Intention to consume products in the circular economy in Vietnam

BY

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Research on product consumption intention in the circular economy in Vietnam

Abstract
Along with the trend of the times, encouraging the promotion of circular economic development in Vietnam is the driving force behind this research. Based on the theory of planned behavior, accompanied by similar research topics around the world, this study explores factors that influence the intention to consume products in the circular economy in Vietnam. Vietnam. The study took opinions from 350 survey participants (from 18 - over 45 years old), through linear structural model analysis, the results showed that attitude is a factor that strongly influences purchase intention. followed by factors: perceived quality, perceived value, subjective norms, perceived behavioral control, product knowledge, environmental benefits.

Keywords: circular economy, products in the circular economy, consumption intention

1. Introductions

Circular economy is a long-term vision, a strategic approach towards sustainable development for each nation individually and the world as a whole. The benefits of a circular economy can include (i) reducing carbon emissions, (ii) conserving natural resources, (iii) achieving emission-free goals, and (iv) striving for sustainable development. However, there are still many barriers hindering the progress towards a circular economy. According to Calvo-Porral, C. and Lévy-Mangin, J.P., (2020), the acceptance and usage of products by consumers in this model remains a challenge, and this is considered one of the relatively significant obstacles to achieving a sustainable economy. Additionally, the aspect of intention to accept recycled products in the circular economy model has not yet been explored. In line with this research direction, Singhal, D., Tripathy, S. and Jena, S.K., (2019) argue that consumers play a crucial role in the circular economy as they can make choices that support circular processes, opting for sustainable products that can be repaired and recycled, as well as properly disposing of products at the end of their life cycle. Therefore, achieving the goals of the circular economy towards sustainable development relies heavily on the role of consumers. Hence, exploring the factors influencing consumers' intention to use products in the circular economy is essential.

2. Overview of Research and Related Concepts

2.1. Overview of Researches

2.1.1. International studies

The article "Intention towards re-manufactured products in closed-loop supply chains" by Wang, Y., Wiegerinck, V., Krikke, H., & Zhang, H. (2013) serves as evidence for the main assumption in the paper regarding closed-loop supply chains, which assumes that consumers still have concerns about re-manufactured products (despite consuming these products would help achieve sustainability goals). It aims to complement CLSC research primarily focused on activities by examining consumers' perceptions and behaviors related to re-manufactured products. The integration of planned behavior theory and perceived risk theory along with concepts of perceived benefits and product knowledge has formed a theoretical model suitable for this research context. The results show that purchase intention is directly influenced by purchase attitude, followed by perceived behavior control, and indirectly influenced by perceived risk, perceived benefits, and product knowledge through attitude.

From the perspective of Hazen and Wang (2016), consumers not only engage in returning used products but also need to accept consuming these products. However, in reality, consumers have a negative perception of re-manufactured

products, so they are unwilling to accept them. Therefore, one can envision that an individual's attitude and behavior reflect their understanding of the circular economy. The authors evaluate macro-level factors such as price, government incentives, and environmental benefits with the moderating influence of consumer attitudes at the micro-level. Through their research process, the authors present findings indicating that attitude is a crucial moderating factor affecting the intention to transition to consuming re-manufactured products.

According to Wang, Y., and Hazen, B.T. (2016), perceived value of re-manufactured products is positively correlated with purchase intention. The model results indicate that knowledge of quality, knowledge of green cost, and green knowledge collectively influence perceived value. Knowledge of quality and knowledge of green cost measure perceived risk; however, knowledge of quality has a greater influence.

The study by Wang, Y., Hazen, B.T., and Mollenkopf, D.A. (2018) assessed the role of consumer perceived value in re-manufactured products through variables such as environmental benefits, price advantage, and perceived sacrifice (perceived quality; perceived risk). The research results demonstrate that all observed variables are positively related to perceived value. Moreover, the perceived risk variable is considered an intermediary variable that influences perceived quality and perceived value.

