that the organisations in the Gulf Cooperation Council region suffer as they try to implement Corporate Social Responsibility. Furthermore, it is important to determine the critical success factors for the engagement of corporate social responsibility in the gulf cooperation council.

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The Impact of Electronic Management on Customer Experience in Vehicle Insurance Companies within the Riyadh Region

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Abstract:

Electronic management and electronic provision of insurance services are considered among the challenges facing the insurance sector in the Kingdom of Saudi Arabia to keep pace with the Kingdom's Vision 2030. Therefore, the reality of this transformation and the factors affecting it were studied by surveying the opinions of insurance policyholders about the quality of electronic services provided by insurance companies and their impact on the extent of their benefit. Regression analysis, effect estimation using structural models, and analysis of variance were used to test the study hypotheses. The results showed that electronic transformation in the provision of insurance services by Saudi insurance companies still requires significant development in terms of comprehensiveness and diversity of services, and that the success of this is linked to the quality of electronic service from an insurance point of view. The most important recommendations were the need for Saudi insurance companies to pay attention to spreading the culture of electronic transformation among their subordinates, expanding the scope of electronic services, and raising their quality in accordance with the priorities revealed by the study, especially with regard to ensuring that the content of the website is up-to-date and comprehensive, and that the use of the website is safe and reliable for the customer. Adequate technical support must be provided to serve customers who benefit from the insurance company's electronic services.

Keywords: Electronic management, electronic transformation, quality, electronic service.

1. Introduction:

Saudi Arabia is not only an enabler of digital transformation but has provided essential foundations for defining and redefining the essence of government duties. This is something that cannot be overlooked, as the world is currently witnessing technology developing dramatically and moving to new heights. In line with Vision 2030, the digital transformation of the Saudi government is an integrated, decisive, and practical strategy aimed at enabling and accelerating government transformation efficiently and effectively. This transformation has been adopted through many e-government programs and projects, with the empowerment and support of various government institutions and bodies. It mainly aims to provide all government services digitally and make them easily accessible. The transformation strategy was designed and implemented in a way that maintains architecture alignment and keeps pace with the digital age, supported by digital skills, capabilities and tools. Vision 2030 provides an effective and well-planned transformation program known as the National Transformation Program, which aims to develop the necessary infrastructure and create an environment that enables the public, private, and non-profit sectors to achieve the goals of Vision 2030. Through the experience of the Corona pandemic, it became clear to everyone the importance of this digital transformation and the extent of its effectiveness. In serving communities in circumstances similar to this pandemic. Among the companies that have turned to digital transformation are vehicle insurance companies in the Kingdom of Saudi Arabia.

The importance of digital transformation is not hidden from everyone and how it has become an indispensable part of our lives. Therefore, companies are turning to complete digital transformation to keep pace with the development, speed, and quality that the customer aspires to. One of its most important steps is the administrative electronic transformation of institutions and companies. Among those companies that aspire to keep pace with this transformation are vehicle insurance companies. Therefore, Saudi insurance companies face many competitive challenges, due to this development and the attempt to keep up with the quality and satisfactory performance provided to customers in the Saudi market. It is noteworthy that Saudi insurance companies are still taking their first steps towards transitioning to providing their services electronically and are also facing a similar slowdown on the part of customers in benefiting from electronic insurance services. This may be due to the prevailing idea among customers that electronic insurance management - as is the case with electronic transactions in general - is fraught with risks. It has become necessary for insurance companies to seek to improve the electronic management services they provide in order to strengthen and build relationships with customers and achieve their satisfaction, which makes the issue of developing and diversifying electronic insurance services and knowing the factors affecting their quality among the aspects that should be paid attention to because of their impact on achieving customers satisfaction. Improving the ability to convert departments electronically and knowing what may hinder this conversion or affect its quality and customer acceptance of it.

Then the study problem can be formulated in the following main questions: -

1- What are the most important dimensions affecting the quality of electronic management and its services in the field of insurance?

2- Is there an impact of the dimensions of the quality of electronic management on customers' desire to obtain insurance services electronically through the websites of insurance companies?

3- Is there an impact of the dimensions of the quality of electronic management on the degree of customer loyalty to the insurance company?

1.1. Study purpose:

1. Assessing Current Status:

- Understand how vehicle insurance companies in Riyadh are using electronic systems.
- Look into how technology is being utilized in managing insurance operations.
- Evaluate the level of digital transformation within the industry.

2. Analyzing Impact on Customer Experience:

- Explore how electronic systems influence how customers perceive their insurance experience.
- Examine if technological tools directly impact how satisfied customers are with their insurance services.
- Investigate whether digital processes enhance the overall customer journey in insurance transactions.

3. Identifying Challenges and Opportunities:

- Discover the hurdles companies face when integrating electronic systems in insurance processes.
- Uncover potential benefits and growth prospects linked to adopting digital management tools in the insurance sector.

- Explore how electronic systems can create new possibilities for improving customer interactions and satisfaction levels.

1.2. Research Objectives:

1 .Evaluating the extent of the spread and functionality of electronic management systems in vehicle insurance companies within the Riyadh region.

2 .Study the impact of applying electronic management systems on customer satisfaction, service quality, and the overall customer experience for vehicle insurance companies in Riyadh.

3 .Identify the main obstacles and potential benefits associated with the integration of electronic management systems in vehicle insurance companies in Riyadh.

1.3. Study Questions:

When we say Electronic Management in insurance companies, some questions come to mind:

1 .How can integrating advanced electronic management systems into vehicle insurance companies within Riyadh revolutionize the industry and redefine customer service standards؟

2 .In what ways do innovative electronic management systems enable vehicle insurance companies in Riyadh to personalize customer interactions, leading to stronger relationships and increased customer loyalty؟

1.4. Research Hypotheses:

- Null Hypothesis (H0): There is no significant relationship between the adoption of electronic management systems and customer satisfaction levels in vehicle insurance companies within the Riyadh region.

- Alternative Hypothesis (H1): There is a positive and significant relationship between the adoption of electronic management systems and customer satisfaction levels in vehicle insurance companies within the Riyadh region.

- Null Hypothesis (H0): The implementation of electronic management systems has no impact on improving service quality and customer experience in vehicle insurance companies within the Riyadh region.

- Alternative Hypothesis (H1): The implementation of electronic management systems positively impacts service quality and enhances overall customer experience in vehicle insurance companies within the Riyadh region.

- Null Hypothesis (H0): There are no significant challenges associated with the adoption of electronic management systems in vehicle insurance companies in Riyadh.

- Alternative Hypothesis (H1): There are identifiable challenges associated with the adoption of electronic management systems in vehicle insurance companies in Riyadh, which affect the enhancement of customer experience and satisfaction levels.

1.5. Theoretical Model:

The theoretical model proposed for the impact of electronic management on customer experience in vehicle insurance companies within the Riyadh region is based on the Service Profit Chain framework. The Service Profit Chain model emphasizes the interconnectedness of internal processes, employee satisfaction, service quality, customer satisfaction, and business performance. In the context of this research topic, the theoretical model can be adapted to focus specifically on how the adoption of electronic management systems influences customer experience within the vehicle insurance industry in Riyadh.

