




Determinants of Purchase Intention of Recycled MSME Products: The Role of Social Capital, Subjective Norms, Product Knowledge, Environmental Concern, and Perceived Behavioral Control in Indonesia

Doli Muhammad Ja'far Dalimunthe ^{*1}, Tengku Ezni Balqiah ^{*2}, Heri Pratikto ^{*3}
, Rifelly Dewi Astuti ^{*4}, Arif Qaedi Hutagalung ^{*5}

¹Universitas Sumatera Utara, Medan, 20155, Indonesia

²Universitas Indonesia, Jakarta, 10430, Indonesia

³Universitas Negeri Malang, Malang, 65145, Indonesia

⁴Universitas Indonesia, Jakarta, 10430, Indonesia

⁵Universitas Sumatera Utara, Medan, 20155, Indonesia

*Corresponding Author: dolidalimunthe@usu.ac.id

ARTICLE INFO

Article history:

Received: 10 March 2026

Revised: 20 April 2026

Accepted: 10 May 2026

Available online: 30 May 2026

E-ISSN: 2776-6276

P-ISSN: -

How to cite:

Dalimunthe, D. M. J., Balqiah, T. E., Pratikto, H., Astuti, R. D., Hutagalung, A. Q., "Determinants of Purchase Intention of Recycled MSME Products: The Role of Social Capital, Subjective Norms, Product Knowledge, Environmental Concern, and Perceived Behavioral Control in Indonesia", Journal of Management Analytical and Solution (JoMAS), Vol. 6, No. 2, May, 2026, doi: doi.org/10.32734/jomas.v6i2.25206

ABSTRACT

This study aims to examine the determinants of purchase intensity toward recycled products produced by Micro, Small, and Medium Enterprises (MSMEs) in Indonesia. The study integrates the Theory of Planned Behavior (TPB) with social capital to better explain consumer behavior. Data were collected from 530 respondents across three provinces North Sumatra, West Java, and East Java and analyzed using Structural Equation Modeling–Partial Least Squares (SEM-PLS). The results reveal that Environmental Concern ($\beta = 0.081$; $p < 0.05$), Perceived Behavioral Control ($\beta = 0.250$; $p < 0.001$), and Subjective Norms ($\beta = 0.431$; $p < 0.001$) have a significant positive effect on purchase intensity. Furthermore, Subjective Norms significantly mediate the relationship between Social Capital and Purchase Intensity ($\beta = 0.107$; $p < 0.001$), as well as between Perceived Behavioral Control and Purchase Intensity ($\beta = 0.225$; $p < 0.001$).

This study contributes to the extension of the TPB framework by incorporating social capital in the context of MSMEs in Indonesia and provides practical insights for promoting sustainable consumer behavior toward recycled products.

Keyword: Social Capital; Subjective Norms; Product Knowledge; Environmental Concerns; Perceived Behavior Control; Purchase Intensity; MSMEs



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<http://doi.org/10.32734/jomas.v6i2.25206>

1. INTRODUCTION

Consumption is considered one of the main contributors to environmental problems. One form of an environmental problem that requires the most attention in Indonesia is garbage. Garbage is defined as all types of solid waste originating from human and animal activities, and is disposed of because it is no longer useful or unwanted [1]. Indonesia is the third largest plastic waste-producing country in the world [2], with 67.8 million tons of plastic waste in 2020. A total of 270 million people produce 185,753 tons of waste every day. This means that each resident produces around 0.68 kilograms of waste per day [3].

Based on data obtained from the website of the Minister of Environment and Forestry in 2021, the highest composition of waste is food waste at 40%, followed by wood, twigs, and leaves at 12.9%.

