

Determinants of Consumer Purchase Intention for Refurbished and Recycled Electronics in the Context of the Circular Economy

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ABSTRACT

The rise in electronic product demand and consumption has led to an increase in electronic waste, posing a challenge to reducing environmental impacts and achieving sustainability. Therefore, transition efforts towards a circular economy, involving various parties including consumers, are needed. This research aims to determine the relationship between factors influencing consumer purchase intentions towards circular economy products, focusing on refurbished electronics and recycled electronics. This research extended the Theory of Planned Behaviour (TPB) by adding environmental concern, perceived risk, and receptivity to green communication variables. Data collection was carried out through questionnaires distributed online using non-probability sampling. Analysis was conducted using the Partial Least Squares-Structural Equation Modeling (PLS-SEM) method. Based on a data sample of 289 respondents, the results show that attitude, subjective norm, perceived behavioural control, and receptivity to green communication variables significantly influence consumer purchase intentions regarding refurbished and recycled gadgets. Another finding is that environmental concern emerges as a positive driver across all TPB factors, while perceived risk negatively impacts consumer attitudes. The research implications suggest that companies should focus on building positive consumer attitudes through quality assurance programs, leverage social influence through environmental campaigns, and develop transparent communication strategies to address perceived risks while highlighting the environmental benefits of circular products.

KEYWORDS

Circular economy, purchase intention, recycled electronic, refurbished electronic, theory planned behavior



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INTRODUCTION

Population growth, urbanization trends, and rising living standards have led to an increase in the use of natural resources. The unsustainable exploitation of resources generates large amounts of waste and can lead to significant environmental consequences, such as marine environmental damage and climate change. Humans consume natural resources at a much faster rate than can be regenerated by nature's biocapacity (Outlook, 2020). Resource scarcity, environmental concerns, and stricter regulations have compelled researchers from academia and industry to develop strategies that tackle the sharp increases in the number of end-use and end-of-life products (Singhal et al., 2019).

In response to these problems, the United Nations has launched a strategy to achieve the Sustainable Development Goals by 2030 to address environmental issues (Kongarchapatara & Hanpanit, 2021). One of these goals is the circular economy, which focuses on responsible production and consumption (Jan, 2022). Indonesia has also launched a national strategy,

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including a circular economy, incorporated in the 2020–2024 National Medium-Term Development Plan (*RPJMN*) as part of its low-carbon development strategy (Bappenas, 2020).

A circular economy aims to generate economic growth by maintaining the value of products, materials, and resources in the economy for as long as possible, thereby minimizing the social and environmental damage caused by the traditional linear economic approach (Ellen MacArthur, 2015). Linear economic systems incur large costs in the form of environmental degradation even though they provide economic benefits. This economic model is no longer competitive, as it does not conform to the principles of sustainable social, economic, and environmental growth advocated by the circular model.

One environmental issue that has continued to grow in recent years is the increase in waste from electrical and electronic products (e-waste) (Parajuly et al., 2020). The development of technology and digitalization brings significant benefits and provides new opportunities for growth, ranging from improving welfare, expanding education, providing quality healthcare services, facilitating trade, to overcoming challenges posed by climate change (Lazar, 2021). The increased use of electronic devices is accompanied by a rise in the volume of waste, as shown in The Global E-Waste Monitor 2020.

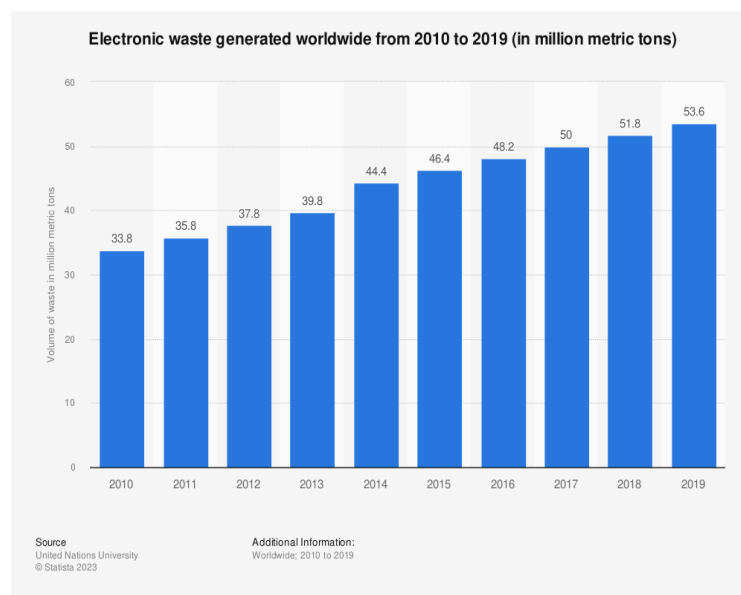


Figure 1. Global E-Waste Growth
Source: United Nations University, 2020

Based on data from the Ministry of Environment and Forestry in 2021, the amount of electronic waste in Indonesia reached 2 million tons. Of the total landfills, only 17.4% are well managed, while the rest are still stored at home or sent to landfills where they are mixed with other types of waste. This poses a potential risk of resource loss and negative impacts on the environment and human health (Andarani & Goto, 2014). Despite the problem, the growth of e-waste also offers significant potential economic value due to the presence of recoverable and valuable metals (Parajuly et al., 2020). Therefore, efforts are needed to maintain the value of electronic products as resources with the highest value for as long as possible (Sari et al., 2021).