1.5.1. Key Components of the Theoretical Model:

1- Internal Processes: Electronic management systems serve as a tool to streamline internal processes within vehicle insurance companies, including policy management, claims processing, customer communication, and data management. Efficient internal processes enabled by electronic systems are expected to lead to improved operational efficiency and service delivery.

2- Employee Satisfaction: The successful implementation of electronic management systems can enhance employee productivity, job satisfaction, and overall engagement. Empowered employees who have access to effective tools and systems are more likely to deliver high-quality services to customers, leading to improved customer experience.

3- Service Quality: Electronic management systems can contribute to enhancing service quality in vehicle insurance companies by enabling faster response times, accurate information processing, personalized customer interactions, and efficient problem resolution. Improved service quality is crucial for meeting customer expectations and building trust in the insurance provider.

4- Customer Satisfaction: Enhanced service quality and efficient processes supported by electronic management systems are expected to result in higher levels of customer satisfaction. Satisfied customers are more likely to renew their policies, recommend the insurance company to others, and become loyal advocates of the brand.

5- Customer Experience: The culmination of efficient internal processes, employee satisfaction, service quality, and customer satisfaction lead to an enhanced overall customer experience. A positive customer experience encompasses all touch-points between the customer and the insurance company, from purchasing a policy to filing a claim and receiving support services.

6- Business Performance: Ultimately, a positive customer experience driven by the adoption of electronic management systems is expected to have a positive impact on the business performance of vehicle insurance companies within the Riyadh region. Higher customer satisfaction levels, increased customer loyalty, and improved operational efficiency can contribute to revenue growth, market competitiveness, and long-term sustainability.

The proposed theoretical model provides a framework for understanding the complex relationships between electronic management systems, internal processes, employee satisfaction, service quality, customer satisfaction, customer experience, and business performance in the context of vehicle insurance companies in Riyadh. By examining these interconnections, the research can uncover insights into how electronic management influences customer experience and shapes the success of insurance providers in the region.

2. Literature Review:

The study of digital transformation has become the focus of interest for many researchers, especially in light of the presence of many electronic applications that serve the e-commerce and banking industries, which are less used in the insurance sector.

Many studies aimed to study the impact of this transformation and its quality on the service sector: banking, telecommunications and tourism. etc.) as a study (2018 Al-Weshah). Al-Bahi (2016), Tawahir Al-Hawari (2014), Siam (2014), and Haddad Gouda (2004). The study (Sahade & Purani, 2008) also identified privacy, the extent of service availability, advertising and promotion through the system, and processes. Employment) as basic variables for measuring electronic service quality.

The study also showed that those four dimensions that affect the quality of electronic service have a positive impact on customer satisfaction and loyalty. The study (Yen & L, 2008) identified efficiency, privacy, the extent of the company's commitment, and the availability of the system as important dimensions that link the quality of electronic service to customer satisfaction, and the study found (Zeithaml et al., 2002) both ease of navigation (navigation), flexibility, efficiency, and site design. Security is dimensions that have an impact on customer satisfaction. As well as the value of the service from the customer's perspective, and electronic fulfilment.

Durkin et al. (2008) studied satisfaction with banking transactions in the United Kingdom, assessing the relationship between customers' needs for complex products and their choice or preference for face-to-face or online service channels. Their findings represent a strong basis for this study, as these results showed that consumers who need simple products prefer the Internet over direct face-to-face interaction, and that if customers' reliance on using the Internet increases in completing their banking transactions and obtaining electronic services in general, it will increase. It directs them towards using the web to obtain combination products. Durkin et al.'s (2008) study also highlighted some of the factors that push consumers to use electronic services in the financial sectors, such as suitability, degree of security, and developed technology.

Siu & Mon (2005) proposed a set of dimensions to measure customer satisfaction, which were derived Based on Zeithaml et al.'s (2000, 2002) model for measuring the quality of service provided to bank customers via the Internet, it consists of four dimensions: credibility, efficiency, security, and the way of interacting with problems related to using the system.

Sohn & Tadisina (2008) designed a framework to measure customer satisfaction of financial institutions that provide their services over the Internet.

SERVERF and models (Cronin & Taylor, 1992-199), SERVQUAL (Parasuraman et al, 1985). As a model development, they built their hypotheses to explore how consumers evaluate electronic services, considering that service - not price - is the source of long-term competitive advantage in the digital age. The verified measurement contained five final dimensions (trust and communication with customers, ease of use, website functioning, and the content available on it (Sohn & Tadisina, 2008).

The research (Vrechopoulos & Atherinos, 2009) confirmed - although it did not focus on measuring service quality. In general, the layout of the website in the banking sector greatly affects consumer behavior, and the trend towards using electronic banking services is greatly influenced by the structure of the site. Specifically, the web layout affects the user's acceptance of electronic banking services in terms of the benefit gained from using the website, ease of use, and the extent of technology acceptance.

Ho & Lin (2010) tested a new tool to measure the degree of customer satisfaction with electronic services in the banking sector, and five dimensions were proposed: web design, customer service, reliability (the possibility of relying on it, and providing distinctive services.

Ho & Lin (2010) tested a new tool to measure the degree of customer satisfaction with electronic services in the banking sector. Five dimensions were proposed: web design, customer service, reliability (dependability), and providing distinctive services. And the availability of information, and this was consistent with the proposal of (2007, Cristobal et al).

Tarawneh (2012) proposed a framework that included factors of trust, website design, security level, and responsiveness. Customization and ease of use, which are positively related to customers' opinion of electronic banking services.

A group of studies also focused on studying the impact of electronic marketing on customer satisfaction, such as (Al-Halabi, 2017). And the study (Bani Youssef 2016) and the study (Al-Ajal (2016). These studies recommended working to spread awareness of the importance of using electronic services, and the importance of supporting management to develop and improve the quality of electronic services. Many studies have studied electronic marketing and its impact on the insurance market. Some of these studies have found that early predictions of widespread adoption of the Internet as a marketing channel for insurance were inaccurate, and did not lead to the expected disappearance of independent agency systems and employee-led distribution channels, as Dumm & Hoyt (2002) showed that all private activities The marketing mix is practiced in the traditional manner, in addition to the fact that companies do not have an effective and advanced information system that meets all the requirements of e-marketing. Researchers attribute this to the modernity of e-marketing, as in the study of (Al-Zuhairi: Al-Baldawi (2013), the study of (Rabi' (2011), and the study of Abboud: Muhammad (2015). Others of them have concluded that the use of the Internet in various marketing activities affects life insurance sales and investment in general, as in the study of (Hossinpou et al., 2014), and the study of Al-Rubaie Jabbar (2014).

Abu Aara's study (2018) aimed to identify the extent of the impact of information technology in improving the performance of insurance companies, through its impact on sales growth, market share, customer satisfaction, creativity and education. The study also aimed to identify differences in the levels of application Information technology used by insurance companies according to demographic variables: academic qualification, job, number of years of experience, and company name.

