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DRIVING E-WASTE REDUCTION THROUGH REFURBISHED HOME APPLIANCES: FACTORS INFLUENCING PURCHASE INTENTION OF MALAYSIAN CONSUMERS

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ABSTRACT

Malaysia is facing a serious electronic waste (e-waste) issue, as home appliances are one of the major sources of electronic waste generation in the country each year. The shift to a circular economy by purchasing refurbished home appliances is a possible option, but the market is not developed yet because the demand for refurbished appliances is not recognized. This study intends to examine the factors which affect the Malaysian consumers' purchase intention of refurbished home appliances and also the potential barriers faced by the consumers in adopting refurbished home appliances based on an extended Theory of Planned Behavior (TPB). The research used a cross-sectional quantitative study to obtain the data from the online survey method involving 104 Malaysian consumers. Multiple linear regression analysis showed that the extended TPB framework could account for 68.6% of the variance in purchase intention. Attitude and Perceived Behavioral Control were the only significant positive predictors, as shown in the empirical results ($\beta = .534$, $p < .001$ and $\beta = .238$, $p = .029$ respectively). On the other hand, Subjective Norm and the extended variable Perceived Price Advantage are not statistically significant. In addition, the analysis identified that the barriers that hinder consumer intention are perceived high cost and low quality. Theoretically, this study validates TPB model for refurbished home appliances and also points to an attitude-intention gap, where price advantage alone does not elevate intention. For the perspective of practical applications, the findings encourage industry stakeholders to prioritize more than just low prices. They should actively be fostering consumer trust by ensuring product quality, after-sales service availability and increased environmental consciousness.

Keywords: E-waste; Refurbished; Home appliance; Sustainability; Green product

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ABSTRAK

Malaysia menghadapi isu sisa elektronik (e-sisa) yang serius oleh kerana peralatan rumah merupakan salah satu sumber utama penghasilan sisa elektronik di negara ini setiap tahun. Peralihan kepada ekonomi kitaran dengan membeli peralatan rumah yang telah diperbaharui adalah satu pilihan penyelesaian, namun pasaran bagi produk ini masih belum berkembang kerana permintaan untuk peralatan rumah yang telah diperbaharui tidak diketahui. Kajian ini bertujuan untuk mengkaji faktor-faktor yang mempengaruhi niat pembelian pengguna Malaysia terhadap peralatan rumah yang telah diperbaharui dan juga halangan yang dihadapi oleh pengguna dalam menerima pakai peralatan rumah yang telah diperbaharui berdasarkan teori Tingkah Laku Terancang (TPB) yang diperluas. Kajian ini menggunakan kaedah kuantitatif keratan rentas untuk mendapatkan data daripada kaedah tinjauan dalam talian yang melibatkan 104 pengguna Malaysia. Analisis regresi linear berganda menunjukkan bahawa rangka kerja TPB yang diperluas boleh menyumbang 68.6% daripada varian dalam niat pembelian. Sikap dan Kawalan Tingkah Laku yang Dirasakan adalah peramal positif yang signifikan seperti yang ditunjukkan dalam keputusan empirikal ($\beta = .534$, $p < .001$ dan $\beta = .238$, p .029 masing-masing). Sebaliknya, Norma Subjektif dan pembolehubah lanjutan Kelebihan Harga yang Dipersepsikan adalah tidak signifikan secara statistik. Di samping itu, analisis mengenalpasti bahawa faktor utama yang menghalang niat pembelian pengguna adalah persepsi kos yang tinggi dan kualiti yang rendah. Secara teorinya, kajian ini mengesahkan model TPB untuk peralatan rumah yang diperbaharui dan juga menunjukkan jurang sikap-niat, di mana kelebihan harga sahaja tidak meningkatkan niat. Untuk perspektif aplikasi praktikal, dapatan ini menggalakkan pihak berkepentingan industri untuk mengutamakan lebih daripada sekadar harga rendah. Mereka harus secara aktif memupuk kepercayaan pengguna dengan memastikan kualiti produk, ketersediaan perkhidmatan selepas jualan dan peningkatan kesedaran alam sekitar.

Kata kunci: E-sisa; Diperbaharui; Perkakas rumah; Kelestarian; Produk hijau

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List of Abbreviations

ElektroG	Elektrogesetz
EU	European Union
IC	Integrated circuit
IT	Information technology
LCD	Liquid crystal display
LEDs	Light-emitting diodes
PCs	Personal computers
SDG	Sustainable Development Goal
TVs	Televisions
US	United States
WEEE	Waste of electrical and electronic equipment
CE	Circular Economy
SPSS	Statistical Package for the Social Sciences

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CHAPTER ONE:

INTRODUCTION

1.1. Background of the Study

Malaysia is at a critical phase in its journey towards sustainable development, it is currently dealing with a crisis of increasing electronic waste (e-waste) that poses a threat to the environment. According to Azman et al., (2024) the country produces 365,000 tonnes of e-waste annually, while Hussin et al., (2023) as cited in Department of Environment (2022) stated that Malaysia is projected to generate 24.5 million units of e-waste by 2025. As such, it indicated an alarming situation. In 2022, home appliances which consist of air conditioners, refrigerators, and washing machines represent as much as 32.9% of the annual total e-waste quantity (Department of Environment, 2022). Several factors such as rising consumerism, rapid technological obsolescence, and wide availability of affordable electrical and electronic equipment (EEE) drive the e-waste increment. While home appliances are essential in modern living, it hold significant portions of Malaysia's domestic e-waste due to cheap appliances typically have short lifespans and the on-going development of recycling infrastructures.

The Malaysian government is dedicated to tackling this issue. They have established frameworks such as the Circular Economy Policy Framework (2024) and the Circular Economy Blueprint for Solid Waste in Malaysia (2025-2035), which encourage sustainable approaches for production and consumption. These initiatives align closely with the United Nations Sustainable Development Goals (SDGs), particularly SDG 12 (Responsible Consumption and Production). The idea of refurbishing home appliances, which involves product testing and fixing to restore full functionality,

offers a convincing solution to these goals. By refurbishing home appliances to make them last longer, Malaysia can cut down on e-waste, protect natural resources, and offer low-income families a cheaper alternative to buy new home appliances.

This strategy is strengthened by the MADANI government framework, which was initiated by Prime Minister Anwar Ibrahim's government and focuses on sustainable and fair growth. Environmental responsibility is an important part of the MADANI philosophy, which calls for a forward-thinking Malaysia. Therefore, using refurbished home appliances to support the circular economy is a great way to follow MADANI's core principle of sustainability (Kemampanan).

Although regulatory frameworks are gradually improving, the commercial scale of the refurbished home appliance market remains stagnant, primarily due to a critical deficit in empirical consumer demand data. Furthermore, Malaysia's current infrastructure for the collection, diagnostic testing, and restoration of used appliances remains underdeveloped. Market activity heavily favors smaller personal electronics such as smartphones and laptops, leaving a massive gap in the major household appliances sector. This imbalances triggers a compounding issue. A lack of visible market data deters potential refurbishment enterprises from entering the segment whereby this lack of supply ultimately forces consumers to ignore refurbished home appliance entirely.

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1.2. Problem Statement

Malaysia has great plans for a circular economy, such as the Circular Economy Framework. However, there is still a big gap between these government plans and how the actual market works. Right now, not many Malaysian consumers are buying refurbished home appliances. This is a big issue because using refurbished appliances is very important to reduce electronic waste (e-waste). Currently, there is a vicious cycle in the market, which is consumers do not know much about refurbished appliances so demand is low, and because demand is low, businesses are afraid to sell them.

To fix this issue, we need to understand consumer behavior. However, past academic studies have three main gaps that this study intents to solve:

First, there is a lack of research in the Malaysian context (Contextual Gap). Most past studies about why consumers buy refurbished products were done in Europe, India, and China. We cannot just copy their results because Malaysia is different. Malaysian consumers have different cultures, different income levels, and different habits when buying electronics. Therefore, we need specific data about Malaysian consumers.

Second, standard theories leave out economic factors (Theoretical Gap). This study uses the Theory of Planned Behavior (TPB), which is a good model. But standard TPB only looks at psychological factors like attitude, social pressure (subjective norms), and control. It completely ignores money. When people buy refurbished home appliances, price is a major factor. Therefore, standard TPB is not enough. This study adds a new factor called Perceived Price Advantage to see if saving money actually changes consumer intentions.