2.1.2. The studies conducted in Vietnam
In Vietnam, the concept of circular economy is gaining more attention, both within the research community and in society. The research paper titled "Building a Circular Economy: Policies, Practical Results in Some Countries, and Policy Suggestions for Vietnam" by authors Dang Quynh Nhu and Dinh Quang Huy proposes measures to establish a legal framework and direction for the sustainable development of the circular economy, aiming towards sustainable development in Vietnam. Another study, "An Overview of Circular Economy Research" by authors Ho Thi Kim Anh and Pham Tu Anh from the Ho Chi Minh City University of Industry, examines three main aspects of the circular economy, drawing from previous debates to provide readers with the most comprehensive understanding. Specifically, in each different field, the circular economy has different definitions and applications. For instance, proponents of the "finite natural capital" viewpoint, such as Segerson et al. (1991), argue that the circular economy describes economic activities and the environment interacting in a closed loop. In 2012, the Ellen MacArthur Foundation (EMF) released a report on the circular economy, supporting its development and serving as a collaborative hub for businesses, policymakers, and scholars. The circular economy also stems from the ideological standpoint that "waste equals food." The purpose of this research is to reduce the ambiguity of debates surrounding the circular economy and provide the clearest perspective for researchers in Vietnam.

2.2. Related Concepts
2.2.1. Theory of Planned Behavior

The Theory of Planned Behavior, developed by Ajzen (1991), evolved from the Theory of Reasoned Action (TRA). The author posits that intention is the most accurate predictor of actual consumer behavior. Attitude, subjective norms, and perceived behavioral control are factors influencing behavioral intentions. This theory serves as a foundation for studies on behavioral intentions towards a product and specific behaviors. For instance, in research on intentions to purchase green products, Yadav, R., & Pathak, G. S. (2016) extended the Theory of Planned Behavior by adding two environmental concern factors and environmental knowledge. The research findings indicate that both factors are positively related to attitude and intention to purchase green products. Regarding recycled products, Wang et al. (2013) similarly adopt Ajzen's (2019) viewpoint to assess the intention to consume such products.

2.2.2. Circular Economy
In different political entities and cultural contexts, the concept of the circular economy (CE) is understood and applied differently (Yu F, Han F, Cui Z, 2015). For Japan and Singapore, the eco-city model is favored and strongly developed. Additionally, Japan and South Korea emphasize raising consumer awareness of recycled and upcycled products, highlighting citizens' responsibility for resource use and waste management. In China, the circular economy model is applied to align with economic growth and address natural resource constraints. In Europe, countries like the UK, Switzerland, Denmark, and Portugal primarily apply the concept of the circular economy to waste management. Furthermore, various business models incorporate the circular economy concept into material reuse or recycling. Germany integrates the concept of the circular economy into environmental policies to promote sustainable resource utilization, thereby fostering economic growth. In the United States and other European countries, the circular economy concept is applied and enforced mainly among businesses and large corporations, with a focus on minimizing, reusing, recycling, and remanufacturing. One of the implemented programs includes researching and developing products aimed at extending product life cycles. Overall, the circular economy is an economic system that applies circular principles in production and consumption to align with sustainable growth and address natural resource challenges.

2.2.3. Products in the Circular Economy
Products in the circular economy are those that apply circular principles in their production for consumer use. The circular economy is built on the 3R principle: Reduction, Recycling, and Reuse. The first "R" principle, Reduction, refers to minimizing the use/exploitation of new natural resources, while the second "R" principle, Recycling, involves recycling materials and energy, ultimately turning waste into resources for product manufacturing. The final "R" principle, Reuse, entails reusing waste as inputs in the circular economy. In other words, the "3R" principle focuses on the reality that waste will be recycled and returned to the production process for a new product in the circular economy. Currently, alongside the development of the era, the circular economy

principle is understood more broadly with the addition of the 5R+ principle, which encompasses and provides a more comprehensive approach to the circular economy. In the 5R+ principle, two additional principles are included: Rethink and Redesign.

3. **Research Methodology**

To ensure the research is conducted most comprehensively, the author simultaneously employs two methods: qualitative research method and quantitative research method.

3.1. Qualitative Research

The author proposes a research model to evaluate the factors influencing the intention to consume Vietnamese bamboo fiber products based on literature review, construction of theoretical frameworks, and inheriting previous studies to outline measurement scales. Through the research process, the author identifies that the model in this research context consists of 11 factors, where PI is the dependent variable influenced through 3 intermediate variables including AT (attitude), PQ, PV. The remaining variables are SN, CBC, PK, PP, PR, EB, GI.

