

Consumer's Willingness to Use Circular Furniture Products with a Norm Activation Model Approach

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Abstract. The growing market demand on Furniture Industry had a negative impact on the environment, such as forest exploitation, production and consumption waste. A solution to several environmental problems is to implement a circular economy. Circular economy can be realized through the implementation of circular business models by companies. Consumers also play an important role implementing the circular economy practices. The purpose of this study is to determine the variables that significantly affects consumers' willingness to use circular furniture with the Extended Norm Activation Model. The sampling method used purposive sampling and obtained 471 respondents. Data were analyzed by PLS-SEM method using SmartPLS 4.0. The results of the study found that the awareness of consequences, ascribed of responsibility, environmental concern, perceived consumer effectiveness, personal norm, information driver, and willingness to use circular furniture products all have a positive and significant influences.

Keywords: *Circular Economy, Furniture, Norm Activation Model, PLS-SEM*

1. Introduction

The current world development has affected the industrial sector, one of which is the furniture industry. The furniture industry is an industry that has a considerable share in international trade. This happens because furniture is very closely related to humans, carrying out daily activities requires furniture (tables, chairs, cabinets, and so on) to support productivity so that the demand and use of furniture products increase [1]. In 2015, the world's furniture production value reached USD 406 billion, growing by 16% from USD 350 billion in 2009.

In 2013, Indonesia's furniture consumption reached Rp 9 trillion. With the more human population in Indonesia, the consumption of furniture products will increase from year to year. Data from the Indonesian Ministry of Environment and Forestry in 2015, wood production for furniture needs reached 35.3 million ha. With the increasing consumption rate and demand for the domestic market, forest exploitation is increasingly carried out by producers and not offset by reforestation programs. This is supported by FAO data, the rate of forest destruction in Indonesia is 1,315,000 ha per year or reduced by 1%.

Another problem faced by the furniture industry is the emergence of environmental impacts caused by product processing waste. The waste produced is sawdust, small pieces of wood, bark, and wood chips from sawmilling and cutting), liquid waste from product painting, and emission gas waste produced from production machines. The waste generated in furniture products is not only produced in terms of producers but also by consumer side. With the predicted increase in consumption figures, it will have an impact on consumables in the use of furniture products.

The problems faced by the furniture industry can be overcome by implementing a circular economy. The circular economy concept is a model that considers several factors in reducing the use of resources, energy, waste, and gas emissions by using closed production-consumption cycles, slowing down, and narrowing material and energy turnover [2]. The transition to a circular economy

can be realized through the implementation of the Circular Business Model (CBM) [3]. CBM is how a company can create, capture, and deliver product value based on the logic of value creation by adopting a resource efficiency system (remanufacture, recycle, reuse, redesign, reduce, and repurpose) and utilizing the economic and environmental value contained in the product [4] [5]

Based on the background, the author is interested in researching the willingness of consumers to use circular wooden furniture with a norm activation model approach. Data processing will be assisted by using SmartPLS software. Later the results of the study are variables that have been identified as influencing consumer willingness, then analyze variables that have a significant and insignificant influence, and provide strategic recommendations to increase consumer willingness.

2. Methods

Figure 1 presents the research framework. Model used this study adopts the extended version of NAM based on previous research by [6] and [7].

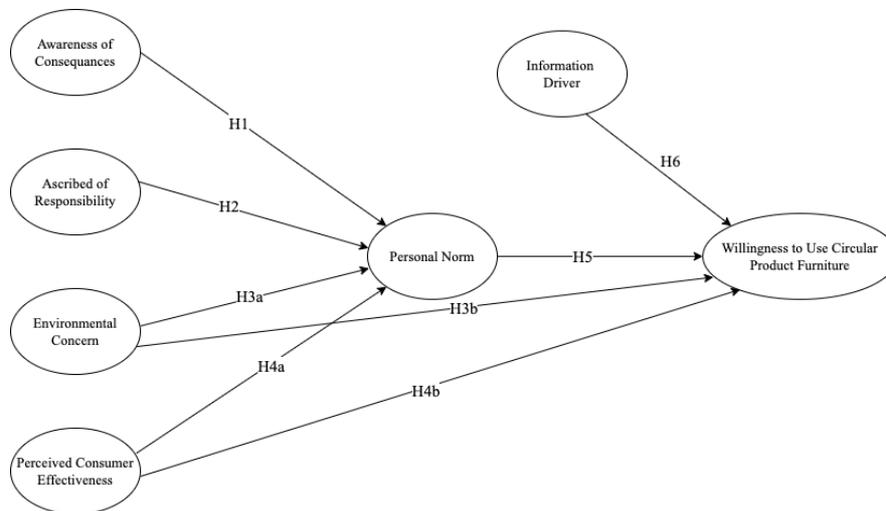


Figure 1 Conceptual Model

Research hypotheses for determining Consumer's Willingness to use Circular Product Furniture within the scope of *Extended version of Norm Activation Model* (NAM) are as follows:

H1: Awareness of Consequences has a significantly positive effect on Personal Norm

Awareness of Consequences (AC) focuses on consumer's awareness of the negative consequences caused by pro-social activity or inaction. Based on research by [8], the use of conventional motors has a negative impact on the environment. Where air conditioning positively and significantly affects personal norms in the context of using an electric motor. Previous research by [6], air conditioning positively influences personal norms in terms of consumer intentions towards green hotels.