Third, past studies focus too much on the positive sides (Barrier Gap). Most researchers only ask why people want to buy green products. They forget to study why many consumers are still reluctant or afraid to buy them. To truly help the e-waste problem, we must find out both the positive drivers and the negative barriers that stop Malaysian consumers from purchasing refurbished items.

1.3. Research Questions

To accomplish these objectives, the study will answer three research questions:

RQ1: What is the general level of purchase intention toward refurbished home appliances among Malaysian consumers?

RQ2: Which is the most significant factor that influenced Malaysian consumers' intention in purchasing refurbished home appliances?

RQ3: What are the possible barriers that hinder the intention of Malaysian consumers to purchase refurbished home appliances?

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1.4. Research Objectives

This study aims to achieve the following objectives:

RO1: To measure the level of purchase intention toward refurbished home appliances among Malaysian consumers.

RO2: To identify which TPB-based factor (attitude, subjective norm, perceived behavioral control or perceived price advantage) most significantly influences the intention of Malaysian consumer to purchase refurbished home appliances.

RO3: To identify possible barriers that hinder the intention of Malaysian consumers to purchase refurbished home appliances.

1.5. Significance of the Study

This study would makes several important contributions:

Academia

The study will test how an established theory like the Theory of Planned Behavior (TPB) can fully explain consumer' purchase intention in Malaysia.

Industry

For industry practitioners, the results will give companies that wish to enter or expand to the refurbished appliance market a useful information. Retailers and refurbishers can use the factors analysis to help them with critical decision-making related to pricing and the aspect of consumers' convenience.

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Society

For societal dimension, many benefits will be delivered when refurbished appliances market developed successfully, such as making it easier for low-income households to afford necessary appliances, creating jobs in the recycling and refurbishment industries, and lowering the environmental impact of e-waste.

1.6. Scope and Limitation of the Study

This study focuses on consumer behavior in Malaysia, but it is limited to a small sample size of only 104 respondents. This sample size was calculated using GPower 3.1 software to make sure the data is enough for statistical testing. According to

Yenipinar et al. (2019), “GPower was designed as a general stand-alone power analysis program for statistical tests commonly used in social and behavioral research.” However, because this research uses convenience sampling with only 104 respondents, the findings cannot represent the entire population of Malaysia. Instead, this small sample is used as an early step to give a detailed look into what drives consumer behavior regarding green products.

Besides, in regard to Theoretical frameworks, this research is grounded in Theory of Planned Behavior (TPB). According to TPB, the behavior of an individual is driven by indvidual’s intention, and the intention is influenced by three factors: attitude toward the behavior, subjective norm, and perceived behavioral control. The factors represent as independent variables, and intention represent as mediator, meanwhile behavior represent as dependent variable. However, this study used the intention as the final dependent variable and measures only the purchase intention as a proxy for the actual behavior. This is due to the practical challenges to track the actual purchasing behavior within the research time frame.

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1.7. The Organisation of the Study

Remaining content of this research paper is organized into four chapters:

Chapter 2 presented a depth review of the literature that focused on four main topics: the current arising problem of e-waste, e-waste management and its challenges, refurbishment as an e-waste reduction strategy, and the consumer behavior towards refurbished products. This part pointed out important knowledge gaps.

Chapter 3 focused on the methodology which consisted of eight topics: conceptual framework, hypotheses development, research design, operational definition,

measurement of variables, data collection, time horizon, sampling, and the techniques of data analysis.

Chapter 4 presented the result of the statistical analysis which consisted of seven main sections: data preparation and screening, demographic profiling of respondent, reliability analysis of questionnaire items, analysis of Pearson Correlation, analysis of Multiple Linear Regression, thematic analysis, and summary of the chapter.

Chapter 5 presented a depth discussion and intepretation of the analysis result which cover five topics: discussion of the findings, implication of the study, limitation of the study, recommendations for future research, and overall conclusion of the study.

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CHAPTER TWO:

LITERATURE REVIEW

2.1. The Circular Economy and Refurbishment

The circular economy is a different economic model created to overcome the limits of the traditional linear system, which simply takes raw materials, makes products, and disposes of them. Instead, this new model focuses on keeping materials moving in a continuous loop through reducing, reusing, remanufacturing, refurbishing, and recycling (Kirchherr et al., 2017). When applied to electronic waste management, the circular economy focuses on extending the lifespan of electrical and electronic goods, which helps reduce the mining of natural resources and stops huge amounts of trash from going into landfills (Geissdoerfer et al., 2017).

Refurbishment plays a vital role in this circular system because it fixes up old or used items so they can be sold in the market once again (Bressanelli et al., 2018). This method not only keeps old home appliances out of the waste stream but also saves raw materials and reduces the environmental damage caused by factories making new products. Ultimately, the success of this circular model depends heavily on buyers, who determine market demand and decide if refurbishment businesses can survive (Mugge R. et al., 2025). Therefore, understanding what makes consumers want to buy refurbished household appliances is crucial information for companies and policymakers who want to support the circular economy in Malaysia.

2.2. Electronic Waste (E-waste): Challenges and Management

E-waste management involves the collection, processing, and disposal of old electronic devices in ways that protect nature. Currently, global e-waste is rising fast

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because people are buying more gadgets, which unfortunately contain dangerous chemicals like lead, mercury, and cadmium. If we do not handle this trash properly, it will release toxic particles that poison the environment and cause serious health problems for humans. Therefore, good management is important to protect people, safeguard nature, and secure the future of factory supply chains. Additionally, recycling e-waste helps us recover valuable materials, which promotes a circular economy and reduces our need to mine raw resources. Baldé, (2024) emphasizes that laws focused on recovering resources are vital for keeping future supply chains stable, which is why many rich countries have created specific laws to manage the massive increase in electronic trash (Jain et al., 2023, as cited in Grandhi et al., 2024).

Countries all over the world have introduced different laws to manage this problem, showing a clear division between developed and developing nations. For instance, Germany uses the ElektroG policy to require companies to set up take-back programs and recycle electronics safely, while Canada uses the Canadian Environmental Protection Act and Extended Producer Responsibility programs to force manufacturers to take full responsibility for recycling their own products. Similarly, Japan uses its home appliance recycling law to make sure shops and factories collect and recycle old household items. At the same time, developing nations like China, Brazil, and Malaysia have started their own rules, such as China's Solid Waste Pollution Control Law, Brazil's National Solid Waste Policy, and Malaysia's Environmental Quality Regulations 2005, which all provide guidelines for treating electronic trash safely.

Even though these laws exist, managing e-waste faces major social and economic challenges, particularly because informal recyclers dominate the industry. Informal

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recyclers are unregistered groups that do not follow government rules and use dangerous methods, whereas formal recyclers are official companies that use advanced technology and follow environmental laws. According to Lu et al., (2015), informal recyclers dominate because they are flexible and provide convenient, door-to-door collection services for homes and small shops. However, this convenient service comes with a heavy environmental cost because these informal workers often burn electronics in the open air to get valuable metals quickly, releasing dangerous chemicals into the air and soil (Okwu et al., 2022). Furthermore, Abalansa et al., (2021) state that the informal sector is very inefficient at recovering resources, and this is supported by Leung et al. (2008, as cited in Okwu et al., 2022), who note that informal recycling methods successfully recover only about 25 percent of the useful metals inside the devices.

Economic issues also make it hard for the safer, formal recycling sector to grow, as building high-tech recycling factories and hiring experts is very expensive (Herat, 2021). Because of these high costs, rich countries often ship their e-waste to developing nations where laws are weak and labor is cheap. Sadly, informal recyclers control the market in these poorer nations, and as Lu et al., (2015) point out, these informal workers usually extract only the most expensive parts and simply dump the toxic leftovers into local environments. Finally, a lack of public awareness is a major obstacle because many citizens in developing countries do not know how to dispose of electronics properly or understand the dangers of ignoring the problem. Muhani, (2012) notes that the public rarely follows e-waste guidelines actively, which weakens official recycling businesses, showing that countries cannot just rely on written laws but must also focus on strict law enforcement, funding better technology, and educating the public.

