

**PURCHASE INTENTION TOWARD CIRCULAR ECONOMY
PRODUCTS IN THAILAND**



**A THESIS SUBMITTED IN PARTIAL FULFILMENT
OF THE REQUIREMENT FOR
THE DEGREE OF MASTER OF MANGAEMENT
COLLEGE OF MANGEMENT
MAHIDOL UNIVERSITY
2020**

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Thesis
entitled
**PURCHASE INTENTION TOWARD CIRCULAR ECONOMY
PRODUCTS IN THAILAND**



.....
Mr. Suttirat Hanpanit,
Candidate

.....
Boonying Kongarchapatara,
Ph.D.
Advisor

.....
Asst. Prof. Winai Wongsurawat,
Ph.D.
Chairperson

.....
Asst. Prof. Duangporn Arbhasil,
Ph.D.
Dean
College of Management
Mahidol University

.....
Teerapong Pinjisakikool,
Ph.D.
Committee member

Thesis paper
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was submitted to College of Management, Mahidol University
for the degree of Master of Management

on
August 26, 2020



.....
Mr. Suttirat Hanpanit,
Candidate

.....
Boonying Kongarchapatata,
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Advisor

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Dean
College of Management
Mahidol University

.....
Teerapong Pinjisakikool
Ph.D.
Committee

ACKNOWLEDGEMENTS

My gratitude to the advisor at CMMU, Dr. Boonying Kongarchapatara for accepted me as his student although I wasn't marketing student. And also his support and suggestion until the very last minute to complete this thesis and guided me to get the high pass. Second, Dr. Suthep Nimsai for the consultant of the topic.

Then I also thank you SCG and my colleges at SCG that offered me a job to work for circular economy project before I resigned.

In addition, I also thank my friends, especially Mr. Likhit Promphonmuang who passed my questionnaire for more than 100 sets. Thank my family, Ms. Lapassanan Buranapatpakorn and her family who helped me out a lot for the questionnaire distribution to complete the survey.

Lastly, I thank you myself the most that worked hard and put so much effort on this thesis. Although I got a Cervical spondylosis and Lumbar instability symptoms after long hours reading with thesis but thanks the endurance of my body which helped me through that.

Suttirat Hanpanit

PURCHASE INTENTION TOWARD CIRCULAR ECONOMY PRODUCTS IN THAILAND

SUTTIRAT HANPANIT 6149083

M.M. (ENTREPRENEURIAL MANAGEMENT)

**THESIS ADVISORY COMMITTEE: BOONYING KONGARCHAPATATA, Ph.D.
ASST. PROF. WINAI WONGSURAWAT, Ph.D. TEERAPONG PINJISAKIKOOL,
Ph.D.**

ABSTRACT

The circular economy is a promising solution to solve the world's environmental problem. There are some knowledge gaps for consumer behavior. Therefore, this research aims to explore Thais' behavior for the purchase intention factor. The study adopted the Theory of Planned Behavior. The research was conducted from April to June 2020 in Thailand by using convenience random sampling with snowball techniques. In the end, we got 559 respondents, and the results were shown that attitude perceived behavioral control and subjective norms have the relationship for purchase intention. and the results of moderators were; age can moderate perceived behavioral control and subjective norms. Price sensitivity can moderate attitude. Perceived convenience can moderate attitude and perceived behavioral control, and product involvement can moderate attitude and perceived behavioral control.

**KEY WORDS: CIRCULAR ECONOMY/ PURCHASE INTENTION/ UPCYCLE/
THEORY OF PLANNED BEHAVIOR/ SUSTAINABLE DEVELOPMENT**

123 pages

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LIST OF ABBREVIATION

- ASEAN - The Associate of South East Asia Nations
- TBCSD - Thailand Business Council For Sustainable Development
- PET - Bottlepolyethylene terephthalate
- U.K. - United Kingdom
- UNEP – United Nation Environment Programme
- ATT – Attitude Toward Behavior
- PBC – Perceived Behavioral Control
- SN – Subjective Norms
- SJN – Subjective Norm
- PI – Purchase Intention
- SPSS - Statistical Package for the Social Sciences
- EC - Environmental Concern
- PACE - Platform for Accelerating the Circular economy
- DDT - Dichloro-Diphenyl-Trichloroethane
- EU – European Union
- BCG Economy – Bio , Circular , Green Economy
- CMMU – College of Management, Mahidol University

CHAPTER I

INTRODUCTION

1.1 The Environmental Problems

At present, the world faces environmental problems and pollutions. Greenhouse gas emissions have increased by 70% from 1970 to 2014, leading to global warming and other environmental effects. The emission of greenhouse gas reflects climate change and global warming (World Wide Fund for Nature, n.d.). Since 1880, the average global climate has increased by 0.6°C and created impact to more than 1,400 species (Root et al., 2003). From this, it affects the iceberg, which diminishes and melt which increases the sea level and affects the lands and islands around the coastal areas. Higher temperature also affects with ecosystem and animal species which risks for the extinctions (Anbumozhi, V., & Kim, J. 2016)

Furthermore, cumulative plastic production increased also causes the problem. Jambeck et al. (2015) said that in 2010 around 275 million metric tons of plastic was dumped into 192 coastal countries and these wastes, up to 12.7 million metric tons, may enter to the sea areas which can cause big problems to the aquatic animals and their ecosystem. Geyer et al. (2017) also showed us that in 2015, 6,300 million metric tons of plastic was generated 9% will be recycled, and 12% were incinerated and the rest of 79% were waste that affected to the land which affected the environment. And by 2050, around 12,000 million metric tons of plastic will be with us in the land. This is very serious problem. This result in signifying that there is mismanagement from plastic pollution can cause the severe problem to us (Jambeck et al., 2015). On top of this, throughout the product cycle of plastic; from production, use, and disposal, every single stage emits greenhouse gases, therefore, not only the effect from the waste, but plastic can cause the global warming indirectly (Astrup, Fruergaard, & Christensen, 2009).

In addition of the plastic mismanagement problems, there is also the problem over the lifespan of products at present day bear shorter lives. Compare the launch of the products in the year 2000 and the year 2005, the data shows that most of the produced products launched in the year 2000 have a longer life span than in the year 2005. For example, the median life span of printing equipment in the year 2000 can last around 9.0 years, while printing equipment in the year 2005 can last only 8.2 years. Likewise, Microwave in the year 2000 can last 10.9 years while in 2005 it can last only 9.4 years (Bakker et al., 2014). The shorter lifespan reflects more frequent repurchase products, which is good for the economy as the circulation of money will flow throughout the business. However, as the environmentalist's perspective, this result is the big problem. Looking back to the emission that created from the manufacturing process and waste disposal at the end of product life, this is a disaster. Plastic can emit Carbon at every stage from manufacturing to disposal which create the impact for greenhouse. In the past 130 years, there are 45% more Carbon Dioxide emission to the earth (Bekun, Alola, & Sarkodie, 2018).

In reality, there are far worse than the paper has mentioned above. There are plenty of problems that humanity has created to the earth, such as environmental degradation, toxicants, and others. If humans still continuously do the same thing, there may not be tomorrow for the earth. The future of the earth is in the hand of humanity; to restore, preserve, and sustain the earth, human should be aware of these problems and start doing something.

1.2 UN And Sustainable Development Goal

The environmental problems have gotten more substantial, and it becomes more severe to humanity. Therefore, as the role of the United Nations or "UN", they have launched the UN Sustainable Development Goals in 2015 which consist of; 1: No Poverty, 2: Zero Hunger, 3: Good Health and Well-being, 4: Quality Education, 5: Gender Equality, 6: Clean Water and Sanitation, 7: Affordable and Clean Energy, 8: Decent Work and Economic Growth, 9: Industry, Innovation and Infrastructure, 10:

Reduced Inequality 11: Sustainable Cities and Communities, 12: Responsible Consumption and Production, 13: Climate Action, 14: Life Below Water, 15: Life on Land, 16: Peace and Justice Strong Institutions, 17: Partnerships to achieve the Goal

UN states that the goal of sustainability is to achieve Sustainable Development Goals by 2030 (Costana et al., 2016). In order to achieve this, the UN has to have a proper strategy and action plan. Therefore, circular economy has emerged as a part of strategies to support the UN to achieve the Sustainable Development Goal under the goal of “Responsible Consumption and Production,” and another goal is “Climate Action.”

Circular economy helps reduce the ecological footprint by changing the way of produce and consume to preserve and restore the natural; reduces carbon footprint, and eventually reduces greenhouse emission, impacting the global climate. (Schroeder, Anggraeni, & Weber, 2018; United Nations Development Program, n.d.)

Hence, the UN Sustainable Development Goal cannot concentrate only economic growth and ignore sustainability. The sustainability is important as well. This concept has changed from the past that either select one between economy or environment as win-lose situation (Hoffman et al., 1999) to win-win case that we have to achieve both economic and environmental (Porter & van der Linde, 1995).

Moreover, on top of the UN, the European Commission, too, announced over circular economy practices and made it to priority task to reduce the environmental problems (European Commission, 2017). Additionally, on top of the European Commission, more multinational organizations mentioned the crisis of the earth and environment (D’Amato et al., 2017). For example; in European Environment Agency for Environmental policy targets and objectives 2010-2050, Organization for Economic Co-operation and Development (Organization for Economic Co-operation and Development, 2011) and European Commission (European Commission, 2017) in 2015 while in the consumer side, people are more aware and conscious over green issues (Zou & Chan 2019).

For circular economy in multinational level, there is also a collaboration among many countries to develop the Circular economy concept. For example; World Circular Economy Forum (SITRA) from years 2017 to 2019, take place at Finland in

2017), Japan in 2018 and back to Finland in 2019 (Narayan & Tidström, 2019; Antikainen, R., Lazarevic, D., & Seppälä, J. 2018).

Hence, there is also the Ellen MacArthur Foundation a charity organization that pushes the circular economy toward a global scale (MacArthur, 2013). They play a significant role in encouraging, educating, and facilitating various parties in promoting the circular economy. The organization has worked with World Resources Institute and World Economic Forum to publish a document about moving toward circular economy called “PACE” or “Platform for Accelerating the Circular Economy in order to raise the awareness of the circular economy to get the solutions over the environmental problems (Camilleri, 2019).

1.3 The Trend of Circular Economy

Since the UN announcement, nowadays, the circular economy concept has gained more attention. According to D’Amato, Korhonen, & Toppinen (2019) claimed that from a survey of 123 companies listed in DJSI, the concept of “circular economy” is the most used among BCG Economy or bio-economy, circular economy and green economy. Furthermore, from the literature review Kalmykova, Sadagopan, & Rosado (2017) mentioned that since the year 2000, there were 118 papers across multiple dimensions circular economy from theory, policy, case studies, and academic sources, practice and business cases and other geographies.

1.4 The Origin of Circular Economy

There is no precise information about the origin of the circular economy. However, there are many sources of literature claims that the circular economy concept is inspired by the books of the different writers.

The first one was from Rachel Carson, “Silent Spring.” The book explained about the use of the synthetic pesticide or DDT in the agricultural industry which impact

with the population of birds. The book explains that if it continues until there are no birds left, the entire ecosystem will be affected. The effect is more severe than humanity estimated as if there are no birds to eat insects then, the population of insects will be increased, then they will eat the crops in the human agricultural industry, and eventually, humanity will no longer have enough crop for consumption. These chain effects will lead to the extinction of humanity at the end (Carson, 1962; Winans, Kendall, & Deng, 2017; Sheldon, 2016; Bocken, Pauw, Bakker, & van der Grinten, 2016; Gregson et al., 2015).

The second concept comes from the book named “The Economics of the Coming Spaceship Earth” by Boulding. It describes opened economy and unlimited resources as the world in the past and the closed economy as the world in the future. The world in the past, with the opened economy, resources are infinite and unlimited. Human can extract and exploit anything they would like for. It is the world of freedom resources. While in the closed economy, compares as a spaceship that contains the resources, it is limited as the spaceship has the limited space. Therefore, if humans keep extract and pollute, there will be no more resources left for humans in the end. Humans need to find a cyclical ecological system for continuously produce; restore and reuse, which will aim to perseverance the materials for future generations (Boulding, 1966).

