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"Driving sustainability in reverse logistics: The interplay of environmental, economic, social factors Moderated by organization culture"

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Abstract

The retail industry in Pakistan, notably in Rawalpindi and Islamabad, plays a key role in the country's economy. Sustainable procurement incorporates social, environmental, and economic concerns to ensure that purchase decisions consider the larger impact on people and communities.

This study analyzes the effects of procurement sustainability on reverse logistics within this sector, concentrating on the moderating function of organizational culture. The research analyzes the linkages between environmental, economic, and social procurement sustainability and reverse logistics, as well as how corporate culture influences these relationships.

The primary data were collected through a standardized questionnaire and analyzed using SPSS. The findings demonstrate that environmental, economic, and social procurement sustainability considerably and favorably affect reverse logistics. Additionally, organizational culture has a significant moderating impact, strengthening the impact of sustainablility on reverse logistics.

These observations underscore the need of establishing a supportive organizational culture to realize the benefits of sustainable procurement in reverse logistics within the retail business in Pakistan.

Keywords: environment procurement sustainability, economic procurement sustainability, social procurement sustainability, reverses logistics, organization culture, retail industry etc.

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Chapter 1: Introduction

1.1. Background of the Study:

Reverse logistics, intimately linked with the difficulties of product returns, recycling, and trash management, acts as a crucial component within modern supply chain management. While standard logistics channels focus on the linear flow of commodities from suppliers to consumers, reverse logistics navigates the reverse route, comprising the movement of products from consumers back to suppliers or other points of origin. This dynamic process, particularly pronounced within the retail business, gains heightened significance due to its impact on customer happiness, environmental sustainability, and operational efficiency (Chopra & Meindl, 2019)

Within the retail sector, the successful management of reverse logistics has arisen as a strategic priority for firms attempting to reconcile opposing objectives of profitability and sustainability. The intricacy of reverse logistics transcends beyond basic logistical activities, covering a variety of environmental, economic, and social elements. Environmental challenges, such as carbon emissions, trash generation, and resource depletion, underline the need of adopting eco-friendly practices throughout the supply chain. Economic pressures, including rising operational expenses and intensifying competition, need the optimization of resource usage and value recovery from returned items .Moreover, social expectations about ethical sourcing, fair labor methods, and community engagement further complicate the picture of reverse logistics operations (Letunovska et al., 2023)

Amidst these multiple problems, corporate culture emerges as a significant moderator that determines the success of sustainability programs within reverse logistics. Organizational culture, characterized by common values, beliefs, and norms, exerts a tremendous influence on decision-making processes, employee behavior, and overall organizational performance. A culture that values sustainability provides an atmosphere suitable to innovation, collaboration, and continual development in reverse logistics techniques (Carter et al., 2020).

Against this backdrop, this study starts on a quest to uncover the delicate interplay of environmental, economic, and social elements controlled by organizational culture within the arena of reverse logistics sustainability in the retail business. By going into the depths of this complex terrain, the research attempts to find insights that might educate strategic decision-making, foster operational excellence, and pave the path for a more sustainable future in retail supply chains. Join us as we go on this trip to investigate the intersection of reverse logistics, sustainability, and organizational culture, where obstacles become opportunities and innovations determine the route forward.

1.2. Operational definitions:

1.2.1. Environmental Procurement Sustainability:

“Environmental procurement sustainability is the ability to preserve and safeguard the natural environment throughout time through suitable practices and laws,serving present requirements without affecting the availability of resources in the future.” (Lăzăroiu et al., 2020)

Environmental procurement sustainability emphasizes the adoption of techniques and technologies that reduce unfavorable environmental impacts throughout the retail supply chain. It comprises methods such as eco-friendly sourcing, energy-efficient operations, and waste reduction activities. Within the retail sector, the application of environmental procurement sustainability practices is crucial in lowering environmental footprints, increasing resource efficiency, and satisfying evolving consumer expectations for eco-conscious products and services.

1.2.2. Economic Procurement Sustainability:

"Economic sustainability is the strategy whereby economic operations are handled in such a way as to protect and promote long-term economic well-being. In practice, it tries to create a balance between economic growth, resource efficiency, social equality and financial stability” (Brooks et al., 2020)

Economic procurement sustainability focuses on creating economic viability and resilience within the retail supply chain. This means optimizing cost-effectiveness, encouraging fair labor practices, and enhancing supply chain resilience against economic disruptions. By focusing economic procurement sustainability, retailers in Pakistan may enhance their

competitiveness, create equitable economic possibilities for stakeholders, and handle volatile market

1.2.3. Social Procurement Sustainability:

"Social procurement is a practice that focuses on using procurement operations to provide social and economic objectives beyond the typical acquisition of goods and services. It entails designing and implementing procurement strategies that reflect social and environmental considerations, such as supplier diversity, working conditions, and environmental sustainability." (Troje & Andersson, 2021)

Social procurement sustainability relies on sustaining ethical labor standards, increasing community engagement, and advancing social welfare within the retail ecosystem. It comprises activities such as fair trade practices, employee welfare programs, and community development projects. In the Pakistani retail industry, the incorporation of social procurement sustainability efforts is crucial for encouraging inclusive growth, cultivating positive relationship.

1.2.4. Organizational Culture:

According to (Robbie & Katanga, 2020) "Organizational Culture is how organizations do things." According to Richard Perrin, "Organizational culture is the sum of values and rituals that serve as a glue to integrate the organization's members and make continuous growth. It plays a vital role as a moderator in the implementation and efficacy of environmental, economic, and social procurement sustainability policies within retail operations. A healthy corporate culture characterized by values of openness, accountability, and innovation can allow the adoption of sustainable practices, encourage employee engagement, and develop a culture of continuous improvement within retail firms in Pakistan.

1.2.5. Reverse Logistics:

RL is a word often used to indicate to role of logistics in product returns, decreased supply, recycling, and reuse of materials replacement, removal of waste, reprocessing, maintenance and remanufacturing .Reverse logistics is a procedure targeted to the purposes of the reverse flow of items. While conducting RL, task retailers are at the starting point, and they play a very significant function.(Jha et al., 2022)

Reverse logistics, comprising procedures such as product returns, refurbishing, and recycling, acts as the dependent variable in this study. It reflects the efficiency and effectiveness of sustainability-driven practices within the retail supply chain, highlighting the extent to which environmental, economic, and social procurement sustainability initiatives contribute to optimizing resource utilization, minimizing waste, and enhancing overall supply chain sustainability performance.

1.3. Research gap:

Identifying and filling research gaps is vital for advancing scholarly inquiry and producing meaningful additions to the current body of knowledge. In the framework of this study on reverse logistics sustainability in the retail business, several various types of research gaps appear, each presenting prospects for additional exploration and theoretical growth. These gaps span theoretical, contextual, and methodological dimensions, shining light on areas where existing literature may be insufficient, inconsistent, or missing in empirical evidence.

One significant gap is to the need for a comprehensive framework that incorporates environmental, economic, and social components of sustainability within the context of reverse logistics in the retail business. While existing research offers insights into each of these elements individually, there is a shortage of holistic frameworks that capture the interdependencies and trade-offs inherent in sustainable reverse logistics methods (Shekarian et al., 2022) A comprehensive theoretical framework would provide a structured lens through which researchers and practitioners may examine and address sustainability concerns in reverse logistics operations, supporting more informed decision-making and strategy formulation.

Another gap arises from the little empirical study investigating the specific difficulties and prospects of reverse logistics sustainability within the retail business in poor countries, such as Pakistan and other. Much of the existing literature on reverse logistics sustainability is based on studies undertaken in wealthy countries, where regulatory regimes, infrastructure capacities, and consumer habits may differ dramatically from those in poor economies (Letunovska et al., 2023)As such, there is a need for context-specific research that analyzes how environmental, economic, and social issues intersect within the unique context of the retail industry in Pakistan, thereby generating insights that are relevant and applicable to practitioners operating in comparable environments.

The other gap which I noted comes from the restricted use of quantitative research methodologies in evaluating reverse logistics sustainability, notably within the retail industry. While qualitative studies provide useful insights into the attitudes, views, and actions among stakeholders involved in reverse logistics operations, quantitative approaches offer opportunity for statistical analysis and generalization of findings .However, the majority of extant research in this subject relies primarily on qualitative approaches on reverse logistics in manufacturing and construction (Chileshe et al., 2016), with very few studies applying quantitative methodologies to analyze the links between environmental, economic, and social issues in reverse logistics sustainability. Closing this methodological gap necessitates the adoption of rigorous quantitative research methodologies, such as surveys and statistical modeling, to strengthen the empirical rigor and robustness of study findings.

By addressing these theoretical, contextual, and methodological shortcomings, future research attempts in reverse logistics sustainability can contribute to a more comprehensive understanding of the dynamics at play within the retail business. Through the integration of theory, empirical data, and methodological rigor, academics may enhance knowledge in this subject, inform policy and practice, and drive positive change towards more sustainable supply chain processes.

1.4. Problem statement:

In the retail industry of Pakistan handle product returns and recycling effectively, which is known as reverse logistics. Nowadays, firms are pushed to buy items in a method that considers the economy, environment, and society, making sure they're sustainable. However, we don't understand these sustainable shopping practices effect reverse logistics in Pakistani retail.

Also, the way a company's culture affects these sustainable practices and their impact on reverse logistics isn't extensively examined. A company's culture - like its values and beliefs - can either aid or impede sustainable buying attempts(Saruchera & Asante-Darko, 2021). That's why it's crucial to work out how a company's culture affects the connection between sustainable buying and reverse logistics in Pakistan's retail business and industry. This research intends to fill this vacuum by looking at how economic, environmental, and social sustainability in buying patterns effect reverse logistics in Pakistani retail. We also want to see how a company's culture affects this relationship. By understanding these links, we may offer important recommendations to retailers, legislators, and others who wish to make Pakistani retail more sustainable and efficient.

“So the problem statement is that how economic, environmental, social procurement sustainability will affect the reverse logistic in retail industry in Pakistan when moderated by organization culture”.