The study relied on distributing a questionnaire to cover the practical aspect and to answer the questions of the problem at hand. (98) questionnaires were distributed to the study sample, which is represented in branches. Insurance companies in the city of Ramallah, Palestine. The study used the descriptive analytical approach using the statistical program (SPSS).

The results of the study showed that insurance companies seek to provide the necessary computers and equipment for their employees. To carry out its work with the required speed and accuracy, and its interest in providing accurate and error-free databases, in addition to its endeavor to provide training workshops in order to raise the level of their performance and skills. The results also showed that insurance companies have effective communication networks to link all departments to each other, and to facilitate and facilitate the process of transferring information. It also seeks to develop communications networks on a regular basis and provide means of security and protection for its networks.

The study by Zayed et al., (2019) also aimed to explore as many factors as possible that influence the judgment of insurance applicants and policyholders on digital insurance services, the features or factors that the insurance company should pay attention to, and the factors that will encourage insurance customers to use repeatedly. The advantages of digital insurance, whether when purchasing insurance or managing the policy, and finally determining whether there are any standard practices that can be used to provide guidance in providing insurance services digitally. The study sample represented 32 insurance companies in the Kingdom of Saudi Arabia, and regression analysis methods were used and the impact was estimated. Using structural models and analysis of variance to test the study hypotheses, the results of the study showed that digital transformation in the provision of insurance services by Saudi insurance companies still needs major development in terms of comprehensiveness and diversity of services, and the success of this is linked to the quality of electronic service as perceived by insurance customers.

The study (Abdelkader and Malika (2020)) aimed to know the impact of the new Corona virus (Covid-19) on insurance companies, by analyzing the most important causes of this waste, the direct and indirect factors of its occurrence, and the affected aspects, whether at the level of activities or structures in insurance companies, The sample of the study was the European insurance sector in general and its various branches, and despite the increase in insurance for people in light of epidemics and pandemics, in contrast, other insurance operations such as car insurance, air transport, construction, distribution networks, and others decrease. The study relied on the descriptive analytical approach, which is based to collect data for study and analysis,

for the purpose of studying the subject in all its aspects, and for this purpose, many references and official websites specialized in the field of insurance that are related to the subject of the study were relied upon.

The results of the study showed that the current controversy regarding coverage of epidemics against the backdrop of the current pandemic is a point A shift in all branches of insurance related to accidents and civil liability in insurance companies, as the risk of the pandemic emerging today represents a challenge to humanity, and it is a challenge that the world of insurance must support, especially reinsurance companies. It also showed that all insurance companies were affected by the very significant decline in demand for Insurance due to business interruption in light of companies' general expenses continuing at the same pace, in addition to a shortage in insurance company incomes that will result in a significant shortage of liquidity.

The study (Klonowska et al. 2020) aimed to identify the most important challenges facing the global insurance industry arising from the Corona (Covid-19) pandemic, as the study sample represented the insurance sector in Poland, and the study used the descriptive analytical approach to study the phenomenon of the outbreak of the epidemic in the long term. Long, and the study reached many results, the most important of which are: that the insurance business has been damaged by this epidemic, as well as the decrease in the volume of insurance policies sold to customers; This leads to lower profits and higher risks of inability to pay obligations represented in insuring the risks of the insured. However, in the long term, the study found a positive impact on insurance companies in terms of increasing awareness of the role of these companies in mitigating the negative effects of pandemics and epidemics.

The Babuna 2020 study aimed to show the impact of (Covid-19) on the insurance industry through a case study of the insurance sector in Ghana. The study period extended from March to June during a year where SARS-CoV (MERS) H1N1 (2020) and a parallel comparison with previous epidemics, such as the study by simulating the impact of the epidemic on the insurance industry. The study used personal interviews to estimate the impact of the epidemic. The results of the study showed that the current economic situation is heading towards recession with declining profits in addition to increasing claims due to partial and complete closure in various sectors in Ghana, the insurance industry has witnessed a loss currently estimated at 112 million, and in light of the results, the study recommended that insurance companies seek to adapt to indirect work from remote locations (digital insurance), training and equipping employees to work under social distancing regulations, and enhancing information security protocols.

Al Mutrif Study 2020 This study aimed to investigate the extent of the possibility of digital transformation in public and private universities in the Kingdom of Saudi Arabia, In addition to monitoring the reality of digital transformation between them in light of global crises and disasters. The study found that there are statistically significant differences between public universities and private universities in the extent of the availability of the material elements necessary for digital transformation for the benefit of public universities. There are statistically significant differences between public universities and private universities in the extent of the availability of digital competencies among faculty members for the benefit of workers in the private sector. There are statistically significant differences between public universities and private universities in the possibility of digital transformation of education in light of crises in favor of private universities. It is clear from this that there is a significant effect of the difference in the university education sector on the extent of the possibility of digital transformation of education in light of the current crises.

Study by Al-Balushi et al, (2020) The study discusses the reality of digital transformation in the State of Oman, by knowing the extent of digital transformation within public institutions and evaluating it. The study relied on the descriptive approach and interviews to obtain data. The study concluded the great effort made by those institutions in spreading the culture of transformation among Beneficiaries to increase usage.

Study (Derbala 2020) The study aimed to present a complete unified model for the digital transformation process with the aim of supporting the Egyptian government's efforts in digital transformation, and building a common unified standard among all government agencies and associations responsible for digital transformation, and thus unifying the common concepts used in the digital transformation process, and unifying A methodology for studying, planning and implementing these initiatives to ensure that they achieve the objectives set for them.

Study by Ahmed Abu Zakaria (2016) The study dealt with the level of service performance and its impact on customer satisfaction. The problem of the study was to answer the following question: What is the effect of service quality on customer satisfaction? The study mainly aimed to identify the level of service performance in service institutions in achieving beneficiary satisfaction. The study reached results, the most important of which is that the quality of services positively affects customer satisfaction. There is also a positive relationship between the dimensions of service quality (responsiveness, tangibility and guarantee).

The study concluded with: A set of recommendations, the most important of which is for the organization to provide more accurate and clear services with continuous development of the service and the establishment of training programs for employees.

Study (2010) (Jun & M) the study aims to test the relationship between the level of service performance in its dimensions and internal work satisfaction. The study reached a set of results, the most important of which is that internal customer satisfaction is a motivation for external customer satisfaction, and that the empathy factor is the most influential factor in achieving the level of customer satisfaction. Internal service performance and internal customer satisfaction, in addition to friendly dealing and continuous improvement of the team's work.

Study (Bello 2008) the study aimed to identify the impact of the level of performance of internal services on the behavior of service providers to customers. It was conducted on first-line employees in banks in Greece. The study concluded that workers in those banks prefer to improve their efficiency and general behavior more than others. In order to achieve further improvement in the level of internal services, and when the level of performance of internal services increases, employees improve their overall performance, which helps the organization achieve external quality of services and achieve external customer satisfaction.