The third concept is from “Four Laws of Ecology”, Commoner (1968) reflects the circular economy perspective under four laws which consist of; first, everything is connected to another thing; either humans or animals rely on one another. Second, everything must go somewhere; something people use, once ends of its life, it does not disappear; it goes somewhere. Third, nature knows best – natural selection is the best method. Although humans try their best, it is incomparable with what nature does. And fourth, there is no such thing as a free lunch – every action has its consequence, the same problems with environmental issues go back to humans who have created much pollution in the world as a circle that we cannot run away. These four laws reflect that there is no possibility that humans will survive by not relying on nature. Therefore, what humans need to do is preserve and restore the natural resources for tomorrow.

These three books have shaped into the core concept of circular economy. And we can summarize into brief explanation of circular economy as;

A concept of the regenerative and regenerative loop of production and consumption in resource. Control both input and output, retained in the system through circulation supported products and services designs. This concept implies that the material is limited, but if there is a proper management, all materials and components in the loop can circulate back into the system and regenerate for future use (MacArthur, 2013; Ghisellini, Cialani, & Ulgiati, 2016; Peronard & Ballantyne, 2019).

1.5 Circular Economy Business Model

In the circular economy approach, not only the product has to change to serve the concept, but the business model will also need to be changed.

In the past, the traditional business model is simple. The firms take raw material, then transform raw material into the product by production process and sell it to customers, once products are reach the end of life, customers will get rid of the products as a waste as a simple concept of take-make-dispose.

On the other hand, for a new approach for the circular economy as a business model, many different business models emerged from the circular economy concepts. For example; product service system, repairing, refurbishment, refilling, remanufacturing, et cetera. These business models are referred to make-use-return concept (Muranko, Andrews, Chaer, & Newton 2019). It is a radical change that businesses model adapted to the circular economy and service customers in circular way (Hens, 2015). The radical change not only affects the enterprise, but it is affect consumer-level also due to the perception of consumers that preferred first-hand products due to perception of quality (APPRSG & APPMG, 2014).

Although on the production side, the process of product reconstruction or remanufacturing favors the firms as it reflects the cheaper cost of input and easier for management (Kuan-Siew & Hazen, 2016). But in the reality, there is also evidence that the second-hand products are not replacing the new products, but it is the additional selling on top of the new product. Consumers still buy the new product and also buy

remanufactured items as an addition items which reflect as more waste in the disposal stage (Zink & Geyer, 2017; Thomas, 2003).

Stahel (1982) mentioned that there is a psychological obstacle that humanity needs to overcome in his paper. As consumers perceived that “new is bigger-better-faster”, there is a need to change this perception. People perceive higher quality from new products than remanufactured ones, even though the remanufactured ones are upgraded to be equal with the new items which results in the behavior that customers still buy newer version of product continuously even though they already acquired ones.

Therefore, this radical change toward a circular economy requires time for transition. Lewandowski (2016) claimed that it requires a proper strategy to encourage and engage all stakeholders. Especially for customers, they have to adapt behaviors to get used to the new business models emerging from the circular economy.

1.6 Examples for Circular Economy Approach

Along with the UN's movement, at the enterprise and corporate level, there is a concept of "triple bottom line" that suggests the company focuses not only on the business performance but also on sustainability. As the concept of triple bottom line, there are three dimensions that the company needs to focus on sustainability; economy, environment, and social. If the company ignores environmental and social and concentrates only on the economy, then, in the end, they will not achieve sustainability goals. The environmental pollution will continue going to affect humans in the long run. Therefore, the company also needs to focus on other two things, first, to control and second, to balance the environment, social and economy in order to achieve sustainable growth. (Ghisellini, Cialani, & Ulgiati, 2016; Jabbour et al., 2017; Gaur et al., 2019)

And circular economy becomes the attention of the firms. As several firms try to implement the triple bottom line by conduct the Circular economy approaches. Below are some examples from big-name companies that approach toward the circular economy business model;

- Fairphone2 – the new approach to design the phone on two main principles; long-lasting design and reusable and recyclable. The product life can last longer than the original phone and able to decompose and split its components into technical loops which means the components part can bring back, remanufacture and reuse again in the cycle (Mestre & Cooper, 2017)
- Nike – The company launched Nike Flyknit 2016 which the material made from recycled PET lace tips and recycled factory waste rubber. This one also show the example of the technical loop and industrial symbiosis by reprocess PET bottle in one industry and use proceed PET material to produce shoes in another industry (Mestre & Cooper, 2017)
- Caran d'ache pen X Nespresso – Another example from the brand collaboration as part of industrial symbiosis to use the waste from one industry and produce a new product from another industry. This pen is another example. The pen was made from the waste from the Nespresso Capsule cap and remanufactured into a pen. (Metro, 2019)
- IKEA subscription - There is a campaign that IKEA launches to achieve the circular economy strategy; they opened for furniture rental service. This service will make customers return furniture to IKEA once they want to change furniture or stop the program. The objective of this campaign is to avoid the mismanagement of waste from the customer. Therefore, IKEA implemented product as a service concept by provide the rental service to customers and as customers own nothing from this concept, therefore, they will create zero waste. From this program, IKEA can use the old furniture that customers return to repair, refurbish, and make it available for the next rent. (Peronard & Ballantyne, 2019)

Moreover, some organizations work with enterprise too. For instance, the Ellen MacArthur Foundation, on top of educating and promoting this movement, they collaborate with enterprise partners to create sustainable development toward the circular economy in terms of manufacturing and product design. Below are some examples from the collaboration;

- H&M group is a leading fashion brand that explores the possibility of manufacturing closed-loop textiles and applying a circular economy toward commercial good and non-commercial goods from brands (H&M Group, 2019)
- Unilever - and started to pilot the fast-moving circular goods and also work with the circular flow of plastic packaging. (Ellen MacArthur Foundation, n.d.a)

1.7 Circular Economy at National Level

Various countries tried to implement and adapt to the circular economy before the UN announces the Sustainable Development Goal. Ogunmakinde (2019) shows us some countries that are the very first movers toward circular economy, which are; Germany, Japan, and China.

In Japan, the movements are related to circular economy since 1970 as the government issued waste disposal law. While in 1991; Japan was the first country to enact the circular economy legislation under resource-efficient law. (Ghisellini, Cialani, & Ulgiati, 2016). Furthermore, in the year 2000, Japan also introduced the Basic Act on Establishing a Circular Society (Ogunmakinde, 2019).

In Germany, the country has adopted the law to enforce the Circular economy since the year 1972, which guiding toward environmental protection under the waste disposal act (Heck, 2006). While 1994, a sustainable development model was introduced, and in the year 1996, incorporate with a sustainable development model Heck, (2006) says that the German government introduced “Closed Substance Cycle and Waste Management Act” or “kreislaufwirtschaft” which is related to Circular economy (Ogunmakinde, 2019).

While in China, although the road map of the circular economy has adapted from Germany and Japan. China was the first country to adopt the law of circular economy at the national level. Due to their fast-economic expansion, it trades with environmental problems such as water depletion and air pollution (Yong, 2007). The program named “11th Five-Year Plan for National Economic and Social Development was written in 2004 (Winans, Kendall, & Deng, 2017). The development is classified

into three groups; micro for the enterprise level, meso for the eco-industrial parks and macro for provinces to cities (Ogunmakinde, 2019; Geng & Doberstein 2008).

In 2009, they have announced “Circular economy promotion law.” The collaboration among stakeholders, individuals, and the government tries to reduce the impacts of consumption in China. Therefore, it drives the country at a fast pace (Ogunmakinde, 2019).

1.8 Circular Economy in ASEAN

Although it is very new in ASEAN members, every member steps heavily toward Circular economy. In 2019, they have been started working with EU over the program of “EU-ASEAN High-Level Dialogue on Environment and Climate Change” (ASEAN Secretariat News, 2019). Two meetings were conducted among EU and ASEAN nations in 2019, this indicate the acceleration from the program toward circular economy especially in plastic economy which heavily affect as major problems worldwide and also future plans for Sustainable Cities and Communities, addressing ‘SMART Green ASEAN Cities (Akenji et al., 2019)

Furthermore, there are the urge to step up to industry 4.0 among ASEAN and circular economy would be the key factor to achieve industry 4.0. Since the use of industry 4.0 framework would create zero waste. And in the evaluation process if the industry can achieve circular economy it is also mean that they achieve industry 4.0 (Anbumozhi & Kimura, 2018)

1.9 Circular Economy in Thailand

Although Thailand is a country that rich in natural resources, but due to rapid economic development for decades, which spread the development from cities to rural areas under mismanagement and unsustainable exploitation of natural resources also affects environmental problems in Thailand (Feeny, 1984; Tuntawiroon,1980).

For examples; in, 2006, there were around 40,000 tons a day of waste generated in Thailand. And 48% were organic waste which mean another 52% is another kind of waste which may create the impact of the waste management in Thailand and reflect to the environmental problems (Kaosol, 2009). As a result, Wattayakorn (2006) also mentioned that 200,000 metric tons of waste discharged to the gulf of Thailand. And in some areas in the gulf got 70% pollutants. Consequently, Azad et al. (2018) stated that they have found microplastic in the commercial fish during the time they took the field research in 2017. From this evidence, there will be some effects in the ecosystem of fish in the Gulf of Thailand and this will spread as a chain effect and ultimately affect human in the future. Furthermore, in the same year, Greenpeace recommended Thailand to create a plastic management roadmap to mitigate the impact of plastic pollution on wildlife. Statistically, that marine animals in Thailand are in danger from plastic waste, 300 animals died from plastic per year. (Green peace, 2019)

Furthermore, around the year of 2017 to 2018, several areas in Thailand faced extremely high PM 2.5 throughout country. The level of PM 2.5 is immensely higher than average, and many areas reached the level that might be harmful for health condition and at worst, it costs life (Pongpiachan, 2014). Also, Marks (2011) says that Thailand faced the climate change and government need to adapt the policy to response over these serious problems

These recent events are the effects of mismanagement and unsustainable exploitation of natural resources in Thailand. And if there is no solution provided, these problems will get worse and affect larger areas with more severe damages.

Although there were some attempts to solve the problem by reorganizing the industrial sector, back in 1972 Ministry of Industry has launched the eco-development estate, which is part of the circular economy concept, but it failed due to lack of financial support from the government. Nevertheless, in 2006, Map Ta Phut was the second eco-industrial estate in Thailand, focuses on developing the industry sector and moving toward waste reduction but it was not enough for solution and the sustainability (Winans, Kendall, & Deng, 2017).

In 2018, "Thailand 4.0" has become buzz in the presses and medias, the government's twenty-year roadmap that aims to unlock the country's economic challenge. In order to sustainably develop the country, there are four core objectives of

Thailand 4.0 that government aims as a top priority: 1. Economic Propensity 2. Social Well-Being 3. Raising Human Value, and 4. Environmental Protection BCG Economy Model has also been announced as an action plan to support the core objective of Thailand 4.0 Roadmap. The BCG Economy Model consists of a bio-economy, circular economy, and green economy; this BCG model aims for sustainable development and environmental protection. This strategy also a top-down from government to the enterprise level. The concept of the Royal Thai Government aligns with the strategy which mentioned that in order to drive the sustainability model, the concept of BCG is required both in vision and strategies. It is vital to share common things among multiple stakeholders. (Buasuwan, 2018; Desatova, 2018; Ngammuangtueng, Jakrawatana, & Gheewala, 2020)

For enterprise level - Thailand Business Council For Sustainable Development or "TBCSD" has brought the issue of Thailand 4.0 and mentioned circular economy to be their critical issues in the year 2019 and ask for collaboration among 39 top industrial firms in Thailand. They published the book TBCSD Sustainable Development 2019, which reports how each corporate in Thailand starts implementing circular economy plans. From this, at the enterprise level, there are some awareness and concerns over the environmental problems. Companies start to take some actions; this implication will also lead to industrial symbiosis in the future. (Tangwanichagapong, Logan, & Visvanathan, 2020; Piyathanavong et al., 2019)

Furthermore, for SMEs, although the diversity of business may not be that broad. Several SMEs try to promote the circular economy, such as a coffee shop, that gives a discount to customers who bring their cups. Alternatively, companies that use waste to upcycle process transform waste and resell another product, such as the SCG bag, which made from a cement bag. Some business models use the concept of sharing economy; Grab, Get, Lineman, and lastly the eco refill station stores; the convenience store that customers can bring their containers to refill the goods, this will reduce unnecessary waste from packages.