1.5. Research objective:

The main objective of this is to measure the effect between reverse logistic and economic, environment and social procurement sustainability on retail industry of Pakistan. So the research objectives are:

RO1: Examine the impact of economic procurement sustainability on reverse logistics in Pakistan's retail industry.

RO2: Analyze the impact of environmental procurement sustainability on reverse logistics in Pakistan's retail industry.

RO3: Investigate the impact of social procurement sustainability on reverse logistics in Pakistan's retail industry.

RO4: Explore the moderating role of organizational culture between economic procurement sustainability and reverse logistics in Pakistan's retail industry.

RO5: Assess the moderating role of organizational culture between environmental procurement sustainability and reverse logistics in Pakistan's retail industry.

RO6: Evaluate the moderating role of organizational culture between social procurement sustainability and reverse logistics in Pakistan's retail industry.

1.6. Research questions:

RQ1: How does economic procurement sustainability impact reverse logistics in Pakistan's retail industry?

RQ2: In what ways does environmental procurement sustainability affect reverse logistics in Pakistan's retail industry?

RQ3: What influence does social procurement sustainability have on reverse logistics in Pakistan's retail industry?

RQ4: In what manner does organizational culture moderate the relationship between economic procurement sustainability and reverse logistics in Pakistan's retail industry?

RQ5: How does organizational culture influence the moderation between environmental procurement sustainability and reverse logistics in Pakistan's retail industry?

RQ6: What role does organizational culture play in moderating the relationship between social procurement sustainability and reverse logistics in Pakistan's retail industry?

1.7. Purpose of the study:

The goal of this research is to examine the impact of procurement sustainability in terms of economic, social, and environmental factors on reverse logistics in Pakistan's retail sector, with a particular emphasis on Rawalpindi and Islamabad. It intends to explore how corporate culture moderates this relationship, providing insights into ways for increasing sustainability practices and optimizing reverse logistics operations in the retail industry.

1.8. Significance of study:

The value of this study rests in its ability to give significant insights to many stakeholders. It offers academic development by addressing a vacuum in the existing literature about sustainable SCM specifically within the context of the Pakistani retail sector. Practically, the findings can inform retailers' decision-making processes, aiding in optimizing supply chain operations and saving costs. Policymakers can apply these insights to establish policies that support sustainable behaviors in order to achieve good results in the organization.

Moreover, the study underlines the importance of company culture in regulating the relationship between sustainable procurement methods and reverse logistics outcomes, hence leading efforts to develop supportive cultural contexts inside retail firms. Ultimately, the study's conclusions have the potential to bestow competitive advantages to retailers by aligning with consumer desires for ecologically and socially responsible operations, contributing to brand recognition, customer loyalty, and overall market competitiveness.

1.9. Scope of study:

This study looks into how reverse logistics are affected by sustainable procurement practices in terms of the economy, society, and environment in Pakistan's retail sector, particularly in Rawalpindi and Islamabad. The research also explores how organizational culture moderates this link.

Chapter2: Literature Review

The retail industry in Pakistan has witnessed substantial expansion and transition in recent years, emerging as a critical sector supporting economic development and customer engagement. With a population over 200 million and a developing middle class, Pakistan presents a lucrative market for merchants, both domestic and foreign. The retail scene in the country contains a varied range of formats, including traditional markets, modern supermarkets, hypermarkets, and e-commerce platforms, catering to the diverse requirements and interests of people across urban and rural locations. Amidst this tremendous expansion, the concept of sustainability has gained hold within the retail industry, mirroring global trends towards ecologically responsible and socially conscientious business practices. At the heart of sustainability in retail lies the concept of reverse logistics, which comprises the recycling, refurbishment, and disposal. Reverse logistics plays a critical role in eliminating waste, decreasing environmental impact, and improving resource utilization throughout the product lifecycle.

2.1. Theoretical underpinning:

Resource-Based Theory asserts that a firm's internal resources and capabilities are important to gaining and preserving competitive advantage. This idea indicates that resources that are precious, uncommon, distinctive, and not replaceable can enable a corporation to outperform its competitors. Physical assets like capital and equipment, intangible assets such as copyrights and brand recognition, and organizational capabilities like experience and processes are considered important resources. By efficiently using these distinctive characteristics, organizations can produce tremendous value and establish a solid market position.

2.2. Sustainability in reverse logistics:

The relevance of sustainability in reverse logistics is underlined by various considerations. First and foremost, environmental problems, such as climate change, resource depletion, and pollution, have heightened awareness about the need for eco-friendly supply chain operations. Governments and regulatory organizations are gradually implementing stronger environmental laws, pushing enterprises to adopt sustainable ways to their operations, including reverse logistics procedures. Sustainability has gained substantial attention as a strategic concern among corporations (Chen et al., 2019).

Furthermore, customer preferences are evolving towards companies and retailers that demonstrate a commitment to sustainability and ethical business practices. In Pakistan, like elsewhere, consumers are becoming more environmentally conscious and socially aware, seeking products and services that correspond with their values and views. Retailers who prioritize sustainability in their reverse logistics operations can gain a competitive edge, increase brand reputation, and promote consumer loyalty.

Against this backdrop, this literature study intends to explore the mechanisms of driving sustainability in reverse logistics within the retail business of Pakistan. The examination will dig into several facets of sustainability, including environmental issues, economic ramifications, social responsibility, and the moderating role of business culture. By reviewing existing research and empirical evidence, the review intends to provide insights into best practices, difficulties, and possibilities for promoting sustainability in reverse logistics within the Pakistani retail sector.

The reverse of the relationship has not gotten significant attention among industry and academia. Thus, attention has mostly focused on how reverse logistics contributes to sustainability(Alnoor et al., 2019).In the ensuing parts, the study will go into each of these dimensions, giving a complete analysis of the literature and putting light on major themes and trends affecting the sustainability agenda in Pakistan's retail industry. Through this research, the review hopes to contribute to a fuller understanding of the importance of sustainability in reverse logistics and its implications for the future of retailing in Pakistan.

2.3. Environmental procurement sustainability in Reverse Logistics:

Environmental sustainability in reverse logistics is driven by the understanding of the severe environmental impacts associated with standard linear supply chains. The linear model, defined by a one-way flow of products from manufacturers to consumers and subsequent disposal, contributes to resource depletion, pollution, and greenhouse gas emissions (Shekarian et al., 2022). In contrast, reverse logistics offers potential to close the loop and create a more circular economy, where products are recycled, refurbished, or remanufactured, lowering the need for virgin materials and minimizing waste (Mahmood et al., 2020).

In Pakistan, waste management and recycling techniques are becoming increasingly crucial factors for merchants as they aim to minimize their environmental footprint. With fast urbanization and population expansion, solid waste output is on the rise, providing

considerable issues for municipalities and local authorities. In this context, merchants play a significant role in managing waste through effective reverse logistics procedures.

Retailers in Pakistan are exploring several techniques to boost trash management and recycling in their reverse logistics operations. This includes developing collection procedures for returned products, sorting recyclable materials, and cooperating with recycling facilities or third-party logistics providers to ensure proper disposal and recycling of products. Initiatives like as take-back schemes, where consumers can return products at the end of their lifecycle for recycling or disposal, are also gaining support among merchants in Pakistan .The notion of green supply chain management (GSCM) is crucial to promoting environmental sustainability in reverse logistics within the retail business of Pakistan. GSCM stresses the integration of environmental issues into all elements of the supply chain, from product design and procurement to production, distribution, and end-of-life management (Offei et al., 2023). In the Pakistani context, research on GSCM has underlined the significance of collaboration and partnerships among stakeholders, including suppliers, manufacturers, retailers, and consumers, to achieve sustainable goals. (Liu et al., 2020)

Studying the deployment of GSCM principles in Pakistani retail enterprises have discovered numerous strategies for decreasing environmental effect in reverse logistics. These include optimizing transportation routes to limit fuel use and emissions, adopting eco-friendly packaging materials, and investing in energy-efficient systems for warehousing and distribution. Additionally, research has stressed the need for legislative assistance and incentives to encourage enterprises to embrace sustainable practices and overcome challenges such as lack of awareness, cost concerns, and infrastructural limits (Ali et al., 2020).

Several case studies and empirical research provide insights into the effectiveness of environmental sustainability initiatives in reverse logistics within the retail business of Pakistan. These studies show effective solutions, obstacles faced, and lessons learned by merchants in their attempts to increase environmental sustainability.

Overall, environmental factors are crucial to driving sustainability in reverse logistics within the retail industry of Pakistan. By implementing green supply chain strategies, streamlining waste management and recycling operations, and leveraging partnerships and collaborations, merchants can contribute to environmental conservation and establish a more sustainable future for Pakistan.

2.4. Economic procurement sustainability in Reverse Logistics:

Sustainability in reverse logistics not only implies environmental benefits but also has substantial economic ramifications for the retail industry. This section addresses the economic implications of sustainable reverse logistics, concentrating on cost savings, resource usage, and value creation.

Efficient procedures can lead to substantial cost savings and improved resource utilization for merchants. By improving the management of product returns, merchants can cut transportation expenses, minimize inventory holding costs, and streamline inventory management procedures. Moreover, sustainable reverse logistics activities, such as remanufacturing and refurbishment, can unleash additional economic value by extending the lifecycle of items and minimizing the need for new raw materials. Procurement sustainability strongly affects reverse logistics, economic viability, and customer loyalty (Zinn & Goldsby, 2019)

Research reveals that investments in sustainable reverse logistics efforts might offer large benefits for retailers. A study by Hsu et al. (2019) indicated that enterprises employing sustainable reverse logistics strategies achieved gains in operational efficiency, reduced expenses, and better profitability. By adopting closed-loop supply chain systems and embracing circular economy principles, merchants may transform trash into useful resources, so producing economic value while minimizing environmental impact.

Cost savings are a fundamental driver of sustainable reverse logistics projects in the retail business and if such conversation takes place it usually concerns primarily transaction cost and potential price surcharges for green items at the level of a single purchase (Halonen, 2021).