H2: Ascribed of responsibility has a significantly positive effect on Personal Norm

Ascribed of responsibility (AR) is a feeling of responsibility that arises from individuals after causing a problem. When individuals feel responsible for the negative consequences of their behavior, they will develop personal norms for behaving pro-environment [9]. Based on research by [10] in promoting adoption behaviors of eco-friendly bicycle use, it was found that AR has a positive and significant effects on personal norms.

H3a: Environmental Concern has a significantly positive effect on Personal Norm

With the urgent situation of global warming conditions, more people start to take the environmental issues seriously [11]. Environmental concern is defined as an individual's emotional reactions, such as worry, dislike, and affection for environmental problems [12]. Environmental concern is an important factor in promoting personal norms. Previous research by [6] shows that environmental concerns positively affect personal norms for staying in green hotels.

H3b: Environmental Concern has a significantly positive effect on Willingness to Use Circular Product Furniture

Environmental concern is one of the cognitive steps to predict an environmentally friendly behavior of individuals [13]. Based on research by [6], it proves that environmental concerns have a positive impact on consumers' intention to stay in green hotels. Research by [14] shows that environmental concerns are the main driving factor for consumers' intention to use electric vehicles.

H4a: Perceived consumer effectiveness has a significantly positive effect on Personal Norm

Perceived Consumer Effectiveness (PCE) is a person's assessment towards a contribution given to the environment. Based on research by [7], PCE positively influences personal norms in the context of promoting energy-saving equipment consumption behavior in China. Previous research by [6] proves PCE has a significant positive relationship with personal norms.

H4b: Perceived consumer effectiveness has a significantly positive effect on Willingness to Use Circular Product Furniture

Previous research by [15] found that a high PCE can improve product purchasing behavior. Then, research by [7] proved that PCE positively influences the purchasing behavior of energy-saving equipment in China.

H5: Personal Norm has a significantly positive effect on Willingness to Use Circular Product Furniture

Research by [16], shows that personal norms positively mediate the relationship between AR and the purchase of energy-efficient equipment. Then the research by [17], explained that the purpose of recycling is activated through personal norms.

H6: Information Driver has a significantly positive effect on Willingness to Use Circular Product Furniture

According to [18] three main drivers for consumers to participate in circular economy, namely information about circular products, product design, and repair services. Research by [19] explains, the thing that influences consumers' decision to buy furniture is how to collect information about furniture of interest

The respondent in this research were Indonesian citizens in their productive age, minimum 17 years old, and already having incomes. Overall, 471 responses were collected through online questionnaires using Google Form with 5 points likert scale. Then, 6 hypotheses were being analyzed using SmartPLS 4.0 for the acceptance or rejection.

3. Result and Discussion

3.1 Path Diagram

Figure 2 below is a path diagram used in this study

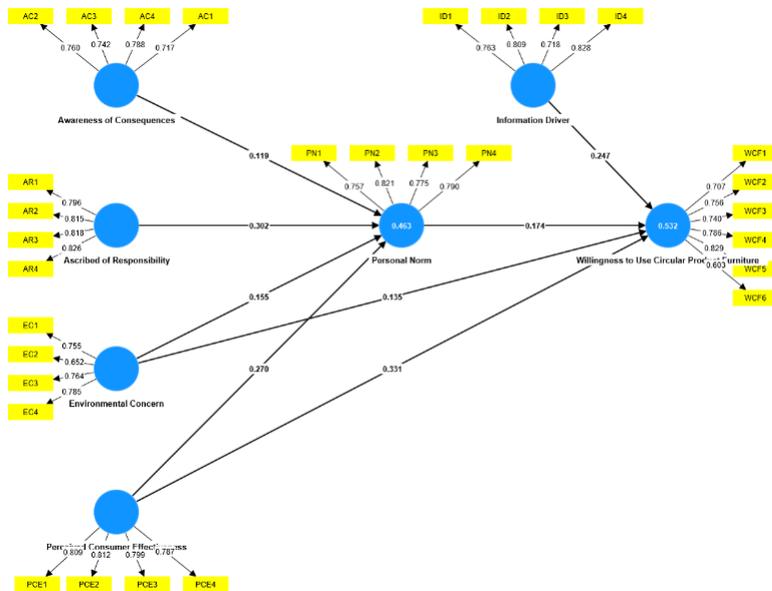


Figure 2 Path Diagram

3.2 Outer Model

3.2.1 Convergent Validity

The recommended AVE value > 0.5 , if it is below 0.5 it will eliminate the indicator that has the smallest value. Table 1 shown the loading factor in latent variable indicators.