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2.3. Refurbishment as an E-Waste Reduction Strategy

According to Abbey et al., (2015), refurbished products are old items that are fixed up to look and work like new, which allows them to be sold again after going through repairs, component replacement, and repackaging. Chen and Chen (2019, as cited in Chen et al., (2020) mention that the main goal of refurbishment is to recycle used electronics up to a specific quality standard so they can be put back onto the market. In a similar way, Pigosso et al., (2010) explain that the entire process involves collecting secondhand goods, checking how well they work, and upgrading or replacing their parts so that new buyers can use them.

Lately, refurbished products have become much more important, especially when talking about environmental sustainability. Tseng et al. (2015, as cited in Wang and Hazen (2016) point out that refurbishing products is a key part of the circular economy, bringing both financial and environmental advantages. For instance, reusing a product fully or even just using some of its parts helps the earth by stopping the bad impacts of making brand-new things, such as using up natural resources, and it also prevents old items from being thrown into landfills (Ardente et al., 2018). Furthermore, Charter and Gray (2008) calculated that remanufacturing a product uses only about 15 percent of the energy needed to make a completely new one, which means we can save up to 85 percent of energy by choosing to refurbish.

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2.4. Underpinning Theory: The Theory of Planned Behavior (TPB)

The core foundation of this research is the Theory of Planned Behavior (TPB), which was originally created by Ajzen (1991). Standard TPB is one of the most popular models used by academic researchers to predict human actions. The main idea of this

theory is that a person's actual behavior is directly driven by their behavioral intention.

According to Ajzen (1991), this intention is shaped by three core independent variables: attitude, subjective norm, and perceived behavioral control. In the context of green marketing, many researchers agree that the standard TPB framework works very well to explain why consumers choose environmentally friendly goods (Hong et al., 2023; Moser, 2016; Sreen et al., 2018). However, this study only tests the relationships up to the level of purchase intention, which serves as the main dependent variable. The actual buying behavior is not measured directly because it is difficult to track the real purchasing activities of respondents within the short time frame of this study.

2.4.1. Attitude and Purchase Intention

Attitude refers to whether a person views a specific behavior as good or bad, positive or negative. In green product research, past studies show that consumers develop positive attitudes when they believe that buying eco-friendly items helps protect nature and shows they are responsible shoppers (Moser, 2016; Sreen et al., 2018).

Furthermore, researchers point out that a consumer's attitude becomes stronger when they have strong environmental beliefs, a positive self-image, and high concern for nature (Hong et al., 2023; Liobikiene et al., 2016; Zaremohzzabieh et al., 2021). Good product quality and trusting product claims also help improve consumer attitudes toward sustainable items.

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2.4.2. Subjective Norms and Purchase Intention

Subjective norm is defined as the social pressure a person feels from important people around them to perform or not perform a certain action. Research highlights that family members, close friends, and peers have a strong influence on green buying choices (Sreen et al., 2018).

This social pressure from family and the community is especially powerful in group-oriented, collectivistic cultures like Malaysia (Liobikiene et al., 2016; Zaremohzzabieh et al., 2021). Additionally, modern channels like online reviews, social media, and word-of-mouth can make subjective norms even stronger by spreading social approval to a wider audience (Hong et al., 2023).

2.4.3. Perceived Behavioral Control and Purchase Intention

Perceived behavioral control (PBC) refers to how easy or difficult a consumer thinks it is to perform the action. Past literature points out that PBC depends heavily on practical external factors, such as whether a product is easy to find, affordable, and convenient to buy (Liobikiene et al., 2016; Moser, 2016).

Consumers feel higher control when products have cheap prices and easy market access (Sreen et al., 2018). Buyers also experience higher internal control when they feel confident in their own ability to make smart, informed shopping choices (Hong et al., 2023).

2.4.4. Extended TPB: Integrating Perceived Price Advantage

Although the standard TPB model is effective, it focuses heavily on non-economic psychological factors and completely leaves out financial considerations. To address

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this recognized limitation, this study expands the standard TPB model by adding Perceived Price Advantage as an extra direct factor influencing intention.

Past literature confirms that perceived price advantage plays a key role in determining whether people buy green items (Joshi & Rahman, 2015). Buyers who care a lot about cost are less likely to buy green products if they seem too expensive. On the other hand, if consumers feel that eco-friendly items are cheap or save them money, their willingness to buy increases significantly. Therefore, combining standard TPB factors with price benefits provides a much stronger framework for studying why Malaysian consumers choose to purchase refurbished home appliances.

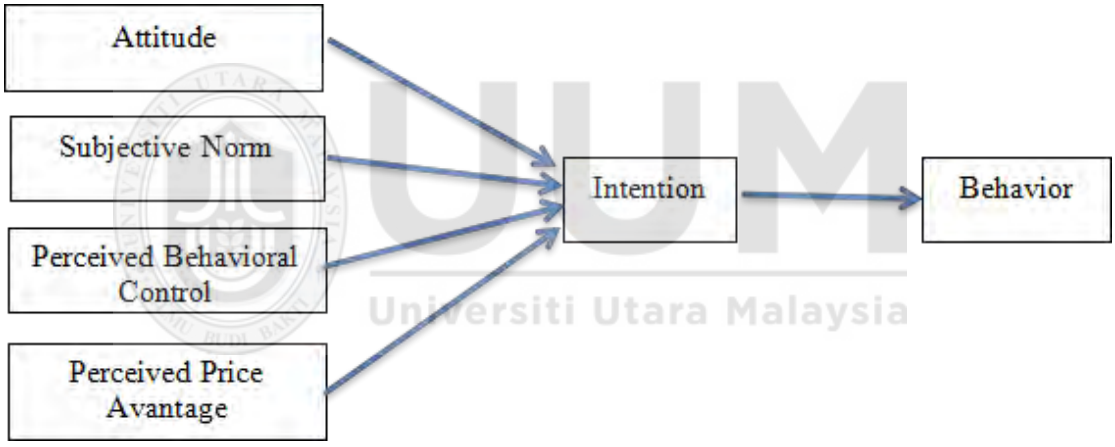


Figure 1 – Underpinning Theory: Theory of Planned Behavior (TPB) with an extended constuct of Perceived Price Advantage

2.5. Barriers Hindering Purchase Intention

To fully satisfy the research objectives, it is also necessary to study the negative factors that stop consumers from buying. Past researchers have noticed a clear "attitude-intention gap," where people hold positive environmental attitudes but still refuse to buy the actual products (Joshi & Rahman, 2015).

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This gap happens because of serious consumer barriers, such as a complete absence of trust in green claims, fear of bad product quality, high prices, limited information, and low product availability (Joshi & Rahman, 2015). Since refurbished home appliances are still quite new to Malaysian consumers, identifying and ranking these negative barriers is crucial to understanding consumer reluctance.

2.6. Summary and Research Gap

In conclusion, the literature shows that attitude, subjective norm, and perceived behavioral control are consistently vital factors that shape consumer intentions to buy eco-friendly products. Additionally, perceived price advantage plays a key role as an extra factor that directly strengthens this buying intention. Based on these findings, it is confirmed that using the Theory of Planned Behavior, along with the added factor of price benefits, provides a solid underpinning theory for studying why Malaysian consumers choose to purchase refurbished home appliances.

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Nevertheless, the existing literature reveals that three major gaps in the study of consumer purchase intention with regard to green products:

1. **Lack of local research in the Malaysian context**

   The majority of these studies have been carried out outside Malaysia. To give an example, Moser, (2016) concentrated on European consumers, Liobikiene et al., (2016) investigated Lithuanian consumers, Sreen et al., (2018) conducted research on Indian consumers, and Hong et al., (2023) investigated Chinese consumers. Although these studies are useful, it is possible that they cannot represent the purchase intention of Malaysian consumers due to the distinct cultural, economic, and infrastructural context.

2. **Too much focus on general green products instead of specific home appliances**

   The majority of past studies center on green products in general and do not specifically address refurbished home appliances, which has not yet been properly explored despite their potential contribution in reducing e-waste. This indicates the necessity to conduct a dedicated research on the factors that affect the intention of the Malaysian consumers to purchase the refurbished home appliances.

3. **Failure to study negative consumer barriers**

   Most studies concentrate on what influences purchase intention, they seldom explore why some consumers are reluctant to buy green products, despite one study has highlighted the existence of barriers such as absence of trust, perceived product quality, and limited information can hinder positive attitudes toward green or environmentally sustainable products.