Efficient reverse logistics procedures enable merchants to recover and reuse valuable materials, components, and goods, hence decreasing the requirement for new production inputs. This not only saves procurement prices but also conserves natural resources and reduces trash output. Studies have shown that applying sustainable reverse logistics strategies, such as product remanufacturing and refurbishing, can result in large cost reductions and resource utilization gains for retailers (Condeixa et al., 2022)

In addition to direct cost reductions, sustainable reverse logistics efforts can offer indirect economic benefits for merchants. For example, by boosting customer satisfaction and brand

reputation through appropriate product disposal and recycling methods, merchants can enhance customer loyalty and encourage repeat business. Moreover, by complying with environmental standards and exhibiting corporate social responsibility, merchants can avoid risks associated with non-compliance and reputational damage, so maintaining their long-term financial success (Mishra et al., 2023)

Remanufacturing and refurbishment are significant tactics adopted by retailers worldwide to derive economic value from returned products and end-of-life assets(Cunha et al., 2018). These methods entail the disassembly, repair, and reassembly of products to restore them to a like-new condition, so extending their usable life and producing value for merchants and consumers alike. In the context of sustainable reverse logistics, remanufacturing and refurbishment give potential to cut costs, enhance product quality, and meet consumer demand for economical and ecologically friendly products.

Studies have demonstrated that remanufacturing and refurbishing processes can produce major economic benefits for merchants worldwide. For example, a case study of a leading retail chain may demonstrate how the deployment of remanufacturing processes for returned electronic items has resulted in cost savings, enhanced product quality, and higher customer happiness. By leveraging modern technologies and new business models, merchants can benefit on the economic opportunities given by sustainable reverse logistics methods, ultimately driving profitability (Julianelli et al., 2020)

2.5. Social procurement sustainability on reverse logistics:

Social responsibility and stakeholder engagement are essential components of sustainable reverse logistics strategies in the retail industry. This section discusses the relevance of social responsibility, the role of stakeholders, and techniques for effective participation in the context of reverse logistics operations. social sustainability principles are rapidly being included into organizations' operations and supply chain management plans, making it a crucial component(Hervani et al., 2022)

Social responsibility refers to the ethical duty of corporations to act in a manner that considers the well-being of society and stakeholders. In the context of reverse logistics, social responsibility involves a range of issues, including labor practices, community involvement, and ethical treatment of suppliers and customers. By addressing social responsibility in reverse logistics operations, retailers can strengthen their reputation, create confidence with stakeholders, and contribute to beneficial social outcomes (Abazov, 2021).

In Pakistan, where labor rights and social welfare are key concerns, retailers play a crucial role in encouraging fair and ethical practices throughout their supply chains. This involves guaranteeing safe and fair working conditions for individuals involved in reverse logistics activities, as well as engaging with local communities to solve social concerns and promote sustainable development projects. By incorporating social responsibility concepts into their reverse logistics processes, retailers can demonstrate their commitment to ethical business practices and generate goodwill among stakeholders (Kishan & Bhutto, 2023)

Stakeholders in reverse logistics operations involve a wide spectrum of individuals and organizations, including employees, consumers, suppliers, government agencies, and non-governmental organizations (NGOs). Each stakeholder group has specific interests, concerns, and expectations surrounding reverse logistics methods, making effective participation crucial for achieving sustainable goals.

Employees are essential stakeholders in reverse logistics operations, as they are directly involved in establishing and maintaining reverse logistics procedures. Retailers must engage with employees through training programs, feedback mechanisms, and incentive structures to ensure their active engagement and commitment to sustainable practices. Moreover, retailers should engage with suppliers and logistical partners to align goals and share best practices for minimizing environmental impact and fostering social responsibility throughout the supply chain. (Horani, 2020)

Customers also have a significant role in driving sustainability in reverse logistics. By educating consumers on the importance of responsible consumption and disposal practices, businesses can empower them to make educated decisions and engage in recycling and take-back programs. Additionally, businesses can harness customer input and preferences to design reverse logistics projects to fit their requirements and expectations, ultimately boosting customer happiness and loyalty.

Effective stakeholder engagement is vital for the success of sustainable reverse logistics efforts(Vostrykov & Jura, 2022). Retailers can adopt several techniques to engage stakeholders proactively and create collaboration towards shared sustainability goals.

One option is to build multi-stakeholder partnerships and forums where representatives from diverse stakeholder groups may come together to discuss difficulties, share information, and co-create solutions. These collaborations can facilitate information exchange, create trust, and promote collective action to overcome difficult sustainability concerns in reverse logistics.

Another method is to develop transparent communication techniques that keep stakeholders informed about the company's reverse logistics policies, procedures, and performance. By providing timely and accurate information, merchants may develop confidence, demonstrate accountability, and solicit input from stakeholders, hence boosting their involvement and buy-in for sustainable projects (Pati et al., 2020)

Furthermore, retailers can integrate stakeholder involvement into their corporate governance structures by forming specific sustainability committees or advisory boards that comprise representatives from major stakeholder groups. These committees can give direction and supervision on sustainability matters, promote alignment with stakeholder interests, and encourage continuous development in reverse logistics processes.

Reverse logistics serves as the dependent variable in the theoretical framework, indicating the outcome or effect of sustainable buying procedures regulated by company culture. The success of reverse logistics is impacted by the amount to which environmental, economic, and social sustainability factors are integrated into procurement methods, as well as the organizational culture that drives decision-making and behavior inside the firm.

2.6. Organizational Culture:

Organizational culture has a crucial role in defining the deployment and efficacy of sustainable reverse logistics strategies inside retail enterprises. This section dives into the role of organizational culture as a moderator, studying its influence on staff behaviors, decision-making processes, and overall sustainability performance in reverse logistics operations.

Organizations employ reverse logistics to improve operational effectiveness and assure market success (Butzer et al., 2017).Organizational culture involves shared values, attitudes, customs, and behaviors that define the identity and character of an organization. In the context of reverse logistics, organizational culture substantially influences employee attitudes and behaviors towards sustainability initiatives. A culture that stresses environmental stewardship, social responsibility, and ethical conduct generates a sense of purpose and dedication among employees, driving them to embrace sustainable practices in their everyday work.(Arefieva et al., 2021)

In Pakistan's retail market, where traditional business practices may prioritize short-term profits above long-term sustainability, building a culture of responsibility and accountability is vital for promoting positive change in reverse logistics operations. Retailers must develop values such as integrity, transparency, and regard for the environment throughout the firm,

empowering workers to behave in harmony with sustainable aims and principles (Hyder et al., 2023)

Organizational culture also impacts decision-making processes within retail organizations, impacting how sustainability issues are integrated into strategic planning, resource allocation, and risk management. A culture that emphasizes innovation, cooperation, and continual improvement fosters proactive decision-making and investment in sustainable technology and processes. In contrast, a culture that is reluctant to change or prioritizes short-term gains may limit efforts to embrace and implement sustainable reverse logistics programs. (Cricelli et al., 2021)

In Pakistan's retail sector, where market dynamics and regulatory environments are shifting rapidly, merchants must create a culture of agility and resilience to overcome risks and capitalize on opportunities in reverse logistics. By building a culture that prioritizes experimentation, learning, and adaptability, retailers may stimulate innovation and creativity, enabling them to create creative solutions to sustainability concerns and keep a competitive edge in the marketplace

Organizational culture serves as a vital moderator that either increases or impedes the success of sustainable reverse logistics strategies inside retail enterprises. To utilize organizational culture for sustainable performance, merchants must invest in programs that foster cultural alignment with sustainability objectives. This includes leadership development programs, employee training and engagement activities, and performance evaluation procedures that recognize and reward behaviors aligned with sustainable goals (Hafizh & Aswar, 2020).

Furthermore, merchants can employ storytelling and communication tactics to emphasize the link between organizational culture and sustainability, showcasing success stories, role models, and collective successes that demonstrate the company's dedication to responsible business practices. By embedding sustainability into the fabric of company culture, merchants can establish a virtuous cycle where employees are inspired to contribute positively to sustainability activities, leading to greater performance and stakeholder value.

Organizations with a strong culture of sustainability are more likely to address environmental, economic, and social factors in procurement strategies, resulting to more successful reverse logistics outcomes. Conversely, firms with a poor or inconsistent culture of sustainability may experience difficulty in establishing sustainable buying processes and maximizing reverse logistics performance.