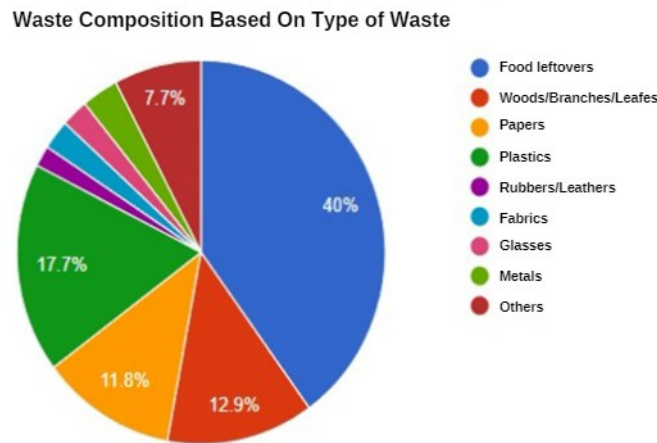


Figure 1. waste composition based on type of waste

Source: *website sipsn.menlhk.go.id*

There are also types of waste that can be recycled and cannot be recycled. Our data shows that the average waste generation reaches 31.4 million tons per year, there are 11 million tons of unmanaged waste, or equivalent to 35% of the total waste generated. This amount is relatively large when compared to the absorption of waste that can be managed, namely as much as 20.4 million tons of waste per year [4]. Circular economy is considered an important solution for achieving the SDGs/TPBs in 2030 as part of a low-carbon development strategy to reduce greenhouse gas emissions with a reduction target of 29% - 41% in 2030 [5]. The term Circular Economy is defined as "restorative and regenerative by design and aims to maintain products, components, and materials at the highest levels of utility and value at all times" [6]. Based on Google Trends data, from 2020 to September 2022, there were a number of changes in the lifestyle of the Indonesian people during the pandemic. This condition has affected people's habits and encouraged them to start thinking about a healthier and more sustainable lifestyle. It was recorded that 2 of the provinces had a high interest in tracking recycling which was led by East Java, followed by the Special Region of Yogyakarta, Bali, East Kalimantan, and the Riau Islands.

Table 1. Top 5 Region with The Highest Search Rate of Recycling

No.	Top 5 Region with The Highest Search Rate of Recycling Keyword
1	East Java
2	Special Region of Yogyakarta
3	Bali
4	East Kalimantan
5	Riau Islands

Source: Google Trends (2020-2022)

One of the recycled products that are now widely produced by many entrepreneurs (MSMEs) is handicraft products, mainly made from paper and cardboard. In the industrial world, there is a lot of waste such as used paper and cardboard, which in the end is immediately disposed of in the Final Disposal Site (TPA). However, some people found this particular phenomenon as an opportunity to create quality and competitive products. The management of paper and cardboard waste that is often encountered today is used to make Art Paper, often also used to make handicrafts such as wastebaskets, flower vases, pencil cases, tables, chairs, and many more. One of the MSMEs that produces craft products through processed paper and cardboard is Creabrush (based on survey data that has been conducted). Creabrush is an MSME that produces various kinds of crafts made from paper and cardboard, starting from tables, photo frames, chairs, various accessories, and other furniture. This business development is carried out by relying on the owner's capital through simple equipment that is capable of producing high-value products and one of the actions to reduce waste and pollution to the environment is through the empowerment of vagrant kids.

Changes in a healthy lifestyle and the existence of public awareness of the environment are one of the things that affect the success of recycling product businesses. More people that are aware and care about the environment means a

greater interest of them in buying recycled products. The better the public's knowledge of recycled products also affects the greater intensity of purchases of recycled products. Purchase intensity is someone's estimate to repurchase certain products/services from the same company, based on possible situations and circumstances. According to Assael, purchase intensity is the last stage of a series of consumer buying decision processes. This process begins with the emergence of a need for a product or brand (need arousal), followed by information processing by consumers (consumer information processing). Furthermore, consumers will evaluate the product or brand. The results of this evaluation ultimately lead to intensity or intensity to buy, before consumers actually make a purchase. Research conducted by Ali [7]. Entitled "Nexus between Environmental Consciousness and Consumers' Purchase Intensity toward Circular Textile product in India: A Moderated-Mediation Approach" shows that environmental awareness directly influences purchase intensity and perceived risk, and perceived benefits mediate the direct relationship between environmental awareness and purchase intensity. Furthermore, product knowledge conditionally moderates the indirect effect of EC on PI (through perceived risk and perceived benefit) so that the mediating effect of perceived risk and perceived benefit varies greatly at low/high levels of product knowledge.

