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Master's Thesis

**Impact of Green Delivery Practices on Customer Purchase Intentions in E-Commerce
Sector of Pakistan: A Quantitative Study**

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ABSTRACT

This study examined the impact of green delivery practices on customer purchase intentions in the e-commerce sector of Pakistan. The research was conducted in response to the rapid growth of online shopping and rising environmental concerns related to last-mile delivery, packaging waste, and logistics emissions. Green delivery practices were considered the independent variable, customer purchase intention as the dependent variable, customer perception of green delivery practices as the mediating variable, and cost sensitivity and delivery convenience as moderating variables. A quantitative research design was adopted, supported by a positivist philosophy and deductive approach. Primary data were collected through a structured questionnaire from 150 online shoppers in Pakistan. Responses were measured on a five-point Likert scale, and data were analysed using SPSS through descriptive statistics, regression, mediation, and moderation analysis.

The findings revealed that respondents valued environmentally responsible delivery options ($M = 3.75$), supported combined deliveries to reduce pollution ($M = 3.70$), and perceived green delivery as reducing environmental harm ($M = 3.65$). Regression analysis confirmed that green delivery practices significantly influenced purchase intention ($B = 0.715$, $\beta = 0.729$, $p < 0.001$, $R^2 = 0.531$). Mediation analysis showed customer perception partially mediated the relationship, with an indirect effect of 0.264 (BootLLCI = 0.118, BootULCI = 0.435). Moderation results indicated that cost sensitivity and delivery convenience did not significantly moderate the perception–purchase intention relationship. The study concludes that green delivery practices enhance purchase intention in Pakistan’s e-commerce sector, particularly when they are convenient, environmentally responsible, and positively perceived by customers.

Keywords: Green delivery practices, customer purchase intention, e-commerce, customer perception, cost sensitivity, delivery convenience.

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CHAPTER 1: INTRODUCTION

1.1 Background of the Study

Electronic commerce has become a major force in the transformation of global retail, reshaping how consumers search for products, compare alternatives, make payments, and receive goods. Online shopping has been increasing in the world due to digitalisation, mobile connectivity, platforms-based business model, and transforming consumer expectations towards convenience and rapid delivery (Bao et al., 2025). This shift can also be seen to have taken place in emerging economies where the e-commerce concept is increasingly being considered to have an influence in the growth of the retail sector, the reach of the market and the inclusion of the digital market. Nevertheless, the growth of e-commerce in developing economies is often accompanied by the difficulties related to the capacity of logistics, trust of the consumers, payment systems, and the stable infrastructure of the delivery (Bao et al., 2025; UNCTAD, 2024).

Pakistan reflects this wider global and developing-market shift. The e-commerce ecosystem in Pakistan has expanded due to more internet connectivity, more penetration of smartphones, growth in online sales whose execution is based on social media, and increased consumer trust in online payments (Hasan, 2024). Recent trade data released by the U.S. International Trade Administration indicate that the 46th largest e-commerce market in the world in 2024 is Pakistan and its e-commerce revenue is US\$5.4 billion. High mobile penetration is also mentioned in the same report, indicating that 198 million 3G/4G users in 2024, which reveals a robust base to support the further development of online retail (International Trade Administration, 2026). Policymaking-wise, the draft e-Commerce Policy 2.0 of Pakistan also mentions that the e-commerce ecosystem in Pakistan is constantly on the verge of change yet remains to be full in terms of logistics, trust, payments, sustainability, and other aspects (Ministry of Commerce, 2025).

In Pakistan the e-commerce activity is specifically concentrated in the urban areas where the consumers generally enjoy a better access to the internet, a greater exposure to online shopping platforms and generally greater access to better courier service providers in the urban area. The urban consumers are hence better placed to be in contact with e-commerce delivery systems relatively often and to assess factors associated with delivery, including the speed, convenience, packaging, reliability and environmental responsibility (Saleem et al., 2022). To this end, urban e-commerce consumer setting is of special significance in terms of reestablishing whether green delivery practices can have any impact on the customer purchase intention in Pakistan.

Although e-commerce offers convenience, variety, and access, its rapid growth has also intensified concern about environmental sustainability (Romero et al., 2024). UNCTAD (2024) very well outlines the environmental effects of e-commerce. While e-commerce can help eliminate some in-person visits to stores, it can also lead to more transport, packaging, returns, warehousing and energy consumption along the supply chain (Nogueira et al., 2022). Also, the environmental sustainability of e-commerce for business-to-consumer services is tightly associated with warehouses and distribution centres, transportation, packaging, product returns and consumer behaviour (Biancolin & Rotaris, 2024). This implies that delivery is not just a "marginal" function; it is key to e-commerce sustainability (Romero et al., 2025).

Within this broader sustainability debate, green delivery practices have emerged as an important strategic response. For e-commerce, green delivery practices can include electric vehicles, drop-off centres, click-and-collect options, consolidation, route optimisation, packaging that is recyclable or reusable, environmentally sustainable return policies and timely delivery to avoid fuel waste and failed delivery attempts (Mucowska, 2021; Ignat & Chankov, 2020). Last-mile logistics studies suggest that delivery is one of the most prominent and crucial components of the consumer online shopping experience and that consumers are not only concerned with the quality and price of products but also with how they are delivered (Rajendran & Wahab, 2022; Raj et al., 2024). So, green delivery is becoming an environmental and CX issue.

Recent international studies suggest that sustainability can influence how consumers evaluate delivery options, but the relationship is not straightforward. Klein and Popp (2022) found that sustainability strongly influences the acceptance of last-mile delivery methods; however, convenience, usefulness, ease of use, and price also remain important factors. Similarly, Villa et al. (2023) reported that many e-commerce customers appreciate the idea of delivering products in an environmentally sustainable manner, but price and speed still matter most for many consumers. Likewise, Kiba-Janiak et al. (2024) found that price is most important for e-customers to choose a delivery method, even when considering sustainable business models. These results indicate that customers' purchasing intentions are influenced by a balance between green and other factors, such as price and time.

This tension is especially relevant in Pakistan. The e-commerce environment in Pakistan is growing, but it remains structurally distinct from many mature digital markets (Daniyal et al., 2025). Data on export trade suggests that in Pakistan approximately 95% of e-commerce

transactions are based on cash-on-delivery, which leads to liquidity and cost management issues for the businesses (International Trade Administration, 2026). Meanwhile, Pakistan's policy review reveals that there are lingering problems with logistics efficiency, trustworthiness, digital inclusivity and the incorporation of green considerations into the e-commerce system (Naveed et al., 2025) . In such a situation, a transition to green delivery cannot be taken for granted. It needs to be examined from a consumer perspective, in particular whether customers are prepared to reward (or punish) greener delivery systems through their intention to buy online.

1.2 Problem Statement

Despite the rapid expansion of online shopping and the increasing importance of sustainability, there is still limited evidence on whether green delivery practices actually influence customers' willingness to buy from e-commerce platforms in Pakistan. The literature offers valuable scope to understand green consumerism and e-commerce usage, but it often addresses general green consumption, green advertising or e-commerce adoption in general rather than specific to green delivery (Bharti & Suneja, 2025; Vu et al., 2026) .

For example, Saleem et al. (2024) examined green consumerism in Pakistan's online retail context and found that environmental attitudes, perceived ease of use, and perceived usefulness influence behavioural intention to use e-commerce. Ashraf et al. (2024) demonstrated the influence of green advertising on consumers' purchasing intentions in Pakistan, while Gill et al. (2024) found trust, promotion, convenience, comparison and time sensitivity are critical components of online shopping. These are all important studies, but none is directly investigating the impact of green delivery on Pakistan's e-commerce purchase intention. This suggests a contextual and conceptual knowledge gap. This is particularly significant because home delivery is one of the most prominent sustainability points of contact between shops and consumers.

The problem, therefore, is twofold. First, there is an increasing pressure on e-commerce firms in Pakistan to be "sustainable", while delivering low prices and quick shipping (Ahmad et al., 2023). Second, we lack evidence of whether Pakistani consumers put enough weight on green delivery to affect their intentions to purchase (Siyal et al., 2021). In the absence of such evidence, businesses may be reluctant to adopt greener supply chains, while policymaking to support sustainable digital economies might not progress. This research remedies the problem

by studying the effect of green delivery on customers' purchase intentions in the context of Pakistan's e-commerce industry.

1.3 Research Aim, Objectives, and Questions

The main aim of this study is to examine the impact of green delivery practices on customer purchase intentions in the e-commerce sector of Pakistan.

To achieve this aim, the study will pursue the following objectives:

Research Objectives

- To examine whether green delivery practices significantly influence customer purchase intentions in Pakistan's e-commerce sector.
- To assess how customers perceive green delivery practices in terms of environmental responsibility, usefulness, and attractiveness when making online purchase decisions.
- To identify the main factors that shape the relationship between green delivery practices and purchase intention, particularly in relation to cost, convenience, and consumer awareness.

In line with these objectives, the study will address the following research questions:

Research Questions

- How do green delivery practices influence customer purchase intentions in the e-commerce sector of Pakistan?
- How do customers perceive green delivery practices when purchasing through e-commerce platforms?
- Which factors most strongly shape customer purchase intention when green delivery options are offered?

1.4 Significance of the Study

This study is significant in theoretical, practical, and contextual terms. Theoretically, it adds to the growing body of research on sustainable e-commerce, by looking specifically at green delivery as opposed to green products or green marketing more broadly. International research has already shown that sustainability concerns can impact acceptance of delivery options and

future purchase of products (Klein & Popp, 2022; Štofejšová et al., 2023). But these links are not well studied in Pakistan, where consumer preferences, infrastructural constraints and online shopping patterns might differ from Europe or other mature markets. By focusing on this evidence, this study contributes to the context-sensitive evidence on sustainable consumption in e-commerce.

Practically, the study can help e-commerce firms, logistics providers, and digital retailers understand whether green delivery should be treated merely as a compliance or branding issue, or as a genuine driver of customer demand. If green delivery is found to have a positive impact on purchase intention, then companies can potentially outperform their competitors by investing in cleaner vehicles, sustainable packaging, route optimisation and more transparent delivery information. If not, then companies may need to complement efforts toward sustainability with rewards, education, or value enhancement rather than relying solely on the assumption that people care about green issues enough to change their behaviour (Villa et al., 2023; Kiba-Janiak et al., 2024).

The study is also relevant for policymakers and industry stakeholders in Pakistan. The draft e-Commerce Policy 2.0 acknowledges the need to infuse sustainability into Pakistan's emerging e-commerce economy and outlines logistics as a key policy area (Ministry of Commerce, 2025). This research will provide insights and evidence on the effectiveness of green delivery and may support future policy, education, and sustainability measures for Pakistan's e-commerce sector.

1.5 Methodology Overview

This study will adopt a quantitative research design because its main purpose is to measure and test the relationship between green delivery practices and customer purchase intentions in a structured and empirical manner. Using a quantitative design is appropriate for detecting relationships among a large number of respondents and for establishing whether the association between study variables is statistically significant (Ghanad, 2023). Primary data will be used in the study, gathered through a questionnaire survey of consumers in Pakistan with online shopping experience. The purpose of the questionnaire is to determine customers' attitudes towards green delivery and their intentions to buy in e-commerce.

The target population of the study will consist of online shoppers in Pakistan, and an appropriate sampling technique will be used to obtain responses from relevant participants. Once the data has been collected, the questionnaire responses will be analysed using statistical software SPSS. On one hand, descriptive statistics will be used to provide an overview of the demographics of the respondents and overall response patterns, while inferential statistical analysis, such as correlation and regression analysis, will be used to test the association between green delivery and purchase intention. This research method is suitable for achieving the research objective and in line with other studies on green e-commerce and purchase intention.

1.6 Thesis Structure

This thesis is organized into five chapters. Chapter 1 introduces the study by presenting the background, problem statement, research aim, objectives, research questions, significance, methodology overview, and overall structure of the thesis. Chapter 2 reviews the relevant literature on e-commerce, green delivery practices, sustainable consumer behaviour, and purchase intention, and develops the conceptual foundation of the study. Chapter 3 explains the research methodology in detail, including research design, sampling, data collection, variable measurement, and data analysis procedures. Chapter 4 presents the empirical findings of the study and interprets the statistical results. Finally, Chapter 5 discusses the findings in relation to the literature, draws conclusions, presents recommendations, acknowledges limitations, and suggests directions for future research.