Although there are some trends from consumers try to reduce the use of resources, consumers start to concern over environments, there are some products and stores that penetrate their business toward circular economy products in Thailand, but they are not much well-known only in a specific group of people.

On the average of consumer-level across Asia, there is research comparing Thai and other Asian countries; China, India, Indonesia, Malaysia, Myanmar, Singapore, and Vietnam, over the purchase intention for remanufactured products, as part of the circular economy concept. The conclusion is that Thai has the lowest purchase intention among other countries and ranked below average on environmental consciousness even though green knowledge is higher than the average of Asian countries. Lastly, comparing to the proportion among Thais in environmental conscious, the proportion of how environmental conscious is higher than high environmental conscious among Thais (Wang & Kuah, 2017). There is one evidence to answer for this result that value in each country's context is different, which shapes the behavior to behave toward the circular economy differently in both thinking, decision, and behaving (Anakwe. 2002; Dunn & Shome, 2009).

Therefore, this paper will explore that if marketers would like to intensify promotion about circular economy, what would be the key factors that switch the behavior of consumers toward the circular economy in order to support the national road map and protect the earth.

CHAPTER II

LITERATURE REVIEW

This paper aims to explore the determinant of purchase intention of circular economy products from Thai consumers and also explore the moderators which affects the purchase behavior.

The paper has developed the main theory from (Paul, Modi, & Patel, 2015) in the previous paper; it was the study about green product consumption of Indian by using the Theory of Planned Behavior. In this paper, will change the context to Thais; as in Thailand, the circular economy concept is very new and challenging. And among ASEAN countries, Thailand has the lowest purchase intention toward circular economy product (Wang & Kuah, 2017).

Therefore, this paper will study and explore the readiness of Thais toward the purchase intention of circular economy products. In addition, this paper will also explore the moderators that affect purchase intention of Thais. This study will fill the gap of previous research and provide information to use as managerial implication, get actions that humanity needs implement in order to increase the purchase intention toward circular economy products.

Research Question: What are the factors that affect a consumer's purchase intention for the circular economy product? Moreover, what and how each moderator affects purchase intention toward a circular economy product?

2.1 Circular Economy

Although circular economy is one of the emerging trends in global, there are plenty of explanation, but there is no clear, definite definition of circular economy (Park, Sakris, & Wu, 2010). There were several sources that have given the definition; a

circular economy is a systemic approach that changes the way of the linear economy from take-make-dispose principle, decoupling economic activity and finite resources depletion and generate zero waste as an ideal by using circular economy as make-use-return (MacArthur, 2013). While Prieto-Sandoval, et al. (2019) said that in order to prevent scarce resources from depletion, humanity could try to close the energy and material loops by implement cyclical and regenerative environmental innovation. Bring used material and energy process and cycle back to the system. As well as Andersen (2007) that proposed the concept of resource minimization as reduction the use of resources to create the same input. And the concept of cleaner production that minimizing the waste and emission under maximization the output.

Naustdalsslid (2014) said that the China Council for International Cooperation on Environment and Development stated that circular economy is “a generic term for reducing, reusing and recycling activities conducted in the process of production, circulation, and consumption.” (p. 305). Also, circular economy is the balance between environmental concern, resource usage and economics (Mcdowall et al., 2017; Winans, Kendall, & Deng, 2017).

Moreover, Camilleri (2018) mentioned that the change from restorative design from a circular economy helps reduce the depletion of the resources and externalities. Moreover, it provides a reverse supply chain and logistic and also radical technical design. As circular economy tries to create zero waste by cycle the waste back to use. To do this, humanity needs better design for products as the existing products may not support all materials to cycle back to the loop (Hopkinson et al., 2018). Create both eco-effectiveness and eco-efficiency (D’Amato et al., 2017). In addition, Pucha et al. (2014) stated that circular economy is the approach toward sustainable development by applying the ecological circulation of resources into the system, this application will change from the traditional consumption to the new concept as circular economy.

The circular economy concept has divided into three principles which are; one, eliminate waste and pollution. Two, keep products, materials, and components in the cycle. And three, regenerate back the natural system.

In conclusion, there are some concrete ideas that the circular economy is a closed-loop system that decoupling economic growth and natural restoration. Combine two perspectives; economic and environmental. Change from the way of linear economy

into the process of waste back to the cycle as circularity. Since it is about production, circulation, and consumption, radical innovation is required toward the circular economy approach.

2.1.1 Approaches and Concepts in Circular Economy

2.1.1.1 Cradle to cradle is the concept that is popular among researchers about circular economy, this famous concept developed from papers (Stahel, 1982; McDonough & Braungart, 2002). All of papers developed the idea of a closed-loop approach into the concept of cradle to cradle. This concept has changed the consumption of traditional consumption “cradle-to-grave” or linear economy, as “take-make-dispose” into the “cradle-to-cradle” or circular economy, as “make-use-return”. It says that resources with the linear economy, either biological or technical, always end up in the landfill become a waste. This cradle to cradle concept is also called a strategy of slow and closing the loops (Mestre & Cooper, 2017). At present, many products build to be obsolescent, do not last long eventually become a waste. Manufacturers always produce with a massive number of productions; do the one size fits everyone, which turns out to be more wasteful and inefficient as the production that produce in mass volumes and keep in stocks may turns out to be deadstock and become waste instead.

Moreover, there are technical products made from low-quality materials, and then when it is time to decompose, it shows problems of separating the components. Therewithal, sometimes face the “Monstrous Hybrid” which mixed up between many components in one product, and it is unable to degrade, and it harms the natural system for example; shoes that people wear. The shoes laces contain both biological and technical materials as the strap are made from fabric but at the edge of the lace it wrapped with plastic. And when it comes to decompose the waste where it was hard to separate the technical and biological parts (McDonough & Braungart, 2002). Therefore, to fix this problem we all should start since the product design process to make it easier to separate the waste and able to recycle 100%.

Besides, there are organizations or people talked about recycling process to save the environment, but in term of reality, it was actually downcycling, which devalues the products and may leak the contamination from materials or chemicals into the earth as toxic from the mismanagement process. Alternatively, we need to be aware

of hazardous material that fits neither biological loop nor technical loop. Lastly, it would be more effective if there is a change to use local material instead of the one-size-fits-all (McDonough & Braungart, 2002)

Stahel (1982) said that circular economy is consisted two main implications for products as slow the loops and close the loops. These two implications could support the biological loop and technical loop and lead us to succeeding the concept of circular economy.

2.1.1.2 Slow the loops involves the life extension for the material. Add some values or change the design to make the life cycle last longer. Stahel (1982) suggested that extending the product life will reduce natural resource depletion and contribute to sustainable development. The concept of this strategy mainly focuses on how to make the product last longer and slower replace with the new product. This is also link with the inertia principle which adapted from the word of Aristotle, and this concept explains that products can last long and remains to its identical (Stahel, 2010). Physical durability or the design for emotional durability could make users attached and want to keep the product longer and try to maintain its identical are also part of the slow the loops as it results in the same objective (Chapman J. 201; Tukker. 2015).

2.1.1.3 Close the loops, this is the most important concept for the circular economy as closed-loop restores all waste into its system and it is aligned with the concept of circular economy that trying to minimize waste to zero.

Therefore, close the loops concept could be the ideal implication toward circular economy. The concept could make the resources circulate back and replenish in the system and metabolism of material flow (Staphel,1982).

In Ayres & Simonis (1994) and Camilleri (2018) suggested that if there is no proper closed-loop management, there will be continuous waste that leaks out from the system, which will continuously impact the environment; nevertheless, this is not only landfill waste, but there is also some emission of gas that affects the earth.

Closed-loop system is the key concept which leads to eco-effectiveness, which means zero waste. Camilleri (2018) also said that the close loop is the important part of restoration from restorative design and provide the protection of the resources. Winans, Kendall, & Deng (2017) recommended that the industrial symbiosis is supported to achieve closed-loop strategy as waste from the output of one cycle could

be input as another cycle, which requires radical innovation to succeed. McDonough & Braungart (2002) said that in order to fix with the monstrous hybrid or to eliminate the concept of waste means to design things; products, packaging, and systems from the beginning and the understand the concept of waste cannot be existed. Biodegradable plastic is one example that product turns back to the cycle as it goes back to the natural (Confente, Scarpi, & Russo, 2020)

In the end, it also requires either product or business design to align with a design for behavioral change. This concept facilitates customers to adjust their behavior toward a more circular economy mindset in both slow the loop and close the loop. Therefore, it is the responsibility of both companies and consumers to collaborate in order to optimize both slow and close loop approaches (Wastling, Charnley, & Moreno, 2018). In additional McDonough & Braungart (2002) said that it is important for us that we need to be concerned for “Monstrous Hybrid”.

Moreover, focus specifically in the concept. The term of industrial symbiosis is one of the important terms for the circular economy. It helps complete the closed-loop system by the collaboration among firms from various industries. Lombardi & Laybourn (2012) suggested that the industrial symbiosis provides and exchanges the physical material and energy among firms and helps to create eco-innovation as it reflects cross-sectional knowledge-based sharing. This ultimately helps all industries to get the knowledge they are not familiar for waste reduction and recycling process with and lead to the helps of both financial and product performance. Baldassarre et al. (2019) also added that it could even create a new business model innovation from industrial symbiosis.

2.1.1.4 Technical and biological cycle, on top of the slow and close the loops that have mentioned above from cradle to cradle concept. MacArthur, (2013) also developed the framework of technical and biological cycle in order to visualize how to keep all the materials and components in its cycle. As these 2 cycles need to be monitored and managed properly to keep the materials in the flow and achieve circular economy approach.

MacArthur, (2013) also called the technical and biological cycle as “Butterfly Diagram”. Figure 2.1 explains the outline for circular economy principle

which aim to create zero waste by splitting the products into two cycles or as the wings of the butterfly; one side is biological cycle, and another is technical cycle.

The diagram aims to accomplish three principles of the circular economy, which are; one, eliminate waste and pollution. Two, keep products, materials, and components in the cycle. And three, regenerate back the system where it belongs. (MacArthur, 2013; Camacho-Otero, Boks, & Pettersen, 2018).

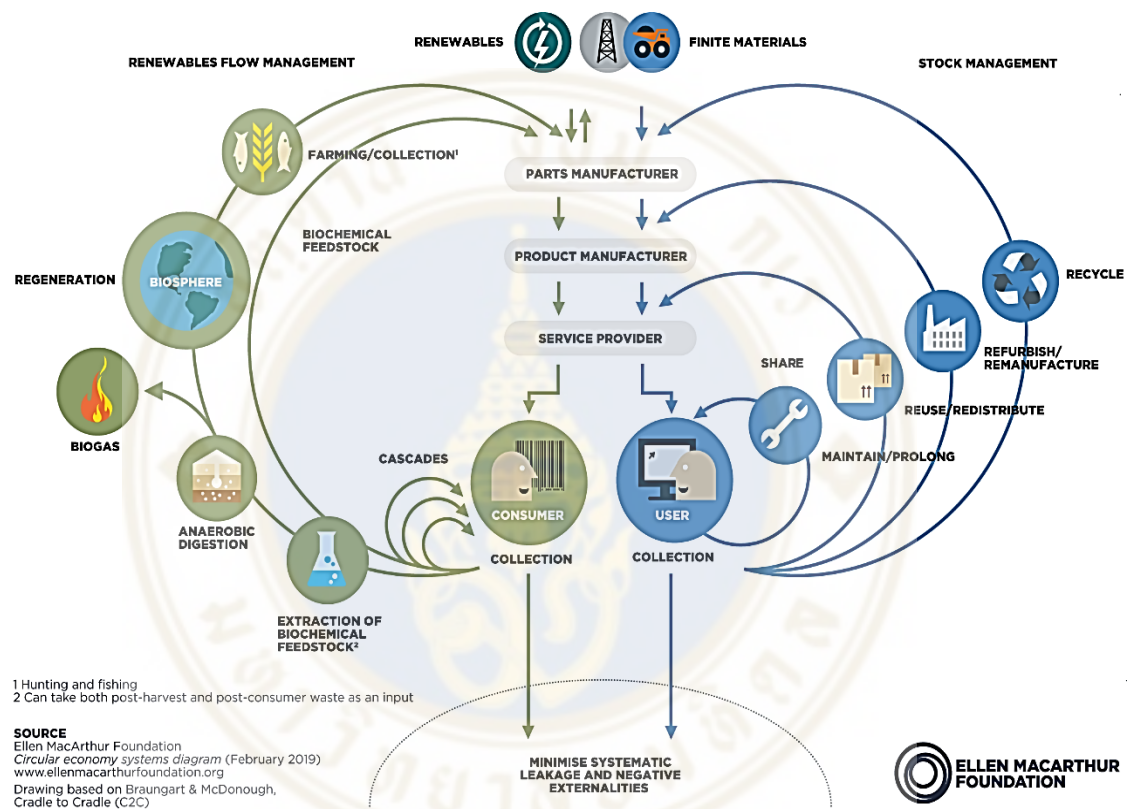


Figure 2. 1 Butterfly Diagram (Ellen MacArthur Foundation, n.d.a.)