From the research entitled "How Does Green Product Knowledge Effectively Promote Green Purchase Intensity?" conducted by Hong wang in 2019 showed that green trust and perceived consumer effectiveness partially mediate the relationship between green product knowledge and green purchase intensity. The relationship between green trust and green purchase intensity is positively moderated by perceived price. Compared to low perceived prices, green trust has a greater effect on green purchase intensity in the case of high perceived prices. However, the relationship between consumers' perceived effectiveness and purchase intensity is not moderated by perceived price. The increase of awareness of various environmental issues has led to changes in the way consumers live their lives [8]. Lack of consumer awareness of the environment can be caused by a perceived disinterest in the product. However, consumer awareness of environmentally friendly products has increased in recent years [9]. Environmental awareness directly influences purchase intensity and perceived risk, and perceived benefits partially mediate the direct relationship between environmental awareness and purchase intensity [10].

Given the increasing urgency of environmental issues, understanding consumer behavior toward recycled products has become essential. In particular, examining purchase intention toward recycled handicraft products provides important insights into the adoption of sustainable consumption practices in Indonesia. Despite the growing body of literature on green consumption, limited studies have integrated social capital into the Theory of Planned Behavior (TPB) framework, especially in the context of MSMEs in developing countries. In addition, the mediating role of subjective norms remains underexplored. Therefore, this study aims to analyze the determinants of purchase intention toward recycled MSME products by integrating social capital into the TPB framework. Specifically, this study examines the roles of social capital, subjective norms, product knowledge, environmental concern, and perceived behavioral control. This study contributes to the literature by: (1) extending the TPB model through the inclusion of social capital, (2) examining the mediating role of subjective norms, and (3) providing empirical evidence from the MSME sector in Indonesia to support sustainable consumption practices.

2. METHOD

This study employs an explanatory research design using a quantitative approach. Data were collected through a cross-sectional survey using an online questionnaire distributed via Google Forms. The study aims to examine the determinants of purchase intensity toward recycled products produced by environmentally responsible business activities in Indonesia, particularly recycled handicraft products. The sampling technique used in this study is purposive sampling, targeting respondents who have prior experience purchasing environmentally friendly or recycled products. The respondents consist of individuals aged 17 years or older residing in Sumatra and Java. A total of 1,459 responses were initially collected. However, a data screening process was conducted to ensure data quality by removing incomplete responses, eliminating inconsistent or patterned answers, and verifying that respondents met the selection criteria. As a result, 530 valid responses were retained for further analysis. The questionnaire consists of 32 measurement items using a five-point Likert scale (1 = strongly disagree to 5 = strongly agree). The items measure six latent variables adapted from previous studies. These include eight items for knowledge of recycled products [11]. In addition, demographic information was collected to describe respondent characteristics. Data analysis was conducted using Structural Equation Modeling–Partial Least Squares (SEM-PLS), which is a variance-based SEM approach suitable for analyzing complex models with latent variables. SEM allows the simultaneous examination of relationships between indicators and constructs, as well as relationships among constructs.

The SEM-PLS analysis consists of two main components: the outer model (measurement model) and the inner model (structural model). The outer model is used to assess the validity and reliability of the constructs, including convergent validity (indicator loadings > 0.70 and Average Variance Extracted (AVE) > 0.50), reliability (Cronbach's Alpha and Composite Reliability > 0.70), and discriminant validity using the Fornell-Larcker criterion and the Heterotrait-Monotrait (HTMT) ratio. The inner model is used to test the hypothesized relationships between constructs by evaluating path coefficients, t-statistics, and p-values obtained through bootstrapping. The coefficient of determination (R^2) is also used to assess the explanatory power of the model. Additionally, mediation analysis is conducted to examine indirect effects between variables within the model. [12]