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CHAPTER THREE:
RESEARCH METHODOLOGY

3.1. Introduction

This chapter described the methodology used for this study in identifying the factors that influence purchase intention of Malaysian consumers towards refurbished home appliances. This chapter outlined important components such as theoretical framework, hypotheses development, research design, data collection procedures, sampling strategy, and data analysis technique used to achieve the objectives and research questions. This study was grounded in the Theory of Planned Behavior (TPB) to explain the relationship between independent variables and dependent variables. Hypotheses were developed by identifying independent variables based on previous studies. The research design used is quantitative, deductive, field study and cross-sectional. This chapter also explained the target population, sampling methods, and techniques used for data analysis.

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3.2. Theoretical Framework

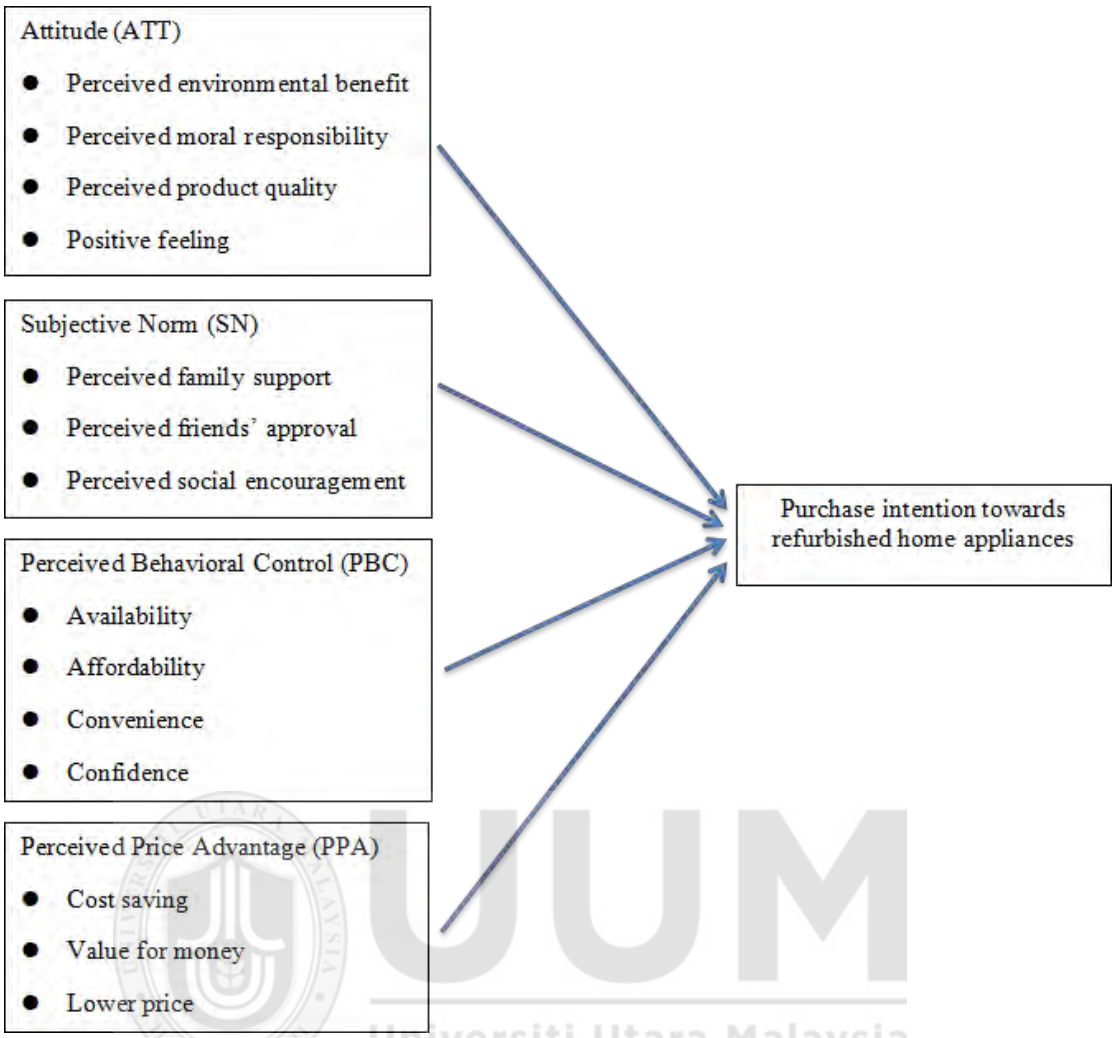


Figure 2 - Theoretical Framework of Factors Influencing Malaysian Consumers' Purchase Intention toward Refurbished Home Appliances (Adapted from Ajzen, 1991; Hong et al., 2023; Joshi and Rahman, 2015; Liobikiene et al., 2016; Moser, 2016; Sreen et al., 2018; Zaremohzzabieh et al., 2021)

This framework illustrated the proposed relationships between the Theory of Planned Behavior constructs: Attitude, Subjective Norm, and Perceived Behavioral Control, together with the extended factor, Perceived Price Advantage, in explaining Malaysian consumers' purchase intention toward refurbished home appliances.

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3.3. Hypotheses Development

The hypotheses in this study were developed based on findings from previous studies. Attitude is an overall evaluation of an individual about purchasing refurbished home appliances and may be based on beliefs concerning environmental benefit, product quality, and individual moral responsibility (Hong et al., 2023; Liobikiene et al., 2016; Moser, 2016; Sreen et al., 2018; Zaremohzzabieh et al., 2021). Subjective norm refers to the perceived social pressure from family, friends, or the society which are important in collectivist societies (Hong et al., 2023; Liobikiene et al., 2016; Sreen et al., 2018; Zaremohzzabieh et al., 2021). Perceived behavioral control (PBC) is the perception that the behavior is easy or difficult and it depends on factors like availability of products, price, and confidence (Hong et al., 2023; Liobikiene et al., 2016; Moser, 2016; Sreen et al., 2018). It has also been indicated that the perceived price advantage is an additional factor that influences green purchase intention which is the belief that refurbished products have good value for money (Joshi and Rahman, 2015). Based on the results, the following hypotheses were proposed:

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3.3.1. Attitude, Subjective Norm, Perceived Behavioral Control, and Perceived Price Advantage

H_1: *There is a significant relationship between attitude and purchase intention for refurbished home appliances.*

H_2: *There is a significant relationship between subjective norm and purchase intention for refurbished home appliances.*

H_3: *There is a significant relationship between perceived behavioral control and purchase intention for refurbished home appliances.*

H₄: *There is a significant relationship between perceived price advantage and purchase intention for refurbished home appliances.*

3.4. Research Design

This research is conducted as a deductive study, as it is based on an established theory and aims to test hypotheses derived from the Theory of Planned Behavior (TPB). The purpose of this research is strictly explanatory, as it seeks to explain the statistical influence of core TPB constructs namely attitude, subjective norm, and perceived behavioral control, along with the extended construct of perceived price advantage, in shaping the intention to purchase refurbished home appliances.

Survey research utilizing structured, close-ended questionnaires is used to collect data from a wide sample of Malaysian consumers. This research applies a non-contrived setting, specifically a field study layout. The interference of the researcher is minimal because data collection occurs in a natural environment without any manipulation of the independent variables. As such, this is a correlational study aimed at examining the numerical relationships between variables. The category of research is entirely quantitative, allowing all data analysis to be conducted statistically using descriptive and inferential statistics.

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3.5. Operational Definition

This research involves five variables: attitude, subjective norm, perceived behavioral control, perceived price advantage, and purchase intention. Each variable was operationalized by adapting items from prior studies and measured using multiple 5 points Likert-scale in survey questionnaires.

i. Attitude is measured through items such as perceived environmental benefits, perceived responsible consumer, perceived product quality, and positive feeling.

ii. Subjective norm is measured through items such as perceived social pressure from family members, perceived expectations from friends or community.

iii. Perceived behavioral control is measured through items such as availability, affordability, convenience, self-confidence to make informed decisions.

iv. Perceived price advantage is measured through items such as perceived cost savings, value for money, and lower price.

v. Purchase intention is measured through items such as intention to purchase, willingness to purchase, and likeliness to purchase.