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To reduce environmental impact and achieve sustainability, the transition towards a circular economy is critical.

The circular products that are the focus of this research are electronic products made from recycled materials and can be recycled, as well as *reused* products that are updated by manufacturers or OEMs (*refurbish*). These two types of products were chosen because *refurbish* is a process directly related to companies producing refurbished electronics and represents a promising strategy that allows for high retention of original value. *Refurbish* is the process by which an authorized company collects and updates used products to a functional and satisfactory condition before selling them to new customers (Rathore et al., 2011). *Refurbish* can be seen as a low-cost, high-quality, and socially responsible option to produce a lower-end version of the product (Van Weelden et al., 2016). In addition to the refurbishment process, another step that companies take is the use of recycled materials in their production process to achieve sustainability. Although recycling is not a top priority in the circular economy (e.g., Sabbaghi & Behdad, 2018; Vanegas et al., 2018), this stage is inevitable for many goods and circumstances, and thus worth investigating (Polyportis et al., 2022). Recycling protects the raw material content while retaining most of the added value generated during product production (Kuah & Wang, 2020).

User *behaviour* and decision-making have direct implications for the success of the circular economy, encompassing not only reuse and repair but also the subsequent resource recovery (recycling) of the product at the end of its life. Investing in more durable products and/or engaging with circular business models, choosing to repair and reuse functionally damaged products, and disposing of products in a timely and appropriate manner without potential for reuse are examples of such consumer *behaviours* (Parajuly et al., 2020). Circular strategies that seek to improve resource efficiency (including infrastructure, products, business models, and policies) will not succeed without consideration of public acceptance and adaptation (Cherry et al., 2018). The transition to a circular economy is impossible without fundamental changes in consumer *behaviour* related to eco-friendly purchasing, adaptation to new business models, and acceptance of improved products involving repair and remanufacturing (Planing, 2014).

Most research conducted so far has examined the circular model from the perspective of organizations or producers as business model developers in the circular economy (Testa et al., 2020). However, few studies have been conducted based on the consumer's perspective. Therefore, this research investigates the circular economy from a consumer perspective. In order to attract more consumers to buy circular products and further contribute to environmental protection, it is essential to explore in depth the factors that influence consumers' intention to adopt circular products.

The approach in this research applies the Theory of Planned Behaviour (TPB). There are many factors that drive the purchasing *behaviour* of eco-friendly products. According to TPB, behaviour is directly influenced by the intention to behave. Specifically, the Sustainable Development Goals identified three antecedents of behavioural intentions: (1) attitudes, (2) subjective norms, and (3) perceived behavioural control (Ajzen, 1991).

The circular economy and marketing have strong ties that have been built over decades. If consumers want to engage not only with alternative brands and products but also with the new behaviours and ways of consumption suggested by the circular economy, then new types

of communication and marketing strategies are needed to provide insights focusing not only on the available product or service but also on the design process itself (Chamberlin & Boks, 2018).

In addition, companies with green positioning strategies have shown higher customer satisfaction, increased profitability, market share, and overall performance indices. Considering all these arguments, which underscore the importance of eco-friendly consumption for both the environment and businesses, it is essential for marketers to efficiently manage all factors that influence eco-buying *behaviour*, including communication by companies (Sousa et al., 2022).

This research aims to analyze consumer intentions to buy circular economy products by developing the application of the Theory of Planned Behaviour. It integrates two psychological factors—environmental concern and perceived risk—into the model and adds a new variable, receptivity to green communication, to understand the relationship between circular companies and their consumers. The research specifically aims to examine how these factors influence attitudes, subjective norms, and perceived behavioural control in the context of buying refurbished or recycled electronics, ultimately determining their impact on purchase intention. The findings are expected to provide valuable theoretical contributions for future studies and offer practical insights for circular businesses to develop effective strategies that attract consumers by understanding the key drivers behind their purchasing decisions for eco-friendly products.

METHOD

This research uses a quantitative design with a single cross-sectional approach to analyze the influence of various factors in the Theory of Planned *Behaviour* on the purchase intention of refurbished/recycled electronic products. The research was carried out in the Greater Jakarta area, Indonesia, with data collection conducted through an online questionnaire distributed to respondents who were at least 17 years old and were gadget users. The population in this research included all individuals in Greater Jakarta who met these criteria, while the *purposive* sampling technique was used to select respondents who had never bought *refurbished* or recycled products. Data collection was carried out with questionnaires divided into two main sections: demographic characteristics and questions related to the research variables, using a Likert scale to measure attitudes towards each construct analyzed.