CHAPTER 2: LITERATURE REVIEW

2.1 Introduction

This chapter reviews the literature related to green delivery practices and customer purchase intentions in the e-commerce sector of Pakistan. The chapter first explores the concept and development of E-commerce, in focus developing economies, and Pakistan. It then examines the green delivery practices and the related environment issues in ecommerce logistics, customer desire for purchasing, perception of the customer, price sensitivity and delivery convenience. The theoretical framework and review of empirical study on data obtained from some studies in international and Pakistani context is also discussed the chapter. Lastly, the chapter states the gap in the research, the conceptual framework, and the hypotheses for the quantitative study.

The literature shows that e-commerce has created new opportunities for consumers and businesses, but it has also increased concerns about last-mile delivery emissions, packaging waste, failed deliveries, and returns (Raj et al., 2024). It is generally accepted that traditional delivery systems can have a detrimental impact on the sustainability of e-commerce, but the distinction on the willingness to sacrifice the value of price and speed of average deliveries for those of sustainable deliveries has been debated (Nogueira et al., 2021). The direct effect of the greening of road freight transport on the intention to buy is thus the focus of this chapter, but the mediation of the customers' perception and the moderation of the cost and delivery convenience are also examined.

2.2 Concept of E-Commerce

E-commerce refers to the buying and selling of goods and services through digital platforms and online transactions. It encompasses all of the online retailing, digital payments, mobile commerce, social media selling, web-based banking, digital marketing, and platform-based business models (Jain et al., 2021). Hao et al. (2026) call the commercial system fuelled by digital technology “e-commerce” which is determined by infrastructure, technology, consumer behaviour, policy, and market access. Viewed from this angle, e-commerce can be seen as a vast ecosystem of stakeholders such as sellers, consumers and logistics service providers, financial services and even government regulatory bodies.

Globally, e-commerce has changed traditional retail by allowing customers to search for products, compare prices, read reviews, make payments, and receive products at home. This newfound convenience has fostered the shopping habit for online platforms, particularly in metropolises where the internet is more accessible, efficient, and trusted, alongside digital literacy and courier service (Popescu et al., 2025). However, the rise of online commerce varies among countries. Developed economies are likely to offer consumers improved means of payment, consumer protection policies and laws, and environmental policies and laws, along with a more developed logistics network. Developing economies, meanwhile, have constraints like limited infrastructure, problems with trust, digital literacy, poor logistics infrastructure, and payment concerns (Islam & Ferrer, 2025).

The literature also suggests that e-commerce growth depends heavily on consumer trust and delivery reliability. Online shoppers don't have the luxury of physically examining products before buying so they rely on the reputation of the platform, product descriptions, return policies, and delivery times. As a result, the intention to purchase products via ecommerce does not only depend on product price or the usability of the Internet, but also on the quality of the ecommerce logistics service (Habib, 2022). Restuputri et al. (2022) discovered that delivery speed, delivery conducts, order information, product conditions, and the location of the warehouses are significant factors of customer perception for last-mile delivery services. That indicates that delivery is not a sideline, but is essential to the online shopping process.

2.3 E-Commerce Sector in Pakistan

Pakistan's e-commerce sector reflects many of the opportunities and challenges found in developing digital economies. With the advancement of smartphones, mobile internet connections, social media sales, Internet Marketplace Intermediates, and consumer lifestyles, the nation has been witnessing an increase in online retailing (Daniyal et al., 2025). According to ITC's international trade report, Pakistan is the country ranked 46th in the list of e-commerce nations in 2024, generating US\$5.4 billion in revenue. On mobile users, the same source reported that there are 198 million 3G/4G users in Pakistan in 2024, which is a good mobile-first ground for the e-commerce sector to flourish.

Recent market data also show that Pakistan's e-commerce activity is strongly influenced by mobile shopping and cash-on-delivery. According to the estimates of PCMI in 2024, Pakistan has experienced a total e-commerce volume of \$7.7 billion and retail ecommerce volume of

\$5.4 billion. It further stated that 91% of Pakistani consumers shop online through the smartphone and that within the aforementioned there are various drivers for online shoppers such as fast delivery, price, low cost and free shipping. (PCMI, 2024) These results have implications for the present study as they indicate that the user in Pakistan is very much sensitive towards delivery-related and cost-related aspects.

Urban areas are particularly important in Pakistan's e-commerce sector. Generally cellular consumers have extra robust internet access scores, familiarity with online offerings, courier networks, and cell-based commerce familiarity scores, inside urban settings. Major cities like Lahore, Islamabad, Rawalpindi, Faisalabad, and especially Karachi are important for ecommerce retailers and logistics services. Larger cities like Lahore, Islamabad, Rawalpindi, Faisalabad, and in particular, Karachi, are significant markets for ecommerce retailers and logistics providers (Hasan, 2024). However, Saleem et al. (2024) investigated the issue of green consumption in the e-commerce scenario of Karachi and concluded that perceived ease of use and perceived usefulness played a significant contribution towards the behavioural intention to use eCommerce. This implies that when parking customers in cities view these issues with green aspects of e-commerce as beneficial and convenient, they will be receptive to such practices.

However, Pakistan's e-commerce sector also faces serious challenges. This comprises causing collections on delivery, low confidence in online-based payments, late deliveries, product return problems, logistics inefficiencies, and lack of formal integration of sustainability within the delivery systems for e-commerce (Naseem et al., 2021). The draft e-Commerce Policy 2.0 acknowledges the long-standing challenges in the digital payments, logistics, trust, inclusion, and environmental sustainability landscape in Pakistan. The policy also addresses the process of modernising digital commerce in Pakistan through a lifecycle approach, from onboarding, payments, logistics, consumer protection and cross border integration processes (Malkani, 2020).

2.4 Green Delivery Practices in E-Commerce

Green delivery practices refer to environmentally responsible logistics and delivery methods that reduce the negative environmental impact of e-commerce distribution. These practices include electric or low-emission vehicles, route optimisation, delivery consolidation, eco-friendly packaging, reusable packaging, recyclable packaging, pickup points, parcel lockers,

click-and-collect options, reduced failed delivery attempts, and sustainable return management (Cheng et al., 2024). Mucowska (2021) reviewed environmentally sustainable solutions for urban last-mile deliveries and identified green last-mile logistics as an important research area because e-commerce growth increases urban freight activity and environmental pressure.

The last-mile stage is especially important because it connects the seller or logistics provider directly with the customer. It is often the most visible part of the e-commerce process for consumers (Vrhovac et al., 2023). Klein and Popp (2022) explain that last-mile delivery methods such as home delivery, parcel lockers, and click-and-collect are influenced by customer perceptions of sustainability, convenience, usefulness, ease of use, and cost. Their study shows that sustainability matters, but customers do not evaluate delivery options only from an environmental perspective. Instead, they compare sustainability with functional benefits and costs.

Different researchers define green delivery from slightly different angles. Logistics-focused researchers often discuss green delivery in terms of emission reduction, route efficiency, vehicle technology, and shipment consolidation (Khoa et al., 2024). Consumer behaviour researchers focus more on how customers perceive green delivery, whether they trust environmental claims, and whether they are willing to accept higher prices or slower delivery (Nekmahmud et al., 2022). These two perspectives are complementary. Green delivery can only be successful if logistics systems are environmentally improved and customers are willing to accept or support those improvements.

In e-commerce, green delivery also includes sustainable packaging because the package is part of the delivery experience (Yue et al., 2024). Yan et al. (2025) studied consumer willingness to pay for green express packaging and found that consumers with higher environmental awareness were more willing to pay a premium for green packaging, but price remained a restrictive factor. This finding is useful for the present study because it supports both the positive role of environmental perception and the limiting role of cost sensitivity.

2.5 Environmental Issues in E-Commerce Delivery

Although e-commerce creates convenience for customers, it can also produce environmental problems. Some of these challenges encompass higher vehicle traffic, packaging waste, emissions of greenhouse gases, consumption of energy in warehouses, multiple delivery

attempts, and product returns (Romero et al., 2024). According to Nogueira et al. (2022), one way to stimulate last-mile eCommerce is through a fast delivery method of consumer goods, which can generate environmental issues like fossil fuels, congestion, and emissions. Their investigation using their simulations indicates that certain logistics situations can result in lower vehicle mileage if delivery time is more flexible and consolidation is increased.

Biancolin and Rotaris (2024) also highlight that consumers are becoming part of the environmental debate in B2C e-commerce. They explored consumers' willingness to pay to reduce or offset emissions incurred from their online purchases and their openness to alternative ways to collect emissions. This is significant because its focus transitions away from a sustainability-first attitude on the firm level to a responsibility-first attitude on the consumer side. But sustainability wins in e-commerce are not only a matter of what companies can do: it is also a matter of customer choice (Islam et al., 2023).

The literature presents contrasting views on whether e-commerce is environmentally better or worse than traditional shopping. Bjerkan et al., (2020) and Paché (2026) have provided arguments that eCommerce can lessen consumer travel to physical shops, particularly deliveries can be consolidated. Others, however continue to say that e-commerce can be detrimental to the environment due to a number of factors including fast delivery, individual parcels, over-packaging and excessive return rates (Nogueira et al., 2022; Xie et al., 2021). In addition, e-commerce has both positive and negative environmental impact, depending on its transportation, packaging, returns, warehousing, and consumption habits, UNCTAD (2024) has highlighted. Hence, the 'green footprint' of e-commerce ultimately relies on the type of delivery system and the consumer's reaction to more sustainable choices.

2.6 Customer Purchase Intention

Customer purchase intention refers to the likelihood or willingness of a customer to buy a product or service in the future. Purchase intention is defined as the customers readiness to buy from an ecommerce store (Salirrosas et al., 2022). It is partly shaped by price, user confidence, product quality, website usability, security of the payment, reliability of delivery, reviews, and previous experience and value perceived from services. In the context of online shopping, delivery is a crucial factor as it is a key point in customer's judgment regarding the online platform as they make after receiving the product (Aljohani, 2024).

Purchase intention is widely used in consumer behaviour research because it helps predict future buying behaviour. But not all intentions lead to actual behaviour (Baati & Akrouit, 2024). In a study on green apparel buying behaviour in Pakistan, Rasheed et al. (2024) discovered that while consumers may feel concerned about the environment, there can be a complex connection between their intent and their actions. They studied the concept of green purchase behaviour with mediation between green buying intention and mediation between willingness to pay. Interestingly, willingness to pay did not significantly moderate their context suggesting green consumption behaviour may differ between products and customer groups.

In e-commerce, purchase intention is also closely related to customer trust. Ahmad et al. (2024) discussed sustainable packaging, logistics, ethical sourcing and trust in ecommerce in Pakistan. Their studies revealed that packaging, logistics and ethical sourced issues influenced the consumers' buying behavior and trust acted as a mediator for this effect. This is one justification for the measured relationship between purchase intention and the indirect influence of sustainability practices, as they do so through the customer's perceptions and trust.

Green purchase intention is a more specific form of purchase intention. It is the commitment of consumers to purchase products/ services considered to be environmentally responsible. Green products are not the only focus in this thesis but green delivery practices as well (Olfat, 2025). This is extremely relevant as a customer can take a product from an ordinary e-commerce site yet appreciate the site for the eco-friendly wrapping, the productions on low carbon deliveries or consolidated transportation.

2.7 Customer Perception of Green Delivery Practices as a Mediating Variable

Customer perception refers to how customers interpret, evaluate, and respond to a company's practices (Tulcanaza-Prieto et al., 2022). The customer perception of green delivery practices is hypothesized to be used as a mediating variable between green delivery practices and customer purchase intention in this study. This implies that green delivery practices can impact purchase intention, as they first affect the customer's perception of the e-commerce platform as environmentally responsible, useful, trustworthy and attractive.

The mediating role of perception is supported by several studies. Perceived sustainability, perceived usefulness, perceived ease of use, and the perceived costs are found to influence acceptance of delivery methods by Klein and Popp (2022). Their results indicate that customers

are not just sensitive to delivery practices as logistics variables - they are sensitive to the perception of delivery practices. Customers will be more willing to accept the green delivery service if they feel it is beneficial and convenient. If they think that it will be expensive or not convenient for them, they might refuse it even if it is good for the environment (Hoang & Tung, 2024).