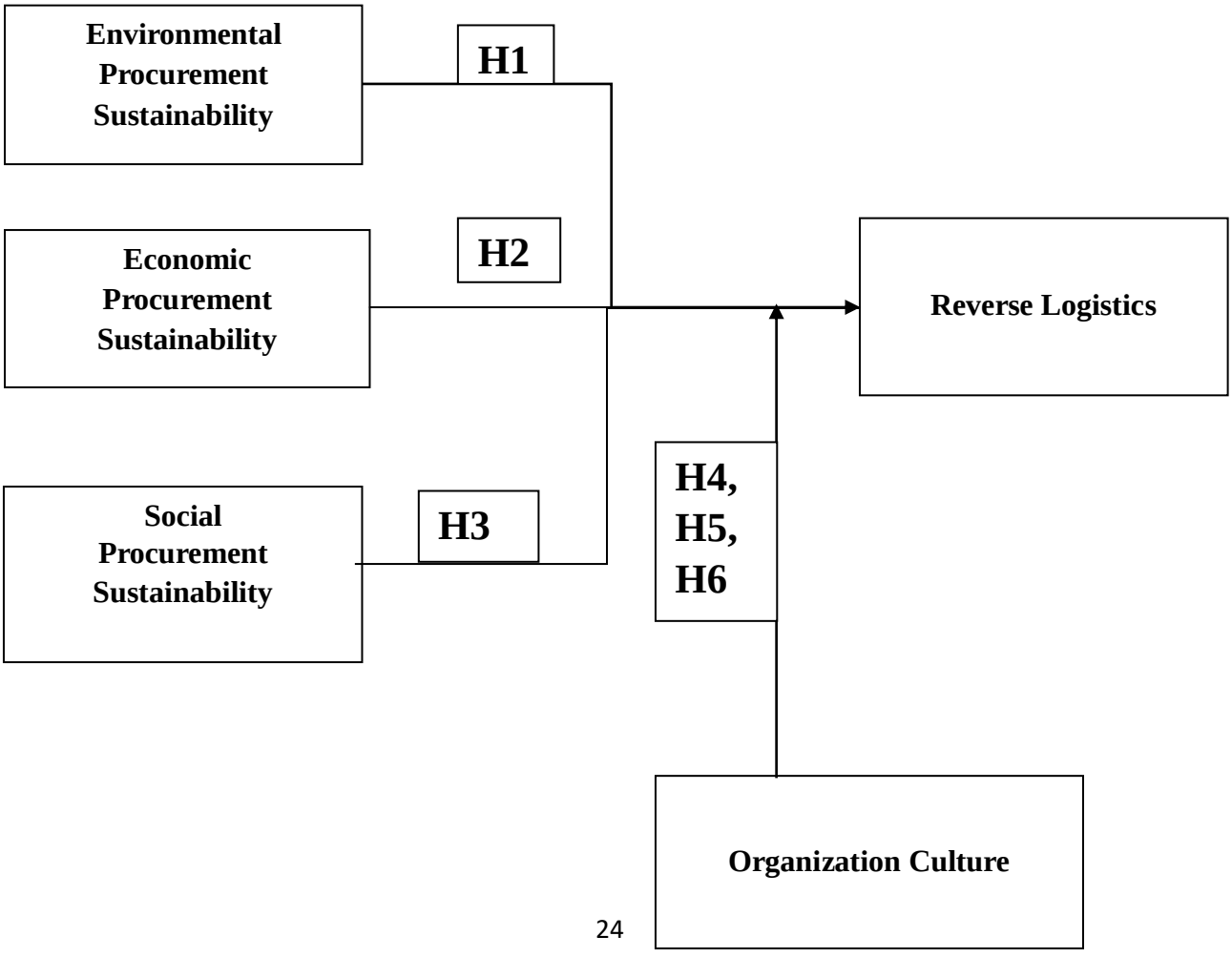
2.7. Theoretical Framework:

The structure that backs and explains a theory is called its theoretical framework (Sreekumar, 2023) Theoretical frameworks serve as the foundation for comprehending the relationships between diverse constructs in research projects. In the context of driving sustainability in reverse logistics moderated by organizational culture, the theoretical framework comprises independent variables, a moderator (Organizational Culture), and a dependent variable (Reverse Logistics). Let's go into each component:

2.8. Integration and Relationships within the Framework:

The theoretical framework asserts that independent variables directly influence reverse logistics performance. However, the degree and direction of these linkages are dependent upon the organizational culture, which moderates the impact of sustainable buying methods on reverse logistics outcomes. A strong culture of sustainability boosts the efficiency of sustainable procurement activities, leading to improved reverse logistics performance and eventually driving sustainability in the supply chain.

2.9. Conceptual framework:



2.10. Hypothesis Development:

We hypothesize that higher levels of environmental procurement sustainability favorably influence reverse logistics performance. Specifically, we predict that organizations implementing green sourcing practices, waste reduction initiatives, and sustainable transportation methods in procurement processes will exhibit improved reverse logistics outcomes (Hussein et al., 2021), characterized by higher product recovery rates and reduced environmental impact This variable relates to the extent to which procurement procedures prioritize environmental factors, such as reducing carbon emissions, minimizing waste output, and promoting the use of sustainable materials. It comprises measures aiming at green sourcing, eco-friendly packaging, and sustainable transportation methods within the procurement process.

H1: Environmental procurement sustainability significantly influence reverse logistics performance.

Our hypothesis proposes that economic procurement sustainability positively impacts reverse logistics performance. We anticipate that organizations employing cost-effective sourcing strategies, engaging in supplier collaboration for cost reduction, and implementing efficient inventory management practices will experience enhanced reverse logistics outcomes (Govindan et al., 2015), including reduced processing costs and increased recovery of economic value from returned products. Economic procurement sustainability pertains to the financial components of procurement processes that contribute to long-term economic viability and profitability. It involves ways to optimize costs, boost resource efficiency, and create value through procurement operations. Examples include cost-effective procurement techniques, supplier engagement for cost reduction, and strategic inventory management to decrease holding costs.

H2: Economic procurement sustainability positively improves reverse logistics performance.

We propose that higher degrees of social procurement sustainability contribute positively to reverse logistics performance. Specifically, we predict that organizations with ethical sourcing policies, supplier diversity initiatives, and community engagement programs will achieve improved reverse logistics outcomes, manifested by heightened customer satisfaction, strengthened stakeholder relationships, and greater social impact. Social procurement sustainability focuses on ethical and social factors within procurement operations. It involves initiatives to ensure fair labor practices, promote diversity and

inclusion, and assist local communities through procurement operations. projects may include supplier diversity programs, ethical sourcing standards, and community involvement projects aimed at developing social responsibility throughout the supply chain.

H3: Social procurement sustainability contributes favorably to reverse logistics performance.

Our final hypothesis shows that organizational culture moderates the links between procurement sustainability parameters and reverse logistics performance. We estimate that firms defined by a strong culture of sustainability will display stronger positive connections between independent variables and reverse logistics performance compared to organizations with weaker sustainability cultures. This moderation effect will be obvious through shared beliefs, norms, and behaviors that prioritize sustainability goals and enhance the influence of sustainable buying methods on reverse logistics outcomes (Dike, 2013). Organizational culture serves as a moderator in the interaction between procurement sustainability characteristics (environmental, economic, and social) and reverse logistics performance. Organizational culture involves shared values, beliefs, conventions, and behaviors that shape the attitudes and behaviors of individuals inside an organization.

H4: Organizational culture influences the relationship between economic procurement sustainability and reverse logistics performance.

H5: Organizational culture impacts the relationship between environmental procurement sustainability and reverse logistics performance.

H6: Organizational culture affects the relationship between social procurement sustainability and reverse logistics performance.

The implementation of economic procurement sustainability positively influences real-time visibility in stock levels and demand patterns within the retail supply chain of Pakistan. Citation: Khan and Rahman (2021) emphasize the significance of economic procurement sustainability in providing real-time insights into stock levels and demand patterns, supporting the hypothesis. Economic procurement sustainability contributes positively to reducing stock outs and minimizing carrying costs in the retail sector of Pakistan. The adoption of environmental procurement sustainability positively influences transparency and traceability in the retail supply chain of Pakistan. Citation: Moghaddam (2020) highlights the potential of environmental procurement sustainability in enhancing transparency and traceability, thereby supporting the hypothesis. The integration of environmental procurement

sustainability positively affects the reliability of product information and authentication in the retail sector of Pakistan.

Chapter 3 Research Methodology

3.1. Introduction:

The necessity of sustainability has become increasingly relevant in contemporary supply chain management methods, particularly within the framework of reverse logistics. Reverse logistics, covering the handling of product returns, recycling, and disposal operations, has considerable opportunity for promoting sustainability initiatives and mitigating environmental externalities. As firms attempt to align their operations with sustainable practices, understanding the intricate interaction of environmental, economic, and social aspects in reverse logistics becomes crucial.

In recent years, scholarly emphasis has focused on the integration of sustainability concepts into reverse logistics operations, highlighting the potential for decreasing waste, limiting resource consumption, and boosting stakeholder value. Environmental sustainability in reverse logistics encompasses measures such as product remanufacturing, recycling, and waste reduction, seeking to decrease the ecological impact of product returns and end-of-life disposal.

Moreover, economic sustainability considerations underline the significance of cost-effective reverse logistics methods that optimize resource usage and generate value creation throughout the supply chain. Economic sustainability strategies may include inventory optimization, supplier partnership for cost reduction, and revenue recovery from returned products (Shahidzadeh & Shokouhyar, 2023).

In addition to environmental and economic elements, social sustainability plays a vital role in designing reverse logistics methods. Social sustainability involves ethical sourcing, fair labor practices, and community involvement programs targeted at generating good social consequences throughout supply chains. By focusing social responsibility in reverse logistics operations, firms can increase stakeholder relationships, strengthen brand reputation, and contribute to broader societal well-being. (Hyder et al., 2023)

While the significance of environmental, economic, and social sustainability in reverse logistics is widely acknowledged, the function of corporate culture as a moderator in establishing sustainable practices remains underexplored. Organizational culture, including shared values, beliefs, and conventions inside an organization, influences decision-making

processes and employee behavior, consequently impacting the adoption and efficacy of sustainability programs.

This research tries to solve this gap by examining the connection between exogenous and endogenous variable performance, modified by organizational culture. By researching how organizational culture influences the relationship between sustainability characteristics and reverse logistics outcomes, this study seeks to give significant insights for firms wanting to strengthen their sustainability practices in reverse logistics operations.

3.2. Research Philosophy:

The research philosophy serves as the basis upon which the entire research enterprise is formed, guiding the researcher's approach to information collection, interpretation, and understanding of the studied phenomenon. The research philosophy that is appropriate to this topic is epistemology. It delves into the acceptable knowledge within the research field and establishes the credibility of information through thorough and strict testing (Isaacs, 2014). Epistemology is mainly focused with enquiring about the acceptable knowledge of the field while addressing the facts and numbers. It asks about the appropriate understanding of the topic of research and identifies the legitimacy of the information owing to rigorous testing (Norris, 2005).

3.2.1. Philosophical Stance:

The philosophical perspective employed in this work is positivism. This means that the study starts by formulating research questions and then gathering data to investigate these topics. Positivism emphasizes on establishing ideas that can be tested with real facts, ensuring the research employs clear and rigorous techniques. This method values measures and results that can be measured and accepted in order to get the desired results (Park et al., 2019). Positivism makes it easier to duplicate findings, which is a major aspect of scientific inquiry. By adopting standardized methodologies and transparent protocols, other researchers can repeat the study and acquire similar results, which increase the dependability and validity of the findings. This ability to replicate is vital in positivism because it highlights the importance of transparency and uniformity in research.