In Figure 2.1, the figure describes the diagram that visualized all the loops in the circular economy approach; technical loop and biological loop.

Biological cycle, if it is well managed and do it properly, after consumption, these waste from biological materials will return to the nature and regenerate back to the cycle as a new natural resource. To better understanding, it compares to the apple drops from the tree, it gets rotten and goes back as the fertilizer under the tree, then the tree will regenerate new apples.

Or another example, once it is depleted and turn to the decomposition process, cotton or wood from one product will be the waste. Then these wastes which belong to the biological loop, would return to nature then regenerate. Natural waste always go back to its nature (if it is not monstrous hybrid). Each cycle has its length of time to complete, but humans are the ones who destroy or intervene in the length. (Murray, Skene, & Haynes, 2015; McDonough & Braungart, 2002).

In conclusion, figure 2.1 explains that biological cycle is about regeneration and renew toward biosphere. As natural waste can decompose back to the earth and reuse it again in the biological cycle.

Technical cycle, on the other hand, recovers and restores products materials and components to its cycle like process of reuse, repair, et cetera. For example, components part like the monitor of laptop could have taken back repair then reinstall into the new model for new products, or refurbish the defected products and sell to customers. For this technical cycle, there is another type of recycling concept as an upcycle, which means recycling waste, making the product usable again while adding more values or features to the product to make the material more valuable. It is the job for both consumers and manufacturers to collaborate and keep the technical parts in the loop. The loop cannot be completed if it misses one party; customers cannot fulfil the technical loop by bring back the materials to reprocess alone while the manufacturers also cannot reprocess if the customers do not send back the materials. In figure 2.1, in this cycle, the product life can be maintained as maintenance process and once it ends the life cycle, there are process of reuse, refurbish and recycle the technical waste in the cycle.

Therefore, from these two cycles, if ideally implemented correctly, there will be zero waste create from circular economy concept. Everything will be taken back to the loop, which brings back the second life of waste.

2.1.1.5 Eco-efficiency and eco-effectiveness. As these two terms are the concept toward the circular economy. It is the key objective of both biological and technical loop and cradle to cradle concept driving toward sustainability. These two terms seem similar but in term of the results are very different between these concepts.

For eco-efficiency, McDonough & Braungart (2002) defined it as the way to operate the industry in a cleaner and better way for humans and the environment under ethical concerns. It is also described as a simple concept of “More for less.” This shows that its part of the strategy to reduce the pollution but not 100% eliminate the waste, the less eco-efficiency, the more pollution creates.

There was the additional explanation from Ellen MacArthur Foundation that the eco-efficiency can be found in both linear and circular economy (Ellen MacArthur Foundation, 2012) From this view, there was another paper to support the concept. The paper was from Braungart et al. (2007) which mentioned that eco-efficiency alone would not be able to alter linear economy into the circular economy. In the end, there was a quote that says that “Less bad is no good” (p. 1339). As there is still some waste from the eco-efficiency. Although you reduce and minimize the generation of waste, but there are still some wastes left to handle. The eco-efficiency alone would not help create zero waste.

While, eco-effectiveness defined as a redesign of the products to make the best use of material, aim to create cyclical metabolism of material flow, and create zero waste cycle as cradle to cradle concept (MacArthur, 2013; McDonough & Braungart, 2002). This means maintaining or upgrading the quality of resources would be included in the concept of eco-effectiveness. In addition, one waste from one cycle could be input for another production cycle (Braungart, McDonough, & Bollinger, 2007). For example, the waste from PET bottles could be the material to produce shirts or waste from tires could be the material to produce bags. Lastly, the eco-effectiveness could also be found in the concept of design to redesign and the product will also be environmentally friendly and the ultimate goal that transforms from eco-efficiency into eco-effectiveness (Murray, Skene, & Haynes, 2015).

On the other hand, Braungart, McDonough, & Bollinger (2007) also stated that eco-efficiency and eco-effectiveness could complement and support each other. If

we can achieve eco-efficiency, eco-efficiency will develop and improve the outcome and finally we can reach eco-effectiveness.

In the end, toward circular economy, the environmentalist should focus on eco-effectiveness instead of eco-efficiency as the eco-effectiveness is the ultimate goal to achieve in the circular economy concept. But also cannot neglect the eco-efficiency as the eco-efficiency also lead to eco-effectiveness.

2.1.1.6 Implications from researchers in the circular economy.

In order to achieve the circular economy, there are numerous sources recommended various of re- concepts. Below are some of the examples;

- European Waste Framework has issued a directive framework about the management of waste. This framework consists of 3Rs; Reuse, Recycling, and Recovery (European Commission, 2008).
- While for Wang, Wiegerinck, Krikke, & Zhang (2013) said that the circular economy has changed from traditional view (high input while high pollution) into new extensive economic development that focuses on 3Rs – Reduction, Reuse and Recycle which these also apply with the Government of China on Circular economy Promotion Law which enforces on these 3Rs.
- Prakash, (2002) recommended 5Rs as Repair, Recondition, would work to slow the loops. Furthermore, Remanufacture, Reuse, and Recycle would work on the close the loop strategies.
- Murray, Skene, & Haynes (2015) said that restorative very prominent one. As humans have damaged the world, the reduction was not enough. Humans need to restore the nature too.
- Hollander, Bakker, & Jan Hultink (2017) mentioned that in the product recovery phase during the design for product integrity. The authors recommended the concept of reversing obsolescence that would change the obsolete products and revalue it by Re-contextualising (Change product into a different context than its former form) plus Repair, Refurbish, and Remanufacturing.
- For WRAP – or The Waste and Resources Action Programme, another charity organization from the UK that also works for a circular economy. They only mentioned 2Rs for Recover and Regenerate in their Circular economy cycle (The Waste and Resources Action Programme, n.d.)

- Stahel, (1982) suggested that there should be 4R; Reuse, Repair, Recondition and Recycling to make the product last longer (a concept from product-life extension which is part of Circular economy)
- There was one journal that explains up to 9Rs consisted of Refuse, Rethink, Reduce, Reuse, Repair, Refurbish, Remanufacture, Repurpose, Recycle, Recover, (Kirchherr, Reike, & Hekkert, 2017)
- Originally McDonough & Braungart (2002) mentioned 4Rs as Reduce, Reuse, Recycle, and Regulate in their book.
- Lastly, Jawahir & Bradley (2016) suggested 6Rs as Reduce, Recycle, Redesign, Remanufacture, and Recover for the multiple product life-cycles.
- While Ellen MacArthur Foundation also has its own Re framework that guides the organizations like business or country toward the circular economy. The framework is called “ReSOLVE”, which consists of; Regenerate, Share, Optimize, Loop, Virtualize, and Exchange (Ellen MacArthur Foundation, n.d.b.).

In conclusion, there was no definite concept on which is the best implication for circular economy, but all were set under the goals of slow and close the loop. Moreover, since circular economy is a very new concept, and it may need a radical change in product and business model, in the future, there could be more implications to support circular economy,

2.1.1.7 Product Service System, since the concept of the circular economy is about waste return back to the loop. On top of restorative design, sometimes there is a need of services to drive toward circular economy. Various works of literature use services to help drive the concept since customers alone are not capable to perform the circular economy as they cannot circulate the waste into the loop. Therefore, some of the business models of the circular economy concept also include the product-service system, especially in sharing economy and collaborative consumption. Camacho-Otero, Boks, & Pettersen (2018) and Peronard, & Ballantyne (2019) said that service has a vital role in advancing to circular economy. Service can help facilitate the backflow of materials into the system.

Moreover, service can also play as a part of the value creation process. In some cases that customers do not own the product, they pay less care to take care of the product, which might affect the useful life of the products. Therefore, the service providers can help maintain and prolong the life of the product by collaborating with customers which suit with the slow the loop of the circular economy (Tukker, 2015).

Therefore, the manufacturer could use a product-service system to engage with customers and extend life in order to. The service provider can dictate the life of the products. The product service system facilitates all stages from purchase until disposal, which means that proper waste management could be from a service provider. Or service provider would facilitate and accommodate customers for disposal stage which increase the chance of becoming more toward close loop system Camilleri (2018).

2.1.2 Circular and Green Economy

Since circular economy approach is very new in Thailand. Compare to green economy which has been talked, discussed and implemented for quite sometimes which led to more academic journals of green economy. There were journals and conferences about green marketing in Thailand such as CMMU (2020) set up the conference about the green behavior for Thai consumers. Maichum, Parichatnon, & Peng (2017) mentioned about green product consumption from the perspective of young Thais as environmental concern and environmental attitude affected the purchase intention. Maichum, Parichatnon, & Peng (2016) studied the purchase intention of green products

in Thailand with moderating effect of environmental concern and environmental knowledge. Johri, & Sahasakmontri (1998) explored the green marketing in cosmetic products in Thailand. Furthermore, the government agency has also pushed toward the green economy more than the research papers of circular economy (NSTDA, 2019).

While circular economy, there are merely none for academic journal. Since it is very new and not much article about circular economy, people may not understand what the circular economy is, and may misunderstand the concept of circular economy with green economy. Therefore, this paper will distinguish both concepts. Hence, in this section, will discuss the fundamental concepts of green and circular economy and identify the common and the different among these two concepts.

If we focus in the concept of the green economy concept from UNEP. It aimed for three main focuses; environmental sustainability or reduce environmental risks, economic growth, and well-being for the humanity. The concept drives toward the reduction of carbon emission, preserve, and conserve the source of nature. Moreover, this also created concepts like green building, green products, et cetera, which reduce the use of natural resources and try to make the least use of it. (UN Environment Program, n.d.)

D' Amato et al. (2017) stated that the circular economy and the green economy are in the mainstream of the academic around the world. These concepts are inter-related and have something in common. The essential part is that the green economy is the umbrella concept of the circular economy. The green economy focuses on the reduction of resources and the preservation of resources. The implications of green economy are reuse, recycling, and reduction. The key point is recycling method; it can be separated into both upcycling and downcycling, but in the context of green economy, they would assumed it to be downcycling as the main objective is to reduce the waste but does not focus on adding value to the waste. Moreover, green economy focuses on eco-efficiency and sustainability like a circular economy as it is circular economy's umbrella; green economy is as ideation and concept, while circular economy is the operating part. (Loiseau et al., 2016). On the other hand, for the circular economy, the concept emphasizes on the upcycle approach as trying to create and add value for the waste and provides the nature-based solution as a part of being green.

Loiseau et al. (2016) also mentioned other green economy concept which relates to the objective of economic growth, environmental sustainability, and people's well-being. Furthermore, the most mentioned keyword for the green economy is sustainability.