Saleem et al. (2024) also support the importance of perception in Pakistan's e-commerce context. They found that perceived ease of use and perceived usefulness were positively and significantly influencing attitudes towards e-commerce use in Karachi. While their study was not related to green delivery per-se, it does provide some context-oriented evidence which suggests that behaviour intentions of the consumers are influenced according to their perceived usefulness and ease of use of using a green oriented ecommerce approach.

Customer perception can be divided into three important dimensions for this study. Perceived environmental responsibility is defined as the extent to which customers think that an e-commerce website is actually lessening environmental damages (Zheng et al., 2020). Second, perceived usefulness is the degree to which perceived value is provided as a result of green delivery but is not perceived to affect service quality (Zhang et al., 2024). Thirdly, perceived attractiveness is defined as the effect of green delivery on the image of a platform and its attractiveness (Liu et al., 2025). These dimensions are crucial because they help us understand why green delivery can have or have not an impact on the intention to purchase.

2.8 Cost Sensitivity and Delivery Convenience as Moderating Variables

Cost sensitivity refers to the extent to which customers are influenced by price when making purchase decisions (Zafar et al., 2025). Cost sensitivity is suggested as a moderating variable for this study. Moderator: A variable that affects the strength or direction of the relationship between two other variables. The customers' perception of green delivery could not always necessarily explain their purchase intention, as they might not purchase such products when delivery costs are higher (Olfat, 2025).

Several studies support this argument. The findings from Yan et al. (2025) showed that green express packaging increased environmental awareness and in turn, there was an increase in willingness to pay for the green packaging, which had a restricting impact of price. Likewise, Villa et al. (2023) discovered that customers' preferences for green transport may be

complemented with the price and timeliness of delivery. Price also was among the top three for delivery method choice, according to Kiba-Janiak et al., (2024). Overall, these results demonstrate that cost is still one of the best entrants in terms of constraints against green delivery adoption.

Delivery convenience is the second moderator in this study. Convenience is defined as how easy, fast, accessible and effortless it is to get a product. In the context of ecommerce, many consumers prefer to shop online as it can save their time and effort (Wang et al., 2025). Delaying customers, forcing customers to go to pick-up points, reducing the number of deliveries, or charging extra fees for green delivery might make green delivery less desirable for customers. On the other hand, when it's easy for customers to alternate to green shipping, then they are more likely to be receptive to it.

2.9 Theoretical Foundation

This study is mainly supported by the Theory of Planned Behaviour and the Technology Acceptance Model. Ajzen's (1991) Theory of Planned Behaviour (TPB) states that intention to change behaviour depends on attitude, subjective norms, and perceived behavioural control (PBC). Adoption of green delivery may foster positive attitudes to an e-commerce platform if customers think that the platform is environmentally friendly. However, if customers perceive a social norm to patronize network effects for sustainable businesses it can come into play as well. This is because of the perceived behavioural control that customers could have when some see little benefit in green deliveries if it does not benefit them in any way and is more costly and inconvenient (Tarigan et al., 2021).

The Technology Acceptance Model is also relevant because e-commerce is a technology-based shopping system. Davis (1989) suggested two determinants of technology acceptance, perceived ease of use and perceived usefulness. The concepts can be helpful for this study since customer may have a positive attitude towards green delivery service if they find the service beneficial, easy and convenient to their shopping behavior. In addition, Klein & Popp (2022) combined the two in the model of acceptance for the last mile delivery method.

TPB combined with TAM is suitable for this thesis due to the fact that the concept of green delivery includes both an environmental attitude and a digital service acceptance factor. What this does is make it clear why customers might want to purchase goods from an

environmentally responsible company as well as clarify if purchasing environmentally friendly delivered goods is beneficial and easy. An association between cost sensitivity and convenience can be connected with perceived behavioural control, since customers might not opt to buy in a green way if it is costly and inconvenient.

2.10 Research Gap

The literature shows that green delivery practices are becoming increasingly important in sustainable e-commerce, but there is still limited evidence from Pakistan. Recent international research has focused on sustainable last-mile delivery (Rażniewska et al., 2026), parcel lockers (Aljohani, 2024), the click and collect option (Hoang & Tung, 2024), willingness to pay (Aljohani, 2024), green packaging (Aljohani, 2024), and consumer acceptance (Rażniewska et al., 2026). These studies do, however, focus primarily on developed or more mature markets, however. This research cannot be entirely applicable in the context of Pakistan, due to the difference in the e-commerce environment in which the Pakistani consumers operate, including cash on delivery, price sensitivity, shoppers' doubts and concern about delivery, and the unbalanced logistics networks.

Pakistani studies have examined green consumerism, green advertising, sustainable packaging, trust, and online shopping behaviour (Ahmad et al., 2023; Ahmad et al., 2024; Gill et al., 2024). But, very few studies directly address whether green delivery practices affect the intent to purchase in the e-commerce segment of Pakistan. Also, several research studies focus on the direct effects of green delivery on purchase intention and do not account for the mechanism by which green delivery influences purchase intention. The present study aims to fill this gap with regards to the use of Customer Perception as a mediating variable. It adds cost sensitivity and delivery convenience as moderating factors as they are often included in the literature as significant factors that influence customer's decisions.

2.11 Conceptual Framework

The conceptual framework of this study is based on the relationship between green delivery practices and customer purchase intention. Customer purchase intention are the dependent variables, independent variables related to green delivery practice. Customer perception of green practices in the delivery service is taken as a mediating variable. The moderation variables are cost sensitivity and delivery convenience.

The framework proposes that green delivery practices can influence customer purchase intention directly. An e-commerce platform implementing recyclable packaging, optimised routes, low emission vehicles or consolidated delivery, for instance, will help customers perceive the platform as environmentally friendly and potentially encourage them to do more business with it. But the impact might not be direct alone. However, the first step in green delivery practices could be to influence customer perception. When customers feel these practices are helpful, when they are responsible, when they are emphasized as being trustworthy, and when they are appealing, customers may be willing to buy again.

Conceptual Framework

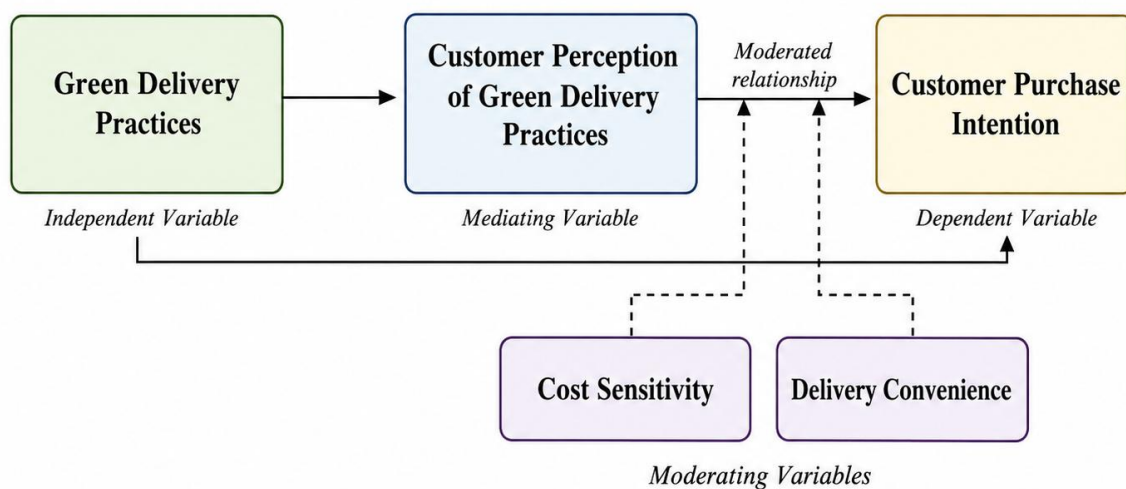


Figure 1 Conceptual framework for the study

2.12 Hypothesis Development

The hypotheses are developed according to the three research questions of the study.

H1: Green delivery practices have a significant positive impact on customer purchase intention in Pakistan's e-commerce sector.

This hypothesis tests the direct relationship between green delivery practices and purchase intention. It is based on the assumption that customers are more likely to purchase from e-commerce platforms that demonstrate environmental responsibility through sustainable delivery methods.

H2: Customer perception of green delivery practices significantly mediates the relationship between green delivery practices and customer purchase intention.

This hypothesis explains the mechanism through which green delivery practices influence purchase intention. Green delivery may increase purchase intention because it improves customer perception of the platform's environmental responsibility, usefulness, trustworthiness, and attractiveness.

H3: Cost sensitivity and delivery convenience significantly moderate the relationship between customer perception of green delivery practices and customer purchase intention.

This hypothesis tests the boundary conditions of the model. The positive effect of customer perception on purchase intention is expected to be weaker when cost sensitivity is high and stronger when delivery convenience is high.

2.13 Chapter Summary

This chapter reviewed literature on e-commerce, Pakistan's e-commerce sector, green delivery practices, environmental issues in e-commerce delivery, customer purchase intention, customer perception, cost sensitivity, and delivery convenience. The literature shows that green delivery can positively influence customer purchase intention, but the relationship is not simple. Researchers agree that sustainability matters, but many studies show that customers still give strong importance to price, speed, convenience, usefulness, and trust.

CHAPTER 3: RESEARCH METHODOLOGY

3.1 Introduction

This chapter explains the research methodology adopted for the study. The aim of this chapter is to give a simple and systematic explanation of the way the study will be conducted, of the ways in which data will be collected, and of the proposed relationships between the study variables to be tested. The methodology is aimed to provide objective measurement, statistical testing as well as hypothesis validation in the study in order to analyze the effect of green delivery practices to customer's purchase intention.

The methodological structure of this chapter is based on Saunders' Research Onion, which provides a layered framework for designing research. Research onion starts from broad philosophical assumptions to gradually get to the techniques and procedures that are useful for particular research (Saunders et al., 2020). For this reason, the research philosophy, the research approach, selection of the research methods, research strategy, representativeness of the times, sampling, steps in collecting data, tools for measuring variables, analysis of data, reliability and validity, and ethical considerations are explained in this chapter.

3.2 Research Onion Framework

Saunders, Lewis and Thornhill's Research Onion is used as the methodological foundation of this study because it offers a logical and structured way of designing research. The model has many layers, namely research philosophy, research approach, methodological choice, research strategy, time horizon and techniques and procedures. When it comes to the methodology choices, each layer aids the researcher in making informed choices (Saunders et al., 2020).

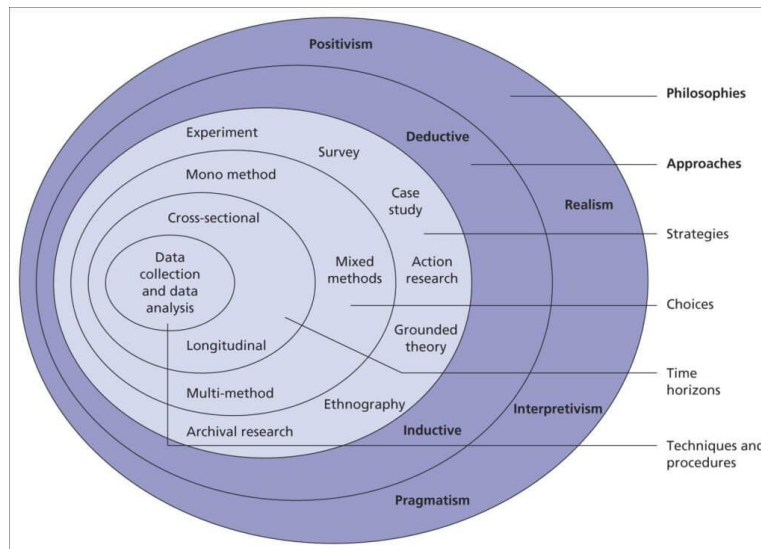


Figure 2 Saunders research onion diagram (Saunders et al., 2020)

3.3 Research Philosophy

Research philosophy refers to the assumptions that guide how knowledge is developed and interpreted in a study. This study is using positivist philosophy. It is appropriate because a study is focused on observable and measurable facts, so the approach would be positivism (Lim, 2023). Delivered variables such as the use of implementations of green delivery practices, customer perceptions, cost sensitivity, delivered convenience and purchase intention of the customers can be statistically analyzed by the use of structured questionnaire items.