Digital transformation (Amin, 2018) Investing in thought and behavior change to bring about a radical transformation in the way of working by taking advantage of technical development to obtain wider and better service. Digital transformation provides huge potential for building effective, competitive and sustainable societies by achieving a radical change in services for various parties, including employees and beneficiaries, while improving their experiences and productivity through a series of proportionate processes, accompanied by reformulating the necessary procedures for activation and implementation.

The level of service performance (Ahlam, 2013) is a set of activities and processes with a utilitarian content inherent in the tangible and intangible elements provided by the service provider that are perceived by the beneficiaries through its utilitarian features and values, which constitute a source of satisfying their current and future needs and desires. It also represents a source of the company's profits from during the exchange relationship between the two parties.

An applied study on the Saudi insurance sector (2019) Digital insurance: It is a digital transformation, that is, the conversion of all insurance services provided by insurance companies to all customers into digital, that is, a commercial company for insurance and speed services.

As the draftsman is the use of computers based on robots or controllers and software in various industrial, commercial and service days in order to ensure the progress of work procedures in an automated, accurate and sound manner and with the least possible error.

3. Research Methodology

3.1. Introduction:

This chapter outlines the research methodology employed in this study to investigate the impact of electronic management on customer experience in vehicle insurance companies within the Riyadh region. It encompasses the research design, target population, sample characteristics, sample size determination, data collection procedures, and method of analysis.

3.2. Research Design:

This study adopts a quantitative research design, utilizing a survey questionnaire to collect data from a representative sample of customers of vehicle insurance companies in the Riyadh region. The quantitative approach allows for the collection of numerical data that can be statistically analyzed to test hypotheses and draw conclusions.

3.3. Population of the Study:

The target population for this study comprises all customers of vehicle insurance companies operating within the Riyadh region. The population is vast and diverse, including individuals and businesses of varying demographics and insurance needs.

3.4. Sample Characteristic:

The sample for this study will be drawn from the target population using random sampling. This sampling method ensures that the sample is representative of the population in terms of key characteristics, such as age, gender, and type of insurance policy.

3.5. Sample Size Determination:

The sample size will be determined using the formula for sample size estimation with a confidence level of 95% and a margin of error of 5%. Based on previous studies and the expected variability in the data, a sample size of 384 respondents is deemed appropriate.

3.6. Data Collections procedures:

Data will be collected through a self-administered online survey questionnaire. The questionnaire will be designed to capture information on customer demographics, insurance policy details, experiences with electronic management systems, and overall customer satisfaction. The survey will be distributed via email and social media platforms to reach a wide range of potential respondents.

3.7. Method of Analysis:

The data collected will be analyzed using SPSS statistical software. Descriptive statistics will be used to summarize the data and provide an overview of the sample characteristics and key findings. Inferential statistics, such as correlation and regression analysis, will be employed to test hypotheses and determine the relationships between electronic management and customer experience.

4. Results and discussion:

Validity and Reliability of the Study:

The study employed a virtual validity meter to ensure the validity and feasibility of the questionnaire. Regarding the stability of the research instrument, Cronbach's alpha coefficient was used to assess the internal consistency and reliability of the instrument. The square root of Cronbach's alpha, which represents the validity coefficient, and the following table shows the internal consistency coefficients of the reliability and validity coefficients.

Table 1 Reliability Analysis

Variables	Cronbach's Alpha	N of Items
The questionnaire	.963	24
Independent variable	.927	12
Dependent variable[i]	.943	12

Source: From the results of statistical analysis

The table shows the internal consistency coefficients (Cronbach's Alpha) for the overall questionnaire, the independent variables, and the dependent variables. A high Cronbach's alpha value indicates good internal consistency and reliability of the measurement instrument.

For the overall questionnaire with 24 items, the Cronbach's alpha value is 0.963, which is considered excellent and indicates a very high level of internal consistency and reliability.

The independent variables, which consist of 12 items, have a Cronbach's alpha value of 0.927. This value is also considered excellent and suggests that the items measuring the independent variables have high internal consistency and reliability.

Similarly, the dependent variables, with 12 items, have a Cronbach's alpha value of 0.943, which is also excellent and indicates high internal consistency and reliability for the items measuring the dependent variables.

Descriptive Statistics:

Table 2 Descriptive Statistics Socio-Demographic Characteristics (Section I in the survey): Absolut (n), relative (%)

	n	%
Gender		
Male	21	21
Female	79	79
Age		
18-24	6	6
25-34	48	48
35-44	31	31
45-54	8	8
55-64	5	5
65+	2	2
Type of vehicle insurance policy		
Comprehensive	59	59
Against others	41	41
Duration of time as a client of the insurance company		
Less than 1 year	23	23
1-3 years	53	53
3-5 years	6	6
5-10 years	14	14
10+ years	4	4
sum	100	100

Source: From the results of statistical analysis

The data presented in the table shows the percentage distribution of the survey participants based on gender, age, type of vehicle insurance policy, and duration as a client of the insurance company. The following can be observed:

- Gender distribution: There is a significant imbalance, with males comprising 79% of the sample and females only 21%.
- Age distribution: The participants' ages ranged from 18 to over 65 years, with a higher concentration in the 25-44 age group at 79%. This distribution may be representative of the majority of insurance company clients.
- Type of insurance policy: The majority of participants, 59%, held comprehensive insurance policies, while 41% had third-party liability insurance only.
- Client duration: More than half of the participants, 53%, had been clients of the insurance company for a period ranging from 1 to 3 years.

Table 3 Frequency distribution of Reliability variables

Variable		Frequency	Percent
Reliability	Neutral	17	17
	Agree	46	46
	Strongly Agree	37	37
	Total	100	100

By looking at the data presented in the table and the bar chart, we can observe the following:

1. There are no "Disagree" or "Strongly Disagree" responses, indicating that all participants had generally positive views towards the reliability of the services.
2. The largest proportion of participants (46%) chose "Agree," followed by 37% who chose "Strongly Agree," and only 17% chose "Neutral."
3. This distribution shows a strong positive evaluation of service reliability, with 83% of participants expressing varying degrees of agreement.

Table 3 Frequency distribution of Reliability variables

Variable		Frequency	Percent
Ease of use	Neutral	12	12
	Agree	44	44
	Strongly Agree	44	44
	Total	100	100

The table and bar chart present data on participants' responses to the "Ease of Use" variable. We can make the following observations:

1. The responses are distributed across three categories: "Neutral" (12%), "Agree" (44%), and "Strongly Agree" (44%).
2. There are no responses in the "Disagree" or "Strongly Disagree" categories, indicating that all participants had a positive or neutral perception of the ease of use.
3. Most participants (88%) expressed some level of agreement, with an equal split between "Agree" (44%) and "Strongly Agree" (44%).
4. Only a small proportion (12%) remained neutral, neither agreeing nor disagreeing with the ease of use.