Figure 3.1. Proposed research model
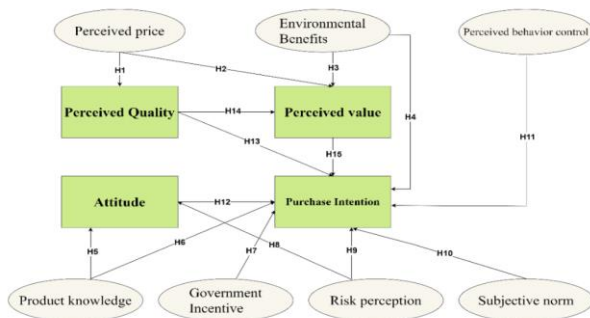
3.2. Quantitative Research

Using an online survey method, the author collected data to meet the requirements for processing and analysis. The survey questionnaire was designed and distributed to Vietnamese consumers via Google Form online. The data, after processing, will be sequentially analyzed using the following techniques: (1) Cronbach's Alpha reliability test; (2) Exploratory Factor Analysis (EFA); (3) Confirmatory Factor Analysis (CFA); (4) Structural Equation Modeling (SEM) test.

4.1. Exploratory Factor Analysis (CFA)

The purpose of exploratory factor analysis is to assess whether the factor structures satisfy discriminant and convergent validity, examine the suitability of the observed variables included in the CFA analysis, and evaluate the adequacy of the survey data through goodness-of-fit indices, as per Hu & Bentler (1999).

- The model is considered appropriate for the survey data when the Chi-square test yields a P value of less than 0.05 (i.e., 5%).
- A Chi-square/df value of less than 3 is considered good, and less than 5 is acceptable.
- The model records GFI, CFI, TLI values greater than 0.95 as excellent, greater than 0.9 as good, and greater than 0.8 as an acceptable threshold.
- The RMSEA index below 0.05 is considered very good, between 0.05 and 0.1 is good, and above 0.1 is considered poor.
- According to Nunnally (1978), a reliable scale should have a Cronbach's Alpha reliability coefficient of 0.7 or higher

According to Awang (2015), to assess reliability, discriminant validity, and convergent validity of a scale, one should rely on CR (Composite Reliability), MSV (Maximum Shared Variance), and AVE (Average Variance Extracted). Specifically (1) AVE > 0.5; CR > 0.7 implies good reliability, (2) AVE > 0.5 indicates good convergent valid (3) AVE > MSV, and > the correlation coefficient between concepts imply good discriminant validity. CR, AVE, and MSV values are calculated using the Stats-Tools-Package.

Table 4.1. Convergence and Discriminant Validity Testing

Factor	Observed Variables	FL	MSV	CR	AVE	Cronbach" Anpha
AT	AT1	0.812	0.215	0.793	0.562	0.734
	AT2	0.820				0.670
	AT3	0.802				0.741
EB	EB1	0.750	0.319	0.854	0.541	0.818
	EB2	0.672				0.847
	EB3	0.797				0.813
	EB4	0.808				0.811
	EB5	0.799				0.815
CBC	CBC1	0.748	0.166	0.855	0.608	0.837
	CBC2	0.782				0.819
	CBC3	0.786				0.819

	CBC4	0.815				0.809
	CBC5	0.780				0.822
PR	PR1	0.841	0.011	0.861	0.862	0.708
	PR2	0.817				0.712
	PR3	0.834				0.677
	PR4	0.854				0.720
PI	PI1	0.935	0.032	0.934	0.559	0.906
	PI2	0.933				0.908
	PI3	0.933				0.899
PK	PK1	0.768	0.195	0.835	0.510	0.881
	PK2	0.750				0.799
	PK3	0.776				0.803
	PK4	0.817				0.801
	PK5	0.507				0.834
GI	GI1	0.751	0.391	0.750	0.510	0.754
	GI2	0.736				0.736
	GI3	0.717				0.731
	GI4	0.758				0.754
SN	SN1	0.858	0.040	0.838	0.633	0.757
	SN2	0.843				0.807
	SN3	0.865				0.750
PQ	PQ1	0.810	0.277	0.831	0.622	0.776
	PQ2	0.814				0.725
	PQ3	0.835				0.791

- Assessment of Reliability (CR): The CR values for all factors are >0.7. Since Cronbach's Alpha is above 0.7, all factors demonstrate reliability
- Convergence Assessment: It is observed that all AVE values are greater than 0.5, indicating that convergence is ensured.
- Discriminant Assessment: From the presented results in the table, it is noted that the MSV values are always smaller than the AVE values. Therefore, discriminant validity is ensured, and the correlation of each variable with other variables in the model is less than the square root of the AVE of that variable.

