



Consumer Protection Frameworks by Enhancing Market Fairness, Accountability and Transparency (FAT) for Ethical Consumer Decision-Making: Integrating Circular Economy Principles and Digital Transformation in Global Consumer Markets

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Authors' contributions

This work was carried out in collaboration between both the authors. Author RM designed the study, performed the statistical analysis, wrote the protocol, managed the literature search and wrote the first draft of the manuscript. Author DV managed the analyses of the study. Both the authors read and approved the final manuscript.

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ABSTRACT

This research explores the evolving role of consumer protection laws for enhancing market fairness, accountability, and transparency (FAT) to facilitate informed consumer decision-making within the digital economy. Exploring international standards by The United Nations Guidelines for Consumer Protection (UNGCP), the Organisation for Economic Co-operation and Development (OECD), and the United Nations on Trade and Development (UNCTAD), as well as regional initiatives like the European Commission's, the study investigates circular economy principles for consumer resilience and marginalized groups such as low-income populations and rural communities. Utilizing a normative and exploratory research approach, data is gathered from global policy documents and scholarly sources. Comparative qualitative analysis is conducted to identify standard practices. The significance of adopting consumer protection frameworks to study the intricacies of digital transactions and environmental sustainability and its impact on consumer protection law, which will help citizens make informed decisions. This study highlights innovative strategies, such as the OECD's guidelines for e-commerce and national policies promoting circular economy principles. By exploring case studies from countries like Germany, the Netherlands, China, Japan, India and Oman for circular economy practices and Sweden, the United States, Armenia, Australia and Oman for financial sector improvements, the research provides the framework for improving consumer protection policies globally.

Keywords: Circular economy; consumer protection act; digital transactions; fairness; accountability; and transparency (FAT), OECD, UNCTAD, UNGCP, sustainability.

1. INTRODUCTION

A consumer is the end user of a product or service. A consumer can be an individual or an economic enterprise. Unlike customers, who may purchase products but not necessarily use them, consumers directly utilize the goods or services. For instance, children are consumers while their parents are customers; similarly, when gifts are bought, the purchasers are customers, and the recipients are consumers. In the modern economy, consumers have evolved from passive recipients to tech-savvy decision-makers who demand quality, transparency, and ethical practices, expecting value for their money. Historically, consumer protection began during the Great Depression [1] he emphasizes accurate product information. With globalization, the need for international cooperation and harmonized consumer protection standards became essential. Institutional bodies like the Organisation for Economic Co-operation and Development (OECD) and the United Nations (UN) have developed guidelines to address consumer rights for emerging market challenges [2,3]. This gave rise to Ethical consumption, which promotes a circular economy by encouraging practices that minimize waste and maximize resource efficiency [4,5]. The word circular economy was given by MacArthur E., Zumwinkel, K., & Stuchtey, M. R [6]. To implement the circular economy, we need to observe retailers about their practices, consider

environmental costs, support fair trade, reuse and repair items, and invest ethically [7,8]. In the modern economy, consumer protection must continually adapt to safeguard against unfair practices and ensure market fairness. The evolving nature of the Consumer Protection Act is not restricted to protect consumer rights but also addresses fair digital transactions and environmental sustainability. UNCTAD, UNGCP and OECD these legislative enhancements have expanded consumer protection, incorporating measures to manage digital transactions effectively and promote sustainable practices [9]. The United Nations Guidelines for Consumer Protection (UNGCP), established in 1985 and revised in 2015, provide a comprehensive blueprint for safeguarding consumer rights, fostering ethical business practices, and promoting fair trade across global markets [10]. Internationally, organizations like the United Nations Trade and Development (UNCTAD) have reinforced consumer protection frameworks [11,12]. Regionally, the European Commission's "Strengthening Consumer Resilience for Sustainable Recovery" agenda, adopted in 2020 and projected to continue through 2025, demonstrates a proactive approach to modern challenges, including the COVID-19 pandemic and the shift toward digital and green economies [13]. This agenda integrates environmental and digital protections into consumer rights frameworks to adapt consumer protection for evolving market conditions. The OECD's

guidelines for consumer protection in e-commerce complement these efforts by addressing the digital marketplace challenges [14].

