

## AN EXTENDED TPB MODEL TO PREDICTING CONSUMER ACCEPTANCE TOWARDS REMANUFACTURED GOODS: A CASE FOR MALAYSIA

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### Abstract

The purpose of this research is to unearth the factors which affect consumers attitude and their intention to purchase remanufactured goods in an emerging country like Malaysia. Thus, the proposed research model used in this study was grounded on the most frequently applied model, i.e. Theory of Planned Behaviour (TPB) and was further extended by integrating constructs like perceived knowledge, perceived risk and perceived benefit along with the original TPB constructs namely attitude, subjective norm and perceived behavioural control. The data was collected from 253 Malaysian consumers, primarily working adults with a steady income who have purchasing and absolute power over their choices of consumer electronics, specifically remanufactured products. The outcomes propose treasured understandings about the importance of studied constructs and how these constructs are indispensable in shaping positive behaviour towards acceptance of remanufactured products. Thereby, regulative bodies, remanufacturer, educators, government institutions, non-profit organizations and industry players could joint effort to raise awareness among Malaysian consumers towards sustainability and to encourage their attitude and behavioural intention towards remanufactured products. This research is one of the very few empirical researches endeavoured to evaluate Malaysian consumer's attitude and purchase intention towards remanufactured products.

### Research paper

**Keywords:** Theory of Planned Behaviour; Remanufactured goods; Attitude; Intention; Malaysia

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## **Introduction**

The unprecedented rise of information technology, population and the world economy has given a monumental push towards electronic waste (e-waste). According to King et al. (2006), e-waste encompasses several metals such as beryllium, lead, mercury, cadmium, etc. Contrary to sustainable resolution, the prevalent practices of discarding the e-waste is considered hazardous to the environment. Thereby, with closed-loop supply chain (CLSC) more prominence is warranted to the sustainable production (Singhal et al., 2019). To make the sustainable production and consumption, various components from both end of use (EOU) and end of life (EOL) are brought to the forward supply chain making it an inherent part of CLSC. Consequently, the attainment of EOL products are also regarded as pivotal to the CLSC process (Abbey et al., 2015). In this regard, remanufacturing has been posited as a centre of CLSC.

Remanufacturing is considered essential and pivotal to achieve sustainability from both perspectives, i.e. production and consumption. During the remanufacturing process, a product is made to match the attributes of a new one through the amalgamation of new parts, reused and repaired. It has also been established that at times the mixture of both new and repair part in a remanufactured product makes it more preferred by the consumers owing to its performance. According to Xiao (2017), those manufacturers who aim to make most of the residual value of the used or returned products, remanufacturing has been recommended as the best technique to recover the value. Similarly, according to researchers remanufactured products has a plethora

of benefits such as reduce cost, environment friendly, consumes low energy, fewer raw material required, etc. (Singhal et al., 2020, 2019; Wang and Hazen, 2016). Moreover, the remanufactured products bring more gains to society and pave the way for economic benefit by the utilization of both experienced and non-skilled workforce (Lund and Hauser, 2010). Similar views were illustrated by Raz et al. (2017) that remanufacturing process through the competitive situation always pays back to the society in a better way. Consequently, owing to its success and the potential benefits, remanufacturing is practiced across several domains, i.e. aerospace, electronics and electrical equipment, automobile, etc. (Damian and Suarez-Barraza, 2015). Similarly, large industry players like Caterpillar, GE, HP, and BMW, to name a few have resorted to the remanufacturing process (Sharma et al., 2016). Despite its success, the wealth of academic studies has posited the sheer importance of remanufactured goods, consumers still perceive it as inferior when compared to new products and associate risk buying it (Khor and Hazen, 2017; Abbey et al., 2015). Many also believe that the perceived quality of remanufactured products is faulty compared to new products. Therefore, from the lens of manufacturers, it is recommended to change the consumers' attitudes, resultantly creating a positive impression about remanufactured products (Wang et al., 2019).