The data obtained were analyzed using descriptive statistical methods to provide an overview of the characteristics of the respondents, as well as validity and reliability testing to ensure the consistency of the measurement tool. Further analysis was conducted using Partial Least Squares - Structural Equation Modeling (PLS-SEM) to test the proposed hypotheses and identify relationships between variables in the research model. Through this analysis, the research aims to understand the extent to which variables such as environmental concern, perceived risk, attitude toward buying refurbished/recycled electronics, subjective norms, perceived behavioural control, and receptivity to green communication contribute to the intention to purchase circular products. Thus, the results of the research are expected to provide useful insights for the development of corporate marketing and communication strategies in the context of the circular economy.

RESULTS AND DISCUSSION

Pre-test

The purpose of conducting pre-tests in the early stages of the research is to test whether the question instruments in the research questionnaire are accurate and consistent. Before the pre-test, the researcher first conducts a wording test with the aim of ensuring that each question has been prepared in language that is easy to understand and does not cause confusion.

The researcher conducted a wording test on 7 people from different backgrounds to ensure that the questionnaire could be universally understood. The wording test questionnaire is distributed online through Google Form. Then respondents were asked to fill out a questionnaire and provide input related to their understanding of the words and sentences in the questionnaire. The researcher analyzed the input from the respondents and corrected the shortcomings in the writing of the questionnaire questions so that they could be used to obtain accurate and relevant data.

After making adjustments based on feedback from the wording test, the next step is to carry out a pretest. The test was carried out on 7 latent variables and 30 indicators represented in each questionnaire question. Furthermore, the results of this pretest were analyzed for validity and reliability using SPSS software version 20. Validity and reliability analysis was carried out with 30 question instruments reflecting the indicators of the research variables. Furthermore, the results of this pretest were analyzed for validity and reliability using SPSS software version 20.

Validity Analysis

The validity of the question instrument was evaluated based on the Keyser-Meyer-Olkin (KMO) measure of sampling adequacy, the significance value of Bartlett's test of Sphericity, and the value of the Component Matrix. According to Malhotra (2010), the acceptable limit for SMEs is if the output value is more than 0.5. As for Bartlett's test of Sphericity, the output must be less than 0.05. In addition, the research indicator is declared valid if the Component Matrix is more than 0.5.

Table 1. Pretest Validity Test Results

Latent Construct	Observed Variables	Validity Test			Conclusion
		SME	Bartlett Test	Component Matrix	
<i>Environmental concern</i>	EC1	0.666	0.0000	0.822	Valid
	EC2			0.724	
	EC3			0.724	
	EC4			0.690	
<i>Attitude toward buying refurbished/recycled electronic</i>	ATT1	0.740	0.0000	0.878	Valid
	ATT2			0.948	
	ATT3			0.909	
	ATT4			0.795	
<i>Subjective norm</i>	SN1	0.473	0.0000	0.640	Valid
	SN2			0.743	
	SN3			0.785	
	SN4			0.712	
<i>Perceived behaviour al control</i>	PBC1	0.733	0.0000	0.574	Valid
	PBC2			0.819	
	PBC3			0.760	
	PBC4			0.685	

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Latent Construct	Observed Variables	Validity Test			Conclusion
		SME	Bartlett Test	Component Matrix	
<i>Perceived risk</i>	PBC5	0.779	0.0000	0.822	Valid
	PR1			0.880	
	PR2			0.919	
	PR3			0.802	
	PR4			0.900	
<i>Receptivity to green communication</i>	RGC1	0.686	0.0000	0.716	Valid
	RGC2			0.857	
	RGC3			0.784	
	RGC4			0.775	
<i>Refurbished/ recycled electronic purchase intention</i>	CPI1	0.556	0.0000	0.858	Valid
	CPI2			0.849	
	CPI3			0.764	
	CPI4			0.558	
	CPI5			0.461	

Source : Author's Preparation (2023)

The test results showed that the values of KMO and Bartlett's test of Sphericity obtained in the pretest met the validity requirements and almost all variable indicators had Component Matrix values that met the threshold criteria for the validity test. The CPI5 variable indicator did not meet the validity test criteria because the Component Matrix value was 0.461 below the threshold value of 0.5. The researcher decided to maintain the CPI5 variable indicator with the consideration that the Component Matrix value is close to 0.5 and if the research respondents increase, it is expected that the CPI5 Component Matrix value will increase so that it can meet the criteria as a valid question instrument.

Reliability Analysis

The researcher also conducted a reliability test on the seven latent constructs. Reliability tests were performed on seven latent constructs using Cronbach's Alpha coefficient. The latent construct is declared reliable if the resulting Cronbach's Alpha value is more than 0.6 (Hair et al., 2019).