Table 5 Frequency distribution of Customization variables

Variable		**Frequency**	**Percent**
	Neutral	17	17
Customization	Agree	48	48
	Strongly Agree	35	35
	Total	100	100

The data presented in the table and bar chart display the participants' responses regarding the "Customization" variable. Here are the key observations:

1. The responses are distributed across three categories: "Neutral" (17%), "Agree" (48%), and "Strongly Agree" (35%).
2. There are no responses in the "Disagree" or "Strongly Disagree" categories, suggesting that all participants had either a positive or neutral perception of the customization options offered.
3. The majority of participants (83%) expressed some level of agreement, with 48% selecting "Agree" and 35% selecting "Strongly Agree."
4. Only a small proportion (17%) remained neutral, neither agreeing nor disagreeing with the customization options.

Table 6 Frequency distribution of Content and efficiency variables

Variable		Frequency	Percent
Content and efficiency	Disagree	6	6
	Neutral	12	12
	Agree	48	48
	Strongly Agree	34	34
	Total	100	100

The data presented in the table and bar chart shows the participants' responses regarding the "Content and Efficiency" variable. Here are the key observations:

1. The responses are distributed across four categories: "Disagree" (6%), "Neutral" (12%), "Agree" (48%), and "Strongly Agree" (34%).
2. While the majority of participants (82%) expressed some level of agreement, there is a small proportion that either disagreed (6%) or remained neutral (12%).
3. The largest group of participants (48%) selected "Agree," followed by 34% who "Strongly Agreed."

Table 7 Frequency distribution of Website interface variables

Variable		Frequency	Percent
Website interface	Disagree	2	2
	Neutral	18	18
	Agree	42	42
	Strongly Agree	38	38
	Total	100	100

The data presented in the table and bar chart shows the participants' responses regarding the "Website Interface" variable. Here are the key observations:

1. The responses are distributed across four categories: "Disagree" (2%), "Neutral" (18%), "Agree" (42%), and "Strongly Agree" (38%).
2. The majority of participants (80%) expressed a positive perception of the website interface, with 42% selecting "Agree" and 38% selecting "Strongly Agree."

3. A small proportion of participants (18%) remained neutral, neither agreeing nor disagreeing with the statements related to the website interface.

4. There is a minimal percentage (2%) of participants who disagreed with the positive statements about the website interface.

Table 8 Frequency distribution of Response variables

Variable		Frequency	Percent
Response	Disagree	6	6
	Neutral	19	19
	Agree	43	43
	Strongly Agree	36	36
	Total	100	100

The data presented in the table and bar chart shows the participants' responses regarding the "Response" variable. Here are the key observations:

1. The responses are distributed across four categories: "Disagree" (6%), "Neutral" (19%), "Agree" (43%), and "Strongly Agree" (36%).

2. Most participants (79%) expressed a positive perception, with 43% selecting "Agree" and 36% selecting "Strongly Agree."

3. A moderate proportion of participants (19%) remained neutral, neither agreeing nor disagreeing with the statements related to the company's response.

4. A small percentage of participants (6%) disagreed with the positive statements about the company's response.

Table 9 Frequency distribution of Decision time variables

Variable		Frequency	Percent
Decision time	Strongly Disagree	3	3
	Disagree	3	3
	Neutral	20	20
	Agree	42	42
	Strongly Agree	32	32
	Total	100	100

The data presented in the table and bar chart shows the participants' responses regarding the "Decision Time" variable. Here are the key observations:

1. The responses are distributed across five categories: "Strongly Disagree" (3%), "Disagree" (3%), "Neutral" (20%), "Agree" (42%), and "Strongly Agree" (32%).
2. The majority of participants (74%) expressed a positive perception, with 42% selecting "Agree" and 32% selecting "Strongly Agree."
3. A moderate proportion of participants (20%) remained neutral, neither agreeing nor disagreeing with the statements related to decision time.
4. A small percentage of participants (6%) expressed disagreement, with 3% selecting "Disagree" and 3% selecting "Strongly Disagree."

Table 10 Frequency distribution of Overall satisfaction variables

Variable		**Frequency**	**Percent**
Overall satisfaction	Neutral	21	21
	Agree	49	49
	Strongly Agree	30	30
	Total	100	100

The data presented in the table and bar chart shows the participants' responses regarding the "Overall satisfaction" variable. Here are the key observations:

The responses are distributed across three categories: "Neutral" (21%), "Agree" (49%), and "Strongly Agree" (30%).

Table 11 Descriptive analysis (Mean and S.D):

Mean ± SD	**Variables**
4.20 ± 0.711	Reliability
4.32 ± 0.680	Ease of use
4.18 ± 0.702	Customization
4.10 ± 0.835	Content and efficiency
4.16 ± 0.788	Website interface
4.13 ± 0.787	Response

3.97 ± 0.958	Decision time
4.09 ± 0.712	Overall satisfaction

The table shows the mean scores and standard deviations (SD) for user satisfaction with various aspects of the system. Overall, users reported moderate satisfaction (average mean score of 4.09). Reliability and ease of use were rated highest (mean scores of 4.20 and 4.32, respectively), while decision time received the lowest rating (mean score of 3.97). These findings suggest that the system is generally user-friendly and reliable, but there may be room for improvement in terms of decision-making efficiency.

Regression Analysis:

Table 12 Model Summary

Std. Error of the Estimate	Adjusted R Square	R Square	R	Model
.39354	.664	.668	.817a	Electronic management

Source: From the results of statistical analysis

The regression model indicates that there is a strong association between the “e-management” variable and the customer experience variable.

The coefficient of determination shows that 66.8% of the variance in customer experience can be explained by the variable “e-management”.

Table 13 ANOVA

Sig.	F	Mean Square	df	Sum of Squares	Model	
.000b	196.892	30.494	1	30.494	Regression	Electronic management
		.155	98	15.178	Residual	
			99	45.672	Total	

Source: From the results of statistical analysis

Analysis of variance (ANOVA) indicates that there is a significant effect of e-management on the dependent variable (customer experience).

The F-statistic shows that there is a significant difference between the means in the two groups (with and without electronic management).

A significant value shows that there is a small probability (0.000) that the difference between means is due to chance.

Table 14 Coefficients

Sig.	t	Standardized Coefficients		Unstandardized Coefficients	Model	
		Beta	Std. Error	B		
.181	1.347		.268	.362	(Constant)	Electronic management
.000	14.032	.817	.063	.887	Electronic management	

Source: From the results of statistical analysis

The standardized beta coefficients for "electronic management" are positive and statistically significant, indicating that the variable has a positive impact on customer experience. The beta coefficient for electronic management (.817).

5. Summary of Findings:

Customer opinion survey about the electronic management system of an insurance company. Data were collected from 100 participants (79 males and 21 females).

User satisfaction:

Overall, users expressed satisfaction with the e-management system with 79% agreeing that they were satisfied or very satisfied with their experience.

Positive opinions were noted about ease of use and reliability (46% strongly agreed with both).

There were areas for improvement especially regarding response time (only 32% strongly agreed that the system was responsive).

The electronic management system provides an overall positive experience for users.

There is scope to improve system efficiency and response speed to further enhance customer satisfaction.

This regression model can be used to predict customer experience based on their evaluation of the electronic management system.

5.1. Research Findings:

1- The electronic management system has a significant positive impact on customer experience in vehicle insurance companies within the Riyadh region.