A positivist philosophy supports objectivity, measurement, and generalisation. With the aid of this study, the customers' response is obtained through closed-end type of questions which were presented to the customers in the Likert scale format and numerical data are obtained. This allows testing of hypotheses and exploration of whether there are significant relationships between the variables. For instance, the study wants to determine the impact of green delivery practices on customers' purchasing intention in a significant positive manner. This testing demands objective data and analysis with statistics, a positivistic approach very compatible among the ideologies.

Other philosophies were not chosen because they were deemed less appropriate for the purpose of this study. Interpretivism wasn't embraced, since it has a specific focus upon the understanding of subjective meanings, experiences endured by persons and social interpretations (Pervin & Mokhtar, 2022). Interpretivism may be beneficial in understanding

in more personal terms how the customer understand green delivery, but would not be appropriate to test placed hypotheses on a more diverse sample. Critical realism was not taken up since is more focused on discovering the deeper structure and hidden mechanisms of the social phenomena. This is a potential explanation for sustainable consumption at a deeper level but it deviates from the main quantitative study. This could be a deeper level of understanding of sustainable consumption but it would stray from the main quantitative study (Stutchbury, 2021). Pragmatism was not chosen because it is typically linked to mixed-method research which typically involves using both quantitative and qualitative data (Hampson & McKinley, 2023). This study is of quantitative survey nature, as such, the philosophy of positivism is the best one to use.

3.4 Research Approach

The study adopts a deductive research approach. The deductive method starts from the theories and literature that already exist, proposes hypotheses and tests the hypotheses with empirical data (Casula et al., 2020:39). For the present study, this approach is appropriate because the conceptual framework based on previous literature, Theory of Planned Behaviour (TPB) and Technology Acceptance Model (TAM) have been developed in the previous research done by the researchers on Chapter 1 and 2.

The deductive method enables examination of the following hypotheses: green delivery practices significantly affect customer purchase intention, the mediation of the relationship between green delivery practices and customer purchase intention, and the moderation of the relationship between customer perception and customer purchase intention which are cost sensitivity and delivery convenience. These hypotheses are not based upon any data gathered, but rather are established from previous studies and tested by using quantitative survey data.

An inductive approach was not selected because it is more appropriate when the researcher aims to generate new theories from qualitative data. This is because variables and hypotheses have already been defined in this study, hence induction is not appropriate (Naeem et al., 2023). An abductive approach was also not followed as it would have brought together elements of deduction and induction and is often used when the researcher backtracks and forths between theory and data. There are some reasons why the use of abductive reasoning might be considered helpful in exploratory studies, but the current study is explanatory and hypothesis-

driven (Awuzie & McDermott, 2017). Thus, deductive method suits best for testing the relationship among clearly stated variables to achieve the aim.

3.5 Methodological Choice

This study uses a mono-method quantitative design. Mono-method implies using only one method of data collection and quantitative data refers to data that are numerical and amenable to statistical analysis (Ghanad, 2023). Data collection method: The data will be collected from the respondents using a structured questionnaire, closed ended questions and 5 point likert scale in this research.

The study aims to measure the relationships both in terms of strength and direction, so a quantitative method is appropriate. For instance, the researcher must measure the likelihood of customers buying products from the e-commerce platforms while they perceive the delivery service by those platforms as “green”. Correlation, regression analysis, mediation analysis and moderation analysis are suitable methods of testing this type of relationship.

A qualitative method was not chosen because this would be the most appropriate method if the researcher were interested in detecting richness in description related to the hypotheses, but were not interested in statistically testing the hypotheses. (Lim 2024) Qualitative research might provide insight into why customers want green vehicles delivered while not being able to provide any measure of the link between green vehicles and intention to purchase.

3.6 Research Strategy

The research strategy selected for this study is the survey strategy. A survey is the best method if it is intended to gather data from a relatively large number of respondents in a structured and effective way. The inclusion of this survey strategy in consumer behavior studies occurs more frequently when studying attitudes, perceptions, preferences, and purchase intent, as well as other areas such as customer satisfaction, prices, and tastes and preferences (Sheikh et al., 2024).

3.7 Time Horizon

This study adopts a cross-sectional time horizon. The Cross-sectional study is a study conducted at a single moment in time. This is suitable because the study is designed to find out

the attitude and purchase intention of the present customers towards green delivery in the e-commerce domain in Pakistan. A cross-sectional design is quite suitable for a thesis since the data can be acquired in a brief period of time within the academic context. It can also be used for attitude studies and/or intention research, since the research does not need to be repeated over multiple months or years (Maier et al., 2023). The study will thus interviews that will be taken from Pakistani online shoppers once and analysis of the data will be done to test the formulated hypotheses.

A longitudinal time horizon was not selected because it would require collecting data from the same respondents at multiple points in time (So et al., 2025). There are a number of other potential challenges in achieving this, including the amount of time, the resources and the access that is required to participants, but a longitudinal study could reveal the evolution of customer attitudes towards green delivery over time.

3.8 Population of the Study

The target population of this study consists of online shoppers in Pakistan. This encompasses those who previously bought products or services online, either through e-commerce websites, or by using a mobile phone application or social media hosted online store. The population has value because they are consumers who are directly affected by the delivery process can assess whether green delivery options affect their buying decisions.

The study is based on the Pakistanis as it is intended to help and guide the policymakers to promote sustainable delivery practices for e-commerce in Pakistan, which is growing in a quick pace. PCS also suggests that price and convenience of delivery, cash-on-delivery purchases, trust and awareness of environmental issues are also likely to have an impact on Online shoppers in Pakistan. As the study was not to measure those who have not shopped online at all, this would not have provided enough experience for them to answer the questionnaire with accuracy.

3.9 Sampling Technique and Sample Size

The study will use a non-probability convenience sampling technique. Convenience sampling makes sense as the research will be targeted to the online shoppers who can be reached through the digital medium, including WhatsApp, Facebook, Instagram, LinkedIn, University groups,

and e-mail. Convenience sampling is used due to the nature of the study (i.e., using a questionnaire); it is used to get responses from the people who are available to the researcher and have the suspected inclusion characteristics, facilitating the process of gathering responses to the questionnaire (Memon et al., 2025). Generally, the inclusion criteria are that the respondents are to be the residents of Pakistan and must have reached a phase in their online shopping experience where they have purchased--and paid for-- something online.

The number of respondents in this study is applicable to about 150. This data can be used in quantitative analysis via SPSS, descriptive statistics, reliability analysis, correlation, regression analysis, mediation, and moderation analysis. The larger the sample, the more reliable the results will be, and the more confidence can be placed in statistical results.

3.10 Data Collection Method

Primary data will be collected through a structured questionnaire. The use of the questionnaire is suitable because it is able to provide consistence in data collection from all respondents. The answers will be in the same format and from the same questions, so it will be easier to make comparisons and it will help with statistical analysis. The questionnaire opens with a statement of consent in which we provide parents with information about the voluntary nature of the participation, discretion in response and the confidential nature of the data, while also stating that the data will only be utilized for research for academic purposes. Participants/respondents will be requested if they agree to participate. If someone chooses "No", then he or she will not be asked to go on with the questionnaire.

The questionnaire contains five sections. Demographic information is gathered in section A. Section B assesses 'green delivery practices'. Section C: Customer perceptions of green delivery. Section D measures cost sensitivity and delivery convenience. One section is "E" – which is related to customer purchase intention. Items in Sections B–E are rated on a scale of 1 to 5 with 5 being Strongly Agree, and 1 being Strongly Disagree.

3.11 Data Analysis Techniques

The collected data will be analysed using SPSS. Statistician tests will be run with data after they have been screened for unusual response patterns, missing data and responses, and

incomplete responses. Non-consenting/completing the questionnaires improperly will be excluded.

First, descriptive statistics will be used to summarise the demographic profile of respondents, including gender, age, education level, and online shopping frequency. Descriptive statistics will also be used to establish a general trend of the responses in each variable. Secondly reliability analysis will be made use of Cronbach's alpha. This will add up to the internal consistency index for the items for each construct in the questionnaire. In general, a Cronbach's Alpha coefficient of 0.70 or higher is regarded as an acceptable level for social science studies.

The direct effect of green delivery practices on customer purchase intention will test using regression analysis. This will help to test H1. This will be followed by a mediation analysis to help understand the mediation relation between customer perception and the relationship between green delivery practices and purchase intention. This will facilitate testing of H2. Finally, moderation analysis will be performed to see how strong the relationship between customer perception and purchase intention is when the cost sensitivity and the case would be involved. This will aid in testing of H3. Mediation and Moderation test are widely adopted in behavioural and management research, which allows the Process macro to be applied in SPSS analysis for these tests.

3.12 Reliability and Validity

Reliability refers to the consistency of the research instrument. The reliability of this study will be tested using Cronbach Alpha for construct. Each variable had more than one item measured on the questionnaire so Cronbach's Alpha is used to determine that items in the same section of the questionnaire measure the same construct (Taber, 2017). Validity is a measure of the instrument's ability to measure what it sets out to measure. Content validity is supported because the content of the questionnaire is directly related to the research objectives, conceptual framework and literature review (Marc Lim, 2024).

3.13 Ethical Considerations

Ethical considerations are important because the study involves human participants. The questionnaire begins with a consent statement explaining the purpose of the research, voluntary participation, confidentiality, and the right to withdraw. Respondents will only participate if

they agree to the consent statement. No personal identifying information such as name, address, phone number, or email will be required. This protects the anonymity of participants.

The collected data will be used only for academic research purposes and will not be shared for commercial use. Participants will also have the right to leave the questionnaire at any stage if they do not wish to continue. The study does not involve physical, psychological, or financial harm to participants. However, ethical care is still required because respondents are providing personal opinions. Therefore, all responses will be treated respectfully and confidentially. The researcher will report the findings honestly and will not manipulate the data to support preferred outcomes.

3.15 Chapter Summary

This chapter presented the methodology for examining the impact of green delivery practices on customer purchase intentions in Pakistan's e-commerce sector. Using Saunders' Research Onion, the study adopted a positivist philosophy, deductive approach, mono-method quantitative design, survey strategy, and cross-sectional time horizon.

CHAPTER 4: ANALYSIS OF RESULTS AND DISCUSSION

4.1 Introduction

This chapter presents the quantitative results of the study based on data collected from 150 online shoppers in Pakistan. It explores the impact of green delivery on customer purchasing intentions in e-commerce, as well as the moderating effects of customer perception, delivery expense, and convenience. It starts with a demographic analysis, with regard to sex, age, education, and frequency of online shopping. It subsequently displays descriptive statistics, analysis of reliability, correlation, regression, mediation and moderation. The results are drawn in reference to research objectives, hypotheses and review literature in Chapter 2, and empirical evidence for the green delivery and purchase intention is established.

4.2 Demographics Analysis

The demographic analysis presents the basic background information of the 150 respondents who participated in the study.

Table 1 Gender of respondents

		Frequency	Percent	Cumulative Percent
Valid	Female	61	40.7	40.7
	Male	87	58.0	98.7
	Prefer not to say	2	1.3	100.0
	Total	150	100.0	

Looking at the gender distribution, the number of participants in this study who are male (58.0%) was higher than the number of female participants (40.7%). 1.3% chose not to indicate their gender. The dual nature of both groups serves as a basis for understanding customer perceptions of green delivery practices in the e-commerce industry in Pakistan.

Table 2 Age of respondents

		Frequency	Percent	Cumulative Percent
Valid	18–25 years	110	73.3	73.3
	26–35 years	33	22.0	95.3
	36–45 years	3	2.0	97.3
	Above 45 years	2	1.3	98.7
	Below 18 years	2	1.3	100.0
	Total	150	100.0	

The age distribution revealed that majority (73.3%) of the respondents were within the age group of 18 – 25 years. The number of respondents aged 26–35 years was second highest (22.0%), with a small portion in older age groups. This implies that the study primarily reflects the perspectives of the younger generation of online shoppers, and they are in general more aware about digital platforms, mobile shopping, and ecommerce delivery services in Pakistan.

Table 3 Education Level of respondents

		Frequency	Percent	Cumulative Percent
Valid	Bachelor’s degree	115	76.7	76.7
	Intermediate or below	12	8.0	84.7
	Master’s degree	18	12.0	96.7
	MPhil/MS or above	4	2.7	99.3
	Other	1	.7	100.0

Total	150	100.0	
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The education profile indicates that in most cases the respondents had received a Bachelor's education (76.7%). 12.0% of respondents had a Master's and 8.0% had intermediate or lower education. Only 2.7 % had MPhil/MS or above qualification with 0.7 % choosing other. This suggests that the sample consisted primarily of educated participants which is fitting for this study because educated people tend to comprehend things like green delivery, sustainability, and buyers' intention to buy online.