3.6. Measurement of Variables/Instrumentation

This research used Likert-scale questions to measure the relationship between the constructs in the TPB framework (Attitude, Subjective Norm, Perceived Behavioral Control, and Perceived Price Advantage) and the dependent variable (Purchase Intention). The items were adapted from previous literature and tailored specific to the Malaysian context of the refurbished home appliances. The range of scale range is as follows:

1= Strongly Disagree

2= Disagree

3= Neutral

4= Agree

5= Strongly Agree

Construct / Variable / Factor	Items	Sources
Attitude (ATT)	I believe buying refurbished home appliances would help reduce environmental problems. I believe that I am responsible to protect the environment by buying refurbished home appliances. I believe refurbished home appliances have good quality. I would feel positive about buying refurbished home appliances. Buying refurbished home appliances would make me feel like a responsible person.	Ajzen (1991); Moser (2016); Genovaitė et al. (2016); Ying Hong et al. (2023); Zaremohzzabieh et al. (2021);Naman Sreen et al. (2018)

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Subjective norm (SN)	I believe my family expects me to buy refurbished home appliances. I believe my friends expect me to buy refurbished home appliances. I believe important people in my life encourage me to buy refurbished home appliances.	Naman Sreen et al. (2018); Genovaitė et al. (2016); Ying Hong et al. (2023); Zaremohzzabieh et al. (2021)
Perceived Behavioral Control	If available, it would be easy for me to find refurbished home appliances. If available, refurbished home appliances would be affordable to me. If available, it would be convenient for me to buy refurbished home appliances.	Moser (2016); Genovaitė et al. (2016); Naman Sreen et al. (2018); Ying Hong et al. (2023)

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		I am confident I could buy refurbished home appliances if I wanted to.	
Perceived Price Advantage		If available, refurbished home appliances would be good value for money. If available, buying refurbished home appliances would save me money compared to new ones. I would choose refurbished home appliances over new ones because they are cheaper.	Joshi and Rahman (2015)
Purchase Intention		If available, I would be likely to buy refurbished home appliances. If available, I would consider buying refurbished home appliances.	Ajzen (1991); Moser (2016); Naman Sreen et al. (2018);Genovaitė et al. (2016); Ying Hong et al. (2023); Zaremohzzabieh et al. (2021); Joshi and

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	If available, I intend to choose refurbished home appliances instead of new ones.	Rahman (2015)

Table 1 - Measurement of Variables/Instrumentation

3.7. Data Collection

This research collected primary data using online survey through social media platforms (Facebook, WhatsApp). Respondents was given a clear explanation regarding the purpose of the survey, and participations was based on voluntary and anonymous.

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3.8. Time Horizon

This research adopted a cross-sectional time horizon, means the data was collected at a single point in time.

3.9. Sampling

3.9.1. Population

This research focused on the Malaysian population, without limitations of age, gender, and income level. This comprehensive approach allowed the research to retrieve information within a broader demographic that may potentially invest in home appliances.

3.9.2. Sampling Frame

There was no database of all consumers of Malaysian home appliances and thus no formal sampling frame has been used. Instead, this research used a non-probability sampling method, using voluntary participation through social media platforms.

3.9.3. Unit of Analysis

This research used the individual respondent as its unit of analysis, allowing personal perceptions, intentions, and forces that influence purchasing decisions to be examined.

3.9.4. Sample Size

The sample size was calculated using the G*Power sample size calculator. Considering the confidence level is 95 percent and margin of error is 5 percent, the sample size determined was 104 respondents.

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3.9.5. Sampling Procedure

This research used non-probability sampling, in particular convenience sampling. The survey was distributed through social media platforms (Facebook, WhatsApp).

3.10. Techniques of Data Analysis

This research applied quantitative techniques of data analysis:

i. Descriptive analysis: Used in summarizing the respondent demographics and the level of purchase intention upon refurbished home appliances.
ii. Multiple regression analysis (using SPSS): Used for testing the relationship between independent variables and dependent variable.

3.11. Summary of the Chapter

Overall, this chapter explained the research methodology used to study the purchase intention of Malaysian consumers to buy a refurbished home appliance and explained the research design, population and sampling design, method of data collection, instrumentation and data analysis methods. This methodology selection was aimed to obtain a reliable primary data.

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CHAPTER FOUR:

RESULTS

4.1. Introduction

This chapter present the data analysis and findings of the feedback from 104 respondents collected from Facebook and WhatsApp. The analysis begins with data preparation and demographic profiling, followed by an assessment to measure the reliability and correlation of each construct. Finally, the model is tested using Linear Multiple Regression to evaluate the hypotheses of the relationship between independent and dependent variable in TPB, including the added extension of independent variable

4.2. Data Preparation and Screening

The data were uploaded into the SPSS and underwent a preparation and screening processes prior to the main analysis. Preparation process included defining the unit for Values and Measure column. Then, a composite score is created by calculating the mean for each variable to consolidate multiple items under each variable into single representative variables. These steps are necessary to transform the data into a suitable format for the hypothesis testing later on. Besides, there were no outlier and missing value found as the survey questionnaire is guided by closed-ended Likert scale and each question are prerequisite.

4.3. Demographic Profiling of Respondents

The study managed to collected sample of N = 104 respondents. Table 2 summarizes the demographic profile of the respondents, consisting information of age and gender.

Variable	Category	Frequency (n)	Percentage %
Gender	Male	33	31.7
	Female	71	68.3
	Total	**104**	**100**
Age group	18 to 24	47	45.2
	25 to 34	41	39.4
	35 to 44	14	13.5
	45 to 54	1	1.0
	55 to 64	1	1.0
	Total	**104**	**100**

Table 2 - Demographic Profiling of Respondents

4.4. Reliability Analysis of Questionnaire Items Under Each Variable Construct

To ensure every question is correlate to each other within a variable construct, a reliability testing was conducted to measure the internal consistency based on the value of Cronbach Alpha coefficient. The objective was to ensure the Cronbach Alpha value of a construct is above 0.70, which indicate the questionnaire is valid and the items are highly correlated. Table 3 shows the result of the reliability testing.

Variable	Number of Items	Cronbach's Alpha
Attitude	5	0.948
Subjective Norm	3	0.978
Perceived Behavioral Control	4	0.950
Perceived Price Advantage	3	0.951

Purchase Intention	3	0.974

Table 3 - Reliability Analysis of Questionnaire Items Under Each Variable Construct

Based on Table 3, the result showed that the Cronbach Alpha value for the constructs of Independent Variable (IV) which are the Attitude (A), Subjective Norm (SN), Perceived Behavioral Control (PBC) were 0.948, 0.978, and 0.950 respectively. Besides, the extended IV of this study which is the Perceived Price Advantage (PPA) was at 0.951 of the value of Cronbach Alpha. Meanwhile, the Cronbach Alpha value for Dependent Variable (DV) construct which is the Purchase Intention (PI) was 0.974.

As a summary, this result indicated that the questionnaire developed for this study is valid and each item within constructs are highly correlated.

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4.5. Normality Test

The results of the Kolmogorov-Smirnov and Shapiro-Wilk tests showed a significance value of $p < 0.01$ for all variables, as shown in Table 4. While a significant p-value mathematically means the data is not normal, peer-reviewed methodological studies caution against using these tests as the sole deciding factor.

	Kolmogorov-Smirnov		Shapiro-Wilk	
	Statistic	Sig.	Statistic	Sig.
Mean_Attitude	.286	<.001	.786	<.001
Mean_Subjective Norm	.207	<.001	.856	<.001
Mean_Perceived Behavioral Control	.195	<.001	.865	<.001
Mean_Perceived	.233	<.001	.829	<.001

Price Advantage				
Mean_Purchase Intention	.264	<.001	.749	<.001

Table 4 - Test of normality based on Kolmogorov-Smirnov and Shapiro-Wilk

According to statistical research, both the Kolmogorov-Smirnov and Shapiro-Wilk tests are highly over-sensitive to sample sizes. In real-world survey research, even a tiny, completely harmless variation from a perfect bell curve will cause these tests to show a significant result (Ghasemi & Zahediasl, 2012). Because of this extreme sensitivity, relying only on these significance tests often forces researchers to wrongly reject perfectly good datasets (Mohd Razali & Bee Wah, 2011). Therefore, modern empirical studies recommend evaluating the absolute shapes of data distribution through Skewness and Kurtosis as a more reliable and practical approach to validate parametric analysis.