Extant literature, in the quest to investigate consumer intention to purchase remanufactured products, has chiefly applied theory of planned behaviour (TPB) as the underpinning theory (Wang et al., 2019; Singhal et al., 2020, 2019). In this regard, it has been empirically established that ac-

According to the lens of TPB, all three determinants, i.e. attitude, perceived behavioural control and the subjective norm had been found to have a positive and significant impact in consumers purchase intention towards remanufactured products (Moghadamzadeh et al., 2020). However, these factors itself are suggested to general and provides less explanatory power (Wang et al., 2019). Therefore, for better understanding and higher predictive power, researchers have suggested adding other variables. Considering that, the existing study has tried to expand the extant body of knowledge and TPB by inculcating three variables in the proposed model, i.e. perceived risk, product knowledge and perceived benefit (Tajpour et al., 2020; Doshmanli et al., 2018; Ma et al., 2017). Resultantly, this study fulfils the void in the academic body concerning the examination of consumers intention to purchase remanufactured goods, particularly in the context of a developing nation like Malaysia. Similarly, fulfilling the theoretical gaps, this study will enrich the existing understanding and the mechanisms behind CLSC. Thereby, this study will bring significant insights about sustainable production and consumption and at the same time, it will provide meaningful and valuable practical implications for all stakeholders.

The structure of the remaining article is as follows. Section 2 provides the details of the underpinning theory used in the existing study to conceptualize the proposed framework. Then, followed by the hypotheses' development section. Section 4 sheds light on the research methodology adopted in this study. Section 5 talks about the results section, and section 6 provides the discussion of the results. Section 7 and section 8 highlights the

implications of the study and provides the limitations and suggestion for future research, respectively. Finally, section 9 concludes the research.

## **Literature Review**

### ***Theory of Planned Behaviour (TPB)***

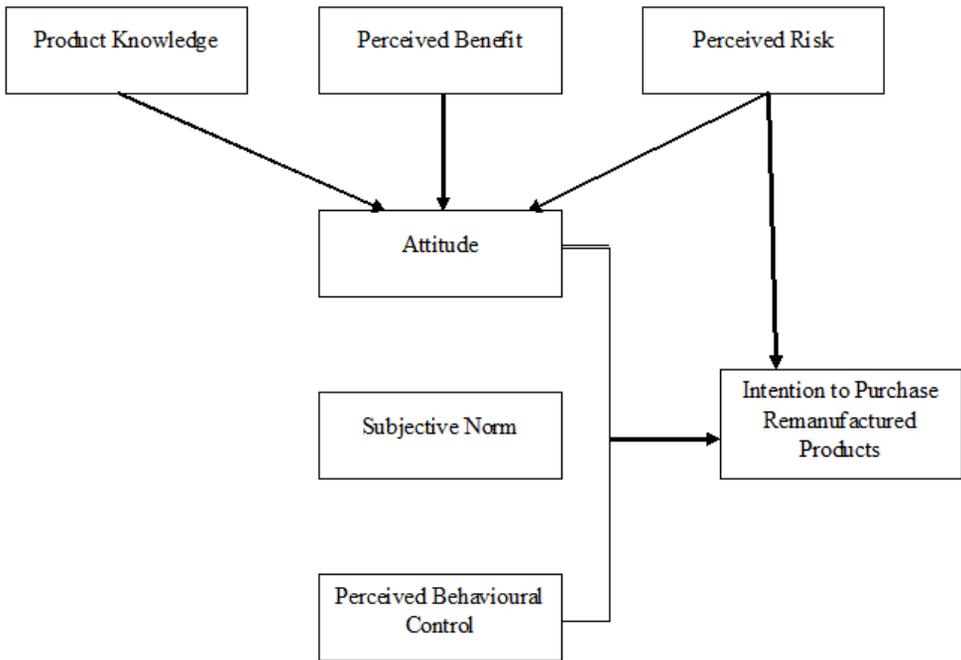
Theory of planned behaviour (TPB) is an extension of the theory of reasoned actions (TRA) as it explains the non-volitional behaviour. It was Ajzen (1991) who originated the theory to predict human behavioural intentions. TPB is the most widely applied theory in determining consumer behavioural intentions (Abbasi et al., 2020; Soliman, 2019; Nejati et al., 2011; Khan et al., 2018). According to TPB, intentions explains human's willingness to perform a specific behaviour. The main idea behind this theory is that human intentions are influenced by their subjective norm, attitude and perceived behaviour control. Owing to its strength in determining human behaviour, it has widely applied in all domain, i.e. halal food (Iranmanesh et al., 2018), intention to pay for streaming services (Sardanelli et al., 2019), tourism (Abbasi et al., 2020; Soliman, 2019; Meng and Choi, 2019). Exclusively, studies on environmental issues such as plastic waste, e-waste has established that TPB has proven to be the strongest underpinning theory to predict such behaviour. Therefore, owing to its successful application with three core variables, i.e. attitude, perceived behaviour control and subjective norm (Conner, 2015) and its usefulness in elucidating human remanufacturing goods, TPB was chosen as the underpinning theory for the proposed model.