3. RESULT AND DISCUSSION

3.1 Measurement Model

In the data analysis and discussion chapter, the SEM-PLS analysis method is used to determine the structural relationship between Social Capital (SC), Subjective Norm (SN), Product Knowledge (PK), Environmental Concern (EC), and Perceived Behavior Control (PBC) variables. on Purchase Intensity (PI) both directly and indirectly (through intermediate variables/moderate variables). Hypothesis testing is carried out based on the results of testing the Inner Model (structural model) which includes the output r-square, parameter coefficients, and t-statistics. To see whether a hypothesis can be accepted or rejected by considering the significance value between constructs, t-statistics, and p-values. Testing the research hypothesis was carried out with the help of SmartPLS (Partial Least Square) software[13]. These values can be seen from the bootstrapping results. The rules of thumb used in this study are the t-statistic >1.96 with a significance level of p-value 0.05 (5%) and the beta coefficient is positive. The value of hypothesis testing and the results of this research model can be described as shown in the image below:

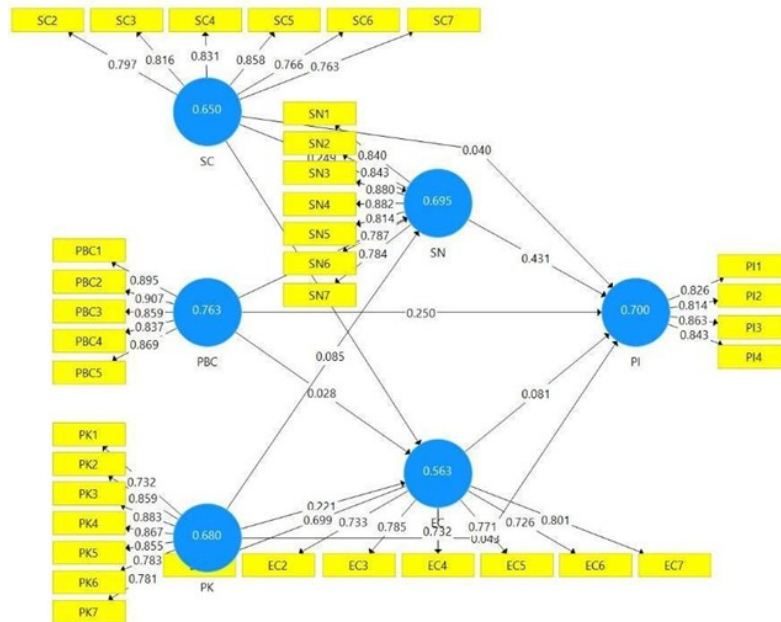


Figure 2. Structural model

Description:

- SC : Social Capital (Social Capital)
- PBC : Perceived Behavior Control (Perceived Behavior Control)
- PK : Product Knowledge
- EC : Environmental Concern
- SN : Subjective Norm (Subjective Norm)
- PI : Purchase Intensity (Purchase Intensity)

The figure shows that the Social Capital (SC) variable is measured by 6 indicators, the Perceived Behavior Control (PBC) variable is measured by 5 indicators, the Product Knowledge (PK) construct is measured by 7 indicators and for moderate variables, it also has a measuring indicator, namely Subjective Norm (SN) is measured by 7 indicators and the moderate Environmental Concern (EC) variable is measured by 7 indicators. The output that explains the relationship between latent variables and their indicators is as follows:

Table 2. Outer Model

Items	Means	std. Deviation	Factor Loading	Cronbach Alpha
Social Capital (SC)				
1. Know neighbours of friends well	4,455	0.775	0.730	0.886
2. People around me take care of each other	4,028	0898	0.759	
3. Friends will work together to solve the problem in an emergency	4.138	0.883	0.820	
4. My friends will help when they are for help	4,057	0896	0.794	
5. Trust the people in the community	4,057	0896	0.794	
6. Care about the thoughts of people	4,049	0.906	0.846	
7. Have the same values as people	4,049	0.906	0.846	