The guidelines of UNCTAD, UNGCP and OECD emphasize transparency, fairness, and security, advocating for consumer protections that meet or exceed traditional commerce. They focus on preventing deceptive marketing practices, implementing data privacy measures [14,9] and ensuring secure online transactions. The OECD guidelines support effective dispute-resolution mechanisms adaptable to the cross-border nature of e-commerce, enhancing global consumer protection [15]. This research systematically assesses how evolving consumer protection laws enhance market fairness and facilitate informed consumer decision-making across various economies. By exploring the adaptation of these laws within the digital economy and assessing their inclusiveness toward marginalized groups, such as low-income populations and rural communities, the research explores case studies from countries like Germany, the Netherlands, China, Japan, India and Oman for circular economy practices and Sweden, the United States, Armenia, Australia and Oman for financial sector improvements, providing the framework for improving consumer protection policies globally.

2. PROBLEM STATEMENT

Due to the growing demand for environmentally sustainable practices and the rise of digital transactions, the Consumer Protection Act's regulatory deficiencies must be investigated to maintain fair market practices and informed decision-making for individuals. This study investigates efficient methods for improving regulatory frameworks and increasing participation for marginalized groups such as low-income populations and rural communities in the digital economy. It explores circular economy practices in Germany, the Netherlands, China, Japan, the EU, India, and Oman, as well as improvements in the banking sector with their amendments in the financial law in Sweden, the US, Armenia, Australia, and Oman.

2.1 Research Questions

1. How have international guidelines influenced the evolution of consumer protection laws in financial digital transactions?

2. What are the key strategies for integrating circular economy principles into consumer protection frameworks and how effective are these strategies?

3. How does consumer protection support the Digital Economy with Fairness, Accountability, and Transparency (FAT)?

4. What elements are vital to make an effective consumer protection policy framework model that ensures Fairness, Accountability, and Transparency (FAT) in a digital economy?

2.2 Methods

This study employs a normative approach to evaluate consumer protection within the digital economy. It uses digital library research to gather data from documents published by international organizations such as The United Nations Guidelines for Consumer Protection (UNGCP), the Organisation for Economic Co-operation and Development (OECD) and the United Nations Trade and Development (UNCTAD), as well as scholarly articles and journals. Through descriptive and comparative qualitative analysis, the research identifies best practices in consumer protection from sources and formulates suggestions for ideal policies. Ethical standards are rigorously maintained to ensure academic integrity. The framework is suggested for enhancing consumer protection policies globally.

3. RESULTS AND DISCUSSION

RQ3: How does consumer protection support the Digital Economy with Fairness, Accountability, and Transparency (FAT)?

A circular economy (CE) is centered on minimizing waste and maximizing resources. It represents a systemic shift from the traditional linear "take-make-dispose" model to one that designs out waste and pollution, keeps products and materials in use and regenerates natural systems. This approach is rooted in designing for longevity, renewability, reuse, repair, refurbishment, recycling and upcycling [16]. The term "circular economy" first appeared in a 1990 study by Pearce and Turner, which addressed the interlinkages between environmental and economic activities [17,18]. They identified a closed-loop material flow in which the financial system operates so that waste is minimized and

materials are continually reused—a concept emphasizes that "everything is an input to everything else" [19]. However, the circular economy's philosophical foundations can be traced back to Kenneth Boulding's 1966 essay "The Economics of the Coming Spaceship Earth" [20]. He introduced the notion of the Earth as a closed system with finite resources and the need for sustainable economic practices. Over time, various related concepts have been developed, such as [21] regenerative design, [21] the performance economy, [22] Cradle-to-Cradle and [23] industrial ecology, all of which contribute to the broader circular economy framework.

3.1 Lesson Learned: A Case Study for the Circular Economy Adaptions

RQ2: What are the key strategies for integrating circular economy principles into consumer protection frameworks and how effective are these strategies?

The concept of the circular economy (CE) has been developed and promoted by several countries, each contributing in various ways to its evolution. However, countries such as Germany, the Netherlands, China, Japan, India, and Oman, for circular economies, have been influential in advancing the implementation of circular economy principles.

Germany has long been a leader in environmental engineering and policies that align with the principles of the circular economy. Its policies on waste management and recycling have been pioneering, contributing significantly to the conceptual and practical frameworks of the circular economy [24]. The Netherlands is well known as a frontrunner in the circular economy. The Dutch government has set goals to become fully circular by 2050, with intermediate targets for 2030. The country has integrated circular economy strategies across various sectors, including business, education and government policies [25]. China has adopted the circular economy as a national policy to enhance environmental sustainability and resource efficiency. Since the early 2000s, China has implemented five-year plans explicitly mentioning the development of a circular economy, starting with the "Circular Economy Promotion Law" enacted in 2009. China's approach has been primarily top-down, aiming to improve industrial processes and reduce environmental impact on a large scale [26,27].