Moreover, in D'Amato, Korhonen, & Toppinen (2019) suggested that the circular economy and green economy have resource efficiency and clean technology in common. While the circular economy is tend toward the circularity of the production system, the green economy aims for more natural-based solutions.

Borel-Saladin, & Turok (2013) said that the green economy's primary focus is the relationship between the environment and economics. Green economy also aims for green growth, which is repairing the environment and related to social problems while trying to push economic growth.

Besides, if take a closer look for the outcomes; this shows that the related products about green economy cover three dimensions; social, economic and environment with eco-efficiency concept; for example, the alternative energy, Carbon footprint labeling product, or some social enterprise projects like the organic fruits from farmers, or green building, green manufacturing, et cetera. In contrast, the circular economy products cover something related with technical and biological loop, which reduces the waste to zero. For example; biodegradable cups that can be decomposed, upcycling products, sharing economy platforms, or refilling stations, and et cetera. As the circular economy concept emphasizes on the restorative design, a design that can restore the waste to its cycle.

Furthermore, between 2 concepts; the green economy is more concern toward eco-efficiency as they try to reduce, preserve the natural materials and reduce the emission while the circular economy is tend toward more eco-effectiveness which more intensive in term of resources based as they try to make zero waste and everything will be circulated in the cycle. Lastly, the circular economy is trying the concept of restoration by providing restorative design or restorative processes to restore the natural parts by using biological loops.

To sum up, figure 2.2 is the conclusion from all the key concepts above for the differences between green economy and circular economy. The key concept of the green economy is broader than the circular economy. Green economy focuses on three

dimensions; economic growth, social equality, and reduce environmental risk. In contrast, the circular economy focuses on only two dimensions; economic and environment. But on the environment side of the circular economy will aim to create zero waste as the primary objective which get support from the concept of cradle-to-cradle, industrial symbiosis, restorative design and eco-effectiveness. In addition, resource efficiency and sustainability are two things in common between two concepts.

To make it easier to understand. In figure 2.3, the table shows some examples as the result from these two models. We can see that green economy examples are stick with the core of environmental and ecological risk reduction plus aim to provide better well-being. On the other hand, the circular economy side focus on maintain the product life and reduce the waste to zero.

For the green economy, in this figure, the example shows as; the first one, green building. In this building, it tries to reduce the energy lost by create eco-efficiency. Second, energy preservation electricity. Third, carbon footprint labelled products; all the products try to reduce the carbon emission. Fourth, social enterprise project; as it helps lifts up the living standard. Increase socially well-being. And fifth, the use of alternative energy, the cleaner energy and safer for the environment.

While the circular economy products start with the biodegradable product, this kind of product can decompose and go back to the nature as the concept of close the loop. For example, the biodegradable coffee cups. Second, longer life time product. These products are linked with slow the loop implication. The product is designed and made to last longer than ordinary product. Third, upcycle product. As a part of close the loop, the upcycle process will bring waste to transform by up value the waste. In this case, marketers bring cement bag and transform it to the bag. Fourth, packaging free business. This implication contains of various methods under the objective of zero waste. In this example, there are the refill stores and portable coffee cup. And the last one, sharing economy is also count as circular economy concept. As sharing economy create zero waste. In this economy, we own nothing, and from this we create zero waste.

Therefore, the circular economy concept is pushing products toward longer cycle, able to bring back to use or even provide the service to create zero waste.

There are some conventional approaches like recycling and reuse as part of both concepts, and either approach tries to drive the world toward sustainability, and the

UN mentions both concepts as part of the UN Sustainable Development Goal. These concepts are both most used among academic journals and organizations these days.

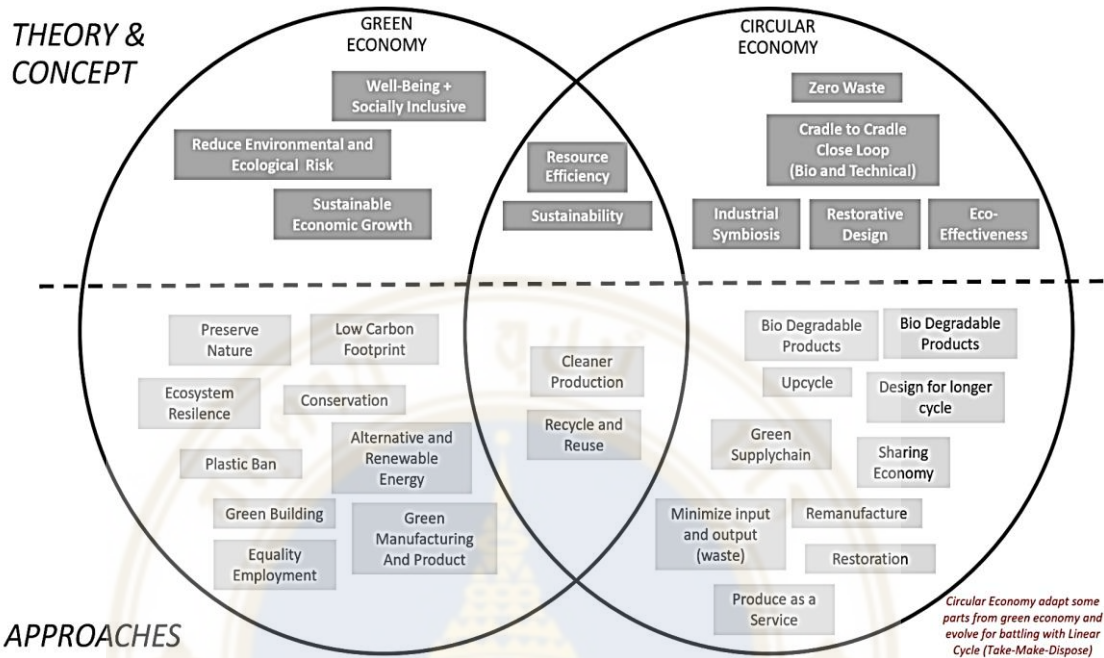


Figure 2. 2 Comparison of Green economy and Circular economy



Figure 2. 3 : Examples of Green and Circular economy products and services

2.2 Theory of Planned Behavior

The Theory of Planned Behavior found by Ajzen is the theory used to predict people's behavior (Ajzen, 1991). It derived from the Theory of Reasoned Action (Fishbein, 1979). It is the framework that guides the willingness or intention to respond in a particular behavior under consideration (Ajzen, 1991). Montano et al. (2008) said that the Theory of Planned Behavior is well-known, well-accepted, and successfully used to predict behavior.

There are many researchers used the Theory of Planned Behavior. For example; predict green hotel visit from young Indian (Verma & Chandra, 2017). Exploration of the purchase intention of green skincare products (Hsu, Chang, & Yansritakul, 2017). The purchase intention of remanufactured products in Malaysia (Kuan-Siew & Hazen, 2016). The exploration of the purchase intention toward remanufactured products in closed-loop supply chains in China (Wang, Wiegerinck, Krikke, & Zhang, 2013). Even the case of Theory of Planned Behavior which can predict dishonest actions (Beck & Ajzen, 1991). More importantly, there was paper that use this theory to explain the intention to purchase green products in Thailand (Maichum, Parichatnon, & Peng, 2016). These are many examples that research papers around the world use Theory of Planned Behavior in order to predict green or environmental behavior.

In the Theory of Planned Behavior, there are four variables; attitude toward behavior, subjective norm, perceived behavioral control and intention toward behavior. These four variables lead to the intention then lead to perform behavior.

2.2.1 Attitude Toward Behavior

Attitude toward behavior is a degree of preference of a particular person toward one specific thing. The degree can vary from negative to positive (Ajzen, 1991). Furthermore, Ajzen & Driver (1992) founded that this determinant act as the expression of one was toward intention, and it did not have a direct effect on behavior, it indirectly affects the behavior via intention. The result of the paper also shows that attitude had no significant direct contribution to behavior at all.

Montano et al. (2008) found that stronger positive attitude could lead to the higher chance of performing the action. Moreover, Wang, Wiegerinck, Krikke, & Zhang (2013) found that attitude toward a behavior was the most influential variable toward purchase intention. As well as Paul, Modi, & Patel (2015) which mentioned in the research that attitude toward behavior had the strongest link for purchase intention in green behavior consumption, if the attitude was positive, it is more likely that respondents would perform the action. Lastly, Kuan-Siew & Hazen (2016) also found that attitude toward behavior could lead to remanufactured products' purchase intention. On the contrary, Strydom (2018) could not find that attitude toward behavior has a relationship with the intention at all in term of green behavior.

Therefore, we can test the attitude of Thais toward purchase the circular economy products since this maybe the strongest variable to perform the purchase intention.

2.2.2 Subjective Norm

Subjective norm is the pressure from the social that impacts the persons' decision-making process to act on a particular action (Ajzen, 1991). This pressure can be referred to; friends, family, government, or other institutions, et cetera. The papers of Kuan-Siew & Hazen (2016) and Conner & Armitage (1998) described that it is the social expectation from one person's assessment that what social will think if he/she conducts the specific behavior.

In the paper of Gaur et al. (2019), it said that the result from the research was found that once people moved into the different place which affected with social pressure and norm, this also led to different purchase intention, it changed the outcome of behavior differently. Kuan-Siew & Hazen (2016) found that subjective norm could lead to the purchase intention for remanufactured products. Furthermore, Albayrak, Aksoy, & Caber (2013) and Bong Ko, Jin (2017) were also found that subjective norm was the most influential for green behavior.

In addition, Chan & Lau (2002) found the interesting result that in the different of social context, the social norm had different degree that influence toward purchase intention in cross cultural study. In the paper, the subjective norm for Chinese customers was stronger than American. And the subjective norm was stronger than

attitude toward behavior unlike American that attitude toward behavior was the most influential variable. While in Bong Ko, & Jin (2017) found that in both Chinese customers and American, subjective norm was the most influential factor in purchase green apparel. On top of this, Soojung, Joonghwa, & Doyle (2015) also found that social media could lead to social pressure on people for their behavioral intention.

On the contrary, Godin & Kok (1996) said that the subjective norm was the least effect variable toward behavioral intention compared with attitude toward behavior and perceived behavioral control. Furthermore, as same as the attitude toward behavior, the subjective norm had no direct relationship toward behavior and need behavioral intention as an antecedent (Ajzen & Driver, 1992).

Hence, this variable may provide the interesting result. Since Bong Ko, & Jin (2017) said that the cultural difference could vary the subjective norms and purchase intention. Therefore, this paper will explore in the context of Thai' culture to verify whether subjective norms has the relationship toward purchase intention.

2.2.3 Perceived Behavioral Control

The perceived behavioral control is the additional part of the Theory of Planned Behavior and from the Theory of Reason Action. This determinant is about the psychological interest of one specific person to act. This variable is about the ease or difficulty of conducting one particular behavior; the easier to perform, the more likely the respondent will behave in a particular way (Ajzen, 1991).

Chang, (1998) said that perceived behavioral control played the most significant role that affects behavioral intention. Moreover, Conner & Armitage (1998) said that we were unlikely to carry out the behavior that we have no control. Furthermore, in Ajzen & Driver (1992) said that together between perceived behavioral control and intention were enough to predict the behavior, as if the intention is constant, then the perceived behavioral control factor that without barrier helps driving the actual behavior. Hence, Montano et al. (2008) also stated that if everything was constant (attitude and subjective norm are constant), the perceived behavioral control could predict the intention of humans. This determinant is significant, the paper of Godin & Kok (1996) which found that perceived behavioral control was as important as the attitude toward behavior for explaining intention.

Furthermore, Muranko, Andrews, Chaer, & Newton (2019) said that perception could be negative or positive. If it was negative, then it may be the constraint to perform the particular behavior. Paul, Modi, & Patel (2015) also found from the research that perceived behavioral control was correlated with purchase intention. Chan & Lau (2002) found that perceived behavioral control in Chinese customers were more influential than American customers.

On the contrary, for remanufactured product research paper from (Kuan-Siew & Hazen, 2016), they could not find that perceived behavioral control can support purchase intention. As well as Zhang (2018) also found that in term of big amount of money such as green housing, perceived behavioral control was not significance toward purchase intention in Chinese customers.