However, researchers Fishbein and Ajzen (2010) and Conner (2015) have also posited that future studies must incorporate other factors to extend the TPB original model developed by Ajzen (1991). It is also narrated that additional factors, i.e. be context-specific factors, will augment the prediction of human behaviour (Iranmanesh et al., 2018). Consequently, adding new variables will be regarded as the extension of TPB. Therefore, the researcher in this study has added perceived risk as a factor which not only affects user's intention to purchase remanufactured goods but also aids in predicting its impact on the attitude of consumers towards purchasing. Researchers in this study has also added product knowledge along with perceived benefit owing to the relevancy of these constructs contextually. Previous studies have also suggested consumers' willingness to purchase remanufactured goods has been lower due to several factors such lack of perceived benefit, lack of product knowledge and the reliability and trustworthiness of sellers (Essoussi and Linton, 2014, 2010). Thereby, consumers' willingness towards purchasing remanufactured products can be increased by exploring the factors such as perceived risk, product knowledge, perceived benefit along with perceived behavioural control, subjective norm and attitude.

### **Conceptual Framework and Hypothesis Development**

To address the gaps in the wealth of existing body of knowledge, this research aimed to investigate the influence of core variables of TPB, i.e. subjective norm, attitude, and perceived behavioural control. This study also

extends the academic literature by extending the TPB model by incorporating additional constructs, i.e. product knowledge, perceived risk and perceived benefit, which can be seen in figure 1. The rationales for the proposed relationship are elaborated based on the literature and hypotheses are discussed as follows:



**Figure 1.** Proposed framework

### ***Attitude***

Attitude (ATT) is referred to as an extent to which a person has a constructive or adverse evaluation or assessment of the behaviour. It has also been posted that positive attitude towards a specific behaviour is the

results of a certain decision. Several studies have empirically established that positive attitude drives consumers behaviour (Abbasi et al., 2020; Iranmanesh et al., 2018; Moon et al., 2018). However, there have been studies which have also brought forward inconsistent findings whereby attitude was not found to be the predictor of human behaviour (Khan et al., 2018; Dixit and Badgaiyan, 2016; Khor and Hazen, 2017). In the context of remanufacturing products, Wang et al. (2020) explored consumers' attitude towards remanufactured products purchase intention in china and empirically concluded that consumers attitude both in the form of experimental and instrumental attitude. Similar views were obtained by Ma et al. (2017), Zhu et al. (2020), Kumar (2017), etc. Nonetheless, owing to the majority of studies where attitude has been empirically established to have a positive effect on consumer behavioural intention leads to the making of the following hypothesis:

*H1. Attitude has a positive effect on consumer's purchase intention towards remanufactured products.*

### ***Subjective Norm***

According to Ajzen (1991), the second factor that predicts consumer intention towards a specific behaviour is the subjective norm (SN). Owing to its social nature, it is regarded as a pressure that is perceived by a consumer to influence his/her decision-making process (Ajzen and Fishbein, 1985). This factor happens to play a crucial role in a society which is closely

knit. Previous scholars have already posited a positive effect of subjective norm on consumers decision making (Khan et al., 2019; Soliman, 2019), particularly when on consumers intention towards remanufactured goods (Zhu et al., 2020; Pisitsankkhakarn & Vassanadumrongdee, 2020; Wang et al., 2020; Ma et al., 2017; Kumar, 2017). Thereby, based on the above discussion, the following hypothesis is formulated:

*H2. Subjective norm has a positive effect on consumer's intention to purchase remanufactured products.*

### ***Perceived Behavioural Control (PBC)***

PBC is regarded as the third core constructs of the original TPB model presented by Ajzen (1991). PBC is a reflection of how easy or cumbersome performing a specific behaviour (Ajzen and Fishbein, 1985). Previous studies have empirically established that PBC has a positive and significant effect on consumers intention to perform a behaviour (Iranmanesh et al., 2018; Abbasi et al., 2020). However, there have been inconsistent results in this regard where the effect of PBC was not found to be significant in influencing individuals' behavioural intention (Singhal et al., 2019; Pisitsankkhakarn & Vassanadumrongdee, 2020; Zhu et al., 2020; Khor and Hazen, 2017; Kumar, 2017). Thus, based on the above discussion, this study makes the following hypothesis:

*H3. Perceived behavioural control has a positive effect on consumer's intention to purchase remanufactured products.*

### ***Perceived Risk***

Majority of the consumer valued remanufactured products as inferior products as they perceive them as being of lower quality (Ferrer & Swaminathan, 2006). Besides, the presence of used components in a remanufactured product decreases the consumer's willingness to purchase remanufactured products (Guide & Li, 2010). The consumers would feel uncertain about the quality as they are unaware of how the product was handled in the past and what are the remanufactured procedure followed by the remanufacturer in the effort to return a new-like condition of the products (Hazen et al., 2012). Several studies identify that perception of low quality on remanufactured products discourages consumers' purchase intention, e.g. Gaur et al. (2015); Van Weelden et al. (2016) and Y. Wang et al. (2013). Research findings by Wang et al. (2013) found consumers' attitude and purchase intention is negatively influenced by perceived risk. Similar findings by Wahjudi et al. (2018) affirmed perceived risk negatively impact on purchase intention the purchase of remanufactured phones in Indonesia as the perceived risk in deciding to purchase remanufactured products come from their doubts about the quality and performance of remanufactured products. Similar findings by Singhal, Tripathy, et al. (2019) and Ma et al. (2017) found attitude and intentions of consumers toward the purchase of remanufactured products are oriented in the negative direction due to the issues of

quality and safety perceived. To examine the impact of perceived risk on attitude, the following hypotheses proposed:

*H4: Perceived risk has a negative effect on consumer's attitude to purchase remanufactured products.*

*H5: Perceived risk has a negative effect on consumer's intention to purchase remanufactured products.*

### ***Perceived Benefit***

Consumers' belief as a positive outcome which is related to real or perceived threats is known as a perceived benefit (Zhang et al., 2018). It most commonly applied in studies related to online buying (Abbasi et al., 2020). Similarly, there has been a stream of research which have established that perceived benefit positively affect consumers attitude (Abbasi et al., 2020; Yoon and Chung, 2018) whereas there have also been studies which have discovered the insignificant effect of perceived benefit (Zhang et al., 2018). According to Wang et al. (2013), consumers cherishes two benefits from using remanufactured products, i.e. personal and social benefit. In a study by Arora and Agarwal (2017) who investigated the role of perceived benefit in developing online shopping attitude and empirically stated its significant effect. Moreover, a recent study by Abbasi et al. (2020) also established that attitude positively mediates between perceived benefit and consumers purchase intention. Therefore, this study implies that when a consumer perceives a benefit from the remanufactured products, it shapes

their attitude positively and resultantly affecting their intention to purchase remanufactured products. Thus, this led to the making of the following hypothesis:

*H6. Perceived benefit has a positive effect on consumer's attitude to purchase remanufactured products.*

### ***Product Knowledge***

According to Brucks (1985), product knowledge is defined as knowledge regarding specific products or services. Researchers have posited that consumer with greater knowledge and information about a specific product will find themselves in a better position to compare alternative products or services (Wu et al., 2018; Wang and Hazen, 2016). A plethora of research has been conducted by earlier researchers that consumers knowledge about product or services has a positive and significant effect on consumers behavioural intention (Abbasi et al., 2020; Singhal et al., 2019; Wahjudi et al., 2018; Ma et al., 2017; Zhu and Chang, 2015). Particularly pertaining to remanufactured goods, it has also been established that consumers with superior knowledge about remanufactured products not only its shapes their attitude but also effects their purchase intention. Thus, the following discussion makes the following hypothesis:

*H7. Product knowledge has a positive effect on consumer's attitude to purchase remanufactured products.*

## **Research Methodology**

### ***Questionnaire Development***

This study used cross-sectional data collection approach to collect the data. All the items were adapted from the existing literature by using a five-point Likert scale ranging from 5 (Strongly Agree) to 1 (Strongly Disagree). Data were collected in four weeks by using an online questionnaire survey on Google Forms. Items for subjective norm, attitude, perceived behavioural control, perceived benefit, product knowledge and perceived risk were adopted by Wang et al. (2013). Whereas, the dependent variable of the study, i.e. purchase intention was adopted from Wang et al. (2020). The online self-administered questionnaire was developed in English and pilot test conducted on a group of ten MBA students to guarantee the questionnaire items understand the survey intention appropriately. All the items are provided in Appendix A.