Japan has pioneered developing and implementing concepts like circular economy, mainly through resource efficiency and waste management policies. The Japanese concept of "mottainai" (a sense of regret concerning waste) has long influenced the country's environmental policies. In the early 2000s, Japan introduced the Fundamental Law for Establishing a Sound Material-Cycle Society, focusing on reducing waste generation and promoting recycling [28,29,30,31]. The EU has been crucial in promoting the circular economy across its member states through comprehensive policies and directives. The European Commission adopted the Circular Economy Action Plan first in 2015 and updated it in 2020, setting actions and targets to maintain the value of the economy's products, materials and resources for as long as possible [32]. India increasingly recognizes the importance of adopting circular economy (CE) principles to enhance sustainability and economic growth, especially in its rapidly growing economy and substantial environmental challenges. The country's approach to circular economy (CE) is becoming more structured and integrated into broader economic and environmental policies [33,34,35,36,37]. India launched its Resource Efficiency Policy to promote sustainable and efficient use of natural resources. The policy encompasses a variety of sectors, including critical raw materials, secondary materials and waste recycling, to establish a systematic approach to resource efficiency. As per the study of D. R. Mishra & Varshney [38], Digital transformation is crucial in the circular economy, boosting retail efficiency and profitability. Though its impact varies across sectors, strategies to address inefficiencies are needed. To align with circular economy principles, India revised its plastic waste management rules in 2016. The government has taken initiatives like the Swachh Bharat Mission, primarily a cleanliness and sanitation campaign by promoting the segregation, collection and recycling of waste nationwide. Many smart cities integrate circular economy (CE) principles into their waste management and material recovery strategies to improve urban sustainability. Companies are innovating in recycling, upcycling and sustainable manufacturing processes. The Confederation of Indian Industry (CII) hosts circular economy symposiums. These annual events gather industry leaders, policymakers, and academicians to discuss and promote circular economy practices in India. Academic institutions and think tanks in India are actively researching the circular economy. For example,

the Energy and Resources Institute (TERI) conducts significant research on resource efficiency and circular economy, providing policy recommendations and strategic guidance. India is part of several international dialogues and partnerships promoting sustainable development and circular economy practices. Collaboration with countries like Finland, which has advanced CE policies, helps exchange knowledge and practices that can be adapted.

Oman's approach to embracing circular economy (CE) principles is emerging. There is growing recognition of the importance of sustainability and resource efficiency in supporting economic diversification and environmental protection. The Sultanate is making strides in areas such as waste management, renewable energy and sustainable urban planning, all aligned with a circular economy (CE) principles. Oman's long-term development plan, Vision 2040, includes sustainability as a core principle. The vision aims to diversify the economy from oil dependency and significantly emphasize environmental sustainability and resource management, critical components of the circular economy [39,40]. The Oman Environmental Policy is an established policy that aims to manage environmental resources sustainably, focusing on reducing pollution and enhancing recycling efforts. These policies indirectly support the transition towards a circular economy by promoting more efficient resource use [39,40,41,42]. Oman's Waste Management Strategy has been actively improving its waste management systems, aiming to increase recycling rates and reduce landfill use. Efforts are being made to sustainably manage municipal and industrial waste, including constructing recycling facilities and waste-to-energy plants [43]. Bee'ah, a leading environmental management company in the Middle East, expanded its operations to Oman, where it works on improving recycling and waste management infrastructure and practices [44,45,46]. Oman is investing in renewable energy projects, such as solar and wind power, which contribute to the circular economy by reducing dependence on non-renewable resources and lowering environmental impact. Developing large-scale solar projects like the Ibril solar project underscores this commitment [47]. Given its arid climate, Oman prioritizes efficient water management. Projects to improve water recycling and reuse are crucial in promoting a circular approach to water resource management. Educational institutions in Oman are beginning to incorporate sustainability and

circular economy principles into their curricula. Workshops and seminars are also being organized to raise awareness among businesses and the public about the benefits of circular economy practices [48]. Several companies in Oman are adopting practices that align with the circular economy, focusing on reducing waste, recycling materials and implementing sustainable operations.