3.3. Research Approach:

The research approach helps decide how we'll find answers—using numbers or words. In our investigation, we selected the deductive method. This means we started with existing theories to handle our study subject. We looked at the problem statement first and then identified responses based on these beliefs. Our study focuses on understanding how economic, social, and environmental factors affect reverse logistics in retail, with organizational culture playing a major role. We collected data, examined it, and finally arrived at solutions to our study topic through this deductive procedure. This involves evaluating the impact of economic, social, and environmental procurement sustainability on reverse logistics, with a specific focus on how organizational culture influences these dynamics within the retail business (Creswell & Poth, 2018). The study path progressed from defining the problem to acquiring data, assessing findings, and ultimately presenting insights into the relationship between various variables.

3.4. Research Method:

The research strategy comprises the utilization of questionnaires as the major tool for data gathering. Questionnaires are structured tools meant to acquire quantitative data participants about their perceptions, attitudes, and behaviors relevant to reverse logistics sustainability and organizational culture. (Hair et al., 2019)

Research methods refer to approaches that are utilized for data collecting and identification of kind of research undertaken. There are three types of approaches used to collect data i.e. mono method, multi methods and mixed method.

Research method adopted in this study is the mono method and the research endeavor is quantitative in character since it is reliable and delivers correct data. This employs the statistical data analysis methodologies to quantify the outcomes. The questionnaire will be deployed to examine and quantify the outcomes.The data used in this source is taken from both primary as well as secondary sources.

3.5. Questionnaire Development:

The first step in the research approach involves the formulation of the questionnaire. The questionnaire is aimed to capture relevant information regarding to environmental, economic, and social sustainability practices in reverse logistics, as well as organizational culture

factors. Careful thought is given to the creation of clear and simple questions that match with the study objectives and theoretical framework.

The questionnaire comprises elements that examine several aspects of reverse logistics sustainability, such as:

Environmental sustainability: Measures to decrease waste, recycle materials, and minimize environmental effect. (Letunovska et al., 2023)

Economic sustainability: Cost-effective techniques, supplier partnerships, and revenue recovery from returned products. (Letunovska et al., 2023)

Social sustainability: Ethical sourcing procedures, stakeholder engagement, and community impact programs. (Offei, 2023)

Letunovska, N., Offei, F. A., Junior, P. A., Lyulyov, O., Pimonenko, T., & Kwilinski, A. (2023). Green supply chain management: The effect of procurement sustainability on reverse logistics. Logistics, 7(3), 47. https://doi.org/10.3390/logistics7030047

Denison, D. (1990). Corporate culture and organizational. Wiley.

Dike, P. (2013). The impact of workplace diversity on organizations.

Dobbin, F., & Jung, J. (2010). Corporate board gender diversity and stock performance: The competence gap or institutional investor bias. North Carolina Law Review, 89, 809-838.

Additionally, the questionnaire features topics to analyze organizational culture elements, such as leadership style, communication patterns, and employee engagement in sustainability projects.

Variable	Items	Source
Reverse logistics	9	Adopted
Economic procurement sustainability	4	Adopted
Environmental procurement sustainability	5	Adopted
Social procurement sustainability	5	Adopted
Organizational culture	5	Adapted

3.6. Data Collection Procedure:

Once the questionnaire is prepared and the sample is identified, data collecting begins. Participants are contacted and requested to complete the questionnaire either online or in person, depending on their preference and practical feasibility. Clear terms and condition were provided to the participant about this. Informed consent is sought from each participant prior to questionnaire completion. A total of 198 questionnaires were collected in which the literate people of the retail industry were included.

3.7. Data Analysis:

Upon completion of data collection, the collected questionnaire responses are loaded into a statistical software tool for analysis, such as SPSS. Descriptive statistics, including frequencies, percentages, means, and standard deviations are calculated to analyze the data and provide an overview of participants' perceptions and attitudes regarding reverse logistics sustainability and organizational culture.

Inferential statistical techniques, such as correlation analysis and regression analysis, may be applied to analyze correlations among variables and test hypotheses obtained from the study framework. Statistical significance tests are undertaken to identify the strength and direction of relationships between variables.

3.8. Ethical Considerations:

Throughout the study process, ethical issues are crucial. Participants' confidentiality and anonymity are protected, and their informed consent is requested prior to participation. Additionally, data processing and storage practices correspond to relevant ethical principles and regulations.

By employing questionnaires as the primary method of data collection, this research method enables the systematic gathering of quantitative data from a diverse sample of participants, providing valuable insights into the relationships between the entire variable in our model.

3.9. Sampling Technique:

Sampling strategy plays a significant part in conducting research since it directly affects the reliability and authenticity of the study's findings. To achieve reliable study analysis, it is necessary to identify the right sample size and sampling procedure. According to Kumar (2005), there are two basic strategies utilized for sampling: Probability sampling and Non-probability sampling. Probability sampling includes randomly picking participants from the

population, guaranteeing that each member of the population has an equal probability of being included in the sample. On the other hand, non-probability sampling does not entail random selection, and participants are picked based on particular criteria, convenience, or researcher judgment.

In the existing investigation, we have opted for the non-probability sampling technique due to its reliability and convenience in our research environment. Non-probability sampling methods are typically employed when it is difficult or impractical to get a random sample from the population. While non-probability sampling can yield significant insights, it is vital to realize its limitations. Findings acquired from non-probability sampling cannot be extended to the full population, as the sample may not be representative of the community as a whole. Additionally, data acquired from a single individual or a small group may not truly reflect the perspectives or experiences of the entire business or sector. Therefore, it is crucial to evaluate the findings from non-probability sampling with caution and acknowledge their limits when drawing conclusions or making suggestions based on the research findings.

3.9.1. Convenience Sampling:

Convenient sampling approach is adopted in this investigation. It is based on the convenience of the researcher or the task(Baridam, 2005). In convenient sampling, sample is taken from a set of people handy to reach or with easy engage. This technique rely on collecting information from respondents of population who are sufficiently available. This sampling technique suggests that gathering responses anyplace you want to get it (Sounders, Lewis, & Thornhill, 2016).

3.10. Population:

The components from set of information. Population can be members of a specific country or segment of community. While sample is a small percentage of population. Sample is driven by a desire of undertaking investigation (Flick, 2015)

The whole set of people or a unit the study seeks to examine is referred to as the population. The demographic of this study is those working in Pakistani retail industry reverse logistics activities. This covers experts in the supply chain who hold positions as sustainability coordinators, procurement officers, warehouse supervisors, and logistics managers.

Every component from the collection of data is included in the population. A population might be a portion of a community or the whole population of a country. In order to

concentrate our study, we have looked at the retail sectors in two Pakistani cities (Rawalpindi and Islamabad). Targeted primarily for data collecting are retail industries. The 10 IMTs, LMTs, and e-commerce companies registered in Rawalpindi and Islamabad provided the data (SECP, 2019). So the population size was 10.The companies chosen for thesis are as follows and we choose these companies because they have a developed business and perform good with supplier relationship and since the area which we choose was Rawalpindi and Islamabad:

- Canteen Store Department (CSD) (20)
- Imtiaz super market (18)
- Metro cash and carry (22)
- Save Mart (19)
- Madina Cash and carry (18)
- Punjab Cash and carry (26)
- Carrefour (20)
- AL Fateh Super market (22)
- Hyperstar (18)
- Panda Mart Foodpanda (15)

3.11. Sample size:

Data gathered without the necessary sample size might not be reliable and results formulated would not be applicable to others. (Baridam, 2005).

$$n= N/1+N\ (e)\ ^\wedge\ 2$$

Where n = sample size

N = the population size

e = proportion of the sampling error

The employee of the retail enterprises located in Rawalpindi and Islamabad were roughly 3000.

- Canteen Store Department (CSD) (371)
- Imtiaz super market (209)
- Metro cash and carry (371)
- Save Mart (312)

- Madina Cash and carry (327)
- Punjab Cash and carry (505)
- Carrefour (313)
- AL Fateh Super market (252)
- Hyperstar (175)
- Panda Mart Foodpanda (165)

The number of educated employees who were selected for the study were 353 and applying the variables in the calculation we get a sample size of 198. The confidence level was set to 95% which gives us 0.05 level of significance or fraction of sampling error.

3.12. Time Horizon:

Through a cross-sectional methodology, participants' data are gathered at a particular point in time. By enabling a glimpse of organizational culture and reverse logistics sustainability within Pakistan's retail sector, this cross-sectional design offers participants' present practices and perceptions. A cross-sectional study does not monitor changes in variables over time; rather, it records data at a single instant. Nevertheless, the results of this cross-sectional study can guide next longitudinal studies that could look at long-term patterns and shifts in organizational culture and reverse logistics sustainability.

3.13. Measurement/Scale Used:

Five point Likert scale was used in the questionnaire. This research work utilized a 5-point Likert scale, enabling the researcher to analyze the data effectively by making comparisons and reporting the degree of positive or negative inclination of respondents towards the elements in the questionnaire(Dalmoro, Vieira,2014) The respondents of research were instructed to rate each question /item on five point Likert scale. That is as follow:

- Strongly disagree (1): Participants strongly disagree with the statement, indicating the lowest degree of agreement.
- Disagree (2): Participants disagree with the statement, suggesting a moderate level of disagreement.
- Neutral (3): Participants show a neutral attitude or lack of opinion on the statement, indicating neither agreement nor disagreement.
- Agree (4): Participants agree with the statement, suggesting a moderate level of agreement.

- Strongly agree (5): Participants strongly agree with the statement, indicating the highest level of agreement.