Table 4 Shopping frequency of respondents

		Frequency	Percent	Cumulative Percent
Valid	2–3 times a month	43	28.7	28.7
	More than once a week	9	6.0	34.7
	Once a month	43	28.7	63.3
	Once a week	8	5.3	68.7
	Rarely	47	31.3	100.0
	Total	150	100.0	

The results of the Internet shopping frequency indicate that 31.3% rarely shop online, 28.7% shop once a month, and 28.7% 2 – 3 times per month. A smaller proportion shop once a week or more than once a week. This indicates that most respondents have some level of online shopping experience, although frequent online shoppers are fewer. Therefore, the responses are suitable for examining perceptions of e-commerce delivery practices and purchase intention.

4.3 Green Delivery Practices

This section presents the descriptive statistics for respondents' views regarding green delivery practices in Pakistan's e-commerce sector.

Table 5 Descriptive statistics on green delivery practices

	N	Minimum	Maximum	Mean	Std. Deviation	Variance
I prefer e-commerce platforms that use eco-friendly packaging for deliveries.	150	1	5	3.52	1.174	1.379
I consider low-emission or fuel-efficient delivery vehicles important in online shopping.	150	1	5	3.56	1.120	1.255
I support e-commerce platforms that combine deliveries to reduce environmental pollution.	150	1	5	3.70	1.180	1.393
I value e-commerce platforms that offer environmentally responsible delivery options.	150	1	5	3.75	1.094	1.197
Valid N (listwise)	150					

The descriptive results show that respondents generally expressed a positive attitude toward green delivery practices, as all four items recorded mean values above the neutral midpoint of 3.00. The most popular score was for “I value e-commerce platforms that offer environmentally friendly delivery options” which had a mean of 3.75 and SD of 1.094. This suggests that plenty of respondents understand the significance of being environmentally-friendly when deciding about the delivery choices they receive for ecommerce platforms. In the same way, the mean value for the statement about supporting combined deliveries for minimising environmental

pollution was 3.70, indicating similar support for delivery consolidation being a sustainable logistics practice. The above findings indicate that Pakistani shoppers are not oblivious of environmental concerns in online shopping delivery services. Instead, they display a positive attitude towards delivery strategies that minimize and eliminate environmental damage. This aligns with the existing research that put forward the idea that applied strategies for green delivery service, including green packaging, low-impact transport, route optimisation, deliveries that are consolidated and parent supervision, are now significant part of sustainable e-commerce logistics (Mucowska, 2021; Cheng et al., 2024).

The remaining two items also show moderately positive responses. 3.52 (agree) and 3.56 (agree) were the mean scores for the questions pertaining to eco-friendly packaging and delivery vehicles with low emissions or fuel efficiency respectively in the context of online shopping. The findings show that participants are not only aware of the aspect of green delivery in transport but also of that in the packaging and efficiency of the vehicles. The standard deviation values vary from 1.094 to 1.180, however, indicating that there are discrepancies in the responses made, and therefore there is not complete agreement of all the customers. This variation is significant as previous research indicates that the customers might be willing to maintain sustainable delivery in principle, but their true intention can be influenced by the price, convenience, speed and usefulness. For instance, ease of use, usefulness, cost, and sustainability are all factors for customers to consider when they accept last-mile delivery (Klein and Popp, 2022). Similarly, Villa et al. (2023) and Kiba-Janiak et al. (2024) discovered that customers might value green delivery, but some other factors like price and delivery speed could also be very effective determinants of choice.

4.4 Customer Perception of Green Delivery

This section presents the descriptive statistics for respondents' perceptions of green delivery practices in e-commerce platforms.

Table 6 Descriptive statistics on customer perception of green delivery

				Std.	
N	Minimum	Maximum	Mean	Deviation	Variance

Green delivery practices make an e-commerce platform appear more responsible.	150	1	5	3.55	1.229	1.511
I believe green delivery practices can reduce environmental harm caused by online shopping.	150	1	5	3.65	1.112	1.237
I perceive e-commerce platforms using green delivery as more trustworthy.	150	1	5	3.45	1.078	1.162
Green delivery practices improve my overall perception of an e-commerce platform.	150	1	5	3.53	1.127	1.271
Valid N (listwise)	150					

The descriptive results show that respondents had a generally positive perception of green delivery practices, as all mean values were above the neutral midpoint of 3.00. The mean for the statement, “I think that using green delivery practices can reduce the environmental damage for online shopping” was 3.65 with a standard deviation of 1.112. This means that a lot of respondents acknowledged the importance of green deliveries and felt there is potential in sustainable deliveries to minimize the negative environmental impacts of online shopping. The mean for “Green delivery practices make an e-commerce platform appear more responsible” was positive with 3.55, indicating that in this regard, an e-commerce platform becomes more responsible due to green delivery practices. These results align with the literature surveyed in Chapter 2, where perception was characterized as one of the key variables that mediate the delivery practices—purchase intention relationship. The perception of the business is linked to how customers perceive or interpret their business practices, and the perception of sustainability is found to influence consumers' acceptance of the last-mile delivery method by Tulcanaza-Prieto et al. (2022), and Klein and Popp (2022), respectively.

The results further show that green delivery practices improved respondents' overall perception of e-commerce platforms, with a mean score of 3.53. Similarly, the statement "I perceive e-commerce platforms using green delivery as more trustworthy" received a mean score of 3.45. This item recorded the lowest mean value among the 4 Items and was still above the neutral value, which showed a somewhat positive perception. This implies that green delivery could play a role in trust but the role of previous shopping experience, delivery reliability, product condition, pricing and service quality might also be influencing pre-dispositions to trust. The standard deviation values range from 1.078 to 1.229, indicating that there is some variation in the opinions of the respondents to green delivery, and that many customers were positive but others were not so sure. This helps the case made in Chapter 2 for how useful, convenient, trustworthy, and perhaps skeptical perceptions of green claims can shape customer perception. In the context of e-commerce, Martínez et al. (2025) highlighted that low or ambiguous green certification might raise doubts among customers, and Saleem et al. (2024) concluded that perceived usefulness and ease of use were the factors that influenced behavioural intention in Pakistan's e-commerce context.

4.5 Cost Sensitivity and Delivery Convenience

This section presents the descriptive statistics for cost sensitivity and delivery convenience as moderating variables in the study.

Table 7 Descriptive statistics on cost sensitivity and delivery Convenience

	N	Minimum	Maximum	Mean	Std. Deviation	Variance
I would hesitate to choose green delivery if it increases the delivery charges.	150	1	5	3.22	1.164	1.354
Price is more important to me than whether the delivery method is environmentally friendly.	150	1	5	3.30	1.214	1.473

I would choose green delivery if it does not delay my order.	150	1	5	3.77	1.201	1.442
I am more likely to accept green delivery if it is as convenient as regular delivery.	150	1	5	3.85	1.195	1.428
Valid N (listwise)	150					

The descriptive results show that cost sensitivity was present among respondents, although the mean scores were only moderately above the neutral point. The statement “I would hesitate to choose green delivery if it increases the delivery charges” recorded a mean value of 3.22, while the statement “Price is more important to me than whether the delivery method is environmentally friendly” recorded a mean value of 3.30. These results suggest that as well as being pro-oriented toward green delivery practices, price is still a significant consideration for respondents in their decision making process. That can make an impact on customers if they value eco-friendly delivery – but their willingness to opt for it decreases if it costs more. However, there are differences in the standard deviation values (1.164 and 1.214), indicating some participants were more price sensitive than others. Villa et al. (2023) stated that although customers are more likely to favor green delivery in theory, the actual factors of price and delivery time are still well-determining their decision-making process. The results also indicate that price is one of the primary considerations that helps determine the choice of delivery methods, which aligns with the findings of Kiba-Janiak et al. (2024).

The results for delivery convenience show stronger agreement compared with cost sensitivity. The statement “I would choose green delivery if it does not delay my order” recorded a mean value of 3.77, while “I am more likely to accept green delivery if it is as convenient as regular delivery” recorded the highest mean of 3.85. The finding provides grounds for believing that consumers would not mind paying for green deliveries if they are not perceived as less convenient online shopping experience. This is significant because convenience is one of the prime motives that customers turn to ecommerce platforms. When the green delivery service delays order or makes it more effortful or challenging to receive its orders, customers may opt for regular delivery services. But, if the green delivery is equally easy to the customer, it's

easier for the customer to say yes. This is in line with Klein and Popp's 2022 saying that Sustainability, but usefulness, ease of use, cost and convenience are still factors in delivery acceptance. Restuputri et al. (2022) also noted the aspect of the product delivery that seems to be an influencing factor in customer's judgment, namely delivery time, product condition, and service quality. Finally, green delivery should be "affordable and convenient" so as to impact a positive change in customer purchase intent.

4.6 Customer Purchase Intention

This section presents the descriptive statistics for customer purchase intention toward e-commerce platforms offering green delivery options.

Table 8 Descriptive statistics on customer purchase intention

	N	Minimum	Maximum	Mean	Std. Deviation	Variance
I am more likely to buy from an e-commerce platform that offers green delivery options.	150	1	5	3.38	1.191	1.418
Green delivery practices positively influence my decision to shop from an online platform.	150	1	5	3.44	1.114	1.241
I would recommend an e-commerce platform that provides environmentally responsible delivery.	150	1	5	3.65	1.112	1.237
I intend to purchase from e-commerce platforms that show concern for sustainable delivery.	150	1	5	3.71	1.096	1.202

Valid N (listwise)	150					
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The descriptive findings reveal that consumers' purchase intention for ecommerce platforms that practice green delivery services is moderate. The mean value for all four items were above the neutral value of 3.00, showcasing that the respondents in general agreed that the green delivery can have a positive impact on their future purchasing. The highest mean score was recorded for the statement, "I intend to purchase from e-commerce platforms that show concern for sustainable delivery," with a mean of 3.71 and standard deviation of 1.096. The results indicated that awareness of responsibility towards both the environment and the community increased the likelihood of the respondents regarding future purchase intentions when initiatives emerged through websites were perceived as environmentally safe and responsible. Similarly, the statement "I would recommend an e-commerce platform that provides environmentally responsible delivery" recorded a mean of 3.65, showing that green delivery may also encourage positive word-of-mouth. The results substantiate the argument presented in Chapter 2 that when customers connect the delivery practices practiced by the retailer with environmental responsibility, green delivery (such as community delivery) can have a positive effect on platform image and customer acceptance, and consequently lead to positive customer buying intentions (Jabeen et al., 2023; Ahmad et al., 2024).

The other two items also show positive but comparatively lower mean scores. The statement "Green delivery practices positively influence my decision to shop from an online platform" recorded a mean of 3.44, while "I am more likely to buy from an e-commerce platform that offers green delivery options" recorded a mean of 3.38. The findings show that while the delivery factor 'green' has a positive effect on intention to buy, it might not be the only determinant of buying. This is in line with what is stated in Chapter 2, as experts require that environmental concerns are often seen in conjunction with other factors, such as price, speed and usability, trust, and convenience when making their decision. For instance, Klein and Popp (2022) discovered that while sustainability is important to customers' acceptance of delivery methods, usefulness, ease of use, cost and convenience remain significant. Similarly, Villa et al. (2023) and Kiba-Janiak et al. (2024) stated that customers might be willing to accept green delivery, but price and delivery time are the factors that are more influential in their choices. Hence, the findings indicate that, green delivery can positively influence in customer buying intention however it might be viewed as a dependent factor by making it affordable, comfortable, and communicating its benefits clearly to customers.

4.7 Hypothesis Testing

The statistical analysis and testing of the proposed hypotheses are presented in this section to analyze the relationship between green delivery practices, customer perception, sensitivity to cost, delivery convenience, and customers' purchase intentions.

4.7.1 H1: Impact of Green Delivery Practices on Customer Purchase Intention

H1: Green delivery practices have a significant positive impact on customer purchase intention in Pakistan's e-commerce sector.