3.2 Lesson Learned: Case Study Reflecting the Enhancing Transparency through Consumer Protection Acts in the Financial Sector

RQ1: How have international guidelines influenced the evolution of consumer protection laws in financial digital transactions?

In Armenia, the rapid adoption of digital financial services has prompted the Central Bank of Armenia (CBA) to enhance its supervisory frameworks, mainly focusing on transparency in pricing and terms and conditions (T&Cs). The CBA undertakes continuous monitoring and compliance checks, including receiving consumer complaints, conducting mystery shopping and rigorously assessing digital service offers [49]. Violations by service providers are met with immediate warnings, with subsequent penalties if corrections are not made promptly. Despite these efforts, the lack of competition among providers remains a significant challenge, often leaving consumers with limited choices and fostering a reliance on available services regardless of their dissatisfaction with the terms. Conversely, in Australia, the Australian Securities & Investments Commission (ASIC) leads initiatives to ensure that digital financial services are transparent and consumer-friendly [50]. ASIC promotes the continuous availability of T&Cs through accessible platforms such as social media and online applications, encouraging providers to use plain language and visual aids to simplify complex information. While these efforts make information more accessible, Australia's challenge is ensuring consumers actively engage with this information to make informed financial decisions [51].

In 2024, Oman undertook a significant reform in its financial regulatory framework by establishing the Financial Services Authority (FSA) through Royal Decree 20/2024 [52]. This new regulatory

body was created to streamline and enhance the efficiency of financial oversight by consolidating the previously distributed responsibilities among various authorities, including the Capital Market Authority and roles overseen by the Ministry of Commerce, Industry and Investment Promotion. By centralizing the oversight of capital markets, insurance, accounting and auditing regulation, the FSA aims to ensure more consistent regulatory practices across the financial sector. This consolidation allows for better integrated supervision, improving the enforcement of consumer protection laws, ensuring accuracy in market disclosures and protecting consumers against financial fraud. Additionally, including accounting and auditing under the FSA's purview highlights the importance of transparency and reliability in financial reporting, which are vital for maintaining investor confidence and the market's integrity. The FSA is also expected to enhance its focus on consumer education and support, empowering Omani consumers with the knowledge to make informed financial decisions. This comprehensive approach demonstrates Oman's ability to safeguard consumer interests, stabilize its financial markets through improved regulatory practices and consumer protection measures, and create financial literacy among citizens.

Sweden approaches consumer protection through legislative acts like the Consumer Contract Terms Act and the Electronic Commerce Act. The Swedish Consumer Agency (Konsumentverket, KOV) and the Consumer Ombudsman (Konsumentombudsmannen, KO) primarily enforce these laws [53]. KOV is particularly active in providing consumer education through its 'Hallå konsument' service, which informs consumers about their rights despite not offering legal representation. Sweden does not have a centralized public forum for consumer complaints; these are typically managed through sector-specific agencies and alternative dispute resolution methods such as the Public Board for Consumer Complaints [54]. The arbitration is praised for its flexibility and efficiency but does not accept cases until the consumer has exhausted attempts at resolution with the trader. This model highlights Sweden's commitment to sector-specific regulatory oversight and accessible consumer education, ensuring that consumer protections are targeted and effective. In the US, establishing the Consumers Union in 1928 marked a significant

milestone. In 1962, the U.S. formally defined consumer safety rights. The U.S. Federal Trade Commission (FTC) was established to protect consumers and promote competition, working globally through formal agreements [55]. The FTC, along with agencies such as the Consumer Product Safety Commission (CPSC), addresses a wide array of consumer issues ranging from deceptive advertising practices to the overall safety of products. To educate the public, the FTC offers many resources on avoiding scams and understanding consumer rights, reflecting its proactive approach to consumer education. While the FTC does not directly resolve individual disputes, it collects complaints via its Consumer Sentinel Network to identify and address harmful business practices. The U.S. heavily utilizes arbitration for dispute resolution, which is enforceable by courts and noted for its efficiency.