Chapter 4: Data analysis and Findings

4.1. Demographics: we received a total of 198 responses from our questionnaire and here are few results and general discussion on it:

4.2. General Discussion about Demographic characteristics of the respondents:

4.2.1. Frequency Distribution and Descriptive Statistics with Respect to Gender:

Table 1

Gender					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Female	63	31.8	31.8	31.8
	Male	135	68.2	68.2	100.0
	Total	198	100.0	100.0	

In this study, we examined the gender distribution among a sample of 198 participants. The data revealed that 135 individuals (68.2%) identified as male, while 63 participants (31.8%) identified as female. These findings highlight a male predominance within our sample.

4.2.2. Frequency Distribution and Descriptive Statistics with Respect to Age:

Table 2

Age					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	30-45 years	60	30.3	30.3	30.3
	Less than 30 years	126	63.6	63.6	93.9
	more than 45 years	12	6.1	6.1	100.0
	Total	198	100.0	100.0	

The study, examined the age composition of a sample consisting of 198 participants. The data revealed distinct patterns across different age groups. Sixty individuals (30.3% of the total sample) fell within the 30-45 age range. This group represents a midlife cohort, potentially characterized by established careers, family responsibilities, and stability. The majority, 126 participants (63.6% of the total) were younger than 30 years. A smaller subset, 12 participants (6.1% of the total) were older than 45 years. These individuals may belong to the senior workforce or have retired, bringing unique perspectives and experiences.

4.2.3. Frequency Distribution and Descriptive Statistics with Respect to experience:

Table 3

Experience					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1-5 years	133	67.2	67.2	67.2
	10-15 years	27	13.6	13.6	80.8
	15-20 years	9	4.5	4.5	85.4
	5-10 years	29	14.6	14.6	100.0
	Total	198	100.0	100.0	

In our study, we examined the professional experience levels of 198 participants. The data revealed that a significant proportion 133 individuals (67.2% of the total) had less than five years of experience. This group likely includes early-career professionals, recent graduates, and those transitioning into their fields. Twenty-nine participants (14.6% of the total) fell within the range of 5-10 years. These individuals have gained some experience but are still considered mid-level in their careers. Twenty-seven participants (13.6% of the total) had 10-15 years of experience. This group represents seasoned professionals who have likely achieved expertise in their domains. And nine participants (4.5% of the total) had 15-20 years of experience.

4.3. Descriptive Statistics:

Table 4

Descriptive Statistics										
	N	Range	Minimum	Maximum	Mean	Std. Deviation	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
OC	198	4.00	1.00	5.00	3.6677	.55304	-.207	.173	1.841	.344
Environmental Sustainability	198	4.00	1.00	5.00	3.7495	.59428	-.320	.173	1.800	.344
Social Sustainability	198	4.00	1.00	5.00	3.7687	.60424	-.419	.173	1.847	.344
Economic Sustainability	198	4.00	1.00	5.00	4.0556	.58973	-.630	.173	2.654	.344
Reverse Logistic	198	4.00	1.00	5.00	3.7778	.54835	-.266	.173	2.831	.344
Valid N (list wise)	198									

The normality test is statistical procedures that explain about sample adjust the normal distribution. It determines how well the data set is modeled by a normal distribution. Kurtosis and Skewness tests are applied to determine the normality of the study. Kurtosis is defined as a measure of normality that is used to indicate the peaks and tails of the distribution (Kim, 2013).

For organizational culture the mean OC score was approximately 3.67, indicating moderate organizational commitment. The standard deviation (SD) was 0.55, suggesting relatively low variability around the mean. The skewness value of -0.207 indicates a slightly left-skewed distribution. The kurtosis value of 1.841 suggests a moderately peaked distribution. For the variable Environmental sustainability, Participants reported an average score of 3.75. The SD of 0.59 indicates some variability in responses. The

distribution is slightly left-skewed (skewness = -0.320) and moderately peaked (kurtosis = 1.800). The mean social sustainability score was 3.77. Responses exhibited higher variability (SD = 0.60). The distribution is left-skewed (skewness = -0.419) and moderately peaked (kurtosis = 1.847). Participants reported a mean score of 4.06 for economic sustainability. The SD of 0.59 suggests relatively consistent responses. The distribution is left-skewed (skewness = -0.630) and moderately peaked (kurtosis = 2.654). Participants reported a mean score of 4.06 for economic sustainability. The SD of 0.59 suggests relatively consistent responses. The distribution is left-skewed (skewness = -0.630) and moderately peaked (kurtosis = 2.654).

The value 3 in Kurtosis indicates a normal distribution and the range of Kurtosis lies between +3 and -3. The outcome of all 3 variables lie in range of +3 and -3 which shows that the data is normally distributed. Skewness defines the extent to which the data is non-symmetrical. The range of skewness is -1 to +1. The values below zero are negatively skewed while the values above zero are positively skewed (Kim, 2013). According to the table, all the values lie in range of skewness i.e., between -1 and +1, which shows that the observed data of all the variables is normally distributed.

4.4. Reliability analysis:

Table 5

	Cronbach Alpha	*N of Items*
Economic procurement Sustainability	.722	4
Reverse Logistic	0.825	9
Organizational Culture	0.601	5
Environmental procurement Sustainability	.770	5
Social procurement Sustainability	.734	5

The reliability test has been carried out to measure the consistency and reliability of questionnaire items for each variable of this study. According to (Taber, 2018) the Cronbach's

alpha values from 0.9 and above show excellent reliability, 0.70-0.9 represent high reliability, values between 0.60 and 0.70 represent moderate reliability and the values below 0.50 represent low reliability.

4.5. Correlation analysis:

Correlation explains the relationship between endogenous and exogenous variables and quantifies the degree to which between them. Correlation can be positive or negative and explains if the association between the variables is positive or negative. Positive correlation means that both the variables move in similar direction and a rise in one variable would increase the other variable as well. The range extends from -1 to +1 of a correlation co-efficient. The positive indication of correlation shows that there is an immediate association and is said to be positive correlation (Yule, 1897). The negative sign of correlation suggests that there is inverse link between the variables and is known as negative correlation.

Correlations

		OC	Environmental. Sustainability	Social. Sustainability	Economc Sustainability	Reverse. Logistic
OC	Pearson Correlation	1		.		
	Sig. (2-tailed)					
	N	198				
Environmental. Sustainability	Pearson Correlation	.515**	1			
	Sig. (2-tailed)	.000				
	N	198	198			
Social. Sustainability	Pearson Correlation	.210**	.597**	1		
	Sig. (2-tailed)	.003	.000			
	N	198	198	198		
Economic. Sustainability	Pearson Correlation	.296**	.473**	.667**	1	
	Sig. (2-tailed)	.000	.000	.000		
	N	198	198	198	198	
Reverse. Logistic	Pearson Correlation	.353**	.550**	.606**	.569**	1
	Sig. (2-tailed)	.000	.000	.000	.000	
	N	198	198	198	198	198

**. Correlation is significant at the 0.01 level (2-tailed).

Table 6

- OC correlates positively with environmental sustainability ($r = 0.515$, $p < 0.01$). This suggests that individuals with higher organizational commitment tend to perceive stronger environmental sustainability practices.

- Environmental sustainability is positively correlated with social sustainability ($r = 0.597$, $p < 0.01$). Participants who perceive better environmental practices also tend to perceive stronger social sustainability efforts.
- Social sustainability correlates positively with economic sustainability ($r = 0.667$, $p < 0.01$). This indicates that organizations emphasizing social responsibility often align with economically sustainable practices.
- Economic sustainability correlates positively with reverse logistics ($r = 0.606$, $p < 0.01$). Organizations focusing on economic viability may also prioritize efficient logistics management.
- Reverse logistics correlates positively with overall sustainability ($r = 0.677$, $p < 0.01$). Effective reverse logistics processes contribute to holistic sustainability efforts.

4.6. Regression Analysis:

The existence of association is determined by correlation analysis whereas the nature of relationship can only be studied through regression analysis. Regression model.

Table 7

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.678[a]	.460	.451	.40616
a. Predictors: (Constant), Economic. Sustainability, Environmental. Sustainability, Social. Sustainability				

This "R" represents the correlation coefficient between the observed values and the predicted values of the dependent variable. In my case, it shows the strength of the relationship between the independent variables and the dependent variable. An R value of 0.678 indicates a moderately strong positive relationship .R-squared (R^2) known as the coefficient of determination, measures the proportion of variance in the dependent variable (Reverse Logistic) explained by the predictors. In this model, R^2 is 0.460, indicating that approximately 46% of the variability in reverse logistics can be attributed to the predictors (sustainability dimensions). Adjusted R-squared accounts for the number of predictors and

adjusts R^2 for model complexity. The adjusted R^2 is 0.451, suggesting that the model retains good explanatory power even after considering the number of predictors.

4.7. ANOVA:

Table 8

ANOVA[a]						
Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	27.231	3	9.077	55.023	.000[b]
	Residual	32.004	194	.165		
	Total	59.235	197			
a. Dependent Variable: Reverse. Logistic						
b. Predictors: (Constant), Economic. Sustainability, Environmental. Sustainability, Social. Sustainability						

The results of the ANOVA (analysis of variance) for the regression model are predicting the dependent variable "Reverse Logistic" based on the predictors: "Economic Sustainability," "Environmental Sustainability," and "Social Sustainability." The regression model explains variability in the dependent variable (Reverse Logistic). The total variability in Reverse Logistic is partitioned into two components: regression (explained) and residual (unexplained). The regression model is statistically significant ($p < 0.01$) based on the F-statistic.the anova tells that model of regression is suitable. For the regression model to be significant, the value of F should be greater than 4 ($F>4$) and the value of p has to be less than 0.05 ($p<0.05$). Here the value of F is 55.023.762 which is greater than 4 and the value of p is less than 0.05 so the overall regression model proves to be significant.