Table 2. Pretest Reliability Test Results

Latent Construct	Observed Variables	Cronbach's Alpha	Conclusion
<i>Environmental concern</i>	EC1	0.7140	Reliable
	EC2		
	EC3		
	EC4		
<i>Attitude toward buying refurbished/ recycled electronic</i>	ATT1	0.9027	Reliable
	ATT2		
	ATT3		
	ATT4		
<i>Subjective norm</i>	SN1	0.6897	Reliable
	SN2		
	SN3		
	SN4		
	PBC1	0.7725	Reliable
	PBC2		

Latent Construct	Observed Variables	Cronbach's Alpha	Conclusion
<i>Perceived behaviour al control</i>	PBC3	0.8936	Reliable
	PBC4		
	PBC5		

Table 3. Pretest Reliability Test Results (cont')

Latent Construct	Observed Variables	Cronbach's Alpha	Conclusion
<i>Perceived risk</i>	PR1	0.8936	Reliable
	PR2		
	PR3		
	PR4		
<i>Receptivity to green communication</i>	RGC1	0.7880	Reliable
	RGC2		
	RGC3		
	RGC4		
<i>Refurbished/ recycled electronic purchase intention</i>	CPI1	0.7584	Reliable
	CPI2		
	CPI3		
	CPI4		
	CPI5		

Source : Author's Preparation (2023)

The test results showed that each latent construct had a Cronbach's Alpha value of more than 0.6, so it was declared to have met the reliability criteria. Therefore, based on the validity and reliability test, it can be concluded that the model formed is valid and reliable to be applied to the main test.

Descriptive Statistical Analysis

This research implemented a survey method and obtained 289 respondents. Then a descriptive statistical analysis was carried out on seven latent constructs to gain deeper insight into the characteristics of the answers given by respondents to each variable. The descriptive analysis approach aims to provide a comprehensive picture of the research subject based on variable data collected from a specific group of subjects. The use of descriptive analysis describes the distribution of data including frequency, mean values, standard deviations, and other statistical parameters.

Descriptive Analysis of Environmental Concern Variables

The results of the analysis showed that respondents had a high awareness of the importance of preserving natural resources and the environment. The highest mean value in the statement "Protecting the natural environment is one of the most important issues facing the world" compared to other indicators. The highest standard deviation is found in the EC2 indicator. This shows that respondents give more diverse answers to the indicator.

Table 4. Descriptive Results of Environmental Concern

Indicator	N	Minimum Score	Maximum Value	Red Indicator	Standard Deviation	Mean Variable
EC1	289	1	6	5.433	0.782	5.491

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Indicator	N	Minimum Score	Maximum Value	Red Indicator	Standard Deviation	Mean Variable
EC2		1	6	5.547	0.839	
EC3		1	6	5.564	0.679	
EC4		1	6	5.422	0.754	

Descriptive Analysis of Attitude Variables

Based on data analysis, respondents have a positive view that purchasing circular products can reduce waste and emissions, overcome environmental problems, and reduce the use of raw materials from nature. The highest approval can be seen from the highest mean value in the statement "In my opinion, buying circular products (refurbish/recycle gadgets) in daily life is important to reduce carbon emissions". The highest standard deviation was found in the AT4 indicator, which indicates that respondents gave more diverse answers to the indicator.

Table 5. Descriptive Attitude Results

Indicator	N	Minimum Score	Maximum Value	Red Indicator	Standard Deviation	Mean Variable
AT1		1	6	4.848	1.064	
AT2		1	6	4.865	1.091	
AT3		1	6	4.851	1.079	
AT4		1	6	4.837	1.127	

Descriptive Analysis of Subjective Variables norm

Based on the mean data from the results obtained, respondents agree that the person they value or whose opinion is valued will approve if the respondent buys a circular product. The highest standard deviation is found in the SN2 indicator. This shows that respondents give more diverse answers to the indicator.

Table 6. Descriptive Results of Subjective Norms

Indicator	N	Minimum Score	Maximum Value	Red Indicator	Standard Deviation	Mean Variable
SN1		1	6	4.536	1.182	
SN2		1	6	3.768	1.418	
SN3		1	6	3.896	1.401	
SN4		1	6	4.495	1.203	

Descriptive Analysis of Perceived Variable behaviour al control

From the results of the data analysis, it can be concluded that respondents tend to agree that they have the ability to buy circular products in the future. The highest approval rate is reflected in the highest average value related to the statement "The decision to buy a circular product (gadget refurbish/recycle) or not is entirely based on my will". Meanwhile, the most significant variability of responses was seen in the PBC1 indicator, indicating that respondents gave more varied answers related to the indicator.

Table 7. Descriptive Results Perceived behaviour al control

Indicator	N	Minimum Score	Maximum Value	Red Indicator	Standard Deviation	Mean Variable
PBC1	289	1	6	4.796	1.337	4.693

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Indicator	N	Minimum Score	Maximum Value	Red Indicator	Standard Deviation	Mean Variable
PBC2		2	6	5.125	0.918	
PBC3		1	6	4.356	1.310	
PBC4		1	6	4.678	1.184	
PBC5		1	6	4.512	1.214	

Descriptive Analysis of Perceived Risk Variables

Based on the results of the data analysis, it is illustrated that respondents' attitudes tend to reflect concerns about the risks associated with circular products. The highest mean value is found in the statement "I am worried that the performance/quality of circular products (gadget refurbish/recycle) is lower than the performance/quality of new products" indicating that this concern is the main concern of respondents. On the other hand, the most significant standard deviation in the response appears on the PR3 indicator, indicating a greater variation in respondents' views or attitudes regarding certain aspects measured by the indicator.