To obtain a more resilient assessment of data distribution, the Skewness and Kurtosis values of the composite mean variables were examined. For medium-sized samples ($50 < n < 300$), a distribution can be considered acceptable for parametric analysis if the absolute Z-scores for both skewness and kurtosis do not exceed a critical value of 3.29 (Kim, 2013). Furthermore, an absolute skewness value greater than 2.0 or an absolute excess kurtosis value greater than 7.0 is widely used as the standard reference threshold indicating a substantial departure from normality (Kim, 2013).

Table 5 presents the descriptive normality value for the mean variables of the study.

Variable	**Mean**	**Std. Deviation**	**Skewness**	**Kurtosis**
Attitude	4.471	0.614	-1.045	0.809
Subjective Norm	4.099	0.799	-0.638	-0.558

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Perceived Behavioral Control	4.238	0.656	-0.365	-0.840
Perceived Price Advantage	4.226	0.613	-0.198	-0.505
Purchase Intention (DV)	4.310	0.686	-0.730	-0.170

Table 5 - Skewness and Kurtosis Results for Main Constructs

As shown in Table 5, despite the abnormality as shown in the Shapiro-Wilk test, the individual Skewness values for all constructs ranged between -1.045 and -0.198, which comfortably satisfies the strict ±2.0 threshold. Furthermore, the Kurtosis values ranged from -0.840 to 0.809, remaining well below the maximum threshold of ±7.0.

Because the data structure shows no extreme outliers and the skewness/kurtosis values indicate a normal, balanced distribution shape, the dataset is deemed sufficiently normal. Thus, the assumption of normality is justified, validating the application of parametric tests, including Pearson Correlation and Multiple Linear Regression.

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4.6. Pearson Correlation Analysis

To examine the strength of relationship between variables, a bivariate Pearson correlation analysis was conducted. Table 6 presents the correlation matrix resulted from the analysis.

Variable	**Mean_PI**	**Mean_A**	**Mean_SN**	**Mean_PBC**	**Mean_PPA**
Mean_PI	1.000	0.798	0.661	0.735	0.643
Mean_A	0.798	1.000	0.657	0.714	0.613

Mean_SN	0.661	0.657	1.000	0.777	0.717
Mean_PBC	0.735	0.714	0.777	1.000	0.771
Mean_PPA	0.643	0.613	0.717	0.771	1.000
Sig. (1-tailed)		< .001	< .001	< .001	< .001

Table 6 - Pearson Correlation Analysis

Based on Table 6, the result indicated that each of the independent variable were strongly correlated with the Purchase Intention. The coefficient for each of the independent variable were ranging from 0.613 to 0.798, equivalent to $p < .001$. This strong relationship indicates that as the value of Attitude, Subjective Norm, Perceived Behavioral Control, Perceived Price Advantage increase, the intention to purchase also increases.

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4.7. Multiple Linear Regression Analysis

4.7.1. Model Summary

Table 7 shows the Adjusted R^2 for the model is .686, highly passed the threshold for social science context. The result shows that the model represents 68.6% for the variance of Purchase Intention. This also indicates that the addition of Perceived Price Advantage as the extension of TPB model for this study was meaningful and relevant.

Model	R	R^2	Adjusted R^2	Std. Error of Estimation
1	.836[a]	.699	.686	.40661

Table 7 - Model Summary

4.7.2. ANOVA

To determine the statistical significance of the overall regression model, ANOVA analysis was conducted. The results of the analysis as presents in Table 8 indicated

that the regression model is highly significant, $F = 57.382$, $p < .001$. The results confirms that the consolidation of Attitude, Subjective Norm, Perceived Behavioral Control, and Perceived Price Advantage is highly significant to predict Purchase Intention. Hence, the objective of this study to examine the individual predictors TPB is relevant and justified.

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	37.948	4	9.487	57.382	$< .001^b$
Residual	16.368	99	.165		
Total	54.315	103			

Table 8 – ANOVA result

4.7.3. Multicollinearity Diagnostics (VIF)

As the variables were highly correlated, it is necessary to ensure that no bias would affect the regression model. Therefore, Multicollinearity was checked using Variance Inflation Factors (VIF). The results shows that the VIF value for all independent variables were ranged from 2.168 to 3.788, below the threshold of 5.0. This indicates that all of these independent variables were distinct enough to be analyzed as separate predictors although they were related.

Table 9 shows the value of VIF for all variables.

Variable (IV)	Variance Inflation Factors (VIF)
Mean_Attitude	2.168
Mean_Subjective Norm	2.882
Mean_Perceived Behavioral Control	3.788
Mean_Perceived Price Advantage	2.714

Dependent Variable: Mean_Purchase Intention

Table 9 - Multicollinearity Diagnostics (VIF)

4.7.4. Hypothesis Testing

The result of regression coefficient showed that there were only two variables achieved a significant statistic. The independent variable of Attitude was the strongest predictor in the model, (β = .534, p < .001), followed by Perceived Behavioral Control (β = .238, p .029). Both variables were below the standard threshold for statistical significance in regression analysis which is less than 0.05 (< 0.05).

Table 10 presents the result of regression coefficients for all predictors.

Variable (IV)	Unstandardized Beta (β)	Standardized Beta (β)	t-value	Sig. *p-value*
Mean_A	.631	.534	6.568	<.001
Mean_SN	.056	.062	.663	.509
Mean_PBC	.264	.238	2.220	.029
Mean_PPA	.090	.093	.965	.337
Dependent Variable: Mean_PI				

Table 10 - Hypothesis Testing

4.7.5. Summary of the Hypothesis

Based on the regression analysis, the findings of the hypothesis testing are summarized in Table 11:

Hypothesis	**Relationship**	**Sig. Value**	**Finding**
H1	Attitude ⟶ Purchase Intention	<.001	Supported
H2	Subjective Norm ⟶ Purchase	.509	Rejected

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	Intention		
H3	Perceived Behavioral Control ⟶ Purchase Intention	.029	Supported
H4	Perceived Price Advantage ⟶ Purchase Intention	.337	Rejected

Table 11 - Summary of the Hypothesis

4.8. Descriptive Analysis: Level of Purchase Intention

To address the research objective of measuring the level of purchase intention toward refurbished home appliances among Malaysian consumers, a descriptive statistical analysis was executed. The level of the construct was evaluated based on a 3-tier classification scale for a 5-point Likert system: Low (1.00 to 2.33), Moderate (2.34 to 3.67), and High (3.68 to 5.00). Table 12 presents the descriptive statistics, including the minimum, maximum, mean, and standard deviation scores for the dependent variable.

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Variable	N	Minimum	Maximum	Mean	Std. Deviation	Interpretation
Mean_Purchase Intention	104	2.00	5.00	4.381	0.726	High

Table 12 - Descriptive Statistics for Level of Purchase Intention

As presented in Table 12, the overall mean score for purchase intention is 4.381 with a standard deviation of 0.726. Based on the established threshold criteria, this empirical result indicates a high level of willingness and intention among the sampled Malaysian consumers to purchase refurbished home appliances.

4.9. Supplementary Analysis: Possible Barriers Hindering Purchase Intention

Apart from finding out the strongest factor that influenced the purchase intention of consumers**,** this study also intent to identify the possible barriers hindering purchase intention upon refurbished home appliances among Malaysian consumers. The survey conducted has recorded 2 respondents who were unwilling to purchase refurbished home appliances. Table 13 presents the list of the reasons stated by the respondents.

No. of Respondent	Reason Stated
1	"Expensive"
2	"Do not trust the quality of refurbished items"

Table 13 – Supplementary Analysis For Identifying Possible Barriers Hindering Purchase Intention

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4.10. Summary Of The Chapter

In conclusion, this chapter presents in detail the statistical analysis of data obtained from 104 respondents. The initial process began with data screening and demographic analysis of respondents, where the gender of the majority of respondents consisted of female individuals while the age range of the majority of respondents was from 18 to 24 years old. Next, the analysis process continued with reliability testing, where the findings showed that all variables were very consistent, with Cronbach's Alpha values between 0.948 to 0.978. Then, Pearson Correlation analysis confirmed that all independent variables including extended variables had a strong positive relationship with the dependent variable, namely Purchase Intention.