H1 examined whether green delivery practices have a significant positive impact on customer purchase intention in Pakistan's e-commerce sector. Independent variable was green delivery practices and dependent variable, customers purchase intention was to be used. This relationship was tested by computing the mean score of the four items in Section B and the four items in Section E, respectively. Cronbach's alpha was first computed for the internal consistency of these two constructs before regression analysis.

Table 9 Cronbach's Alpha for green delivery practices

Cronbach's Alpha	N of Items
.926	4

This reliability result for Section B reveals acceptable Cronbach's Alpha values for green delivery practices, 0.926 for 4 items. This means that for items measuring green delivery practices there is excellent internal consistency.

Table 10 Cronbach's Alpha for customers purchase intention

Cronbach's Alpha	N of Items
.920	4

In addition, the Cronbach's alpha reliability result for Section E also revealed that the Cronbach's alpha of customer purchase intention was 0.920 for four items. This shows also very good internal consistency.

Table 11 Model summary for H1

Model	R	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
				R Square Change	F Change	df1	df2	Sig.
1	.729 ^a	.531	.69685	.531	167.785	1	148	.000

a. Predictors: (Constant), GDP

By analyzing the model summary, it is observed that the R value, or the correlation value, is 0.729, which means that there is a strong positive correlation between the green delivery practices and the purchase intention of customers. R Square value is 0.531 which indicates that 53.1% of the variance in the intention of customer to purchase explained by green delivery practices. This one is an explanatory value and suggests that the concept of green delivery has strong impacts on customers' buying intention on ecommerce websites in Pakistan.

Table 12 ANOVA results table for H1

Model	Sum of Squares	df	Mean Square	F	Sig.
1 Regression	81.475	1	81.475	167.785	.000 ^b
Residual	71.868	148	.486		
Total	153.343	149			

a. Dependent Variable: CPI

b. Predictors: (Constant), GDP

The ANOVA table displays the results of the regression model: $F(1,148) = 167.785$, $p = .000$. The obtained significance value is less than 0.05; hence, the model is statistically valid. This implies that the green delivery practices have a significant impact on customers' purchasing intention. The overall regression model is therefore appropriate for testing H1 and we have established that the relationship between the variables is not due to chance.

Table 13 Coefficients table H1

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Correlations		
	B	Std. Error				Zero-order	Partial	Part
1 (Constant)	.945	.208		4.535	.000			
GDP	.715	.055	.729	12.953	.000	.729	.729	.729

a. Dependent Variable: CPI

As seen in the coefficients table, the positive significant results between green delivery practices and customer's purchase intention were obtained. The unstandardized and the standardized beta value were $B = 0.715$ and $\beta = 0.729$ respectively. The significance value (p) is lower than 0.05 and is equal to 0.000. It implies that the increase of green practices in delivery by one unit leads to the increase in purchase intention of customers by 0.715 units. So, H1 is accepted.

H1 is accepted. The overall results indicate that GDO has positive impact on purchase intention in e-commerce environment of Pakistan. High reliability values were obtained in both constructs indicating reliable measurement and regression results indicated good and significant predictive relationship. This translates to higher customer conversion rate on eCommerce platforms when by-products and delivery solutions are seen as environmentally friendly, when the platforms are eco-friendly or eco-conscious in their packaging and when they utilize low-emission vehicles and integrated logistics solutions. The result is in line with the reviewed literature in Chapter 2 that indicated the significance of green delivery in e-commerce logistics. In the opinion of Mucowska (2021) and Cheng et al. (2024), sustainable delivery services like recycling packages, routing optimisation and low-emission transport help minimise environmental impact in last-mile delivery. On the same lines, Klein and Popp (2022) identified that sustainable aspects affect consumer willingness to accept last mile delivery service and Jabeen et al. (2023) proposed green delivery to influence consumers' preferences and buying intention. Hence, it can be inferred from the present results that green delivery is

not only a green practice but also a customer related factor which positively contributes to customer's purchase intention in e-commerce.

4.7.2 H2: Mediating Role of Customer Perception of Green Delivery Practices

H2: Customer perception of green delivery practices significantly mediates the relationship between green delivery practices and customer purchase intention.

H2 examined whether customer perception of green delivery practices mediates the relationship between green delivery practices and customer purchase intention. In this analysis, an independent variable (green delivery practices – GDP), a mediating variable (customer perception of green delivery practices – CPGD), and a dependent variable (customer purchase intention – CPI) were used. Moreover, the reliability of GDP and CPI had been previously tested during H1 and had demonstrated excellent consistency for both GDP and CPI. Before conducting the mediation analysis for H2, the reliability of the mediating variable “CPGD” was also tested.

Table 14 Cronbach's Alpha for customer perception of green delivery practices

Cronbach's Alpha	N of Items
.887	4

For customer perception of green delivery practices, a Cronbach's alpha of .887 has been obtained for 4 items, revealing the high levels of reliability. It means that there were no errors in the internal consistency of the data. It implies that although there is strong relationship among four indicators of e-commerce platform's overall perception, green delivery causes the e-commerce platform to appear responsible, environmentally friendly, trusted and of a positive picture.

Mediation was examined using Hayes PROCESS Macro Model 4 with 5,000 bootstrap samples at a 95% confidence interval.

Table 15 Model Summary for Green Delivery Practices Predicting Customer Perception

R	R Square	MSE	F	df1	df2	Sig.
.8126	.6604	.3305	287.7726	1	148	.0000

Based on the model summary, the estimated result revealed a high level of influence of green delivery practices toward customer perception of green delivery practices. The R value of .8126 represents a positive and strong relationship between GDP and CPGD. 66.04% is the R Square value which means that the green delivery practices accounted for the variability in customers perception 66.04 percent. The model was statistically significant ($F(1, 148) = 287.7726$, $p < .001$) and the model accounted for variance with an R^2 of 0.8525, indicating that the model explains 85.25% of the variance in how the customer perceives the e-commerce platform.

Table 16 Regression Coefficients for Green Delivery Practices Predicting Customer Perception

Predictor	Coefficient	Std. Error	t-value	Sig.	LLCI	ULCI
Constant	.7382	.1720	4.2924	.0000	.3984	1.0781
GDP	.7729	.0456	16.9639	.0000	.6828	.8629

A positive and significant relationship was found between green delivery practices and customer perception (shown in the coefficient table). The numeric value of $B = .7729$ indicates that every unit increase in Green delivery practices results in a .7729 unit increase in the perception of customers. The difference was statistically significant ($p < .001$), and the confidence interval was not realistic in nature (not containing the null value). This validates the first mediation path; that is, customers who are aware of green delivery are more likely to view e-commerce companies as responsible, trustworthy and caring about the environment.

Table 17 Model Summary for Green Delivery Practices and Customer Perception Predicting Purchase Intention

R	R Square	MSE	F	df1	df2	Sig.
.7539	.5684	.4502	96.8116	2	147	.0000

Model summary revealed that both the green delivery practices and the customer perception present together explained the customer purchase intention. The good R value of .7539 shows the strong relationship between purchase intention and the predictors. The R square value was .5684, reflecting the fact that in total, GDP and CPGD accounted for the variance in customer purchase intention of 56.84%. The combined model was statistically significant for explaining purchase intention which is denoted by $F(2,147) = 96.8116$, $p < .001$.

Table 18 Regression Coefficients for Predicting Customer Purchase Intention

Predictor	Coefficient	Std. Error	t-value	Sig.	LLCI	ULCI
Constant	.6936	.2129	3.2583	.0014	.2729	1.1142
GDP	.4517	.0912	4.9508	.0000	.2714	.6321
CPGD	.3411	.0959	3.5554	.0005	.1515	.5307

As can be seen in the coefficient table, green delivery practices had a significant influence on customer purchase intention as well as customers' perceptions. The direct impact of green delivery practices were positive to purchase intention, $B = .4517$, $p < .001$. The perception of the customer also had a positive and significant effect ($B = .3411$, $p = .0005$). That is, customer perception still strongly affected customer's purchase intention even after controlling for green delivery practices. Thus, customers expectation constitutes an important factor in the study of influence on customers' buying decision about the green delivery.

Table 19 Direct and Indirect Effects of Green Delivery Practices on Customer Purchase Intention

Effect Type	Effect	Std. Error / BootSE	t- value	Sig.	LLCI / BootLLCI	ULCI / BootULCI
Direct Effect: GDP → CPI	.4517	.0912	4.9508	.0000	.2714	.6321
Indirect Effect: GDP → CPGD → CPI	.2636	.0810	—	—	.1178	.4349

The direct effect indicates that the positive effect of green delivery practices on customer purchase intention was still significant even in the model which includes customer perception. The direct effect was $B = .4517$, $p < .001$. The other indirect path (customer perception) also was substantial (+.2636). A 95 percent confidence interval for β was (0.1178, 0.4349) which excludes zero. This indicates that there is a significant mediation effect between customer perception and green delivery practices and the purchase intention.

Overall, the results confirm H2, which states that the extent to which customers experience green delivery practices strongly moderates the link between green delivery practices and customer purchase intention. The results indicate green delivery practices have direct effects on purchase intention and can enhance customer perception that leads to higher purchase intention. Addition of the mediator did not completely turn off the direct effect, so the result suggests partial mediation. Green delivery practices have both direct and indirect effects on consumers' purchase intention through their perception. The results obtained conform with the ones found in literature presented in Chapter 2. Klein and Popp (2022) identified four factors—perceived sustainability, usefulness, ease of use and perceived cost—that impact customer acceptance of last-mile delivery methods. Similarly, it was displayed that PUE plays statistically significant role in determining the behavioral intention in the context of e-commerce in Pakistan by Saleem et al. (2024). These findings are also consistent with those of Tulcanaza-Prieto et al. (2022) who contended that customer perception constitutes a factor which gives an impact on customer evaluation of business practices. Hence, these findings validated the idea that Green Delivery (GDT) becomes more significant with the customers' perceptions of being responsible, trustworthy, useful, and an environmentally-friendly practice.

4.7.3 Moderating Role of Cost Sensitivity and Delivery Convenience

H3: Cost sensitivity and delivery convenience significantly moderate the relationship between customer perception of green delivery practices and customer purchase intention.

H3 examined whether cost sensitivity and delivery convenience moderate the relationship between customer perception of green delivery practices and customer purchase intention. Customer perception of green delivery practices (CPGD), cost sensitivity (CS) and delivery convenience (DC) were considered as moderating variables while customer purchase intention (CPI) was treated as the dependent variable. The reliability of GDP and CPI were already tested under H1 and the reliability of CPGD was tested under H2. Hence, to run the moderation analysis, reliability analysis was performed only for cost sensitivity and delivery convenience before moderation analysis is run with H3. The two moderators were tested together using Hayes PROCESS Macro Model 2.

Table 20 Cronbach's Alpha for cost sensitivity

Cronbach's Alpha	N of Items
.812	2

The reliability result for cost sensitivity shows a Cronbach's Alpha value of .812 across two items. This indicates good internal consistency.

Table 21 Cronbach's Alpha for delivery convenience

Cronbach's Alpha	N of Items
.874	2

The reliability result for delivery convenience shows a Cronbach's Alpha value of .874 across two items. This indicates good internal consistency.

Table 22 Model Summary for Moderation Analysis

R	R Square	MSE	F	df1	df2	Sig.
.7893	.6229	.4015	47.5789	5	144	.0000

The model summary shows that the overall moderation model was statistically significant, with $R = .7893$, $R \text{ Square} = .6229$, and $F(5,144) = 47.5789$, $p < .001$. The total variance in customer's purchase intention was accounted for by customer perception, customer sensitivity, delivery convenience and their interactions altogether, which was 62.29%. Overall this was a good model, however, the relevance of the interaction terms is dependent on the specific moderation.

Table 23 Regression Coefficients for Moderation Analysis

Predictor	Coefficient	Std. Error	t-value	Sig.	LLCI	ULCI
Constant	.0822	.4414	.1863	.8525	-.7902	.9547
CPGD	.5617	.1686	3.3313	.0011	.2284	.8950
CS	.0773	.2408	.3212	.7485	-.3985	.5532

CPGD × CS	-.0279	.0616	-.4536	.6508	-.1497	.0938
DC	.5079	.2151	2.3612	.0196	.0827	.9331
CPGD × DC	-.0266	.0577	-.4616	.6450	-.1407	.0874

As seen in the coefficient's table, customer perception about the green delivery practices was significantly and positively correlated with customer purchase intention, $B = .5617$, $p = .0011$. This indicates that as the perceptions of the consumers about the green delivery service increased, their intention to buy products increased as well. Convenience in delivery also was a significant direct positive influence on purchase intention with $B = .5079$, the p value being .0196. There was not, however, a significant difference as far as cost sensitivity is concerned, with $B = .0773$, $p = .7485$. What is more important is that there were no interaction terms with significance. CPGD interaction with cost sensitivity was $p = .6508$ and CPGD interaction with delivery convenience was $p = .6450$.