Table 1 Convergent Validity

Variables	Indicators	Loading Factor
<i>Awareness of Consequences</i>	AC1	0,717
	AC2	0,760
	AC3	0,742
	AC4	0,788
<i>Ascribed of Responsibility</i>	AR1	0,796
	AR2	0,815
	AR3	0,818
	AR4	0,826
<i>Environmental Concern</i>	EC1	0,755
	EC2	0,652
	EC3	0,764
	EC4	0,785
<i>Perceived Consumer Effectiveness</i>	PCE1	0,809
	PCE2	0,812
	PCE3	0,799
	PCE4	0,787
<i>Personal Norm</i>	PN1	0,757
	PN2	0,821
	PN3	0,775

	PN4	0,790
	ID1	0,763
<i>Information Driver</i>	ID1	0,809
	ID3	0,718
	ID4	0,828
	WCF1	0,707
<i>Willingness to Use Circular Product Furniture</i>	WCF2	0,756
	WCF3	0,740
	WCF4	0,786
	WCF5	0,829
	WCF6	0,603

3.2.2 Discriminant Validity

Table 2 is the Fornell Lacker's values result in this study.

Table 2 Discriminant Validity

Variables	AR	AC	EC	ID	PCE	PN	WCF
<i>Ascribed of Responsibility (AR)</i>	0,814						
<i>Awareness of Consequences (AC)</i>	0,412	0,752					
<i>Environmental Concern (EC)</i>	0,457	0,478	0,741				
<i>Information Driver (ID)</i>	0,442	0,294	0,436	0,780			
<i>Perceived Consumer Effectiveness (PCE)</i>	0,567	0,415	0,608	0,503	0,802		
<i>Personal Norm (PN)</i>	0,576	0,430	0,515	0,637	0,585	0,786	
<i>Willingness to Use Circular Product Furniture (WCF)</i>	0,448	0,383	0,534	0,583	0,640	0,595	0,740

3.2.3 Composite Reliability

Table 3 shows the composite reliability and cronbach's alpha values in this study. Composite reliability aims to measure the internal consistency of an indicator of latent variables. Cronbach's alpha is used to measure the lower limit value of the reliability of indicators on latent variable. Both Composite reliability and Cronbach's alpha meets the reliable criteria if the value is greater than 0.7. Composite reliability is better for measuring the internal consistency of indicators of a construct.

Table 3 Composite Reliability

Variables	Cronbach's Alpha	Composite Reliability	AVE
<i>Awareness of Consequences</i>	0,746	0,839	0,566
<i>Ascribed of Responsibility</i>	0,830	0,887	0,662
<i>Environmental Concern</i>	0,726	0,829	0,549
<i>Perceived Consumer Effectiveness</i>	0,815	0,878	0,643
<i>Personal Norm</i>	0,794	0,866	0,618
<i>Information Driver</i>	0,788	0,861	0,609

<i>Willingness to Engage in Circular Furniture</i>	0,832	0,878	0,548
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3.3 Inner Model

3.3.1 Path Coefficient

The determination value of the path coefficients is between -1 to +1. The closer it is to +1, it indicates a positive relationship and approaching -1 indicates a negative relationship. Table 4 shows the path coefficient values of each variable.

Table 4 Path Coefficient

Variables	Path Coefficient	Relationship
AC → PN	0,119	Positive
AR → PN	0,302	Positive
EC → PN	0,155	Positive
EC → WCF	0,135	Positive
PCE → PN	0,270	Positive
PCE → WCF	0,331	Positive
PN → WCF	0,174	Positive
ID → WCF	0,247	Positive

3.3.2 R-Square

R² classified in 3 categories, namely 0.75 is as strong, 0.50 is as moderate (moderate), and 0.25 is as weak [20]. R² value in this study were shown in Table 5.

Table 5 R-square

Endogenous Variables	R-square	R-square Adjusted	Categories
<i>Personal Norm</i>	0,463	0,459	<i>Moderate (sedang)</i>
<i>Willingness to Use Circular Product Furniture</i>	0,532	0,528	<i>Moderate (sedang)</i>

3.3.3 Q-Square

The closer Q² value to 1, it indicates that the model has a relevant prediction. Q² value in this study were shown in Table 6.