Multiple Linear Regression Analysis, which is the backbone of the objectives of this study, has confirmed the strength of the model that has been developed, with Adjusted R2 at a value of .686. This value means that the extended TPB framework grounded

in this study explains 68.6% of the variation in Purchase Intention among the sample of consumers in Malaysia. Only two variables were found to be significant predictors, namely Attitude ($p < .001$) and Perceived Behavioral Control ($p .029$), thus supporting H1 and H3 respectively. Meanwhile, the other two variables, namely Subjective Norm (H2) and Perceived Price Advantage (H4) were not supported in the model. Lastly, a thematic analysis conducted to gain qualitative feedback revealed that the primary reasons of consumer reluctance were due to high cost and low quality. Overall, these findings provide the empirical evidence required for the discussion of theoretical and practical implications in the following chapter.

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CHAPTER FIVE:

DISCUSSION

5.1. Introduction

This chapter presents a discussion regarding the implications of the analysis findings in the previous chapter on theoretical and practical aspects. Besides, a conclusion regarding the contribution of this study will also be presented. In addition, the limitations in this study are also important to highlight so that recommendations can be proposed to researchers who want to further extend this topic of study. Finally, this chapter also covers the overall conclusion of the study that has been conducted.

5.2. Discussion of Findings

The main goal of this study was to find out what factors make Malaysian consumers want to buy refurbished home appliances. By understanding this, we can help reduce electronic waste (e-waste) and save the environment.

The results showed that the research model is very strong. Together, all the factors explain 68.6% of why consumers want to buy these products. However, out of the four hypotheses made at the start, only two were supported by the data, which are Attitude and Perceived Behavioral Control. The other two factors, Subjective Norm and Perceived Price Advantage, were not supported.

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5.2.1. The Strong Power of Attitude (H1 Supported)

The analysis showed that Attitude is the most important factor influencing a consumer's intention to buy refurbished home appliances. This means that a person's own thoughts, feelings, and environmental values are the main reasons they decide to buy these products.

This matches previous studies which show that a positive attitude is the most important step before someone buys a green product. When Malaysian consumers believe that buying a refurbished washing machine or refrigerator helps reduce e-waste and protects nature, they become highly willing to buy it. Their personal moral values and desire to help the earth are much more important than outside pressures.

5.2.2. The Social Pressure Does Not Matter (H2 Rejected)

The study found that Subjective Norm (social pressure from family and friends) does not affect a consumer's intention to buy. In many traditional studies, researchers say that Malaysians are deeply influenced by what their family and friends think. However, this study shows a different result.

The reason for this is where the products are used. Large home appliances are used privately inside the house. Unlike driving a hybrid car or wearing eco-friendly fashion items, which everyone can see outside, nobody really sees someone’s refrigerator or washing machine. Because it is a private choice, consumers do not care about getting approval from their friends or neighbors. They only care about their own personal needs.

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5.2.3. The Importance of Easy Access and Control (H3 Supported)

Perceived Behavioral Control (how easy or difficult it is to buy the product) was also a significant factor. In this study, it means that consumers need to feel that buying a refurbished appliance is convenient, affordable, and safe.

If consumers feel they can easily find a trustworthy shop, get clear information about the product's condition, and have the money to buy it, they feel in control. This feeling of control removes their doubts and makes them ready to make a purchase.

5.2.4. The Unexpected About Cheap Prices (H4 Rejected)

One of the most surprising results was that Perceived Price Advantage, by getting a cheap price or discount, did not have a direct impact on purchase intention in the final model. Usually, people think that saving money is the main reason anyone buys second-hand items.

However, this result explains a famous problem in green marketing, which is why people say they want to protect the environment but do not actually buy green products. The data shows that while people love saving money, a cheap price alone is not enough.

For Malaysian consumers, if they feel a product is unsafe or might break down quickly, they will not buy it, even if it is very cheap. In fact, if a product is too cheap, they might worry that it is low quality. Therefore, a cheap price only matters after the customer trusts that the product actually works well and is safe.

5.3. Understanding the Results in the Malaysian Context

To truly understand why Malaysian consumers have a high intention to buy these products (a high score of 4.381 out of 5) but do not care about cheap prices alone, we must look at the real situation in Malaysia today.

Right now, the Malaysian government is pushing hard for sustainability through campaigns like the National Circular Economy Blueprint. The high score shows that Malaysians have listened to these campaigns. They understand that e-waste is a big problem and genuinely want to help the environment by choosing refurbished goods.

However, the refurbished appliance market in Malaysia is still not well-established. Unlike the used car market, Malaysia does not have strict, clear laws that force shops to give long warranties or safety guarantees for refurbished home electronics.

Because of this lack of laws, Malaysian buyers feel there is a big risk. They worry about electrical short circuits, fire hazards, or the machine breaking down after just one month. Therefore, they focus heavily on safety and quality rather than just looking for the cheapest option. A Malaysian consumer would rather pay full price for a brand-new appliance with a proper factory warranty than take a risk on a cheap, low-quality refurbished item.

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5.4. Implication of the study

5.4.1. Theoretical implication

The findings of this study bring several important lessons for academic theory, especially regarding how consumers behave in the circular economy. First, this

research proves that the extended theory framework is highly useful in the Malaysian market because it successfully explains 68.6% of why consumers want to buy refurbished home appliances. This shows that combining classic psychological factors with modern economic factors creates a much stronger model for studying green products.

Second, this study successfully fixes a common weakness in older theories, which usually ignored the role of money and prices. By adding price as a specific factor, the study shows that economic reasons and personal thoughts actually work together.

Finally, the results help explain the famous "gap" where people say they want to protect the environment but do not actually buy green goods. It proves that price is not an independent factor because a cheap price is always filtered through a person's attitude toward risk, quality, and safety.

5.4.2. Practical implication

From a practical perspective, the results offer valuable strategies for businesses, green marketers, and policymakers in Malaysia. First, businesses must stop falling into the "discount trap" by using words like "cheap" or "low cost" as their main marketing tool. Because cheap prices are absorbed by the consumer's overall attitude, marketing campaigns should instead focus on building trust by highlighting strict quality testing, product safety, and clear benefits to the environment.

Second, shops must actively reduce consumer fears regarding low quality by offering strong guarantees. Providing a mandatory 1-year warranty, sharing good customer

reviews, and creating clear return policies will help consumers feel that buying a refurbished appliance is a safe choice.

Lastly, the government and green companies need to work together to make the purchasing process as easy as possible. By building trusted online platforms, increasing product availability, and offering reliable door-to-door delivery, they can make consumers feel in control, which will successfully encourage more Malaysians to choose refurbished goods.

5.5. Limitation of the Study

This study provides several relevant theoretical and practical contribution for purchase intention in the context of using refurbished home appliances in Malaysia, but there are also several limitations that must be considered when interpreting the results.

Firstly, there is a limitation involving platform bias in the data collection process. This study was conducted solely via social media (Facebook and WhatsApp groups). This method could possibly produce a bias due to it is heavily relies on online users who are engaged to social media platform. The evident is shown in the demographic profile where the majority of respondents lay within the 18-34 age group. Therefore, the results may not represent the older consumers or those consumers who do not frequently engaged to social media platforms and this limitations may reduce the generalizability of the findings to the broader population of Malaysia.

Secondly, this study only stop at Purchase Intention and not follows up with the actual Behavior of the consumers. According to the complete Theory of Planned Behavior

(TPB) model (Ajzen, 1991), intention is the direct determinant of behavior, hence there is another step as a final dependent variable. Considering time and practical constraints involved in conducting this research, this study only investigates what factors influence the consumer's intention to purchase refurbished appliances. It does not follow up on the respondents to see if those who indicated high intention to purchase, will subsequently carry on to make a real purchase in the future. Although the attitude-intention-behaviour gaps in green purchasing literature are well documented, the high scores in this aspect on the Chapter 4 in this study do not necessarily equal to actual purchasing behaviour.

5.6. Recommendations for future research

This study has came out with the following recommendations for further studies to enhance the understanding of consumer's behaviour towards refurbished home appliances in Malaysia based on the findings and limitations of this study.

First, it is recommended to have other methods to collect data besides social media platforms in future studies to overcome the limitation of platform bias. A combination of online and offline surveys is recommended whereby a part of the survey should be conducted online, with part conducted offline in physical retail stores. This would enable researchers to collect data from larger population including customers beyond the tech-savvy age group and also who are less-active users of digital platforms, subsequently enhancing the generalizability of findings for the general Malaysian population.