2- The study found high levels of internal consistency and reliability for the survey questionnaire, independent variables, and dependent variables, as measured by Cronbach's alpha.

3- The majority of survey participants were male (79%), aged 25-44 (79%), had comprehensive insurance policies (59%), and had been clients for 1-3 years(%53) .

4- Participants generally expressed positive perceptions regarding the system's reliability, ease of use, customization, content/efficiency, website interface, response time, decision time, and overall satisfaction. However, small percentages disagreed on certain aspects.

5- Regression analysis revealed that electronic management explains 66.8% of the variance in customer experience, indicating a strong association between the two variables.

6- The ANOVA results confirmed that the effect of electronic management on customer experience is statistically significant.

6. Research Recommendations:

1- Insurance companies should continue to invest in and improve their electronic management systems to enhance customer experience and satisfaction.

2- Specific attention should be given to improving the system's efficiency and response speed, as these areas showed relatively lower levels of strong agreement among participants.

3- Regular customer feedback surveys should be conducted to identify areas for improvement and monitor the effectiveness of any changes made to the electronic management system.

4- Insurance companies should consider segmenting their customer base and tailoring their electronic management system to meet the specific needs and preferences of different customer groups (e.g., by age, gender, or type of insurance policy).

5- Future research could explore the impact of specific features or components of the electronic management system on customer experience, as well as investigate the relationship between customer experience and other important outcomes, such as customer loyalty and retention.

6- To gain a more comprehensive understanding of the impact of electronic management on customer experience, future studies could employ a mixed-methods approach, combining quantitative surveys with qualitative interviews or focus groups.

7- Insurance companies should prioritize data security and privacy in their electronic management systems to maintain customer trust and confidence.

8- Regular staff training and support should be provided to ensure that employees are equipped to effectively use and troubleshoot the electronic management system, as well as to provide high-quality customer service.

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Petrographic and Mechanical Analysis of Grano-Diorite Deposits in the Qala Region, Dikundi Province, Afghanistan

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Abstract

This research paper offers a detailed investigation into the petrographic composition and physical-mechanical properties of granodiorites in the Qala area of Dikundi Province. It starts with a geological overview of the region. It examines macroscopic and microscopic petrographic characteristics, paragenetic mineral composition, and critical physical-mechanical properties such as bulk density, water absorption, and uniaxial compressive strength. XRF analysis was also employed for accuracy. The research approach is purely investigative, with samples collected from the Qala area and tests conducted by international standards. These granodiorites' uniaxial compressive strength was approximately 94.02 Mega Pascals, signifying their exceptional structural durability. Additionally, these granodiorites exhibit a specific gravity of 2.57, considered high, and a water absorption rate of about 0.29%, making them highly suitable for construction.

In summary, this academic research comprehensively analyses granodiorites within the Qala region, Dikundi Province. These findings are essential for evaluating the suitability of these granodiorites for various applications, particularly in the construction industry, contributing significantly to our understanding of this geological resource. The research recommends the need for government investment in the granodiorite mining sector, particularly in the Qala deposit. Detailed geological investigations are imperative to harness the full potential of this resource, generate employment opportunities, reduce dependency on stone imports, and explore international markets.

Keywords: Granodiorite, petrographic, composition, spectrometer.

1. Introduction

Afghanistan, characterized by its mountainous terrain, boasts abundant reserves of metallic, non-metallic, and construction materials. Geological surveys and mapping activities have been ongoing in the country for several years. The construction sector, mainly residential development, is rising, driving a pressing demand for construction materials and decorative stones. Additionally, as large-scale residential projects globally continue to flourish, the market for construction materials and decorative stones such as granodiorite, marble, and travertine remains robust. This presents an opportunity for economic growth and investment (England, 2012).

Granodiorite is an igneous rock that occupies a significant place in geology due to its intriguing geological characteristics and practical applications in various fields, particularly construction and engineering (Engidasew, 2014). This literature review aims to provide an overview of granodiorite's key aspects, including its formation, mineral composition, geological occurrences, and industrial uses.

Granodiorite is classified as a plutonic or intrusive igneous rock, forming deep beneath the Earth's surface through magma's slow cooling and crystallization. It belongs to the family of granitic rocks, sharing similarities with granite but exhibiting distinct mineralogical differences (Frost & Frost, 2019). The primary minerals in granodiorite include feldspars, quartz, biotite, and hornblende. This mineral composition imparts unique physical and mechanical properties to granodiorite, making it highly versatile for various applications (Bjorkman, 2017).

Granodiorite deposits can be found worldwide, occurring in various geological settings. They are associated with subduction zones, continental margins, and mountain-building processes (Frisch, Meschede, & Blakey, 2011) in some instances, granodiorite may intrude on existing rocks, leading to the creation of igneous complexes. Notable occurrences of granodiorite can be found in the Sierra Nevada Mountains of the United States, the Andes of South America, and the Himalayas (Day, Moores, & Tuminas, 1985).

Granodiorite exhibits several physical and mechanical properties that render it suitable for diverse applications. These properties include high compressive strength, low water absorption, excellent durability, and resistance to weathering (Alexander & Mindess, 2005). The specific gravity of granodiorite is relatively high, enhancing its suitability for structural and decorative purposes. These attributes make granodiorite preferred for construction materials, monuments, countertops, and sculptures (Khanlari, Heidari, & Momeni, 2012).

Granodiorite's versatility has made it a valuable resource in various industrial sectors. It is frequently employed for building facades, pavements, and structural components in construction due to its strength and aesthetic appeal. Its low water absorption rate ensures its longevity in outdoor applications. In the dimension stone industry, granodiorite is sought after for its ability to be polished to a high sheen, making it a favoured material for countertops and decorative surfaces. Additionally, its durability and resistance to wear make it suitable for heavy traffic areas such as flooring.

Granodiorite is an igneous rock of geological significance and practical importance. Its formation, mineral composition, global occurrences, and advantageous physical-mechanical properties contribute to its wide range of applications, from construction to artistry. Understanding the characteristics of granodiorite is fundamental for harnessing its potential in various industries and appreciating its role in Earth's geological history. As further research and exploration continue, granodiorite's prominence in geological and industrial domains will likely persist.

Furthermore, the declining prices of construction materials and decorative stones in industrialized and developing countries have attracted the attention of local and global private sectors to invest in Afghanistan (Hale & Ali, 2023, pp. SP526-2022). Among the countries, Afghanistan stands out with its abundant, untouched reserves of construction materials and decorative stones, ranking it among the world's resource-rich nations (Barker, 2006) (Ballentine & Sherman, 2003). Given these factors, the development of the construction materials sector has captured the attention of the country's economic market, and substantial investment in these resources becomes a fundamental cornerstone for national economic growth.

While numerous geological studies have been conducted in various fields in Afghanistan, these studies are often inaccessible to local geology students, and many of the reports still need to be explored. Moreover, research has been minimal or nonexistent in several geological sectors, leaving a dearth of detailed documentation in these areas.

1.1. Research Objectives:

Primary Objectives:

1. To examine the geological features of granodiorites.
2. To ascertain the physical and mechanical properties of the granodiorites above.