3.3 The Emerging Trends in Consumer Protection Due to Digital Transformation and AI Regulation in Financial Services

Artificial intelligence (AI) and machine learning are increasingly embedded in financial service processes, such as determining eligibility for loans and credit cards, posing unique challenges in consumer protection. These AI-driven systems, often opaque "black boxes" [56] can inadvertently encode biases into their decision-making processes, potentially leading to unfair outcomes based on gender, race, ethnicity, or religion. The lack of transparency in decision-making complicates efforts to ensure fairness and accountability. Regulatory responses to these challenges vary globally. In the United States, the Federal Trade Commission has issued guidelines advocating transparency about the data and algorithms used, significantly when decisions negatively impact consumers [57,58]. Meanwhile, the European Banking Authority mandates that financial institutions using automated models for credit assessment implement internal policies to detect and prevent biases, ensuring data integrity and decision-making fairness [15]. These measures underscore the pressing need for a regulatory framework that can effectively oversee AI applications, balancing the benefits of technological advancements with the imperative to protect consumer rights and maintain trust in financial markets.

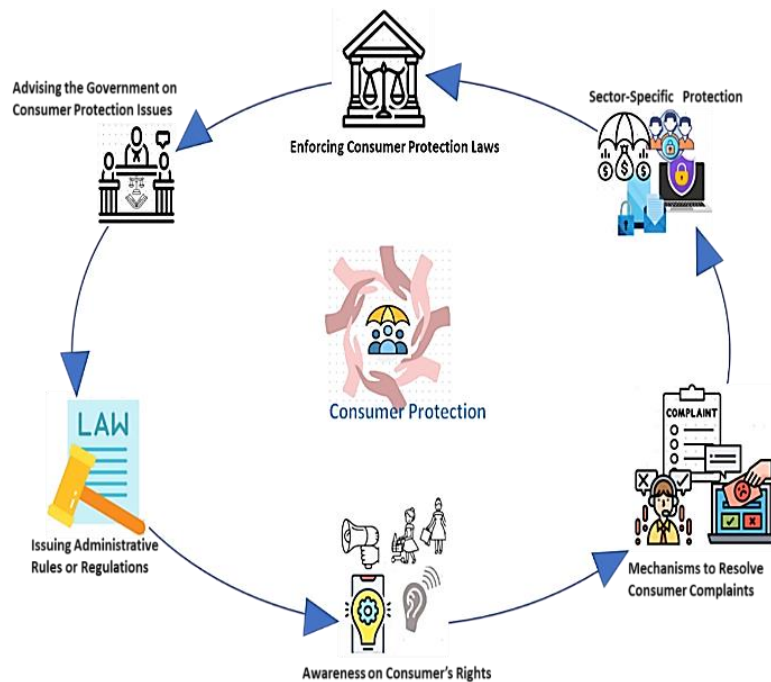


Fig. 1. Proposed model to make the consumer protection policy and frameworks

Source: Made by Author's

The trajectory of AI in financial services is poised for transformative growth, with future trends indicating a shift towards autonomous financial advisors and advanced personal finance management tools. These technological advancements promise enhanced efficiency and personalized services but raise complex regulatory and ethical challenges. As AI systems become increasingly capable of making independent financial decisions, frameworks are needed to ensure fairness and accountability [59]. Ethical considerations [60], particularly protecting consumer data and preventing discriminatory practices, remain paramount. Policymakers and industry leaders are thus tasked with crafting regulations that keep pace with rapid technological innovations and uphold the highest consumer protection standards [61]. By addressing these ethical dilemmas proactively, the financial sector can harness AI's benefits while safeguarding its consumer's integrity and trust, ensuring that the deployment of AI technologies aligns with the broader goals of equity and transparency in financial practices.

4. CONCLUSION

The study reveals that integrating circular economy principles into regulatory frameworks for global consumer protection laws is vital. Consumer protection laws and frameworks have

evolved from basic market fairness principles to advanced frameworks addressing the digital economy. Updated policies promote transparency, educate consumers and adapt to technological and economic changes. Countries like Germany, the Netherlands, China, Japan, India, and Oman have been selected for their diverse approaches to circular economy practices. Germany and the Netherlands are recognized for their advanced environmental engineering and ambitious sustainability goals [24,25]. China's top-down national policy has significantly impacted industrial processes and environmental sustainability [26,27]. Japan's resource efficiency and waste management policies have set an example for sustainable practices [28,29,30,31]. The European Union's comprehensive policy directives offer a cohesive regional approach to circular economy implementation [32]. India's structured approach to integrating circular economy principles into its rapidly growing economy addresses substantial environmental challenges [33,34,62]. Oman's emerging focus on sustainability and resource efficiency demonstrates its commitment to economic diversification and environmental protection [39,40]. In financial sector reforms, countries like Sweden, the United States, Armenia, Australia, and Oman were selected for their unique regulatory approaches. Sweden relies on legislative acts to ensure consumer

protection [53]. The U.S. Federal Trade Commission is crucial in promoting competition and protecting consumer rights through comprehensive regulatory frameworks [55].