4.2. The results of hypothesis testing for the model"

Thus, looking at the model coefficients, the GFI index is 0.897, which is greater than 0.8 (meeting the acceptable threshold); CFI is 0.826, and TLI is 0.884, both greater than 0.8 (satisfying the required threshold for a well-fitting model). Additionally, the RMSEA coefficient is 0.052 (within the range of 0.05 - 0.1), indicating a good fit of the model and alignment with the hypotheses proposed by the research team

Figure 4.2. Results of SEM analysis for the proposed research model
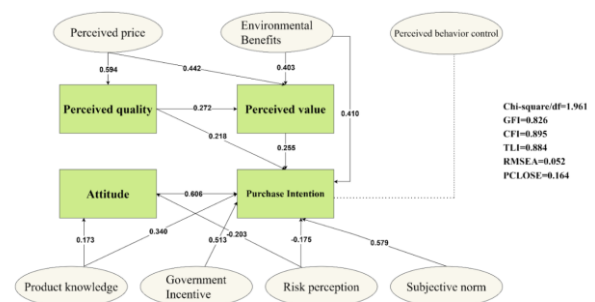
The author comments on the significance levels (sig) and estimates (standardized regression coefficients). It is noted that when using the 95% confidence level, the sig of PP influencing PQ is $0.000 < 0.05$ (AMOS notation *** indicates sig equals 0.000), indicating that the variable PP has an impact on PQ; similarly, the sig of PP is $0.000 < 0.05$, indicating that PP influences PV. These two relationships are significant. According to this understanding, variables with sig ***< 0.05 are all significant for the dependent variable. Additionally, the sig of EB affecting PV is 0.024 <0.05, and the sig of PK affecting AT is 0.027 <0.05, indicating the significance of these two relationships. Furthermore, the sig of

EB affecting PI is 0.009 <0.05, the sig of PR affecting PI is 0.007 <0.05, the sig of SN affecting PI is 0.002 <0.05, and the sig of PQ affecting PI is 0.006 <0.05, showing the significance of these relationships. However, the sig of CBC affecting PI is 0.449 > 0.05, indicating that the variable CBC does not influence PI. Among the 15 hypotheses, one is rejected, and the remaining hypotheses are accepted.

These results indicate that the intention to consume products in the circular economy can be explained by the combined influence of attitude, product knowledge, government encouragement, risk perception, environmental benefits, subjective norms, perceived quality, and perceived value. Together, these factors account for 36.7% of the variance in PI. The impact of the independent variables (risk perception, product knowledge) on the dependent variable attitude (AT) is 0.573, corresponding to 57.3%. Next, the independent variables (perceived quality, perceived price) have a 35.5% impact on the dependent variable (perceived value). The influence of the independent variable perceived price on the dependent variable perceived quality is 29.9%.

5. Conclusion and Discussion

Based on the theory of planned behavior, attitude, subjective norm, and perceived behavioral control are factors that influence consumers' intention to consume a product. However, it's noted that perceived behavioral control is perceived to have no relationship with intention. Furthermore, the results indicate that government encouragement and environmental benefits both have positive relationships with the intention to consume. Additionally, environmental benefits also have a positive relationship with perceived value, and perception of price influences perceived quality and perceived value, which aligns with the findings of Hazen and Wang (2016). With the initial hypothesis that perceived quality has a positive relationship with perceived value, both factors positively impact consumers' intention to consume, which adds to the research by Wang and Hazen (2013). The results also reveal that perceived risk negatively impacts attitude and intention to consume. Attitude is further supplemented by product knowledge; thus, when consumers have good knowledge, they tend to have a positive attitude towards the product. Product knowledge also has a positive relationship with intention to consume.

Finally, these results serve as an affirmation to businesses and managers to enhance the popularity of products in the circular economy. According to this, attitude strongly influences intention to consume, so changing attitudes positively towards these products is key to success. Therefore, manufacturers and governments need to work together to build a positive image of these products through increased understanding or knowledge about them. According to Abbey et al. (2015), consumers do not trust products in the circular economy, such as recycled or reused products, due to doubts about quality. Therefore, promoting perceived quality is crucial to enhance perceived value and consequently increase consumer intention to consume. Furthermore, subjective norm influences perceived intention, indicating that consumers' intention to consume is strongly influenced by those who influence them. Therefore, marketers can target influencers to improve demand for products in the circular economy.

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