Furthermore, salient belief in Theory of Planned Behavior as Ajzen (1991) stated that three salient beliefs prevail in the three determinants: 1. Behavioral beliefs prevail determinant of attitude 2. Normative beliefs prevail determinant of subjective norms, and 3. Control beliefs prevail the determinant of perceived control. Riffai, Grant, & Edgar (2012) also said that these beliefs are the ultimate guide for human behaviors. Kalafatis, Pollard, East & Tsogas (1999) emphasize that behavioral beliefs, and normative beliefs are linked to subjective norm. While control belief is linked with perceived behavioral control. The perceived behavioral control is classify into 3 beliefs.

2.2.3.1 Behavioral beliefs or also call the individual belief or personal salient – is the personal belief of a person. It has a positive relationship with the attitude, the stronger belief, the more positive attitude that the person exhibits (Montano et al., 2008). People learn to preferred behavior that they are strongly desired to do (Ajzen, 1991). In Chang (1998) also said that it is a belief from one person that to do one behavior will lead to one consequence.

2.2.3.2 Normative belief is the belief about concern on a given particular group or individual thinking toward the behavior that will likely happen (Montano, 2008; Ajzen, 1991). For example, if we think that colleagues will be appreciated in a particular behavior, then the subjective norm will be positive and more likely to be performed.

2.2.3.3 Control belief – This is a person's perception, either from secondary information or experience. It is a belief from the judgment whether there are resources or opportunities to take some actions or not. If there are barriers or bigger threats, then it is more likely to be negative perceived behavioral control and more likely not to perform the action. Conversely, if there are significant opportunities or fewer obstacles, it is positively perceived behavioral control and more likely to take some actions (Ajzen, 1991). Verma, & Chandra (2017) also explained in the same way that people's behavioral control follows with their beliefs

2.2.4 Intention Toward Behavior

It is the main factor of the theory. This variable is an immediate antecedent that will drive to the behavior as it has a positive relationship toward behavior. It is the most influential motivational factor to drive to the actual behavior, and it is driven by three independent determinants mentioned above. This antecedent is indicated how much effort people are trying to do in order to perform behavior. It is the expression of human to perform something to achieve the goals (Godin & Kok 1996). However, it might not succeed as it also depends on non-motivational factors like skills, resources, et cetera (Ajzen & Driver, 1992; Ajzen, 1991). Lastly, in the Theory of Planned Behavior, the intention determinant is solely controlled the action (Conner & Armitage 1998).

Ajzen (1991) said that the stronger the intention, the more successful the action would likely to be. These three determinants below contribute the prediction of intention which affect the actual behavior (Ajzen & Driver, 1992)

2.2.5 Theory of Planned Behavior and Theory of Reasoned Action

Chang (1998) suggested that the Theory of Planned Behavior was more accurate than Theory of Reasoned Action, as the factor of Perceived behavioral control improves the prediction of the behavior in the study of predicting unethical action. This variable as well would suit the case of the circular economy since it is also about the judgment and ethic of people. As well as Madden, Ellen, & Ajzen (1992) that have tested the accuracy between 2 theories, the result was as well as in Chang (1998) that perceived behavioral control had a positive relationship with behavioral intention and

behavior. Moreover, they also stated that Theory of Planned Behavior which consists of perceived behavioral control could provide useful information to predict the behavior and provide more variation than Theory of Reasoned Action and with and without the level of control, Theory of Planned Behavior still provides more variation than Theory of Reason Action (Madden, Ellen, & Ajzen, 1992).

Moreover, in Riffai, Grant, & Edgar, (2012) study said that in some contexts, social norm shown as a weak determinant. Furthermore, Godin & Kok (1996) also mentioned over this point that social norm was less important compare to another two determinants which predict the behavior of human. Therefore, this paper needs to use the Theory of Planned Behavior due to if it is the Theory of Reasoned Action, there are only 2 variables; social norms and attitudes toward behaviors, these determinants are not enough for the prediction in the paper. Lastly, Madden, Ellen, & Ajzen, (1992) stated that perceived behavioral control could indirectly affect behavior, as when humans think that they have something little in control, they will have lower intention to perform behavior while having a direct effect on the actual behavior.

2.3 Moderators

2.3.1 Environmental Concern

Environmental concern is the concern over the environmental effect. The degree is varied and depends on each individual's perceived norm and the evaluation of a specific person. Stern, Dietz, & Kalof (1993) said that it may be related to knowledge, past experience, et cetera that shapes one person's perception. The environmental concern divides into three groups; 1. Egoistic (individual) 2. Social-altruistic (others) 3. Biosphere (plants and animals) means that one given problem may be affected with either egoistic or social or biosphere or all of them. Stern and Dietz (1994) suggested that for egoistic are those who concerned only for themselves as self-interest, they are concerned about the environment if they feel that they could benefit or get penalty from it. At the same time, social altruistic are thought that they are willing to sacrifice some

cost in order to protect other human beings. Lastly, some may care for others, and some may care for the whole planet as biospheric thought.

Environmental concern is one type of environmental attitude; the concern is based on a personal level (Schultz et al., 2005). The environmental concern is also a thought that wants to preserve for future generations (Fransson, & Gärling, 1999). And since the environmental concern is the attitude, they had a direct relationship with purchase intention (Paul, Modi, & Patel, 2015). Furthermore, Schultz et al. (2005) also found that the degree of environmental concern varied by the cultural context as one country feels more concerned than another country. Stern & Dietz (1994) also supported similar thoughts to Schultz et al. (2005) as social context reflected with the different degree of environmental concern. Sun et al. (2017) also found that environmental concern had a large effect toward the attitude of consumers. Furthermore, Stern, Dietz, & Kalof (1993) suggested that if people held a belief in an egoistic view, then the purchase intention would be strongly related to environmental concern in the case of self-experience. While Poortinga, Steg, Vlek (2004) found that environmental concern attitude was related to value for public goods and negatively effect on owns prosperity thought. More importantly, And Yadav & Pathak (2016) found that environmental concern moderated attitude toward behavior toward purchase intention. Lastly, Albayrak, Aksoy, &Caber (2013) found that the environmental control could lead attitude toward behavior and subjective norm to purchase intention toward green products.

In contrast Chaudhary, & Bisai (2018) found that environmental concern could not moderate any variable in Theory of Planned Behavior toward purchase green products for young Indian at all. And Maichum, Parichatnon, & Peng (2016) found that in term of purchase intention toward green product, environmental concern could moderate perceived behavioral control and attitude toward behavior but may not moderate the subjective norm.

Therefore, this research paper will explore further for this variable and try to find the result whether environmental can moderate variables toward purchase intention.

2.3.2 Price Sensitivity

Ghali-Zinoubi & Toukabri (2019) said that price sensitivity is related to the sensitivity of customers toward the prices. It affects the decision-making process. Comparison between two types of customers; higher sensitivity affects as the higher the price, the less likely customers to purchase products. While lower sensitivity reflects as the more likely customers will purchase products. Moreover, in their paper, they found that price sensitivity would be lower if the products provided more benefits and superiority. Hsu, Chang, & Yansritakul (2017) found that price sensitivity toward green skincare products could moderate all three variables; attitude toward behavior, subjective norm, and perceived behavioral control toward purchase intention.

Wang, Pham, Dang, & Van (2020) found that with price sensitivity, customers would take the price to be the critical factor for evaluation to purchase products. Furthermore, it suggested that the lower price sensitivity, the higher the moderating effect of perceived quality and purchase intention on organic foods, this was the evidence to consider price sensitivity to be the key moderator in the purchase intention of circular economy products.

Stall-meadows and Davey (2013) found that if customers were aware of the environmental problem, they were willing to pay more on the green products. Furthermore, those who have experience buying green would be more likely to pay more for the next product. While D'Souza et al. (2007) said that if in the context of green products, people were more price sensitive than ordinary products, therefore, the products need to offer something unique and really differentiated. Furthermore, Yue et al. (2020) also found that if customers were more environmental concern, customers with lower price sensitivity were willing to buy green products. And Chaudhary, & Bisai (2018) found that younger generation in India was tend to purchase green products, they had the willingness to pay toward green purchase. Liang et al. (2017) found that in the similar product, price differences could lead to the different decision of higher price sensitivity of customers.

Therefore, price is the important moderator that we could explore it would affect with the purchase intention among Thais.

2.3.3 Product Involvement

Te'eni-Harari, Lehman-Wilzig, & Lampert (2009) said that product involvement is the degree that individual pays involvement toward the features of the specific object which result in a different degree of each people feel toward the same object which depends on individual factor; belief, values, thoughts, experience, et cetera. Therefore, a different category of products will reflect different involvement in each individual.

Buchholz & Smith (1991) said that higher involvement customers, they were willing to pay more attention to the product and also focus more on brands. Customers were willing to pay attention and push more effort to search for more information to purchase products. At the same time, low involvement reflected in a little effort for information. The degree of involvement depends on the product category. Ghali-Zinoubi & Toukabri (2019) said that involvement affected with purchase intention.

Drossos & Fouskas (2010) said that low involvement products were related to lower price, little social concern, and limited purchase decision making. Moreover, they found that only cognitive involvement was related to purchase intention, while affective involvement was not. Putrevu and Lord (2013) said that cognitive involvement was related to utilitarian values, while affective involvement was for hedonic values.

Rahman (2017) said that involvement influenced the attitude and behavior of the individual. For purchase intention, it varies across environmental products, and it was evaluated differently by product category, and product involvement be a part that associated with the product category. For example, high involvement customers were not willing to pay more on the green car (hybrid car). In contrast, in a category of wine, they were willing to. Higher product involvement would need time to evaluate the attribute, information, and prices, and lower product involvement is the opposite.

In the end, there is an assumption to think that the circular economy products are the high involvement products to customers. Therefore, product involvement is selected as the moderator to test whether it can moderate purchase intention or not.

2.3.4 Perceived Convenience

There were not many environmental researches that used perceived convenience as a variable.

Sun et al. (2017) found that convenience was the key variable that made people use plastic bags as it had the most significant impact on the intention to use. In contrast with our circular economy product, since the products were not always available, then it is interesting to see whether consumers are still wanted to purchase or not. Chang, Yan, & Tseng (2012) and Matos & Krielow (2018) also found that perceived convenience played a vital role in purchase intention, as the more convenient, the more likely for purchase intention. Besides, Chang, Yan, & Tseng (2012) found that perceived convenience was about the perception of convenience toward time, place, and action. They also found that perceived convenience affected attitude toward behavior.

Lim & Kim (2011) found that perceived convenience was a key factor in TV shopping as the convenience of TV shopping could substitute mobility toward physical stores for elders. While Lim & Osman (2014) also found that perceived convenience played a significant role in purchase intention for undergraduate students.

Therefore, from these supports, there is a conclusion that perceived convenience is the key factor in customers' purchase intention.

2.3.5 Age and Gender

In Thailand, College of Management Mahidol University (CMMU) conducted research about green product purchasing behavior, and it was reflected that age and gender are a matter for green behavior (CMMU, 2020). Moreover, Han, Hsu, & Lee (2009) also said in the same direction in the research conducted in the USA, that older consumers and females tended to concern more about the environment. Therefore, age and gender were matter, and researchers should not neglect this factor.

Furthermore, in the U.K. Kanchanapibul et al. (2013) found that the younger generation seemed to have more concern about the environmental problem. While for D'Souza et al. (2007) they have found that the older generation were more concerned over the environmental impact on eco label, while the younger generation were not quite sensitive to this issue.

In addition, Schultz et al. (2005) said that different gender reflects with different behavioral intention toward environmental attitude as female provide stronger behavioral intention toward male. Stern, Dietz, & Kalof (1993) also found that female gave the stronger purchase intention toward environmental product than male as female perceived the environmental problem has potential to harm both in egoistic, social-altruistic and biosphere views more than male. Moreover, Stall-meadows & Davey (2013) indicated that females were more interested in green and are more willing to pay for green products than males.