Table 24 Test of Highest Order Interaction Effects

Interaction Effect	R ² Change	F	df1	df2	Sig.
CPGD × CS	.0005	.2058	1	144	.6508
CPGD × DC	.0006	.2131	1	144	.6450
Both Interactions	.0037	.7109	2	144	.4929

Both the interaction of cost sensitivity and with interaction with delivery convenience and of the interaction of customer perception and purchase intention were not seen to have significant moderating effects on each other. The R^2 change for the CPGD × CS interaction was .0005, which was not significant ($p = .6508$). The change in the R^2 for the CPGD × DC interaction was .0006, and was not significant, $p = .6450$. Importance of both interaction terms when tested together was still not significant, $p = .4929$. As such, the moderation effect (H3) was not supported statistically, meaning there was no proof provided to support that claim.

Overall, the findings show that H3 is not supported. Customer perception of green delivery practices and customer purchase intention were not significantly affected by cost sensitivity and delivery convenience. The results, however, offer valuable information nonetheless. Customer perception was still a key positive factor influencing purchase intention and delivery convenience had a direct significant effect on purchase intention. This might imply that the

customer who points out favourable perceptions about green delivery will be more inclined to buy it, which could also mean that the customer appreciates convenience when deciding what he or she wants to purchase online. This sample, however, found that customer perception did not significantly augment or diminish the implication for customer purchase intention and cost sensitivity and delivery convenience did not add influence.

These findings partly align with the literature reviewed in Chapter 2. Firstly, previous research indicated that customers' perception of the price and convenience of green delivery services plays a significant role in their choice. For instance, the research by Klein and Popp, 2022, showed that sustainable design affects the willingness of the clients to take over the products, but usefulness, cost and convenience are still important. Likewise, Villa et al. (2023) and Kiba-Janiak et al. (2024) posit that despite the potential for customers to be accepting of 'greening' delivery systems from a principle standpoint, there is a likelihood that price and delivery time could affect their decision. The present study validates the role of convenience of delivery as a direct predictor of purchase intention, but not moderating. Thus, within Pakistani ecommerce landscape convenience can act as an independent variable which can impact consumers' purchase decision even if it is not impacting the relationship between customer perception and purchase decision.

4.8 Discussion of Results and Comparison with Literature

This section discusses the findings of the study in relation to the research objectives and the literature reviewed in Chapter 2. The results demonstrate a general positive attitude toward 'green delivery' with 69.77% of the respondents believing in the links between green delivery and the use of environmentally responsible delivery options, reduced environmental effects, increased platform perception, and increased delivery convenience. The results here also indicate that cost sensitivity and the convenience of delivery are related to customer decision making but are confounded and do not constructually moderate the relationship between customer perception and purchase intention.

The first objective was to examine whether green delivery practices significantly influence customer purchase intention in Pakistan's e-commerce sector. The descriptive results reveal that generally respondents were giving a positive response towards green delivery practice. The biggest average scores were found in the case of valuating e-commerce platforms that provide environmentally friendly delivery solutions ($M = 3.75$) and combined deliveries to decrease

environmental pollution ($M = 3.70$). These findings suggest that customers are interested in products but crucial for them is also to understand the environmental responsibility of the delivery. The outcome of this fact has confirmed the thesis of Mucowska (2021), who stated that the development of e-commerce has made the process of green last-mile delivery more relevant because of the urban freight transportation (20, 32–35). Likewise, Cheng et al. (2024) accounted for how through some practices, such as the use of low emission vehicles, recyclable packaging, route optimisation and delivery consolidation, the environmental footprint of e-commerce distribution could be decreased.

The regression result for H1 again indicated that Green delivery practices had a significant impact and positively affected customer purchase intention. The relationship between the model was also strong with the value $R = .729$, and the R Square value was .531, which meant that the model could explain 53.1% of the changes among customers intended to buy, with green delivery practices. The coefficient of this variable was also positive and significant ($B = .715$, $p < .001$), meaning that the purchase intention increased with the increase in levels of green delivery. The result aligns with Klein and Popp (2022) findings, which state that sustainability has an impact on the customers' acceptance of last mile delivery methods. It also helps to back the argument made by Jabeen et al. (2023) that green delivery could enhance brand image on customers' adoption and help to convey environmental responsibility. The results of the present study thus indicate that the "green delivery" concept is not only a factor of sustainability but also a possibility to affect consumer behavior in online shopping.

The study is significant in Pakistan's context due to the developing nature of e-commerce and its influence of factors like cost competitiveness, trustworthiness, and the efficiency of logistics and reliability of delivery. As mentioned in Chapter 2, the e-commerce business in Pakistan has experienced rapid growth, and yet no sustained efforts toward sustainability have been made in Pakistan's delivery system (Ministry of Commerce, 2025; International Trade Administration, 2026). Based on the above findings, it is postulated that the Pakistani consumers can be attracted towards the use of 'green' delivery systems if it becomes visible and significant to them. This reinforces the notion that ecommerce companies should not consider the delivery as a business function of their business. Rather, delivery itself can be a strategic differentiator, particularly if the delivery platform employs eco-friendly packaging, fuel-saving delivery methods as well as consolidated delivery systems.

The second objective was to assess how customers perceive green delivery practices in terms of environmental responsibility, usefulness and attractiveness when making online purchase decisions. According to descriptive results, the perception of customers towards green delivery was mostly positive. The belief that green delivery practices can minimize environmental damage related to online shopping ($M = 3.65$) was the highest mean item score. The respondents also confirmed that they believe that green delivery makes an ecommerce platform look more responsible ($M = 3.55$) and enhances overall perception of the platform ($M = 3.53$). These findings demonstrate that green delivery is considered by customers to be an expression of responsibility and environment care. It is also in line with Tulcanaza-Prieto et al. (2022) who said the customer perception is how the customer interprets and evaluates organisational practices.

The mediation result for H2 provided stronger evidence for the importance of customer perception. The green delivery practices significantly influenced customer perception ($B = .7729$, $p < .001$), and customer perception significantly influenced purchase intention ($B = .3411$, $p = .0005$). The indirect effect of green delivery practices on purchase intention via customer perception was also significant (bootstrap CI: .1178, .4349), and was far from zero. This accounted for the significant mediation effect of customer perception between green delivery practices and purchase intention, which verifies this study. The mediation between the direct and indirect effect of the green delivery practices and customer perception was partially mediated, as the direct effect still remained significant once customer perception is introduced.

The literature reviewed in Chapter 2 strongly supports this finding. Perceived sustainability, perceived usefulness, ease of use and perceived cost are factors that affect the acceptance of delivery methods, as Klein and Popp (2022) confirmed. The present study confirmed this with participants indicating that they believe that the green delivery practices have greater impact when there is a positive perception regarding them. Additionally, Saleem et al. (2024) concluded that PUE was significantly related to BI in an E-commerce environment in Pakistan. Likewise, Ahmad et al. (2024) demonstrated packages and sustainable delivery, as well as ethical sourcing, could affect e-commerce trust and buying decisions. The current findings therefore confirm the claim that the environmentally friendly delivery positively influences the actual buying intent but also useful, trusted and appealing.

The mediating role of perception also has practical significance. The positive effect of Green Delivery can be lessened if the customers are not willing to understand or trust the Green

Delivery claims. As mentioned in Chapter 2, the main issues of scepticism and greenwashing highlighted by the customer perception have a significant impact and may be caused by unclear or inflated environmental claims (Martínez et al., 2025). Hence, the results indicate that there is a need to make green delivery practices prominent and credible on e-commerce platforms. Platforms, for instance, can provide information about recyclable packaging, grouping deliveries or low-emission transport or reduction in failed delivery attempts. This can educate people on the benefits these practices deliver to the planet and enhance consumers' experiences of the platform.

The third objective was to identify the main factors that shape the relationship between green delivery practices and purchase intention, particularly cost, convenience and consumer awareness. The descriptive analyses demonstrated that cost sensitivity present but mild in nature. When delivery prices would have to rise if the delivery was green, this was a bit more ambivalent ($M = 3.22$); when price was more relevant than environmental friendliness it had a moderate level of agreement ($M = 3.30$). Convenience of delivery was supported more though. People were more inclined to opt for green delivery in the two instances that it did not cause an order delay ($M = 3.77$) and if it was as convenient as regular delivery ($M = 3.85$). It shows that, while they're not opposed to green delivery, they do demand it not detract from the fundamental convenience they are used to in online shopping.

However, the moderation analysis conducted for H3 revealed that there was no significant moderation between the relationship between customer perception, and purchases through cost sensitivity and delivery convenience. The overall model was significant ($R^2 = .6229$, with the predictors explaining 62.29% of the variation in the customers intention to purchase the product. But the interaction effects among customer perception and cost sensitivity were not significant ($p = .6508$), nor the interaction of customer perception and delivery convenience ($p = .6450$). At this time H3 was dismissed. For in-between cost (sensitive) and delivery convenience, the two factors did not notably bolster or dilute any significant positive or negative relationship between customer perception and purchase intention.

This result partly differs from previous literature, but it does not contradict it completely. In the study by Villa et al. (2023), price and delivery speed were deemed by customers to be important factors, despite them wanting a green delivery. The price, as one of the most influential elements in the customers' decision on delivery method, is also noted by Kiba-Janiak et al., (2024). It was also revealed that customers with Environmental Awareness can be more

willing to support Green Packaging however, price may limit the willingness to pay customers with Environmental Awareness (Yan et al., 2025). Cost and convenience was still applicable at the descriptive level, particularly convenience, although in this present study, it did not act as moderators. It has been suggested that there may be a possibility for price and convenience to affect purchase intention in Pakistan's e-commerce context either directly or virtually, rather than the relationship between perception and purchase intention strength.

One possible explanation is that green delivery is still an emerging concept in Pakistan. Some customers might not yet have enough direct experience of formal green delivery services to gauge them on specific comparisons of cost, convenience and value to environment, so they may not be able to make an informed comparison of the service being offered. Several other factors including cash on delivery, trust and logistics inefficiency and price sensitivity are still major forces in Pakistan's ecommerce landscape as discussed in Chapter 2 (Naseem et al., 2021; International Trade Administration, 2026). Even while customers might have an attitudinal response to green delivery, they value convenience and may not make detailed comparisons between green and regular delivery, as customers in more established e-commerce markets might. The practical importance of delivery convenience could explain why delivery convenience did not play a significant role in the relationship between perception and purchase intention.

The results are also linked to the theoretical framework of the study. Theory of Planned Behaviour (TPB) provides a strong explanation on the factors influencing the intentions to behave which include attitude, subjective norms, and perceived behavioural control (Ajzen, 1991). This theory was supported by the significant effects of the customer perception of green delivery practices and customers' purchase intention. Another link to be considered, in relation to the e-commerce shopping system, is the influence of the technology acceptance model (TAM), which refers to how useful and easy-to-use a technology is, with the degree of customer acceptance (Davis, 1989). Whenever the average customer sees that the green delivery is useful, responsible and the process of delivering is convenient, his/her perception of the positive impact will correspond to this model.

4.9 Chapter Summary

This chapter presented the results and discussion of data collected from 150 respondents. To test these study hypotheses, the demographic profile, descriptive statistics, reliability analysis,

regression and mediation and moderation results were analysed. The results indicated that green delivery practices had positive impact on the customers' intention to purchase, thus supporting H1. The Customer perception of green delivery practices also played a significant role in this relationship, thereby supporting H2. Cost sensitivity and delivery convenience had, however, no significant interactions with the relationship between customer perception and purchase intention, leading to the failure of supporting H3. The next chapter contains conclusions, recommendations and suggestions for future research.