Table 8. Descriptive Results Perceived risk

Indicator	N	Minimum Score	Maximum Value	Red Indicator	Standard Deviation	Mean Variable
PR1		1	6	4.239	1.512	
PR2		1	6	4.183	1.535	
PR3	289	1	6	3.837	1.564	4.123
PR4		1	6	4.232	1.551	

Descriptive Analysis of Receptivity Variable to green communication

Based on the data analysis, respondents are of the view that companies are essential to provide or disclose more information about the environmental characteristics of their products and production methods. The highest average score was indicated in the statement "I consider it important for companies to provide/disclose more information about the environmental characteristics of their products and production methods," indicating that this aspect was of primary concern to respondents. In addition, the highest standard deviation value was found in the RGC1 indicator, indicating a greater variation in respondents' responses to the indicator.

Table 9. Descriptive Results Receptivity to green communication

Indicator	N	Minimum Score	Maximum Value	Red Indicator	Standard Deviation	Mean Variable
RGC1		1	6	4.934	0.959	
RGC2		2	6	5.010	0.906	
RGC3	289	1	6	5.131	0.932	5.082
RGC4		1	6	5.253	0.850	

Descriptive Analysis of Refurbished Variable/Recycled Electronic Purchase Intention

From the results of data analysis, it can be concluded that the intention to purchase circular products is quite high. The highest average value is related to the statement "I am willing to buy energy-efficient equipment". Meanwhile, the most significant variability of responses was seen in the CPI3 indicator, indicating that respondents gave more varied answers regarding the indicator.

Tabel 10. Descriptive Results Refurbished/Recycled Electronic purchase intention

Indicator	N	Minimum Score	Maximum Value	Red Indicator	Standard Deviation	Mean Variable
CPI1	289	1	6	4.318	1.201	4.546
CPI2		1	6	4.294	1.275	
CPI3		1	6	3.737	1.446	
CPI4		2	6	5.232	0.835	
CPI5		1	6	5.149	0.924	

Hypothesis Test

The hypothesis in this research has a predetermined direction of influence, so the hypothesis test is carried out using a one-tailed test with a significance level of 5%. The following are the results of the research model path using SmartPLS software.

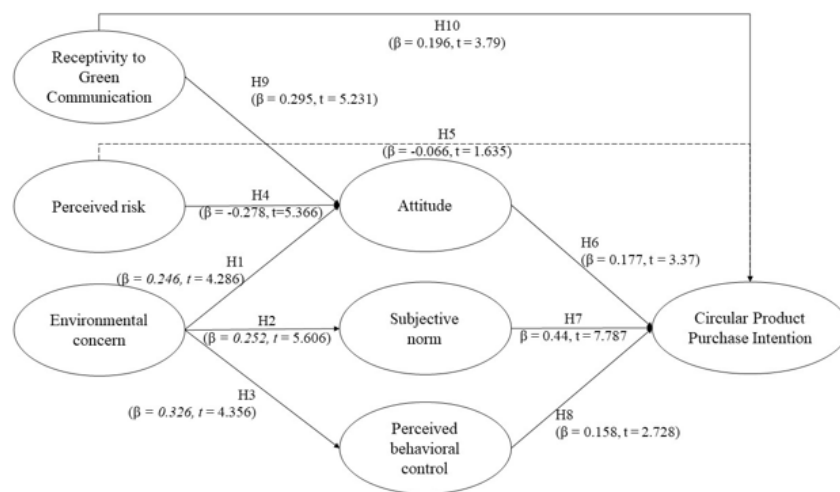


Figure 2. Research Model Path Coefficients

Source: Author's Preparation (2023)

From figure 2, it can be seen that the path coefficient for each relationship in the research model as well as the T value can be used as a reference in determining the significance of the relationship. In more detail, the data from the SmartPLS analysis is presented in table 11 structural model relationships.

Table 11. Structural Model Relationships

Hypothesis	Relationship	Original Sample (O)	Standard Deviation	T Statistics	P Values
H1	EC -> ATT	0.232	0.056	4.105	0
H2	EC -> SN	0.241	0.057	4.207	0
H3	EC -> PBC	0.322	0.055	5.842	0
H4	PR -> ATT	-0.278	0.052	5.366	0
H5	PR -> CPI	-0.066	0.041	1.635	0.051
H6	ATT -> CPI	0.177	0.052	3.37	0
H7	SN -> CPI	0.44	0.056	7.787	0
H8	PBC -> CPI	0.158	0.058	2.718	0.003
H9	RGC -> TO	0.297	0.058	5.131	0
H10	CGR -> CPI	0.196	0.052	3.79	0

Source : Author's Preparation (2023)

Table 1 presents the path coefficients and T-values for each relationship in the research model that can be used as a reference to determine the significance of these relationships. The results in Table 4.17 show that out of the 10 hypotheses submitted, there are 9 hypotheses that are accepted or declared significant because they have a t-value of ≥ 1.645 . On the contrary, there is 1 hypothesis rejected, namely Perceived risk can be concluded that it does not have a significant influence on the purchase intention of circular electronic products because the t-value < 1.645 .