2.4 Theoretical Framework

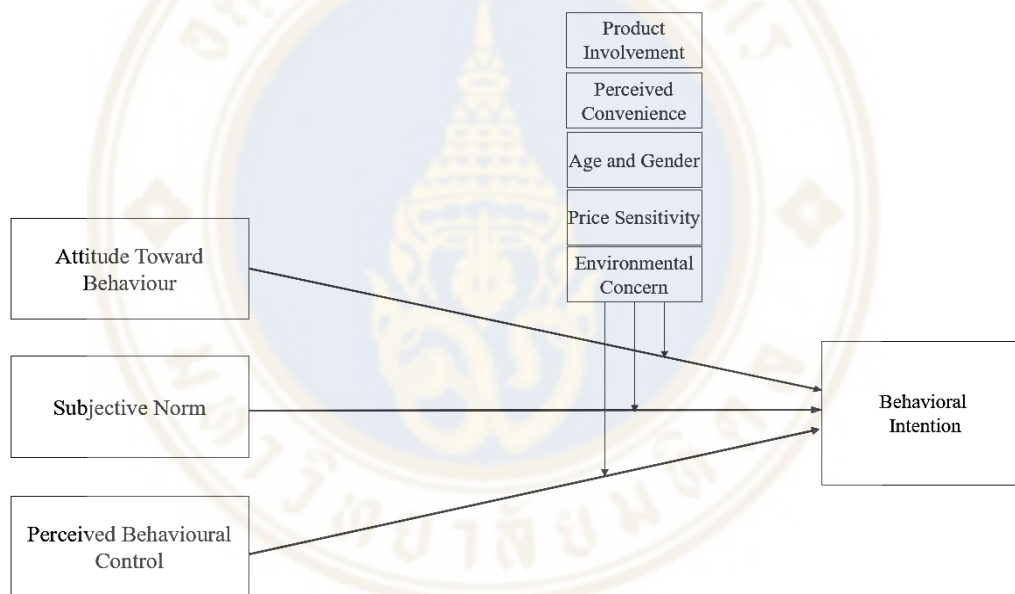


Figure 2. 4 Theoretical Framework

2.5 Hypotheses

According to figure 2.4, there are 8 hypotheses in total which are;

H1: Attitude toward CE product purchasing is positively related to circular economy products

H2: Subjective norm is positively related to the intention to purchase circular economy products

H3: Perceived Behavioral Control is positively related to intention to purchase circular economy products

H4A: With greater Environmental concern, there is a positive relationship between attitude and purchase intention

H4B: With greater Environmental concern, there is a positive relationship between subjective norm and purchase intention

H4C: With greater Environmental concern, there is a positive relationship between perceived behavioral control and purchase intention

H5A: With a greater Price Sensitivity, there is a positive relationship between attitude and purchase intention

H5B: With a greater Price Sensitivity, there is a positive relationship between subjective norm and purchase intention

H5C: With a greater Price Sensitivity, there is a positive relationship between perceived behavioral control and purchase intention

H6A: Perceived Convenience can moderate attitude for purchase intention

H6B: Perceived Convenience can moderate subjective norm for purchase intention

H6C: Perceived Convenience can moderate perceived behavioral control for purchase intention

H7A: Product Involvement moderate attitude for purchase intention

H7B: Product Involvement can moderate subjective norm for purchase intention

H7C: Product Involvement can moderate perceived behavioral control for purchase intention

H8A: Age can moderate attitude for purchase intention

H8B: Age can moderate subjective norm for purchase intention

H8C: Age can moderate perceived behavioral control for purchase intention

H8D: Gender can moderate attitude for purchase intention

H8E: Gender can moderate subjective norm for purchase intention

H8F: Gender can moderate perceived behavioral control for purchase intention

These hypotheses will be tested and analyzed with SPSS program in the next chapter.

CHAPTER III

RESEARCH METHODOLOGY

3.1 Target Population

This paper aimed to study Thais' behavioral intention toward circular economy products, then the target population were broad to cover the demography as much as this paper can. Kamenidou, Stavrianea, & Bara (2020) showed that each generation resulted as generational differences; therefore, in this paper targeted Thais in all generations. The methodology used convenience random sampling with a snowball technique by used an online questionnaire. Since it was more convenient and also reduced the environmental waste from paper and more importantly, the data collection process was limited due to the period of data collection was around May and June 2020 in which Thailand is affected by Covid-19. Therefore, it was the constraint to conduct by using paper base and gather respondents in physical. However, this paper assured that data were sufficient as the online questionnaires which covered many provinces were also efficient to predict the whole population since the internet penetration in Thailand was leapfrogged and covered most of the areas (Gray, & Sanzogni, 2004). And also found that during 2000-2009, the internet growth rate was 30% annually (Thaichon, Lobo, & Mitsis, 2014).

3.2 Measurement

Before start, the questionnaire had briefly explained the circular economy concept to respondents first. This aimed to mitigate the risk of error since the respondents may get confused and lead to the error and misunderstanding about green and circular economy concept.

The below statement is the English version of the introduction part in the questionnaire which translated from Thai version as; “The circular economy is one of the new concepts for environmentally sustainable development. This concept has the idea of reducing waste to zero by providing restorative design, more endurance products, and trying to reuse complements to be 100% of as much as possible”.

Furthermore, since the circular economy concept was broad and covered a wide range of product categories, the questionnaire needs to give some examples to respondents. Hence, the paper has used three types of products to be example; one, upcycle products; shirts from PET bottles and bags from tires, bag from canvas, bag from cement bags.”

Two, the portable coffee cups. The portable coffee cups were familiar with Thais and it was chosen because the familiarity. Three, the refill store, a place where customers can use the package to refill products. These three types of products were demonstrated as example for respondents.

Before entering the questionnaire part, the paper also made sure with respondents to use above example (Picture 1 to 4) as a reference for the circular economy concept. The English translation are below;

“Before proceed to the next part, please referred the concept of upcycle and zero waste packaging as a reference of your behavior.”

3.2.1 Pictures attached in the questionnaire



Figure 3. 1 The shirt that made from the upcycle process of PET bottle



Figure 3. 2 The bag that made from the upcycle of waste



Figure 3. 3 Refill stores (zero waste)



Figure 3. 4 Collapsible cup (Zero waste)

3.3 Questions Construct

There were 5 variables adjusted from (Paul, Modi, & Patel, 2015) for circular economy product which included; 1. Attitude toward behavior consisted of 3 questions, 2. Perceived Behavioral Control consisted of 7 questions, 3. Subjective norm consisted of 4 questions, 4. Environmental concern with 5 questions and 5. Purchase intention have 5 questions.

While perceived convenience adapted from (Chang, Yan, & Tseng, 2012) for 4 questions. Price sensitivity with 3 questions were adapted from (Hsu, Chang, & Yansritakul, 2017). And product involvement for 8 questions are adjusted from (Drossos & Fouskas, 2010)

In addition, there were 2 moderating variables to be included in the framework as age and gender. As Lee (2009) found that differences of gender affected green purchase behavior in Hongkong. And Zhao, Gao, Wu, Wang, & Zhu (2014) found that age and gender affected green consumer behavior. Therefore, this paper used age and gender to verify whether it would be the moderators for Thai's context.

3.4 Questions List

All variables excepted product involvement used 5 points Likert scale where 1 = strongly disagree, 2 = disagree, 3 = neutral, 4= agree and 5 = strongly agree.

The question lists were adapted to circular economy concept which are;

Attitude towards purchasing circular economy products; 1. I like the idea of purchasing circular economy products 2. Purchasing circular economy products is a good idea. 3. I have a favorable attitude toward purchasing circular economy version of a product.

Perceived behavioral control; 1. I believe I have the ability to purchase circular economy products. 2. If it were entirely up to me, I am confident that I will purchase circular economy products. 3. I see myself as capable of purchasing circular economy products in future. 4. I have resources, time and willingness to purchase

circular economy products. 5. Circular economy products are generally available in the shops where I usually do my shopping. 6. There are likely to be plenty of opportunities for me to purchase circular economy products. 7. I feel that purchasing circular economy products is not totally within my control.

Subjective norm; 1. Most people who are important to me think I should purchase circular economy products when going for purchasing. 2. Most people who are important to me would want me to purchase circular economy products when going for purchasing. 3. People whose opinions I value would prefer that I purchase circular economy products. 4. My friend's positive opinion influences me to purchase circular economy products.

Perceived convenience; 1. I can access to circular economy product at any time via mobile shopping 2. I can buy circular economy products at any place 3. Easily access to circular economy product is convenient for me and made me engage with circular economy 4. I feel that using circular economy product is convenience to use

Price Sensitivity; 1. It is acceptable to pay 10% more for circular economy products than for noncircular economy products. 2. I am willing to pay 10% more for circular economy products than for circular economy products. 3. I am willing to spend an extra 500 THB per month (6,000 THB per year) in order to buy circular economy products.

Environmental concern; 1. I am very concerned about the environment. 2. I would be willing to reduce my consumption to help protect the environment. 3. Major political change is necessary to protect the natural environment. 4. Major social changes are necessary to protect the natural environment. 5. Anti-pollution laws should be forced more strongly.

Purchase Intention for Circular economy Products; 1. I will consider buying products because they are less polluting in coming times. 2. I will consider switching to environmentally friendly brands for ecological reasons. 3. I plan to spend more on environmentally friendly product rather than conventional product. 4. I expect to purchase product in the future because of its positive environmental contribution. 5. I definitely want to purchase circular economy products in near future.

While product involvement used five-point semantic differential scale rating 1-5 scale anchored by not important / very important.

Product Involvement; 1. Very Important / Unimportant 2. Requires a lot of thought/ a little of thought 3. Mainly logical or objective / Not mainly logical or objective 4. Based mainly on functional facts / Not mainly on functional facts 5. Express one's personality / not express one's personality 6. Based on a lot of feeling / a little of feeling 7. Decision to buy is based on looks, design and attractiveness / not based on looks, design and attractiveness

3.5 Reliability Test and Analysis

This study used Conbach's alpha to test the reliability of all variables to verify internal consistency. All variables, attitude toward behavior, perceived behavioral control, subjective norm, perceived convenience, environmental concern, product involvement, price sensitivity, and purchase intention, were tested.

Table 3. 1 Reliability test table

Variables	Questions	Conbach's α
Attitude toward behavior	3	0.858
Perceived Behavior Control	7	0.825
Subjective Norm	4	0.882
Perceived Convenience	4	0.861
Environmental Concern	5	0.866
Product Involvement	8	0.798
Price Sensitivity	3	0.889
Purchase Intention	5	0.891

From this point, most of the variable results were more than 0.8 except product involvement was 0.798 which was very close to 0.8.

Ursachi, Zait, & Horodnic (2015) suggested that if the Conbach's α range between 0.6-0.7 is acceptable, while more than 0.8 is good. Therefore, these variables were good enough to use as the value was above 0.8 (only product involvement that was 0.798 which is very close to 0.8)

CHAPTER IV

THESIS FINDINGS

4.1 Demographic Results

This research gathered total 567 respondents across Thailand but only 559 respondents were valid (6 respondents were not willing to agree for the condition of data to be used) which 98.5% of all respondents were useable.

Table 4. 1 Socio-demographic characteristic

Attribute	N	Percent
Gender		
Male	358	60%
Female	201	40%
Location		
Bangkok and Vicinity	181	32.4%
Other provinces	378	67.6%
Generation (As of 2020)		
Baby Boomer	109	19.5%
Generation X	81	14.5%
Generation Y	133	23.8%
Millennial	236	42.2%
Total Respondents	559	

The data this paper has collected were diversified. There were respondents from different genders, ages and location. The minimum of age was 18 and the

maximum was 69. While the mean was 35.77 and the standard deviation is 15.77. The age group were ranging from Generation Z (1997 onward), Generation Y (1981-1996), Generation X (1965-1980), and Baby Boomer (1946-1964).

4.2 Descriptive Statistic

Table 4. 2 Descriptive Statistics

Variables	N	Mean	Std. Deviation
Sum attitude	559	4.2922	.67505
Sum Perceived behavioral control	559	3.7345	.64013
Sum subjective norms	559	3.5326	.82179
Sum perceived convenience	559	3.7925	.80160
Sum price sensitivity	559	3.3649	.92855
Sum environmental concern	559	4.3971	.61916
Sum product involvement	559	3.8643	.57536
Sum purchase intention	559	4.1993	.67839
Age	559	35.77	15.769
Valid N (listwise)	559		

The highest mean toward circular economy product was environmental concern. This could be predicted that the questions from this variable led toward the feeling of green more than other variables. While the lowest mean was subjective norm. But all variables were above 3 which meant that all respondents tended toward more circular economy in all variables.