Second, the framework limitation of stopping at purchase intention should be addressed in future studies and a more comprehensive framework should measure the actual Behavior. Longitudinal time horizon to validate the actual purchase behavior of same respondents could be used in future research. A study of actual buying behavior would give greater insights into the strength of the intention-behavior relationship and could uncover any potential barriers which consumers encounter after the initial intention has been formed.

5.7. Conclusion

Overall, the study has successfully achieved its objective as it has used the Theory of Planned Behavior alonside with an extended variable to investigate a less popular product category in the Malaysian market. Although the platform bias and stopping at the intention stage was the praticality limitations, however, there is an empirical evidence that shows a clear direction and insight for green product businesses. The high predictive ability of this model is indicative of the importance of changing consumer mindset and trust in product quality in order to promote sustainable purchasing, reduce e-waste, and support the transition towards a circular economy in Malaysia.

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Appendix A

SURVEY QUESTIONNAIRE

DRIVING E-WASTE REDUCTION THROUGH REFURBISHED HOME APPLIANCES: FACTORS INFLUENCING PURCHASE INTENTION OF MALAYSIAN CONSUMERS
MEMACU PENGURANGAN SISA ELEKTRONIK MELALUI PERALATAN RUMAH YANG DIPERBAHARUI: FAKTOR-FAKTOR YANG MEMPENGARUHI NIAT PEMBELIAN PENGGUNA MALAYSIA

Dear Respondent, / Responden yang dihormati,

You are invited to participate in a survey for academic research entitled "Driving E-Waste Reduction Through Refurbished Home Appliances: Factors Influencing Purchase Intention of Malaysian Consumers" / "Memacu Pengurangan Sisa Elektronik Melalui Perkakas Rumah Yang Diperbaharui: Faktor-Faktor Yang Mempengaruhi Niat Pembelian Pengguna Malaysia".

This research aims to identify the most significant factor influencing the intention of Malaysian consumers to purchase refurbished home appliances. Your response will provide valuable contributions in understanding the factors that influence Malaysian consumers' intention to purchase refurbished home appliances, which may help promote sustainable consumption and reduce e-waste.

All responses will remain confidential and used solely for academic purposes. No personally identifiable information will be collected. Demographic questions such as age and gender are anonymous and used only for statistical analysis. If you have any questions or concerns regarding this survey, please feel free to contact the researcher at the provided email address.

Thank you for your time and participation.

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Definition of Refurbished Home Appliances / Definisi Peralatan Rumah Diperbaharui:

Refurbished home appliances refer to the transformation of used home appliances (e.g., washing machine, refrigerator, air conditioning unit) to "like-new" condition through the processes of replacing worn and broken parts.
Peralatan rumah yang diperbaharui merujuk kepada transformasi peralatan rumah terpakai (cth. mesin basuh, peti sejuk, unit penghawa dingin) kepada keadaan "seperti baru" melalui proses menggantikan bahagian yang haus dan rosak.

Section 1: Demographic Information / Bahagian 1: Maklumat Demografi

1. Please state your gender / Sila nyatakan jantina anda:

[ ] Male / Lelaki

[ ] Female / Perempuan

2. Please state your age group / Sila nyatakan kumpulan umur anda:

[ ] 18 to 24 / 18 hingga 24

[ ] 25 to 34 / 25 hingga 34

[ ] 35 to 44 / 35 hingga 44

[ ] 45 to 54 / 45 hingga 54

[ ] 55 to 64 / 55 hingga 64

[ ] 64 or over / 64 atau lebih

Likert Scale Rating Indicator / Petunjuk Skala Penilaian Likert:

1 = Strongly Disagree / Sangat tidak setuju

2 = Disagree / Tidak setuju

3 = Neutral (neither agree nor disagree) / Neutral (tiada kecenderungan untuk setuju atau tidak setuju)

4 = Agree / Setuju

5 = Strongly Agree / Sangat setuju

Section 2: Factors of Attitude / Bahagian 2: Faktor Sikap

No.	Item / Pernyataan	1	2	3	4	5
1.	I believe buying refurbished home appliances would help reduce environmental problems. **Saya percaya membeli peralatan rumah yang telah diperbaharui akan membantu mengurangkan masalah alam sekitar.**					
2.	I believe that I am responsible to protect the environment by buying refurbished home appliances. **Saya percaya bahawa saya bertanggungjawab untuk melindungi alam sekitar dengan membeli peralatan rumah yang telah diperbaharui.**					
3.	I believe refurbished home appliances have good quality. **Saya percaya peralatan rumah yang telah diperbaharui mempunyai kualiti yang baik.**					
4.	I would feel positive about buying refurbished home appliances. **Saya akan berasa positif tentang membeli peralatan rumah yang telah diperbaharui.**					

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5.	Buying refurbished home appliances would make me feel like a responsible person. **Membeli peralatan rumah yang telah diperbaharui akan membuatkan saya berasa seperti seorang yang bertanggungjawab.**					

Section 3: Factors of Subjective Norm / Bahagian 3: Faktor Norma Subjektif

No.	Item / Pernyataan	1	2	3	4	5
1.	I believe my family expects me to buy refurbished home appliances. **Saya percaya keluarga saya mengharapkan saya membeli peralatan rumah yang telah diperbaharui.**					
2.	I believe my friends expect me to buy refurbished home appliances. **Saya percaya rakan-rakan saya mengharapkan saya membeli peralatan rumah yang telah diperbaharui.**					
3.	I believe important people in my life encourage me to buy refurbished home appliances. **Saya percaya orang penting dalam hidup saya menggalakkan saya membeli peralatan rumah yang telah diperbaharui.**					

Section 4: Factors of Perceived Behavioral Control / Bahagian 4: Faktor Tanggapan Terhadap Kawalan Tingkah Laku

No.	Item / Pernyataan	1	2	3	4	5
1.	If available, it would be easy for me to find refurbished home appliances. **Jika ada, adalah mudah bagi saya untuk mencari peralatan rumah yang telah diperbaharui.**					
2.	If available, refurbished home appliances would be affordable for me. **Jika ada, peralatan rumah yang diperbaharui adalah mampu milik untuk saya.**					
3.	If available, it would be convenient for me to buy refurbished home appliances. **Jika ada, adalah senang bagi saya untuk membeli peralatan rumah yang telah diperbaharui.**					

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4.	I am confident I could buy refurbished home appliances if I wanted to. **Saya yakin saya boleh membeli peralatan rumah yang telah diperbaharui jika saya mahu.**					

Section 5: Factors of Perceived Price Advantage / Bahagian 5: Faktor Persepsi Terhadap Kelebihan Harga

No.	Item / Pernyataan	1	2	3	4	5
1.	If available, refurbished home appliances would be good value for money. **Jika ada, peralatan rumah yang diperbaharui adalah berbaloi untuk wang.**					
2.	If available, buying refurbished home appliances would save me money compared to new ones. **Jika ada, membeli peralatan rumah yang diperbaharui akan menjimatkan wang saya berbanding yang baharu.**					
3.	I would choose refurbished home appliances over new ones because they are cheaper. **Saya akan memilih peralatan rumah yang diperbaharui berbanding yang baru kerana ia lebih murah.**					

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Section 6: Purchase Intention / Bahagian 6: Niat Membeli

No.	Item / Pernyataan	1	2	3	4	5
1.	If available, I would be likely to buy refurbished home appliances. **Jika ada, saya berkemungkinan akan membeli peralatan rumah yang telah diperbaharui.**					
2.	If available, I would consider buying refurbished home appliances. **Jika ada, saya akan mempertimbangkan untuk membeli peralatan rumah yang telah diperbaharui.**					
3.	If available, I intend to choose refurbished home appliances instead of new ones. **Jika ada, saya berhasrat untuk memilih peralatan rumah yang telah diperbaharui dan bukannya yang baru.**					

If you answered "Disagree" or "Strongly Disagree" to any of the questions in Section 6 (Purchase Intention), please tell us why you may be reluctant to buy refurbished home appliances.

Jika anda menjawab "Tidak Setuju" atau "Sangat Tidak Setuju" kepada mana-mana soalan dalam Bahagian 6 (Niat Membeli), sila beritahu kami mengapa anda mungkin enggan membeli peralatan rumah yang telah diperbaharui.

End of Questionnaire / Tamat Sesi Kaji Selidik

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