1) Hypothesis 1: Environmental concern has a positive influence on attitude toward buying refurbished/recycled electronics

Schultz (2001) explained that environmental concern is a concept that describes the awareness and concern that individuals have about environmental issues, as well as the willingness to sacrifice to protect the environment. Meanwhile, attitude shows the level of good or bad judgment or evaluation of an individual towards a certain behaviour (Fishbein & Ajzen, 1975; Yazdanpanah & Forouzani, 2015). In the context of this research, attitude toward buying product is defined as an individual's positive or negative evaluation of a product or service that involves a combination of cognitive, affective, and behavioural elements (Fishbein & Ajzen, 1975; Kotler & Keller, 2016).

Based on the results of data processing using SEM, it shows that the relationship between the variable of environmental concern and attitude toward buying refurbished/recycled electronics, a t-value of 4,105 was obtained, greater than the t-table of 1,645 at a 95% confidence level. This indicates that environmental concern has a significant influence on the Attitude toward buying refurbished/recycled electronics, which means that hypothesis 1 is accepted. The estimated coefficient in this relationship has a positive value of 0.232 which means that the higher the environmental concern, the more positive the attitude toward buying refurbished/recycled electronics. In other words, someone with a high level of environmental concern will have a more positive attitude towards purchasing environmentally friendly products or circular products. A person who has a positive attitude and a high level of environmental concern will strive to reduce environmental impact (Lacasse, 2016).

2) Hypothesis 2: Environmental concern has a positive influence on subjective norms

The relationship between environmental concern and subjective norms obtained a t-value of 4,207 which is higher than 1,645. Thus, environmental concern has a significant effect on subjective norms. The estimation coefficient in this relationship shows a positive value of 0.241, which indicates that the higher the environmental concern a person has, the higher the subjective norm. In other words, people with a high level of environmental concern will tend to have more positive subjective norms related to purchasing products that are environmentally friendly or circular.

This result is in line with the results shown in the reference research of Zhang & Luo (2021) where environmental concern has a significant effect on subjective norms. Subjective norms are influenced by an increase in environmental concern which reduces the perception of difficulties in terms of resources, time, and other factors related to environmental behaviour (Maichum et al., 2016). Individuals who care about the environment tend to believe that the people they value also support their involvement in environmental conservation behaviours (Bamberg & Möser, 2007).

3) Hypothesis 3: Environmental concern has a positive effect on perceived behavioural control

There was a significant relationship between environmental concern and perceived behavioural control, with a t-value of 5,842 which exceeded the threshold of 1,645. Therefore, it can be concluded that environmental concern has a real effect on perceived behavioural control. The estimated coefficient in this correlation shows a positive number of 0.322, indicating that an increase in concern for the environment is directly proportional to the increase in perceived behavioural control that a person has towards the purchase of circular products. In other words, the higher a person's level of environmental concern, the more likely they are to have a high perceived level of perceived behavioural control towards buying environmentally friendly or circular-based products.

When an individual has concern for the environment, his or her belief in his or her ability to create change through contributions to the environment increases. Increased confidence in the individual's ability to carry out these environmental behaviours can be a driver for more intense involvement in pro-environmental actions (Bamberg & Möser, 2007; Maichum et al., 2016).

4) Hypothesis 4: Perceived risk has a negative influence on attitude toward buying refurbished/recycled electronics

Perceived risk is uncertainty that can have serious consequences related to income or unfulfilled expectations (Peter & Ryan, 1976). The relationship between perceived risk and Attitude toward buying refurbished/recycled electronics had a t-value of 5,366, exceeding the threshold of 1,645. Therefore, it can be said that perceived risk has a significant effect on attitude toward buying refurbished/recycled electronics. The estimated coefficient in this correlation shows a negative value of -0.278, indicating that perceived risk negatively affects attitudes. In other words, the higher the perception of risk, the lower the individual's assessment of owning a product that is circular.

These results are in line with the research of Zhang & Luo (2021) that perceived risk has a negative impact on consumer attitudes towards remanufactured products.

In addition, the results of other studies show that consumers often consider products made from these recycled materials to be of lower quality compared to new conventional products (Bei & Simpson, 1995; Hamzaoui-Essoussi & Linton, 2014).

Furthermore, studies show that consumers' risk perceptions of refurbished phones can negatively impact their attitudes towards the product (Van Weelden et al., 2016). Research by Van Weelden et al., (2016) shows that there are four identified risk components, with performance risk being the most frequently mentioned. Consumers are concerned that refurbished or recycled products will have lower functionality or a shorter lifespan, which can lead to dissatisfaction and negative attitudes towards the product.

5) Hypothesis 5: Perceived risk has a negative effect on refurbished/recycled electronic purchase intention

Based on the results of data processing, the relationship between perceived risk and refurbished/recycled electronic purchase intention has a t-value of 1.635 where the value is lower than the reference of 1.645 so that perceived risk does not have a significant effect on the purchase intention of circular electronic products.