Armenia's focus on transparency and competition in digital financial services [49]. Australia's initiatives to ensure consumer-friendly digital financial services emphasize the importance of clear and accessible information [51]. Oman's recent financial regulatory reforms illustrate the benefits of centralizing oversight to enhance consumer protection and market stability [52]. The rapid integration of artificial intelligence in financial services underscores the need for regulatory frameworks to address biases, ensure data integrity, and maintain transparency in automated decision-making processes [56,57,58,15]. The guidelines issued by the U.S. Federal Trade Commission and the mandates of the European Banking Authority exemplify how regulatory bodies can mitigate the risks associated with AI while leveraging its benefits [61]. Policymakers should focus on transparency, education, and adaptability to design effective consumer protection laws that address current and future market challenges. Collaboration among international regulatory bodies can enhance policy effectiveness through shared learning.

5. SUGGESTIONS

The following suggestions are proposed to enhance consumer protection laws in the digital economy. Adopting and enforcing OECD and UNCTAD guidelines is crucial to ensure transparency, security and fairness in digital transactions. Following examples from Germany, the Netherlands and China, integrating circular economy principles into consumer protection frameworks can promote sustainability through recycling and upcycling. To ensure inclusivity, targeted policies should be developed to protect marginalized groups such as low-income populations and rural communities inspired by initiatives in India and Oman. Comprehensive regulations for AI in financial services, modeled after the US FTC and European Banking Authority, must address biases and ensure transparency. Facilitating cross-border dispute resolution through international cooperation mechanisms supported by the OECD will protect consumers in global digital markets. Investing in consumer education programs akin to those by the Swedish Consumer Agency can inform consumers about their rights and protections in

digital transactions. Regular monitoring and adaptation of consumer protection policies are essential to address emerging challenges in the digital economy. Additionally, requiring continuous monitoring of pricing and terms in digital financial services, as practiced in Armenia, will help consumers make informed financial decisions and build trust. These recommendations provide actionable steps to create inclusive and adaptable consumer protection laws for the digital economy.

The proposed model that can be adopted to make the consumer protection policy and frameworks:

RQ4: What elements are vital to make an effective consumer protection policy framework model that ensures Fairness, Accountability, and Transparency (FAT) in digital economy?

Effective consumer protection policies should include key components to ensure comprehensive consumer rights [63]. Authorities must enforce laws, monitor practices, and act against violations [15]. Agencies need the power to issue detailed regulations to adapt to new challenges [9]. Advising the government on emerging trends and policy updates is essential [13]. Educating consumers through campaigns and programs promotes informed decision-making [61]. Mechanisms to resolve consumer complaints fairly and efficiently are crucial [10]. Sector-specific protections in areas like financial services ensure targeted oversight [53]. Based on the given elements, a framework is created to formulate the consumer protection law, which can safeguard consumer rights and promote market fairness [64-69].

6. FUTURE RESEARCH

Future research should focus on integrating circular economy principles into consumer protection frameworks within digital transactions and the gig economy, particularly emphasizing marginalized groups such as low-income populations and rural communities. The role of AI regulation in financial services, judicial services, hospitality, and retail sectors needs to understand its implications for consumer rights. Comparative analyses of international guidelines and national policies will help identify best practices and areas for improvement. This future research will ensure that consumer protection laws continue to evolve in line with technological

advancements, digital transformation and dynamic market conditions.

DISCLAIMER (ARTIFICIAL INTELLIGENCE)

Author(s) hereby declare that generative AI technologies such as Large Language Models, etc. have been used during the writing or editing of manuscripts. This explanation will include the name, version, model, and source of the generative AI technology and as well as all input prompts provided to the generative AI technology.

Details of the AI usage are given below:

1. Grammarly for proofreading
2. Canva for making the picture diagram
3. Copilot for understanding the circular economy, and Royal Decree of the Finance for Oman

ETHICAL APPROVAL

As per international standards or university standards written ethical approval has been collected and preserved by the author(s).

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COMPETING INTERESTS

Author has declared that no competing interests exist.

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