	4.123 3,872	9,921 1013	0.724 0.713	
Environmental Concern (EC)				
1. More waste or garbage around us from day to day	4,615	0.829	0.651	0.851
2. Worried about future environmental conditions	4,715	0.690	0.700	
3. Almost everything in life today harms the environment	4.155	1009	0.755	
4. Economic growth always harms the environment	3,630	1,140	0.682	
5. Humans abuse the environment	3,972	1,064	0.765	
6. Environmental pollution is a problem faced by society	4,617	0.678	0.722	
7. Soon experience a major ecological or environmental disaster	4,532	0.7704	0.792	
Recycle Product Knowledge (PK)				
	4,458 3,975	0.760 1040	0.732 0.820	0917
1. Aware of recycled products				
2. Know where to buy recycled products	3,996	1006	0.863	
3. Understand the performance and features of recycled products	3,836	1,053	0.845	
4. Know the price range of recycled products				
5. Understand the quality of recycled products	4,040	0939	0.853	
6. Knowing the symbol or marker of recycled products	3,934	1,114	0.755	
7. The price of recycled products corresponds to the quality of the product	4,249	0.838	0.795	
8. Recycle products have various attractive models	4,466	0.719	0.702	
Subjective Norms (SN)				
	4,043	0.976	0.834	0.928
1. Most of the people who are important to me think that I should buy recycled products				
2. Most of the people who are important to me will agree if I buy recycled products	4.175	0.877	0.850	
3. My family members think that I should buy recycled products	4.015	0.946	0879	
4. My friends and colleagues think that I should buy recycled products	3,957	0966	0.875	
5. I feel morally obligated to buy recycled products regardless of what other people do	4.104	0.944	0.823	
6. I feel guilty when I don't buy recycled products				
7. I feel like a better person if I buy recycled products	3,636	1.143	0.800	
	4,045	0969	0.786	
Perceived Behavior Control (PBC)				
	3,991	0.992	0.881	0921
1. I can buy the recycled product easily				
2. I have had various opportunities to buy recycled products	4,083	0937	0897	
3. I feel comfortable buying recycled products	4.143	0.884	0.859	
4. I know which products are recycled and which are not	4,094	0.954	0.841	
5. I know where to buy the recycled product	3,921	1,051	0.880	

Based on the Outer model test table data above, it shows that the Cronbach Alpha value on the five variables is > 0.60, which means that the answers to the questionnaire with the measuring indicators can be declared reliable or consistent.

The loading factor value shows the correlation between the indicator and the construct. An indicator with a low loading value indicates that the indicator does not work in the measurement model. expected loading value > 0.7 [14]. The table above shows that the loading factor values for each variable indicator mostly meet the loading factor requirements. However, several indicators do not work in the measurement model or have a value < 0 .

Table 3. Fornell-Larker discriminant validity

	EC	PBC	PI	PK	SC	SN
Environmental Concern (EC)	0.750					
Perceived Behavior Control (PBC)	0.310	0.874				
Purge Intensity (PI)	0.383	0.643	0.837			
Recycle Product Knowledge (PK)	0.355	0.743	0.538	0.825		
Social Capital (SC)	0.345	0.569	0.489	0.542	0.806	
Subjective norm (SN)	0.454	0.727	0.699	0.604	0.593	0.833

Table 4. HTMT discriminant validity

	EC	PBC	PI	PK	SC	SN
Environmental Concern (EC)						
Perceived Behavior Control (PBC)	0.333					
Purchase intensity (PI)	0.439	0.708				
Recycle Product Knowledge (PK)	0.391	0.798	0.597			
Social Capital (SC)	0.385	0.625	0.554	0.597		
Subjective Norms (SN)	0.501	0.780	0.776	0.652	0.650	

Based on the table, we can see that all HTMT values < 0.9 , thus all constructs have discriminant validity based on HTMT calculations with the highest level of discriminant validity on the variable Perceived Behavior Control on Environmental Concern with a value of 0.333