These results are not in line with the research conducted by Zhang et al. (2021) and Polyportis et al (2022) where in the research perceived risk significantly affects the intention to purchase remanufactured and recycled products.

Purchase intent is a complex construct and is influenced by various factors, including risk perception. However, other factors, such as perception of benefits, beliefs, and lifestyle, can also have a greater influence on purchase intent (H.-S. Chen et al., 2012; Jadil et al., 2022; Van Weelden et al., 2016). Van Weelden et al.'s (2016) research on increasing consumer acceptance of refurbished mobile phones is influenced by several main factors. Even though consumers consider there is a risk, they still accept refurbished phones because they see benefits such as financial savings and environmental sustainability (Van Weelden et al., 2016). However, the influence of perceived risk through attitude mediation on purchase intention has a significant relationship. These results are in line with those shown by MaCarthy and Shrum (1994), perceived risk and purchase intention have no direct relationship; however, this will affect through attitudes (H.-S. Chen et al., 2012). In other words, consumer attitudes towards the consumption of circular products can mediate the relationship between perceived risks and purchase intentions of circular electronic products.

6) Hypothesis 6: Attitude toward buying refurbished/recycled electronic has positive effect on refurbished/recycled electronic purchase intention

According to Ajzen (1991), attitude is defined as a thorough evaluation of a person's behaviour . The relationship between attitude and refurbished/recycled electronic purchase intention obtained a t-value of 3.37, which exceeded the threshold of 1.645. Therefore, it can be concluded that attitude has a significant influence on purchase intention. The estimated coefficient in this relationship shows a positive value of 0.177, which shows that there is an increase in attitudes correlated with increasingly positive intentions towards the purchase of circular products. In other words, someone who has a more positive view of circular products tends to have higher intentions towards purchasing products that are environmentally friendly or circular.

In the framework of circular product purchasing behaviour , attitude is seen as an assessment of the purchase intention of circular products (references). These results are in line with the results shown in the reference research of Zhang et al (2021). Similar findings are also seen in other studies that support the positive relationship between attitudes and purchase intentions of circular products (Jan, 2022; Kongarchapatara & Hanpanit, 2021). Szilagy et al., (2022) found the significance of the influence of attitude on the purchase intention of products that use recycled materials. Consumers who have a positive attitude towards circular products will be more likely to believe that they can provide benefits, such as reducing environmental impact, saving costs, and saving energy (Polyportis et al., 2022; Singhal et al., 2019). Thus, these findings are in line with other studies that highlight the important role of attitude in shaping consumers' desire to buy circular products.

7) Hypothesis 7: Subjective norms have a positive influence on refurbished/recycled electronic purchase intention

Subjective norms are defined as the views or opinions of others that are considered important and can affect a person's decisions (Park, 2000). There was a significant relationship between subjective norms and refurbished/recycled electronic purchase intention, with a t-value of 7,787 which exceeded the threshold of 1,645. The estimation coefficient in this

relationship shows a positive value of 0.44, which means that the more subjective norms increase, the more positive the refurbished/recycled electronic purchase intention. Simply put, the subjective views or norms of one's social environment positively affect the desire to buy products that have a circular nature.

This result is in accordance with a research from Kongarchapatara & Hanpanit, (2021) in the context of circular products showing a positive relationship between subjective norms and purchase intentions. This shows that views and opinions from one's social environment can play an important role in shaping the purchase intention of circular products. This is due to the urge to conform to the social norms of the reference group, where the individual seeks validation and support from the social environment that is considered important or caring (L. Chen, 2013). Similar findings are also seen in the context of the intention to purchase remanufactured products in India which suggests that subjective norms significantly affect intent (Singhal et al., 2019).

8) Hypothesis 8: Perceived behavioural control has a positive effect on refurbished/recycled electronic purchase intention

Perceived behavioural control is a person's perception of the ease or difficulty in performing a behaviour (Ajzen, 1991). The relationship between perceived behavioural control and refurbished/recycled electronic purchase intention obtained a t-value of 2,718, which exceeded the threshold of 1,645, so that perceived behavioural control had a significant influence on refurbished/recycled electronic purchase intention. The estimated coefficient in this relationship showed a positive value of 0.158, indicating that an increase in perceived behavioural control levels correlated with an increase in refurbished/recycled electronic purchase intention. In other words, the stronger an individual's perception of his or her ability to control the purchasing behaviour of a circular product, the higher their tendency to have a purchase intention towards the product.

These results are in line with the results presented in the reference research of Zhang & Luo, (2021) and Sousa et al., (2022). In the context of purchasing sustainable products, such as green products or circular products, external factors such as time, price, and affordability may be beyond the control of the individual. However, Bocken et al. (2016) assert that when a person believes that they have sufficient resources, adequate opportunities, and anticipate fewer barriers, then their perceived behavioural control becomes stronger, which in turn increases their intention to purchase circular products. Similar findings were also found in a research by Li et al. (2018), which stated that consumers tend to engage in circular purchasing behaviours when they feel they are able to control existing factors. Similar findings are also seen in other studies that support a positive relationship between perceived behavioural control and purchase intention of circular products (Jan, 2022; Kongarchapatara & Hanpanit, 2021; Singhal et al., 2019; Szilagyi et al., 2022).