4.8. Coefficient test results:

Table 9

Coefficients[a]						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.944	.226		4.177	.000
	Environmental. Sustainability	.242	.061	.262	3.957	.000
	Social. Sustainability	.250	.071	.275	3.508	.001
	Economic. Sustainability	.243	.066	.261	3.660	.000
a. Dependent Variable: Reverse. Logistic						

When all predictor variables are zero, the expected value of Reverse Logistic is approximately 0.944. For each one-unit increase in environmental sustainability, the expected change in Reverse Logistic is 0.242 (holding other predictors constant). A one-unit increase in social sustainability corresponds to a 0.250 increase in Reverse Logistic (other predictors held constant). Holding other predictors constant, a one-unit increase in economic sustainability leads to a 0.243 increase in Reverse Logistic. All the t values are greater than 2 ($t > 2$) and the p values are less than 0.05 ($p<0.05$), so it shows a significant relationship between dependent and independent variables (Tauni et al. 2017).

4.9. Moderation Analysis:

4.9.1. Moderation analysis 1:

Model: 1

Y: RevLog

X: EnvSus

W: OC

Sample Table 10

Size: 198

OUTCOME VARIABLE:

RevLog

Model Summary

R	R-sq	MSE	F	df1	df2	p
.5589	.3123	.2100	29.3688	3.0000	194.0000	.0000

Model

	Coeff	se	t	p	LLCI	ULCI
Constant	1.0446	.7343	1.4226	.1565	-.4036	2.4928
EnvSus	.6444	.2028	3.1777	.0017	.2444	1.0443
OC	.2870	.2154	1.3322	.1844	-.1379	.7118
Int_1	-.0528	.0559	-.9456	.3456	-.1630	.0574

Product terms key:

Int_1 : EnvSus x OC

Test(s) of highest order unconditional interaction(s):

	R2-chng	F	df1	df2	p
X*W	.0032	.8941	1.0000	194.0000	.3456

1. **Constant (Intercept)**: The constant term of 1.0446 indicates the expected value of the dependent variable 'RevLog' when all independent variables are zero.
2. **Environmental Sustainability (EnvSus)**: The coefficient of 0.6444 suggests that for each unit increase in 'EnvSus', the 'RevLog' increases by 0.6444 units, assuming all other variables remain constant. The t-value of 3.1777 and the significance level (p-value) of 0.0017 (< 0.05) suggest that 'EnvSus' has a statistically significant impact on 'RevLog'.

3. **OC**: The coefficient of 0.2870 implies that for each unit increase in ‘OC’, the ‘RevLog’ increases by 0.2870 units, assuming all other variables remain constant. However, the p-value of 0.1844 (> 0.05) suggests that ‘OC’ does not have a statistically significant impact on ‘RevLog’.
4. **Interaction Term (Int_1 = EnvSus x OC)**: The coefficient of -0.0528 for the interaction term suggests that the effect of ‘EnvSus’ on ‘RevLog’ decreases by 0.0528 units for each unit increase in ‘OC’. However, the p-value of 0.3456 (> 0.05) suggests that the interaction effect is not statistically significant. This means that ‘OC’ does not significantly moderate the relationship between ‘EnvSus’ and ‘RevLog’.

‘EnvSus’ has a significant effect on ‘RevLog’, the moderation effect of ‘OC’ on the relationship between ‘EnvSus’ and ‘RevLog’ is not statistically significant. This suggests that the impact of ‘EnvSus’ on ‘RevLog’ does not depend on the level of ‘OC’.

4.9.2. Moderation analysis 2:

Model: 1

Y: RevLog

X: SocSus

W: OC

Table 11

Sample

Size: 198

OUTCOME VARIABLE:

RevLog

Model Summary

R	R-sq	MSE	F	df1	df2	p
.6689	.4475	.1687	52.3690	3.0000	194.0000	.0000

Model

	Coeff	se	t	p	LLCI	ULCI
Constant	-.8358	.6502	-1.2855	.2002	-2.1181	.4465
SocSus	1.0280	.1773	5.7983	.0000	.6783	1.3777
OC	.7920	.1894	4.1808	.0000	.4184	1.1656
Int_1	-.1559	.0507	-3.0726	.0024	-.2559	-.0558

Product terms key:

Int_1 : SocSus x OC

Test(s) of highest order unconditional interaction(s):

	R2-chng	F	df1	df2	p
X*W	.0269	9.4407	1.0000	194.0000	.0024

Focal predict: SocSus (X)

Mod var: OC (W)

Conditional effects of the focal predictor at values of the moderator(s):

OC	Effect	se	t	p	LLCI	ULCI
3.2000	.5292	.0502	10.5506	.0000	.4303	.6282
3.6000	.4669	.0511	9.1437	.0000	.3662	.5676
4.2000	.3734	.0655	5.7018	.00 00	.2442	.5025

1. **Constant (Intercept)**: The constant term of -0.8358 indicates the expected value of the dependent variable'RevLog' when all independent variables are zero.
2. **Social Sustainability (SocSus)**: The coefficient of 1.0280 suggests that for each unit increase in 'SocSus', the 'RevLog' increases by 1.0280 units, assuming all other variables remain constant. The t-value of 5.7983 and the significance level (p-value) of 0.0000 (< 0.05) suggest that 'SocSus' has a statistically significant impact on 'RevLog'.
3. **OC**: The coefficient of 0.7920 implies that for each unit increase in 'OC', the 'RevLog' increases by 0.7920 units, assuming all other variables remain constant. The p-value of 0.0000 (< 0.05) suggests that 'OC' has a statistically significant impact on 'RevLog'.
4. **Interaction Term (Int_1 = SocSus x OC)**: The coefficient of -0.1559 for the interaction term suggests that the effect of 'SocSus' on 'RevLog' decreases by 0.1559 units for each unit increase in 'OC'. The p-value of 0.0024 (< 0.05) suggests that the interaction effect is statistically significant. This means that 'OC' significantly moderates the relationship between 'SocSus' and 'RevLog'.

The conditional effects of 'SocSus' at different values of 'OC' (3.2, 3.6, and 4.2) are also provided. For instance, when 'OC' is 3.2, the effect of 'SocSus' on 'RevLog' is 0.5292, and this effect is statistically significant ($p < 0.05$).

'SocSus' and 'OC' have significant effects on 'RevLog', the moderation effect of 'OC' on the relationship between 'SocSus' and 'RevLog' is also statistically significant. This suggests that the impact of 'SocSus' on 'RevLog' depends on the level of 'OC'

4.9.3Moderation analysis 3:

Model: 1

Y: RevLog

X: EcoSus Table 12

W: OC

Sample

Size: 198

OUTCOME VARIABLE:

RevLog

Model Summary

R	R-sq	MSE	F	df1	df2	p
.6255	.3912	.1859	41.5516	3.0000	194.0000	.0000

Model

	Coeff	se	t	p	LLCI	ULCI
Constant	-.8687	.6939	-1.2518	.2121	-2.2373	.4999
EcoSus	.9907	.1759	5.6319	.0000	.6438	1.3377
OC	.8114	.2058	3.9420	.0001	.4055	1.2174
Int_1	-.1568	.0507	-3.0931	.0023	-.2568	-.0568

Product terms key:

Int_1 : EcoSus x OC

Test(s) of highest order unconditional interaction(s):

	R2-chng	F	df1	df2	p
X*W	.0300	9.5671	1.0000	194.0000	.0023

Focal predict: EcoSus (X)

Mod var: OC (W)

Conditional effects of the focal predictor at values of the moderator(s):

OC	Effect	se	t	p	LLCI	ULCI
3.2000	.4889	.0548	8.9288	.0000	.3809	.5969
3.6000	.4262	.0566	7.5265	.0000	.3145	.5379
4.2000	.3321	.0711	4.6683	.0000	.1918	.4724

1. **Constant (Intercept)**: The constant term of -0.8687 indicates the expected value of the dependent variable 'RevLog' when all independent variables are zero.
2. **Economic Sustainability (EcoSus)**: The coefficient of 0.9907 suggests that for each unit increase in 'EcoSus', the 'RevLog' increases by 0.9907 units, assuming all other variables remain constant. The t-value of 5.6319 and the significance level (p-value) of 0.0000 (< 0.05) suggest that 'EcoSus' has a statistically significant impact on 'RevLog'.
3. **OC**: The coefficient of 0.8114 implies that for each unit increase in 'OC', the 'RevLog' increases by 0.8114 units, assuming all other variables remain constant. The p-value of 0.0001 (< 0.05) suggests that 'OC' has a statistically significant impact on 'RevLog'.
4. **Interaction Term (Int_1 = EcoSus x OC)**: The coefficient of -0.1568 for the interaction term suggests that the effect of 'EcoSus' on 'RevLog' decreases by 0.1568 units for each unit increase in 'OC'. The p-value of 0.0023 (< 0.05) suggests that the interaction effect is statistically significant. This means that 'OC' significantly moderates the relationship between 'EcoSus' and 'RevLog'.

The conditional effects of 'EcoSus' at different values of 'OC' (3.2, 3.6, and 4.2) are also provided. For instance, when 'OC' is 3.2, the effect of 'EcoSus' on 'RevLog' is 0.4889, and this effect is statistically significant ($p < 0.05$).

'EcoSus' and 'OC' have significant effects on 'RevLog', the moderation effect of 'OC' on the relationship between 'EcoSus' and 'RevLog' is also statistically significant. This suggests that the impact of 'EcoSus' on 'RevLog' depends on the level of 'OC'.

4.10. Hypothesis assessment summary:

Table 13 tells us about the result of hypothesis, it tells us or gives us the information that weather the test is accepted or rejected:

Table 13

Hypothesis	**Accepted/Rejected**
Environmental Sustainability has a significant Impact on RL	Accepted
Social Sustainability has a significant Impact on RL	Accepted
Economic Sustainability has a significant Impact on Rl	Accepted
Organizational Culture Moderates the relationship between Environmental Sustainability and Reverse Logistics	Rejected
Organizational Culture Moderates the relationship between Economic Sustainability and Reverse Logistics	Accepted
Organizational Culture Moderates the relationship between Social Sustainability and Reverse Logistics	Accepted

Chapter 5: Conclusion, Limitations and Future Implications

5.1. Conclusion:

This study examined the relationship between Rl and procurement sustainability economic, social, and environmental in the retail industries of Rawalpindi and Islamabad, Pakistan. It was discovered through quantitative data collection and structural equation modeling that reverse logistics performance is greatly increased by economic procurement sustainability, highlighting the significance of practices like product reuse and recycling in boosting both sustainability and profitability. Similarly, social procurement sustainability appeared as a positive driver of reverse logistics, underlining the relevance of socially responsible practices in creating efficient supply chain operations. While environmental procurement sustainability revealed a favorable link with reverse logistics, deeper integration of environmentally sustainable methods is needed to maximize their impact. Notably, organization culture emerged as a critical moderator, underscoring the necessity for a sustainability-focused culture to improve reverse logistics outcomes.