Table 5. R square and R square adjusted

	R Square	R Square Adjusted
Environmental Concern (EC)	0.159	0.155
Purchase intensity (PI)	0.536	0.531
Subjective Norms (SN)	0.579	0.577

The output of the table above explains the value of the coefficient of determination (R Square) and the adjusted coefficient of determination (Adjusted R Square). Model Summary, information is obtained on how much exogenous variables affect endogenous variables. The Environmental Concern (EC) variable as a moderate variable is influenced by the Social Capital (SC), Perceived Behavior Control (PBC), and Product Knowledge (PK) variables of 0.155. Purchase Intensity (PI) variable as an endogenous variable is influenced by Social Capital (SC), Perceived Behavior Control (PBC) Product Knowledge (PK), Subject Norm (SN), and Environmental Concern (EC) variables of 0.531. The Subject Norm (SN) variable as a moderate variable is influenced by Social Capital (SC), Perceived Behavior Control (PBC), and Product Knowledge (PK) variables of 0.577.

Table 6. Specific Indirect Effect

Path	Original Sample	Sample Means	std. Deviation	Qstatistics	Pvalues	Results
PBC to EC to PI	0.002	0.004	0.010	0.219	0.413	Not Supported
PK to EC to PI	0.018	0.017	0.014	1,276	0.101	Not Supported
SC to EC to PI	0.017	0.017	0.012	1,413	0.079	Not Supported
PBC to SN to PI	0.225	0.224	0.040	5,601	0.000	Supported
PK to SN to PI	0.037	0.039	0.028	1,300	0.097	Not Supported
SC to SN to PI	0.107	0.108	0.024	4,515	0.000	Supported

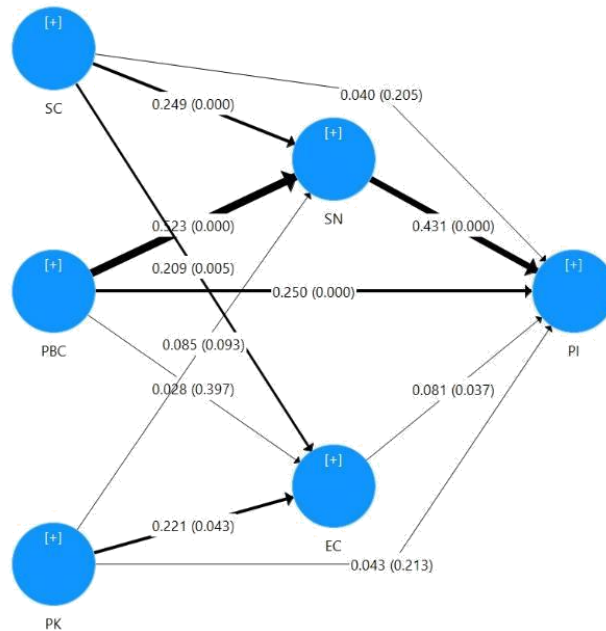


Figure 2. hypothesis test model

Based on the indirect and direct influence of variable data, it can be seen that the hypothetical model below illustrates the relationship between variables both directly and indirectly. Based on the hypothetical model image above, it can be seen that the variable which has a significant effect only occurs in the effect of the relationship between the SC variable on the PI variable through the SN variable significantly, namely 0.107 or 10.7% and the effect of the relationship between the PBC variable on PI through the SN variable is significant, namely 0.225 or 22.5.