9) Hypothesis 9: Receptivity to green communication has a positive influence on attitude toward buying refurbished/recycled electronics

Receptivity to green communication shows the extent to which individuals receive and respond to information related to environmentally friendly business practices. The relationship between receptivity to green communication and Attitude toward buying refurbished/recycled electronics had a t-value of 5,131, exceeding the threshold of 1,645 so it can be concluded that this relationship is significant. The estimated coefficient in this relationship shows a positive

value of 0.297, which shows that there is a positive relationship between the level of receptivity to green communication and a positive attitude towards the purchase of circular products. This means that the more open or responsive a person is to communication related to environmental or sustainability issues, the more positive their attitude towards purchasing circular products.

These results are supported by a research by Singhal et al. (2019) emphasizing the importance of consumers' positive attitudes towards remanufactured products through the dissemination of comprehensive product information to realize a circular economy through remanufacturing.

In addition, both green brand positioning and green brand knowledge have a significant and positive influence on consumer attitudes towards green brands. When consumers have more knowledge about a green brand, they are more likely to have a positive attitude towards the brand (Mehraj & Qureshi, 2022). A research by Lee (2010) found that consumers' emotional acceptance affects their perceptions in a predictable way and that a preference for a suitable emotional intensity manifests differently between consumers with high and low acceptance. Emotional receptivity plays a significant role in shaping consumer evaluations in consumer-marketer interactions (Lee & Lim, 2010)

10) Hypothesis 10: Receptivity to green communication has a positive effect on refurbished/recycled electronic purchase intention

This relationship has a t-value of 3.79, which exceeds the threshold of 1.645, showing that receptivity to green communication has a significant influence on refurbished/recycled electronic purchase intention. The estimated coefficient in this relationship shows a positive number of 0.196, shows that the more responsive a person is to environmentally friendly communication, the higher their tendency to have the intention to purchase products with recycled or circular characteristics. Receptivity to green communication reflects the extent to which individuals receive and respond to information related to sustainable business practices, and this positively contributes to the desire to adopt products that support the recycling or circular aspect.

These results are in line with research by Sousa et al. (2022) which shows the significant role of green companies' communication in shaping consumer purchase intentions. A research conducted by Tewari (2022) shows that the response to green communication has a significant positive impact on consumer purchase intentions for green clothing. Individuals who are more receptive to green communication are more likely to engage in green consumer behaviour s, such as purchasing eco-friendly products or supporting environmentally responsible companies (Paço et al., 2019).

Mediation Analysis

Hair et al. (2018) explain that the mediation effect occurs when a third variable or construct intervenes with two other constructs. The analysis of the influence of mediation was carried out to be able to find out how much the total influence of mediation connecting between variables. In addition, it can be used to evaluate the relationship path of the best variable in the dependent variable that is the target of the research.

Table 12. Structural Mediation Relationships

Line	Original Sample (O)	Standard Deviation	T Statistics	P Values
EC -> ATT -> CPI	0.041	0.016	2.629	0.004
PR > TO -> CPI	-0.049	0.018	2.687	0.004
RGC -> ATT -> CPI	0.053	0.019	2.756	0.003
EC -> PBC -> CPI	0.051	0.022	2.275	0.011
EC -> NS -> CPI	0.106	0.027	3.924	0

Based on the table above, the attitude variable fully mediates the relationship between environmental concern, perceived risk, and receptivity to green communication. In the results of the structural model test, no significant relationship was found between perceived risk and purchase intention. With the existence of the attitude variable as a mediation, perceived risk is able to significantly affect the purchase intention variable. The perception of the usefulness of circular electronic products compared to conventional electronic products is the usefulness of reducing adverse impacts on the environment. This use has a significant positive impact on attitudes towards circular product purchasing behaviour .

CONCLUSION

This research was conducted to identify the influence of factors that affect the purchase intention of circular electronic products in Greater Jakarta based on the framework of the Theory of Planned *Behaviour*. From the findings obtained, it can be concluded that environmental concern has a positive effect on attitudes, subjective norms, and *behavioural* control felt in the context of purchasing refurbished/recycled products. In addition, perceived risk has been shown to affect attitudes but has no effect on purchase intention. Attitudes, subjective norms, and perceived *behavioural* control each have a positive influence on the purchase intention of circular products, while receptivity to green communication also contributes to shaping attitudes and purchase intentions. The managerial implications of this research suggest that companies reinforce subjective norms through environmental education and sustainability campaigns, as well as form positive attitudes by increasing awareness of the benefits of circular products. In addition, improving perceived risk through quality assurance and transparent information will increase consumer confidence. Companies also need to develop distribution strategies that facilitate access to such products and develop effective communication to strengthen consumer responses to sustainability initiatives. With these measures, it is hoped that the purchase intention of circular electronic products can increase in the future.

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