Table 6 Q-square

Variables	Q²	Categories
<i>Personal Norm</i>	0,444	Relevansi prediktif
<i>Willingness to Use Circular Product Furniture</i>	0,500	Relevansi prediktif

3.3.4 Effect Size (f²)

The value of f^2 classified in 3 categories, namely 0.02 indicates that the influence of exogenous variables on endogenous is small, 0.15 indicates as medium, and 0.35 indicates as large [20]. f^2 value in this study were shown in Table 7 below.

Table 7 Effect Size

Variables	f^2	Categories
AC → PN	0,019	Kecil
AR → PN	0,108	Kecil
EC → PN	0,025	Kecil
EC → WCF	0,023	Kecil
PCE → PN	0,071	Kecil
PCE → WCF	0,121	Kecil
PN → WCF	0,031	Kecil
ID → WCF	0,073	Kecil

3.3.5 Model Fit

SRMR value < 0.08 categorized as the good fit category. Then, SRMR value in between 0.08 to 0.1 categorized as the adequate fit. The NFI (Normed Fit Index) value is a value used to compare between a proposed model and a null model. NFI > 0.900 categorized as good fit and NFI 0.500 – 0.800 categorized as marginal fit (Hu & Bentler, 1999). Recap of the fit model were shown in Table 8.

Table 8 Model fit

Parameters	Value	Cut-off Value	Description
		SRMR < 0,08 (<i>good fit</i>)	
SRMR	0,066	0,08 ≤ SRMR ≤ 1 (<i>adequate fit</i>)	<i>Good fit</i>
		NFI > 0,9 (<i>good fit</i>)	
NFI	0,779	0,80 ≤ NFI ≤ 0,90 (<i>marginal fit</i>)	<i>Marginal fit</i>

3.4 Hypotheses testing

Bootstrapping method were used in this research's hypotheses testing. Bootstrapping uses a minimum number of bootstraps of 500 and the number of events is equal to the number of original observations. The parameter compares the value of the t-test table with the t-test stat. If the t-test value is greater than the critical value of z in two-tailed (1.645 if the significance is 10% and 1.96 if the significance is 5%) then it can be concluded that the hypotheses is significant or vice versa. Table 9 is the result of hypotheses testing of the NAM model in this study.

Table 9 Hypotheses testing

Hypotheses	Path Coefficients	T statistics	P values	Conclusion
H1	0,119	2,694	0,007	Significant and positive
H2	0,302	5,686	0,000	Significant and positive
H3a	0,155	2,364	0,018	Significant and positive

H3b	0,135	2,835	0,005	Significant positive	and
H4a	0,270	4,249	0,000	Significant positive	and
H4b	0,331	5,593	0,000	Significant positive	and
H5	0,174	2,743	0,006	Significant positive	and
H6	0,247	5,593	0,000	Significant positive	and

Conclusion

This study shows that H1 awareness of consequences has a positive and significant relationship to personal norms. This is in line with research [7], regarding the use of energy-efficient household appliances. Where, awareness of consequences can activate a person's personal norm. Furthermore, H2 ascribed of responsibility has a positive relationship with the personal norm. This is in line with research by [21] on sustainable second-hand consumption. Where the ascribed of responsibility has a positive influence on personal norms. H3a environmental concern has a positive and significant relationship to personal norms. This is in line with research by [6], regarding consumers' willingness to stay in green hotels. Where, environmental concerns can significantly affect personal norms. H3b environmental concern has a positive and significant relationship to the willingness to use circular furniture products. This is in line with research by [7] regarding the use of household appliances. Where, environmental concern can directly affect behaviour / intention. H4a perceived consumer effectiveness has a positive and significant relationship. This is in line with research [22] where, if a person has environmentally friendly energy consumption behaviours, then a person will feel that they are contributing to the environment. H4b perceived consumer effectiveness has a positive and significant relationship to the willingness to use circular furniture products. This is in line with research [7], where if someone believes that their actions will have a positive impact on the environment, then someone will be willing to use a circular product. H5 personal norm has a positive and significant relationship to the willingness to use circular furniture products. This is in line with research by [7], where PN has a positive influence on the purchase of energy-efficient equipment. H6 Information driver has a positive and significant relationship to the willingness to use circular furniture products. This is in line with research by [19], revealing that the thing that influences consumers' purchasing decisions to buy furniture is how to collect information about furniture of interest.

Of the seven variables, perceived consumer effectiveness has the most influence on the willingness to use circular products. So, the company can develop a marketing strategy to encourage people to use circular furniture products. The recommendations are for companies to declare empowering statements, provide ecolabels, provide complete information about products, and tax enforcement. Further research can use other variables that are likely to have an influence on the willingness to use circular wooden furniture. Then, can be done with objects other than furniture with a norm activation model approach. And, further research can use moderation variables to involve external factors.

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