### ***Sample and Data Collection***

The population focus in this research is the Malaysian consumers majorly working adults with stable income who have purchasing and decisive power over their choices of consumer electronics. The questionnaires were distributed to working individuals who expected to have experience in assessing the considerations on their decision whether or not to purchase remanufactured consumer electronics. The respondents could be individuals who experienced or not experienced in purchasing remanufactured products. Elementary introduction on remanufactured consumers electronics back-

ground, definition and example were provided on the cover letter of the questionnaire package. This is to ensure the respondents who have little knowledge about remanufactured electronics could understand and comprehend the questionnaire easily. The online questionnaire links were sent personally by the author, were asked to complete and return a proof of completion. Convenient sampling method was selected as the primary data source because of the respondent's availability and proximity to the author. The online questionnaire identified as an appropriate technique for data collection during Malaysian government announcement of movement control order due to Covid-19 that enables researcher to reach diverse population without physical meeting. According to Krejcie and Morgan table, 384 respondents were recommended to represent the 32.76 billion Malaysia population, and a total 400 online questionnaire are sent. However, there was only 253 responses received with the response rate of 62.5%. The minimum sample size was estimated by using G\*power software which indicated that to have the effect of 0.15 with the power of 0.95 yielded minimum sample size of 119. As the total sample of the study is 253, which is thus deemed appropriate for statistical analyses. Despite of not meeting the minimum requirement of 384, G\*Power version 3.1.9.4 were used to calculate the sample size, to achieve actual power of 0.95 based on three predictors to both endogenous variables, i.e. attitude and purchase intention the desired sample size was 119 computed. The sample power of 253 respondents received was measured and gained power 0.99 at statistical significance  $\alpha$

level of 0.05. The power 0.99 was above 0.8, indicating the acceptable level of sample power for this research.

In regard to catering to the common method variance in survey-based studies, the researcher in this study conducted Harman single factor test to assess the existence of common method variance in this study. Findings from Harman' single factor test reveal that the study has no issues with common method variance as the single factor test yields 31.738% of the variance, thereby less than the threshold value of 50% (Podsakoff et al., 2003).

## **Results**

### ***Descriptive Statistics***

Findings from Table 1 depicts that more than half of the respondents were aware of remanufactured consumer electronics, i.e. 59%. Statistics also reveal that majority of respondents were male (51%) where 60% were single. Furthermore, a majority of respondents were from the age group from 26-35 years old at 58 per cent. In contrast, the respondent majority household income ranged between RM3001-5000 at 33 per cent, and the majority of respondent worked in the private sector at 71 per cent, *see table 1*, for details.

**Table 1.** Demographic Details

Variable	Categories	Frequency	Percentage
Have you ever heard of remanufactured consumer electronics?	Yes	149	59
	No	104	41
Do you ever purchase remanufactured consumer electronics?	Yes	53	21
	No	200	79
Gender	Male	129	51
	Female	124	49
Marital Status	Single	151	60
	Married	101	40
	Divorced	1	0
Age	Less than 25 years old	25	10
	26 to 35 years old	148	58
	36 to 45 years old	52	21
	46 to 55 years old	24	9
	More than 56 years old	4	2
Household income	Less than RM3000	50	2
	Between RM3001- RM5000	84	33
	Between RM5001- RM7000	47	19
	RM7001 and above	72	28
Employment	Private	180	71
	Government	15	6
	Self-employed	34	13
	Unemployed	16	6
	Others	8	3

### ***PLS-SEM Measurement Model***

Following the guidelines of Hair et al. (2019), both construct validity and reliability were investigated. To evaluate the average variance extracted (AVE), reliability factor loadings and composite reliability (CR) were assessed. Findings in Table 2 reveals that all the items loadings, CR and AVE are more than the threshold values set by Hair et al. (2019).