Table 7. Results of hypothesis test

Hypothesis	Path	Original Sample	Sample Means	std. Deviation	Q statistics	P values	Results
H1	EC to PI	0.081	0.080	0.045	1,785	0.037	Supported
H2	PBC to EC	0.028	0.022	0.108	0.261	0.397	Not Supported
H3	PBC to PI	0.250	0.243	0.070	3,572	0.000	Supported
H4	PBC to SN	0.523	0.518	0.061	8,625	0.000	Supported
H5	PK to EC	0.221	0.231	0.129	1,719	0.043	Supported

H6	PK to PI	0.043	0.050	0.054	0.795	0.213	Not Supported
H7	PK to SN	0.085	0.091	0.064	1,325	0.093	Not Supported
H8	SC to EC	0.209	0.210	0.081	2,570	0.005	Supported
H9	SC to PI	0.040	0.040	0.049	0.823	0.205	Not Supported
H10	SC to SN	0.249	0.249	0.046	5,418	0.000	Supported
H11	SN to PI	0.431	0.432	0.056	7,712	0.000	Supported

3.2 Measurement Model

Based on these data, it can be seen that the hypothesis model shows that the variable that has a significant effect (0.000) occurs between the Social Capital (SC) variable of 0.249 or 24.9% on the Subject Norm (SN) variable than from the moderate variable it has an effect of 0.431 or 43.1% of Purchase Intensity (PI). Then followed by the influence of the variable Perceived Behavior Control (PBC) is equal to 0.523 or 52.3% on the Subject Norm (SN) variable than from the moderate variable it has an effect of 0.431 or 43.1% on Purchase Intensity (PI). The influence of the second variable relationship is the largest and most significant relationship. This happens because when viewed from the answers of the respondents, the average value of the variables in the outer model tends to be greater than the other variables.

4. CONCLUSION

Based on the results and discussion in this study, it can be concluded that of the five variables that have been tested, there are three variables that have a significant effect on Purchase Intensity (PI) directly, namely the variables Environmental Concern (EC), Perceived Behavior Control (PBC), and Subjective Norm (SN). Within the effect of the relationship between the three exogenous variables with moderate variables, there are only two paths that are stated to be significant and have a strong effect, namely the relationship with the Social Capital (SC) variable of 0.249 or 24.9% on the Subject Norm (SN) variable than from the moderate variable the effect is 0.431 or 43.1% of Purchase Intensity (PI). Then followed by the influence of the variable Perceived Behavior Control (PBC), which is equal to 0.523 or 52.3% on the Subject Norm (SN) variable than from the moderate variable it has an effect of 0.431 or 43.1% on Purchase Intensity (PI). The influence of the second variable relationship is the biggest and the most significant relationship. Exogenous variables that are not significant to Purchase Intensity (PI) could be caused by the indicators are not precise or able to define the variable in question. Therefore, it is suggested for further research to pay more attention to the indicators that you want to use to define the variables in the study.

Implication is a consequence or direct result of the findings of scientific research. The results of this study indicate that the variables which include social capital, perceived behavioral control, product knowledge, and environmental awareness have a positive and significant effect on purchase intensity both directly and indirectly (through moderate variables) as measured using indicators that are able to describe or explain latent variables, where the results of the analysis that has been carried out show that these indicators are declared reliable or consistent. In this study, it was found that there are variables that have a greater or stronger influence, namely the two hypotheses. The first hypothesis path is the influence of social capital variables on purchase intensity through subjective norm variables and the second path is the influence of perceived behavior control variable on purchase intensity through subjective norm variables. Social capital leads to how social life is how to socialize with the environment influences purchase intensity where people around or their families suggest or agree that someone buys recycled products and there is the self-awareness to buy products. Perceived behavioral control leads to the ability to purchase, the ability to differentiate recycled products, and product availability (easy to obtain). To increase the purchase intensity of recycled products, the government and other related actors could conduct the outreach activity and socialization of recycled products by MSMEs to the community as well as make promotions by using various existing promotional media. It was hoped that these kinds of programs could positively affect the growth of MSMEs that produce recycled products, because the better the public's knowledge and evaluation of a product, the greater the level of interest and intensity of purchase.

ACKNOWLEDGEMENTS

The authors would like to express their sincere gratitude to all parties who contributed to this research, especially the respondents who participated in completing the questionnaires. The authors also acknowledge the support from Universitas Sumatera Utara, Universitas Indonesia, and Universitas Negeri Malang for providing academic guidance and facilities during the research process.

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