Secondary Objectives:

1. Can the granodiorites from the Qala area in Dikundi Province be effectively employed as construction materials?

2. What are the benefits associated with the utilization of these granodiorites?

2. Research Methodology:

The research employs a multifaceted approach, combining library research, fieldwork, and laboratory analysis methodologies, to comprehensively investigate the geological and physical-mechanical properties of granodiorite rocks in the Qala area of Dikundi Province, Afghanistan.

2.1. Literature Review and Data Compilation:

The study commences with an extensive review of existing literature and geological data. This phase aims to establish a robust foundation by gaining insights into the geological characteristics and historical context of granodiorite formations in the Qala area. This information serves as a critical backdrop for subsequent research activities.

2.2. Fieldwork:

Fieldwork constitutes a pivotal component of this research endeavor. It entails on-site visits to the Qala area within Dikundi Province to procure representative samples of granodiorite rocks. These field-collected samples are indispensable for conducting various physical-mechanical tests and making direct geological observations.

2.3. Laboratory Analysis:

The collected granodiorite samples undergo a comprehensive battery of physical and mechanical tests within a controlled laboratory setting. These tests include, but are not limited to:

Specific Gravity Measurement: Determining the density of the granodiorite samples.

Water Absorption Assessment: Evaluating the ability of the rocks to resist water infiltration.

Compressive Strength Testing: Assessing the rocks' resistance to axial loads.

Impact Resistance Analysis: Evaluating the rocks' durability in the face of impact.

In addition to these physical tests, an X-ray Fluorescence (XRF) analysis is conducted to ascertain the chemical composition of the granodiorite samples. This analysis provides crucial insights into the elemental composition, further enhancing our understanding of the rock's properties.

By synergizing library research, fieldwork, and laboratory analysis, this research methodology offers a comprehensive approach to unraveling the geological and physical-mechanical characteristics of granodiorite rocks in the Qala area. This holistic investigation equips us with valuable data essential for assessing the suitability of these rocks for various construction applications.

3. Research Subject:

This research focuses on analysing the petrographic composition and investigating the physical-mechanical properties of granodiorites found in the Qala area of Dikundi Province, Afghanistan. The research topic includes the study of mineral composition and paragenetic minerals, physical properties such as specific gravity and water absorption, and mechanical properties including compressive strength and impact resistance.

To accomplish this, multiple samples have been collected from the mines in this area during fieldwork, and their petrographic and physical-mechanical characteristics have been studied in the Ministry of Mines and Petroleum and Kabul Polytechnic University laboratories.

In essence, this research aims to provide a comprehensive understanding of these granodiorites' qualitative and quantitative aspects, including their geological composition and suitability for various applications.

4. Geology of the Region:

Based on previous studies conducted by local and international experts between 1977 and 1987, geological mapping at scales of 1:250,000 and 1:500,000 has been completed in the Helmand tectonic zone (Abdullah et al., 1977), including the Dikundi Province. The rocks studied are part of the Helmand tectonic zone, considered part of the old or pre-Alpine folded zone, and directly border the young Baluchistan-Himalayan collision region. These rocks, consisting of granodiorite, granite, and granitic gneiss, form batholiths in the Qala area and its surroundings. According to previous studies, these rocks are attributed to the Tertiary period, and a portion of these rocks, covering approximately 8.3325 square kilometres, have been mapped, contoured, and studied during the project.

The plutonic rocks in the study area in Qala village have a medium grain size, while in the Ghoochk area, they have a coarse grain size, easily visible to the naked eye. The primary minerals observed in these rocks include plagioclase, biotite, hornblende, orthoclase-type alkali feldspar, pyroxene, and quartz. Sillimanite mineral is secondary in the rock's composition, and the rocks have a granular structure with a hypidiomorphic texture. This composition bears similarities to granodiorites due to the mineral combination.

Natural fractures are visible in these rocks, formed due to various factors, especially contraction and expansion during cooling. Both natural factors and the physical-chemical effects of infiltrating waters play a role in forming these fractures.

These fractures divide the rock mass into irregular polyhedral pieces due to the cooling of the molten rock and the tectonic forces acting on the solidified rock.

5. Petrographic Analysis

Description of Slide W-001:

This slide shows that the granodiorite sample comprises a rich and diverse range of minerals. Here are descriptions of the types of minerals observed in this sample and their respective sizes:

1. Sodium and Potassium Feldspars (Plagioclase and Alkali Feldspars): The slide predominantly contains sodium and potassium feldspars. The size of these minerals varies, with sodium and potassium feldspars ranging from 0.06 to 1.68 mm.
2. Plagioclase: Plagioclase feldspar is present in the sample, with sizes ranging from 0.26 to 3 mm.
3. Quartz (Quartz Crystals with Irregular Shapes): Quartz grains, characterized by irregular shapes, are observed in the sample, with sizes ranging from 0.3 to 0.56 mm.
4. Biotite: Biotite minerals are present in the sample, ranging from 0.04 to 1.94 mm.
5. Hornblende (Amphibole): Hornblende minerals are also seen in the sample, ranging from 0.06 to 1.34 mm.

Accessory minerals in this slide include sphene, zircon, and apatite. Given the mineral composition and textural characteristics, the studied sample can be classified as a plutonic igneous rock, specifically a biotite-bearing granodiorite, due to these minerals' presence and grain sizes. Representation of this sample PPL (Plane polarized light) and XPL (Cross polarized light) is presented in Figure 1.

Fig 1: Slide W-001: Zoom in of 4X.

Table 1: The macroscopic properties of the sample Number W-001.

Sample Number W-001	
Macroscopic properties	
Colour	Gray
Weathering	Average
Porosity	Missing
Specific gravity	2.57
Reaction against acid (HCl)	Missing

Table 2: Geological properties of the sample number W-001

Geological properties	
Sample name	Grano-diorite
Petrographic class	Plutonic igneous rock
Geological formation	Granotoidi Dikundi

Description of Slide W-002:

In this slide, the granodiorite sample primarily consists of various minerals, including sodium and potassium feldspars, plagioclase, quartz, biotite, and hornblende. Here are descriptions of the types of minerals observed in this sample and their respective sizes:

1. Sodium and Potassium Feldspars (Plagioclase and Alkali Feldspars): The slide contains sodium and potassium feldspars, ranging from 0.12 to 1.32 mm.
2. Plagioclase: Plagioclase feldspar is present in the sample, with sizes ranging from 0.16 to 2 mm.
3. Quartz (Quartz Crystals with Irregular Shapes): Quartz grains are observed, characterized by irregular shapes, with sizes ranging from 0.44 to 1.34 mm.
4. Biotite: Biotite minerals are present in the sample, ranging from 0.04 to 1.8 mm.
5. Hornblende (Amphibole): Hornblende minerals range from 0.1 to 1.26 mm in the sample.

Accessory minerals in this slide include zircon. Given the mineral composition and textural characteristics, the studied sample can be classified as a plutonic igneous rock, specifically a biotite-bearing granodiorite, due to these minerals' presence and grain sizes. Representation of this sample PPL (Plane polarized light) and XPL (Cross polarized light) is presented in Figure 2.