**Table 2. Convergent Validity and Reliability**

<b>Constructs</b>	<b>Factor loadings</b>	<b>CR</b>	<b>AVE</b>
Attitude (AT)	0.919	0.958	0.85
	0.942		
	0.922		
	0.904		
Subjective Norm (SN)	0.856	0.91	0.771
	0.883		
	0.896		
Perceived Behavioural Control (PBC)	0.914	0.918	0.79
	0.901		
	0.85		
Product Knowledge (PK)	0.884	0.959	0.822
	0.936		
	0.905		
	0.92		
Perceived Benefits (PB)	0.888	0.905	0.762
	0.831		
	0.91		
Perceived Risk (PR)	0.875	0.956	0.784
	0.927		
	0.901		
	0.935		
	0.838		
Purchase Intention (PI)	0.864	0.945	0.851
	0.841		
	0.916		
	0.944		
	0.908		

In regard to measuring the discriminant validity of the studied construct, the researcher used the Heterotrait-monotrait (HTMT) criterion. According to findings in table 3, all the HTMT values are within the cut off

value set by Henseler et al. (2015), i.e. 0.85. Thus, the study has a satisfactory measurement model.

**Table 3.** Discriminant Validity

	<b>ATT</b>	<b>PB</b>	<b>PBC</b>	<b>PI</b>	<b>PK</b>	<b>PR</b>	<b>SN</b>
<b>ATT</b>							
<b>PB</b>	0.515						
<b>PBC</b>	0.112	0.144					
<b>PI</b>	0.714	0.401	0.236				
<b>PK</b>	0.149	0.173	0.785	0.266			
<b>PR</b>	0.253	0.13	0.142	0.318	0.148		
<b>SN</b>	0.411	0.266	0.629	0.486	0.515	0.176	

### ***PLS-SEM Structural Model Analysis***

A non-parametric bootstrapping technique was applied to assess the relationship among the studied constructs in the proposed model with 1000 replications and blindfolding procedure was used to evaluate the  $R^2$  values of all the studies endogenous variables, i.e. attitude and intention, beta coefficient, effect size and p-values. According to the findings,  $R^2$  values for attitude was found to be 0.297, suggesting that 29.7% of the variance in purchase attitude can be explained by product knowledge, perceived risk and perceived benefit. Similarly,  $R^2$  values for intention were 0.495, suggesting that 49.5% of the variance in intention to purchase can be explained by purchase attitude, subjective norm and perceived behavioural control. Moreover, blindfolding technique was applied to investigate the predictive relevance of the proposed model. Findings reveal that for both endogenous

variables, the  $Q^2$  values are more than zero, e.g. purchase attitude (0.248) and intention to purchase (0.414). Thereby indicating that the exogenous constructs have sufficient and large predictive relevance for the endogenous construct. Findings in Table 4 also reveal that out of the proposed relationships only two were found to have an insignificant effect, i.e. perceived behavioural control had no effect on purchase intention ( $\beta=0.042$ ;  $p>0.05$ ) and product knowledge was also found not to affect purchase attitude ( $\beta=0.038$ ;  $p>0.05$ ), thereby H3 and H7 were not supported. Whereas H1, H2, H4, H5 and H6 were supported, *see table 4*.

**Table 4.** Hypothesis Testing

Hypothesis	Relationship	Beta	T Statistics	P Values	Decision	F2
1	ATT -> PI	0.560	10.413	0***	YES	0.504
2	SN -> PI	0.180	2.8	0.003**	Yes	0.039
3	PBC -> PI	0.042	0.758	0.224	NO	0.002
4	PR -> ATT	-0.282	5.149	0***	YES	0.109
5	PR-> PI	-0.128	2.444	0.007**	YES	0.030
6	PB -> ATT	0.484	8.959	0***	YES	0.323
7	PK -> ATT	0.038	0.67	0.251	NO	0.002

Note: \*\*\* $p<0.001$ ; \*\* $p<0.05$  (one-tailed).

## Discussion

The main aim of the study was to unearth the determinants, which can impact Malaysian consumers purchase attitude and their purchase intention towards remanufactured products. The understandings from this research summarized that consumers purchase intention is most impacted by their purchase attitude and perceived risk and least influenced by the subject-

tive norm. On the same side, this study also discovered that perceived behavioural control was found to have an insignificant effect on Malaysian consumers' purchase intention. Furthermore, this study also discovered that consumers purchase attitude was significantly influenced by perceived benefit whereby product knowledge was found to have no effect on their purchase attitude. On the contrary, perceived risk has a significant and negative effect on attitude and intention. Research findings suggest attitude has a positive effect on consumer intention to purchase remanufactured products. This result was found consistent with previous findings done by Khor & Hazen (2017); Singhal et al. (2019) and Pisitsankkhakarn & Vassanadumrongdee, (2020). In this regard, it has been observed that a favourable attitude positively influences purchase intention. This signifies positive attitude attain a high possibility of being converted to purchase intention.