CHAPTER 5: CONCLUSION AND RECOMMENDATIONS

5.1 Conclusion

This chapter concludes the study by presenting the final answers to the research questions, practical recommendations, limitations and future research directions. The study examined the impact of green delivery practices on customer purchase intention in the e-commerce sector of Pakistan. It was a quantitative research with the use of structured questionnaire for the respondents who were 150. Based on a literature review of the relevant theories and practices, the study examined the following: The independent variable was green delivery practices, where the dependent variable was customer purchase intention; The mediating variable was customer perception of green delivery practices; The moderation variables were cost sensitivity and delivery convenience. The findings revealed great importance of green delivery practices in influencing customers' purchase intention, especially in the case where their customers were aware of such practices as responsible, useful and environmentally-good.

The first research question asked how green delivery practices influence customer purchase intentions in the e-commerce sector of Pakistan. The results indicated that customers' purchase intention is positively influenced by the implementation of green delivery practices. The regression analysis results was statistically significant and accounted for 53.1% variance in customer purchase intention, indicating that the green delivery practices has a significant positive coefficient. This means customers will be more inclined to purchase products from e-commerce businesses which have eco-friendly packaging, low emission/efficient vehicles for delivering their products, Integrated Delivery Systems, and environmentally responsible delivery. This study has confirmed that green delivery is a logistical and customer behaviour problem. It aligns with the thesis of sustainable last mile delivery, influencing customer acceptance, customer platform preference particularly if conscious of the environmental importance of sustainable delivery practices (Mucowska, 2021; Klein and Popp, 2022). The discovery is also in line with research indicating that delivery has become a main component of the customer experience that is e-commerce, and no longer its operational element and duty (Restuputri et al., 2022; Raj et al., 2024).

The second research question asked how customers perceive green delivery practices when purchasing through e-commerce platforms. The descriptive results indicated that the general attitude of the respondents was positive towards the green delivery. Feedback from customers

confirmed that implementing environmental protection practices in the delivery process could help minimize damage to the environment, make the platform look as more responsible, boost customer trust in it and enhance its overall image. The mediation results also proved that customer perception plays an important role as a mediating variable between green delivery practice and customer buying intention. This translates to positive green export behaviors impact on purchase intention through the intermediary process of enhancing the customers' perception of the e-sites, not only directly but also indirectly. The mediation was partial which meant that even though the perception of the customers was added to the model, the direct effect of green delivery practices was still significant. This discovery is significant as it demonstrates that customers don't just react to green delivery practices in existence, they react to their perceptions and values of the practices. This reinforces the concept that the willingness of customers to buy products with a sustainability stamp is determined more by their perceptions than anything else, especially if they perceive sustainability practices as useful, trustworthy and responsible (Tulcanaza-Prieto et al., 2022; Saleem et al., 2024).

The third research question asked which factors most strongly shape customer purchase intention when green delivery options are offered. The results revealed that the influence of green delivery practices and the customers perception were the most important ones on influencing customers purchase intention. The convenience to delivery had also practical importance as respondents were more agreement with statements related to delivery convenience and the moderation model indicated that delivery convenience has a direct significant influence on the purchase intention. Nevertheless, there was no significant moderation of the relationship between the customer perception and purchase intention between cost sensitivity and delivery convenience. As a result, their findings differ from H3, which was not supported. This implies that price and convenience are things that customers are interested in but did not significantly reinforce or diminish the association between customer perception and customer intention in this study. This outcome is slightly at odds with other studies, which concluded that price and speed play a significant role in consumer decisions for sustainable deliveries (Villa et al., 2023; Kiba-Janiak et al., 2024). The reality of the finding might be explained within the limits of the Pakistan context as green delivery is still a novel concept and customer comfort with using formal green delivery services might not be comparable to their strife to avail the conventional delivery service.

Overall, the study concludes that green delivery practices can positively influence customer purchase intention in Pakistan's e-commerce sector. The results indicate a positive attitude displayed by customers towards buying from ecommerce stores if they are aware of eco-friendly delivery practices and its benefits. The research also validates that customer perception plays an important role in bringing change in customer's intention of purchase due to Green Delivery. This is in line with the Theory of Planned Behaviour (TPB), where attitudes and perceived behavior are found to affect behavioral intention, as well as the Technology Acceptance Model (TAM) which has demonstrated the influence of perceived usefulness and ease of use on acceptance decisions (Ajzen, 1991; Davis, 1989). Green delivery positively influenced attitudes towards e-commerce platforms, whereas convenience was a reflection of the ease of taking on green delivery. So, it is important to see Sustainable delivery as a strategy for the environment and at the same time a strategy that orientates to the customer.

5.2 Recommendations

The findings of this study provide several practical recommendations for e-commerce platforms, logistics providers and policymakers in Pakistan. First, e-commerce platforms should make green delivery a part of their activities, as the study revealed that this green delivery positively influences customers' decision to purchase. A sustainable approach to packaging, use of recycled materials, minimizing packaging waste, fuel-efficient delivery vehicles, combination of deliveries and green delivery solutions should be emphasised. Positive attitudes towards delivering more responsibly and combined deliveries have been revealed from respondents, learning which more platforms can establish a more responsible image and promote purchase intention. Green Last Mile (LM) Logistics is aligned with the previous studies which identified that responsible delivery systems could also reduce the environmental impact of e-commerce, boosting the acceptance by customers (Mucowska, 2021; Cheng et al., 2024).

Second, e-commerce platforms should communicate the environmental value of green delivery clearly to customers. The mediation outcomes revealed that the customer perception could significantly mediate the relationship between green delivery practices and purchase intention. So green delivery can't be just a matter of a simple implementation. Customers should be aware of what is going on and why it's important. E-commerce businesses should explain their participation in recycling packaging, reducing delivery emissions, taking advantage of the consolidation of orders, reducing the number of delivery efforts failed or improving route

efficiency. This sort of communication can bolster consumer self-confidence and boost platform image. This recommendation is corroborated with literature (Klein and Popp 2022, Saleem et al 2024) as data on customer perception, perceived sustainability and perceived usefulness positively influences acceptance of delivery methods and behavioural intention. But there is a need to prevent exaggeration on environmental claims, as a lack of understanding of the definitions of green claims can lead to doubts or concerns about greenwashing (Martínez et al., 2025).

Third, green delivery should remain convenient for customers. The findings revealed a significant direct effect between delivery convenience and customer purchase intention, with a high level of agreement with statements associated with this chosen option being, 'If I have to choose green delivery services, their delivery time will not make a difference to my purchase', and 'I agree that my convenience of order delivery is a major reason why I buy. Consumers can drive sustainability or they can drive the need to be easy, reliable and timely for e-commerce services. Green delivery options should thus be easy to choose, cover the necessary elements of delivery transparency and should not cause any needless delay and should not pose unnecessary efforts to customers. This is based on research that has revealed that delivery affects consumers' perception, positively or negatively, beyond the environmental factor, but also considering its speed, usefulness, ease of use and service quality (Restuputri et al., 2022; Klein and Popp, 2022).

Fourth, e-commerce companies should avoid making green delivery too expensive. The customer perception-purchasing intention relationship was not significantly moderated by cost sensitivity, the descriptive results indicated that additional delivery costs were additionally moderate concerns for the respondents. It indicates that, if the eco-friendly delivery service's costs are too burdensome to customers, some may doubt selecting it. Platforms should thus strive to provide green delivery at no extra cost wherever that is possible and/or implement loyalty points, discounts, free green delivery campaigns and bundling delivery to promote the use of green delivery services. Previous studies also revealed that price may be a major criterion in delivery choice, despite the possibility of customers appreciating sustainable delivery (Villa et al., 2023; Kiba-Janiak et al., 2024; Yan et al., 2025).

Finally, policymakers and logistics providers should support the development of sustainable e-commerce logistics in Pakistan. Pakistan's ecommerce industry is still developing and faces obstacles regarding lack of trust, delivery systems and logistics and payment systems efficiency

and green delivery can't be possible by companies only. To pave the way for sustainable delivery, there are a number of ways that policymakers can act: incentives for electric vehicles, design guidance for sustainable packaging, awareness initiatives, and collaborating with logistics providers. Delivering a more environmentally sustainable return program, consolidating deliveries, and route optimisation are some other areas where logistics companies can make a positive impact. These will assist the sustainability of the e-commerce industry in Pakistan and enable organisations to adapt to the increasing demand among consumers for responsible deliveries.

5.3 Limitations

Although this study achieved its objectives, it has some limitations. The study used convenience sampling, which means the findings may not fully represent all online shoppers in Pakistan. The sample size of 150 was appropriate for this thesis but also might not represent the complete segment of Pakistan's e-commerce consumers in various regions, income groups, and habits of shopping. The current study used the cross-sectional approach which examined customer perceptions and their intention to buy at one time only. Therefore it does not attempt to account for shifts in customers' attitudes towards green delivery services with time. Another shortcoming is that purchase behaviour was not assessed, but instead, purchase intention was measured. While customers may say they want to buy goods that are environmentally friendly, their actual purchasing activities can vary because of price, convenience, habit, and/or platform availability. There may also be response bias and/or social desirability bias in using a self-report questionnaire.

5.4 Future Research

Future research can extend this study by using a larger and more diverse sample from different cities and regions of Pakistan. It may be helpful to compare online shoppers in cities with those in rural areas as delivery services, internet received and an awareness of sustainability may vary by region. Further research can be conducted to compare the actual behavior with intention of purchase (as a customer's stated intentions do not always lead to actual purchases). The longitudinal design would facilitate researchers to explore the trend of customers' attitude towards green deliveries in light of the growth of awareness of sustainability and green logistics practices in Pakistan. Further study could also include qualitative interviews or a mixed method to investigate the drivers behind customer willingness to accept/reject green delivery services.

The other variables might include environmental awareness, willingness to pay, green trust, greenwashing concern, income level, delivery speed and platform loyalty to derive a more comprehensive view of the attitude towards sustainable e-commerce.

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APPENDIX

Questionnaire

Thesis Title: *Impact of Green Delivery Practices on Customer Purchase Intentions in E-Commerce Sector of Pakistan: A Quantitative Study*

Instructions for Respondents

This questionnaire is designed to understand how green delivery practices influence customer purchase intentions in Pakistan's e-commerce sector. Your responses will be used only for academic research purposes.

Consent Statement

Please read the following statement before answering the questionnaire:

I understand that my participation in this research is voluntary. I understand that my responses will be used only for academic research purposes and will remain confidential. I also understand that I can withdraw from the questionnaire at any time.

Do you agree to participate in this study?

- Yes
- No

Section A: Demographics

1. Gender

- Male
- Female
- Prefer not to say

2. Age Group

- Below 18 years
- 18–25 years
- 26–35 years
- 36–45 years

- Above 45 years

3. Education Level

- Intermediate or below
- Bachelor's degree
- Master's degree
- MPhil/MS or above
- Other

4. How often do you shop online?

- Rarely
- Once a month
- 2–3 times a month
- Once a week
- More than once a week

Likert Scale for Sections B to E

Please rate each statement using the following scale:

1 = Strongly Disagree

2 = Disagree

3 = Neutral

4 = Agree

5 = Strongly Agree

Section B: Green Delivery Practices (Independent Variable)

5. I prefer e-commerce platforms that use eco-friendly packaging for deliveries.
6. I consider low-emission or fuel-efficient delivery vehicles important in online shopping.
7. I support e-commerce platforms that combine deliveries to reduce environmental pollution.
8. I value e-commerce platforms that offer environmentally responsible delivery options.

Section C: Customer Perception of Green Delivery (Mediating Variable)

9. Green delivery practices make an e-commerce platform appear more responsible.

10. I believe green delivery practices can reduce environmental harm caused by online shopping.
11. I perceive e-commerce platforms using green delivery as more trustworthy.
12. Green delivery practices improve my overall perception of an e-commerce platform.

Section D: Cost Sensitivity and Delivery Convenience (Moderating Variables)

13. I would hesitate to choose green delivery if it increases the delivery charges.
14. Price is more important to me than whether the delivery method is environmentally friendly.
15. I would choose green delivery if it does not delay my order.
16. I am more likely to accept green delivery if it is as convenient as regular delivery.

Section E: Customer Purchase Intention (Dependent Variable)

17. I am more likely to buy from an e-commerce platform that offers green delivery options.
18. Green delivery practices positively influence my decision to shop from an online platform.
19. I would recommend an e-commerce platform that provides environmentally responsible delivery.
20. I intend to purchase from e-commerce platforms that show concern for sustainable delivery.