5.2. Limitations and future implication:

This work acknowledges some limits that present opportunity for future research. Future research could apply longitudinal and qualitative methodologies to gain a greater knowledge of the relationships between procurement sustainability and reverse logistics across time. Additionally, investigating the relationship between organizational culture and other moderating elements could give light on how different organizational practices promote sustainable reverse logistics. Furthermore, examining the impact of Rl on overall supply chain sustainability, particularly in the service sector, would offer significant insights into larger sustainability concerns and potential. Also in other industries studies that compare different approaches in the manufacturing sector could assess how environmentally friendly technologies, green supply chain procedures, and circular economy concepts are applied. In order to evaluate the effects of legislative frameworks and industry norms, healthcare research may look into medical waste management, pharmaceutical supply chains, and equipment recycling. In the construction business, case studies could analyze the viability of green building certifications, waste reduction programs, and circular construction methods. In order to improve sustainability performance and stakeholder engagement, studies in the agriculture sector might also examine the implementation of fair trade practices, organic farming methods, and supply chain transparency initiatives.

5.3. Practical implications:

The conclusions of this study bear substantial practical consequences for merchants and governments alike. Retail firms in Rawalpindi and Islamabad can harness the insights acquired to establish effective strategies for incorporating procurement sustainability into their reverse logistics operations. By prioritizing economically, socially, and environmentally sustainable activities, merchants may boost both their sustainability credentials and operational efficiency. Cultivating a sustainability-oriented company culture and enabling information sharing within the supply chain are critical facilitators for boosting reverse logistics performance. Policymakers can utilize these insights to establish policies and incentives that support sustainable behaviors and improve collaboration across supply chain parties. Overall, this study underlines the need of linking procurement sustainability initiatives with reverse logistics techniques to meet economic, social, and environmental goals in the retail industry.

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Appendices:

1: Questionnaire

Driving sustainability in reverse logistics: The interplay of environmental, economic, social factors moderated by organization culture.

Research questionnaire:

This questionnaire has been designed for the sole purpose of collecting data regarding: "Driving sustainability in reverse logistics: The interplay of environmental, economic, social factors moderated by organization culture".

The data collected will be treated with high degree confidentiality and it is meant for academic purpose only. You are kindly asked to fill out this questionnaire by circling appropriate answers.

Regards,

Muhammad Haider Munir.

Section A: general Information:

Name: _____

Gender:

- Male
- Female

Age:

- Less than 30 years
- 30 to 45 years
- More than 45 years

Experience:

- 1-5 years
- 5-10 years
- 10-15 years
- 15-20 years

Section B: organization culture (moderator):

Organizational culture	Strongly disagree	disagree	neutral	agree	Strongly agree
The way things are done is very flexible and easy to change	1	2	3	4	5
We respond well to competitors and changes in Business Environment	1	2	3	4	5
New and Improved ways to do work are continually adopted.	1	2	3	4	5
Attempts to create change usually meet with resistance	1	2	3	4	5
Different Parts of Organization often cooperate to create change.	1	2	3	4	5

Section C: Economic, environmental and social procurement sustainability (independent variable):

Environmental procurement sustainability	Strongly disagree	disagree	neutral	agree	Strongly agree
The company has passed or is preparing to pass, ISO14001 (Environmental Management Series Standard) certification	1	2	3	4	5
The company exhibits a preferential selection of environmentally friendly products in its purchasing and supply behaviors (environmentally friendly products include green logo products and products with low energy consumption; recycling; products containing minimal or zero toxic substances; the use of green packaging or recyclable packaging of degrading products)	1	2	3	4	5
The concept of environmental protection is evident throughout the company's design, procurement, production, sales, use, reuse, processing, and other processes	1	2	3	4	5
The company prefers its suppliers to have environmental certifications	1	2	3	4	5
The company actively shares good environmental practice 1experiences with its partners	1	2	3	4	5

Social procurement sustainability	Strongly disagree	disagree	neutral	agree	Strongly agree
The company has adopted SA8000 (social responsibility standards) to regulate the company management's behavior	1	2	3	4	5
The company has established a	1	2	3	4	5

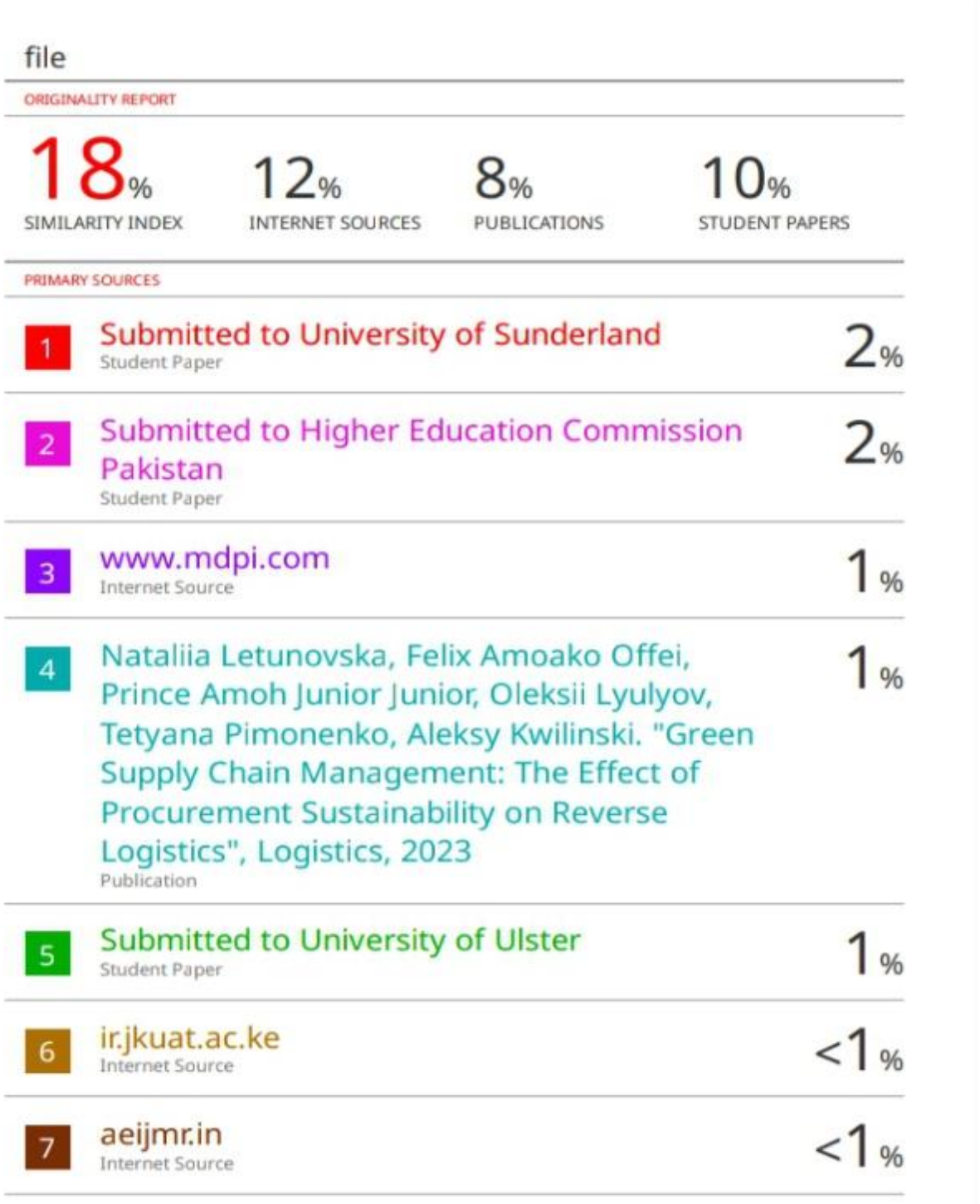
healthy and safe management system					
The company focuses on improving the working environment and welfare benefits	1	2	3	4	5
The company often engages in community charity work	1	2	3	4	5
The company, when selecting partners, gives priority to those who comply with and support laws, regulations, and standards on social sustainability	1	2	3	4	5

Economic procurement sustainability	Strongly disagree	disagree	neutral	agree	Strongly agree
The company considers the costs of management, production, procurement, and other costs	1	2	3	4	5
In practice, the company considers the results of its behavior, e.g., whether it violates relevant laws and regulations, or whether it will result in potential punishment for the company	1	2	3	4	5
The company considers whether its behavior will damage the image of the company	1	2	3	4	5
In practice, the company not only considers short-term profits, but it also focuses on long-term profits. The government policy on environmental, social, and economic sustainability and reverse logistics	1	2	3	4	5

Section D: Reverse logistics (dependent variables):

Reverse logistics	Strongly disagree	disagree	neutral	agree	Strongly agree
Achieving objectives within reverse logistics contributes to achieving the organizational goals	1	2	3	4	5
Reverse logistics is important for our company's future success	1	2	3	4	5
Reverse logistics is important for the functioning of our company	1	2	3	4	5
Reverse logistics plays an important role in the strategy of our company	1	2	3	4	5
High cost is associated with reverse logistics	1	2	3	4	5
There are Uncertainties relating to product returns	1	2	3	4	5
Top management is aware of the importance of reverse logistics	1	2	3	4	5
There is Lack of collaboration with supply chain partners in reverse logistics	1	2	3	4	5
Customers' negative perception is associated with returning of the products	1	2	3	4	5

2: Plagiarism report



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