Moreover, a positive effect of subjective norm on purchase intention was also discovered in this study. This finding was in line with the previous studies which also posited that subjective norm positively affects consumers purchase intention (Khor and Hazen, 2017; Pisitsankkhakarn & Vassanadumrongdee, 2020; Singhal et al., 2019). Thereby, the findings of this study imply that consumers perceived pressure and the influence of their closed once impacts their behavioural actions. Findings of this study imply that consumers decision making are heavily influenced by their closed ones, i.e. family, friends, peers etc pertaining to purchase remanufactured products.

Furthermore, findings of this study also discovered that perceived behavioural control has an insignificant effect on consumers' purchase in-

tention towards remanufactured products. This finding was similar to previous studies by Pisitsankkhakarn & Vassanadumrongdee (2020) and Singhal et al. (2019). This result is quite significant especially in a country like Malaysia, which is a developing country where the behaviour regarding remanufactured products may be different from the developed countries. Another potential for such an insignificant relationship that consumers may not be aware of sellers' accessibility of better-quality remanufactured products owing to the burgeoning stage of remanufacturing in Malaysia. Thereby, more media coverage to spread the information about it may help in future to improve this relationship.

Moreover, this research also discovered that product knowledge was found an insignificant effect on consumers' attitude towards purchasing remanufactured products. Findings of this study contradict with Ma et al. (2017) and Singhal et al. (2019). This finding indicates that consumers have no consciousness and knowledge about the product-related aspects, guarantee, and quality of the remanufactured products. Therefore, the presence of information towards the manufactured products will not even affect consumers attitude towards remanufactured products regardless of how much they are aware of the product, i.e. product knowledge. Furthermore, perceived benefits in this were found to have a positive and significant effect on consumer's attitude towards remanufactured products purchase. Finding of this study is found in line with the earlier published studies by Abbasi et al. (2020) and Hazen et al., (2017).

This research contributes in several ways, i.e. theoretically and practically. Theoretically, this research tries to recognize the factors and their consequence on attitude and intention to purchase remanufactured products among Malaysian consumers. Furthermore, this research extends the original TPB with other less discovered factors to inspect their association and to understand Malaysian consumers premeditate on the attitude and intention to purchase remanufactured products. More prominently, some practical inferences attained from the understandings after the proposed conceptual framework analysis; some commendations are congregated to the improvement of consumer's attitude and intention towards remanufactured product purchase.

Meanwhile, the remarketing course recognizes as the bottleneck towards the understanding of full closed-loop supply chain potential, thereby, this study presents some significant results and to advance initial understanding on consumer acceptance of remanufactured products in the context of a developing country where remanufacturing still in burgeoning phase. Similarly, the main practical contribution of this study is attributed to remanufacturing organizations and all other stakeholders in understanding the factors which influence consumer purchase intention and their attitude pertaining to remanufactured goods and services. The findings of the study have established that a positive attitude is pivotal for the wide reception of remanufactured products among Malaysia consumers. The results of this study will also be beneficial in developing strategies focusing on the recommended imperative qualities. Both private and public sector need to

spread more awareness through the use of social media network and other platforms so that consumers are inculcated about the perceived benefit, remanufacturing process, its benefits to sway their attitude positively, resultantly affecting their purchase intention.

### **Limitations and Future Studies**

Despite the fact that this research encounters its objectives, existing research also faces a number of limitations. Firstly, the study is conducted in Malaysia. Therefore, the proposed framework of this study is desirable to be examined in other countries with a more developed market for consumers towards remanufactured goods. Secondly, aside from the drivers that are considered in the current research, researchers' purpose to include other contextual or cultural elements to make a holistic understanding of users' purchase intention. Thirdly, the cross-sectional design of the study restricts its capability to infer causality in associations among constructs. A longitudinal study is wanted to perceive dynamic variations of consumers attitude and their purchase intentions. Fourthly, respondents in our existing study characterize a small group of the Malaysian population; thus, investigators in future may review how miscellaneous demographics influence on consumers intention towards remanufactured goods. Lastly, the findings of the study cannot be generalized as the majority of the respondents are from the private sector. Thus, future researchers should include sample which is diverse and can be generalized.

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