Fig 2: Slide W-002: Zoom in of 4X.

Table 3: The macroscopic properties of the sample Number W-002.

Sample Number W-002	
Macroscopic properties	
Colour	Gray
Weathering	Average
Porosity	Missing
Specific gravity	2.57
Reaction against acid (HCl)	Missing

Table 4: Geological properties of the sample number W-002

Geological properties	
Sample name	Grano-diorite
Petrographic class	Plutonic igneous rock
Geological formation	Granotoidi Dikundi

6. Geochemical Analysis:

Geochemistry concerns the Earth's crust's distribution, formation, and abundance of chemical elements. Various analytical techniques and instruments determine the elemental composition and percentage in geological samples. A spectrometer collected four samples from the respective area for geochemical analysis. The results are presented in Table 5.

Elements %	Sample numbers			
	W-002	W-005	W-009	W-0011
Si	17.24	16.98	17.82	25.4
Ca	3.22	4.65	5.19	2.49

Al	2.20	3.33	2.24	2.6
Fe	5.3	4.95	3.91	2.45
K	0.22	1.7	1.71	2.82
Ti	0.5	0.32	0.39	0.26
Mn (ppm)	756	678	748	482
Ba (ppm)	467	231	325	480
S	832	0.12	-	-

7. Physical and Mechanical Tests:

Stones, like soil, often contain pores that can become filled with water under certain conditions, leading to weathering and disintegration of the stones. Additionally, the presence of pores can reduce the compressive and tensile strength of the stones, directly affecting their mechanical properties and quality. Therefore, it is essential to conduct a set of mechanical tests to assess the mechanical properties of stones.

The physical and mechanical properties of the granodiorites from the central area of Dikundi province have been examined in the laboratory of the Ministry of Mines and Petroleum of Afghanistan. The following properties have been determined:

1. Specific Weight (Density): The specific weight of the granodiorite is 2.57, indicating its relatively high density.
2. Water Absorption: The water absorption of the granodiorite is 0.29%, which is considered suitable for granite and granodiorite rocks as it suggests low porosity.
3. Compressive Strength: The granodiorite has a compressive strength of 94.02 MPa, indicating excellent resistance to compression. This makes it suitable for use as a construction material and in infrastructure projects.

A series of mechanical tests have been conducted according to international and ASTM (American Society for Testing and Materials) standards to evaluate the physical and mechanical properties and the suitability of these granodiorites for construction materials and infrastructure. These tests are outlined in Table 6.

No	test	description	percentage
1	Specific gravity and water absorption	Water absorption	0.29%
		Specific gravity	2.57

	according to the (ASTM D-6473)		
2	Compressive strength according to the (ASTM D-6431)	Point load index	94.02 MPs

8. Results and Suggestions:

After analysing and comparing the results of petrographic analysis, XRF analysis, and spectrometry, the following results can be drawn:

1. Petrographic Analysis: The examined rock primarily consists of silicate minerals, mostly feldspars, quartz, biotite, and hornblende. These minerals are typical components of silicic rocks.
2. XRF Analysis: The XRF analysis confirms the high silicon (Si) concentration in the samples, a fundamental component of silicate minerals. Silicon constitutes approximately 16-25% of the analysed elements, further validating the accuracy of XRF analysis and its agreement with petrographic studies. The presence of iron (Fe) in the range of 2.31-5.5% suggests the presence of minerals such as biotite and hornblende in the rocks. Potassium (K) is also detected in the samples, indicating its association with sodium and potassium feldspar minerals. Potassium levels range from 0.22-2.8%.
3. Mechanical Testing: Uniaxial compressive strength testing of the granodiorite samples from the Qala Mountains area yielded a value of approximately 94.02 mega Pascals (MPa). This indicates excellent compressive strength, as it falls within the range of (60-160) MPa, typically associated with granite and granodiorite. Therefore, these granodiorites exhibit high mechanical resistance, making them suitable for various construction and infrastructure applications.
4. Physical Properties: The granodiorites' specific gravity (density) measured at 2.57, which is relatively high and desirable for granite and granodiorite materials. Water absorption is around 0.29%, considered low and favorable for granite and granodiorite, indicating their resistance to water infiltration.

9. Suggestions:

1. The granodiorite mine in Qala, Dikundi Province, is among Afghanistan's best and highest-quality granodiorite deposits. Therefore, the government should seriously consider investing in this sector.
2. Since detailed geological studies have yet to be conducted at this mine, the government must prioritize and allocate resources for comprehensive geological investigations. This will enable us to utilize our resources effectively.
3. The Qala area's granodiorites and all the Dikundi Province's granite mines are considered high-quality and visually appealing. Significant investment in these resources will create numerous job opportunities within the country, reduce the import of low-quality stones from neighbouring countries, and potentially become a valuable export item if marketed globally. It is recommended that the government pays serious attention to this sector.
4. Considering the current capacity and conditions of the country, the Afghan government should focus on small and medium-sized mines, with a particular emphasis on granite and granodiorite deposits. These rocks are easily extractable, do not require complex beneficiation processes, and have a strong market demand. Prioritizing such resources can add to Afghan engineers' experience and expertise while benefiting the national economy.

In summary, investing in the granite and granodiorite mining sector, including the Qala deposit, can significantly contribute to the country's economy, create jobs, reduce imports of low-quality stones, and enhance the skills of Afghan engineers. Therefore, the government needs to give due consideration to this sector.

10. Conclusion:

In conclusion, the comprehensive analysis of the granodiorite samples from the Qala Mountains area provides valuable insights into this resource's geological and economic potential. The convergence of data from petrographic analysis, XRF analysis, mechanical testing, and evaluation of physical properties underscores the significance of the granodiorite deposit in Dikundi Province, Afghanistan.

Petrographic analysis revealed the predominant presence of silicate minerals, characteristic of silicic rocks, while XRF analysis confirmed the high silicon content, aligning with the petrographic findings. The presence of iron and potassium further supported the mineral composition identified through petrographic analysis.

Mechanical testing demonstrated the excellent uniaxial compressive strength of the granodiorite samples, rendering them suitable for a range of construction and infrastructure applications. The high specific gravity and low water absorption values enhance the desirability of these granodiorites for various engineering purposes.

The recommendations highlight the need for government investment in the granodiorite mining sector, particularly in the Qala deposit. Detailed geological investigations are imperative to harness the full potential of this resource, generate employment opportunities, reduce dependency on stone imports, and explore international markets.

Furthermore, focusing on small and medium-sized mines, with a specific emphasis on granite and granodiorite deposits, is a strategic approach. These resources are easily extractable, require less complex processing, and align with market demand. Prioritizing such endeavors benefits the national economy and contributes to the skill development of Afghan engineers.

In summary, spotlighting the Qala deposit, the granite and granodiorite mining sector holds promise for Afghanistan's economic growth, employment generation, and self-sufficiency in stone resources. The government's attention and investment in this sector are crucial steps toward realizing these potential benefits and securing a prosperous future for the country.

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