On the other hand, the standard deviation, for price sensitivity held the highest standard deviation of .92855, this indicated that the respondents were varied about the price. Since the range of respondents were broad this could have affect with the price sensitivity. While the lowest standard deviation was the involvement.

4.3 Correlation

Before the interpretation of regression analysis. The partial correlation was tested to check variables were strongly correlated or not. The correlation was tested under controlled variables; age, education and income which shows in the table 4.2

The score of the partial correlation between 0.28 from correlation between price sensitivity and product involvement to 0.64 from correlation between purchase intention and environmental concern. These variables were tested and found that the correlations were not too high.



Table 4. 3 Partial Correlation Result

Control Variables			Sum Attitde	Sum Perceived Behavioral Control	Sum Subjective Norms	Sum Perceived Convenience	Sum Price Sensitivity	Sum Environmental Concern	Sum Product Involvement	Sum Purchase Intention	
Age & Education & Income	Sum attitude	Correlation	1.000	0.572	0.417	0.400	0.320	0.562	0.423	0.578	
		Significance (2-tailed)		0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		df	0	554	554	554	554	554	554	554	554
Sum perceived behavioral control		Correlation	0.572	1.000	0.656	0.605	0.517	0.452	0.452	0.527	
		Significance (2-tailed)	0.000		0.000	0.000	0.000	0.000	0.000	0.000	0.000
		df	554	0	554	554	554	554	554	554	554
Sum subjective norms		Correlation	0.417	0.656	1.000	0.534	0.443	0.359	0.427	0.448	
		Significance (2-tailed)	0.000	0.000		0.000	0.000	0.000	0.000	0.000	0.000
		df	554	554	0	554	554	554	554	554	554
Sum perceived convenience		Correlation	0.400	0.605	0.534	1.000	0.416	0.422	0.388	0.412	

Table 4.3 Partial Correlation Result (cont.)

		Sum Attitude	Sub Perceived Behavioral Control	Sub Subjective Norms	Sum Perceived Convenience	Sum Price Sensitivity	Sim Environmental Concern	Sum Product Involvement	Sim Purchase Intention
Sum price sensitivity	Significance (2-tailed)	0.000	0.000	0.000		0.000	0.000	0.000	0.000
	df	554	554	554	0	554	554	554	554
	Correlation	0.320	0.517	0.443	0.416	1.000	0.290	0.288	0.434
	Significance (2-tailed)	0.000	0.000	0.000	0.000		0.000	0.000	0.000
Sum environmental concern	df	554	554	554	554	0	554	554	554
	Correlation	0.562	0.452	0.359	0.422	0.290	1.000	0.445	0.644
	Significance (2-tailed)	0.000	0.000	0.000	0.000	0.000		0.000	0.000
	df	554	554	554	554	554	0	554	554
Sum product involvement	Correlation	0.423	0.452	0.427	0.388	0.288	0.445	1.000	0.518
	Significance (2-tailed)	0.000	0.000	0.000	0.000	0.000	0.000		0.000
	df	554	554	554	554	554	0	554	554
	Significance (2-tailed)	0.000	0.000	0.000	0.000	0.000	0.000		0.000

Table 4.3 Partial Correlation Result (cont.)

		Sum Attitude	Sub Perceived Behavioral Control	Sub Subjective Norms	Sum Perceived Convenience	Sum Price Sensitivity	Sim Environ- mental Concern	Sum Product Involvement	Sim Purch- ase Intent- ion
	df	554	554	554	554	554	554	0	554
Sum purchase intention	Correlation	0.578	0.527	0.448	0.412	0.434	0.644	0.518	1.000
	Significance (2-tailed)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
	df	554	554	554	554	554	554	554	0

4.4 SPSS Results

4.4.1 Multiple Linear Regression With 3 Variables

The analysis used multiple linear regression with 3 variables; attitude toward behavior, perceived behavioral control and subjective norm toward purchase intention.

Table 4. 4 Analysis Result 3 Variables

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.646 ^a	.417	.414	.51949

a. Predictors: (Constant), sum subjective norms, sum attitude, sum perceived behavioral control

Coefficients						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.187	.154		7.731	.000
	Sum attitude	.419	.040	.417	10.494	.000
	Sum perceived behavioal control	.213	.051	.201	4.207	.000
	Sum subjective norms	.118	.035	.143	3.361	.001

a. Dependent Variable: sum purchase intention

4.4.2 Environmental concern moderator

Furthermore, we also added environmental concern as moderator to moderate as; attitude toward behavior to purchase intention, perceived behavioral control toward purchase intention, and subjective norm toward purchase intention.

Table 4. 5 Environmental moderate attitude

		Coefficients				
		Unstandardized		Standardized		
		Coefficients		Coefficients		
Model		B	Std. Error	Beta	t	Sig.
1	(Constant)	1.045	.181		5.778	.000
	Sum attitude	.386	.040	.384	9.686	.000
	Sum perceived behavioral control	.200	.050	.189	4.005	.000
	Sum subjective norm	.130	.035	.158	3.686	.000
	Age	.006	.001	.141	4.270	.000
	Gender	.093	.046	.066	2.022	.044
	Location	-.049	.048	-.034	-1.033	.302
2	(Constant)	-.059	.735		-.080	.937
	Sum attitude	.285	.189	.283	1.509	.132
	Sum perceived behavioral control	.139	.045	.131	3.059	.002
	Sum subjective norms	.102	.032	.123	3.186	.002
	Age	.004	.001	.087	2.887	.004
	Gender	.060	.042	.043	1.452	.147
	Location	-.030	.043	-.021	-.698	.486
	Sum environmental concern	.531	.170	.484	3.122	.002
	Mod environmental concern x attitude	-.019	.043	-.131	-.436	.663

a. Dependent Variable: sum purchase intention

Table 4. 6 Environmental moderate perceived behavioral control

		Coefficients				
		Unstandardized Coefficients		Standardized Coefficients		
Model		B	Std. Error	Beta	t	Sig.
1	(Constant)	1.045	.181		5.778	.000
	Sum attitude	.386	.040	.384	9.686	.000
	Sum perceived behavioral control	.200	.050	.189	4.005	.000
	Sum subjective norm	.130	.035	.158	3.686	.000
	Age	.006	.001	.141	4.270	.000
	Gender	.093	.046	.066	2.022	.044
	Location	-.049	.048	-.034	-1.033	.302
2	(Constant)	-.807	.716		-1.127	.260
	Sum attitude	.197	.039	.196	5.005	.000
	Sum perceived behavioral control	.459	.215	.433	2.140	.033
	Sum subjective norms	.103	.032	.125	3.237	.001
	Age	.004	.001	.091	3.003	.003
	Gender	.058	.042	.041	1.388	.166
	Location	-.027	.043	-.018	-.622	.534
	Sum environmenta l concern Mod Environment al concern x perceived behavioral control	.699	.162	.638	4.305	.000
		-.071	.047	-.448	-1.527	.127

a. Dependent Variable: sum purchase intention

Table 4. 7 Environmental moderate subjective norms

		Coefficients				
		Unstandardized		Standardized		
		Coefficients		Coefficients		
Model		B	Std. Error	Beta	t	Sig.
1	(Constant)	1.045	.181		5.778	.000
	Sum attitude	.386	.040	.384	9.686	.000
	Sum					
	perceived	.200	.050	.189	4.005	.000
	behavioral					
	control					
	Sum					
	subjective	.130	.035	.158	3.686	.000
	norm					
	Age	.006	.001	.141	4.270	.000
	Gender	.093	.046	.066	2.022	.044
	Location	-.049	.048	-.034	-1.033	.302
2	(Constant)	.059	.582		.101	.920
	Sum attitude	.203	.039	.202	5.163	.000
	Sum					
	perceived	.139	.045	.131	3.055	.002
	behavioral					
	control					
	Sum					
	subjective	.164	.182	.199	.900	.368
	norms					
	Age	.004	.001	.086	2.871	.004
	Gender	.060	.042	.042	1.438	.151
	Location	-.032	.043	-.022	-.749	.454
	Sum					
	environment	.503	.132	.459	3.796	.000
	al control					
	Mod					
	environment					
	al concern x	-.014	.039	-.098	-.350	.726
	subjective					
	norms					

a. Dependent Variable: sum purchase intention

4.4.3 Price sensitivity as moderator

Moreover, we also explored price sensitivity as moderator to moderate; attitude toward behavior to purchase intention, perceived behavioral control toward purchase intention, and subjective norm toward purchase intention.

Table 4. 8 Price sensitivity moderate attitude

		Coefficients					
Model		Unstandardized		Standardized			
		Coefficients		Coefficients			
		B	Std. Error	Beta	t	Sig.	
1	(Constant)	1.045	.181		5.778	.000	
	Sum attitude	.386	.040	.384	9.686	.000	
	Sum perceived behavioral control	.200	.050	.189	4.005	.000	
	Sum subjective norm	.130	.035	.158	3.686	.000	
	Age	.006	.001	.141	4.270	.000	
	Gender	.093	.046	.066	2.022	.044	
	Location	-.049	.048	-.034	-1.033	.302	
	2	(Constant)	-.587	.492		-1.193	.233
		Sum attitude	.742	.111	.739	6.681	.000
Sum perceived behavioral control		.134	.051	.127	2.638	.009	
Sum subjective norms		.096	.035	.116	2.743	.006	
Age		.006	.001	.133	4.120	.000	
Gender		.089	.045	.063	1.993	.047	
Location		-.041	.046	-.028	-.881	.379	
Sum price sensitivity		.652	.152	.892	4.290	.000	
Mod price sensitivity x attitude	-.117	.034	-.905	-3.467	.001		

a. Dependent Variable: sum purchase intention

Table 4. 9 Price sensitivity moderate perceived behavioral control

		Coefficients					
		Unstandardized Coefficients		Standardized Coefficients			
Model		B	Std. Error	Beta	t	Sig.	
1	(Constant)	1.045	.181		5.778	.000	
	Sum attitude	.386	.040	.384	9.686	.000	
	Sum perceived behavioral control	.200	.050	.189	4.005	.000	
	Sum subjective norm	.130	.035	.158	3.686	.000	
	Age	.006	.001	.141	4.270	.000	
	Gender	.093	.046	.066	2.022	.044	
	Location	-.049	.048	-.034	-1.033	.302	
	2	(Constant)	.502	.401		1.251	.211
		Sum attitude	.380	.039	.378	9.728	.000
		Sum perceived behavioral control	.267	.112	.252	2.375	.018
Sum subjective norms		.106	.035	.128	3.011	.003	
Age		.005	.001	.123	3.788	.000	
Gender		.083	.045	.058	1.819	.069	
Location		-.043	.047	-.029	-.911	.363	
Sum price sensitivity		.295	.119	.404	2.491	.013	
Mod price sensitivity x perceived behavioral control		-.043	.030	-.315	-1.404	.161	

a. Dependent Variable: sum purchase intention

Table 4. 10 Price sensitivity moderate subjective norms

		Coefficients			
		Unstandardized Coefficients		Standardized Coefficients	
Model		B	Std. Error	Beta	t Sig.
1	(Constant)	1.045	.181		5.778 .000
	Sum attitude	.386	.040	.384	9.686 .000
	Sum perceived behavioral control	.200	.050	.189	4.005 .000
	Sum subjective norm	.130	.035	.158	3.686 .000
	Age	.006	.001	.141	4.270 .000
	Gender	.093	.046	.066	2.022 .044
	Location	-.049	.048	-.034	-1.033 .302
2	(Constant)	.624	.314		1.992 .047
	Sum attitude	.377	.039	.375	9.620 .000
	Sum perceived behavioral control	.131	.051	.124	2.554 .011
	Sum subjective norms	.220	.086	.267	2.552 .011
	Age	.005	.001	.124	3.804 .000
	Gender	.084	.045	.060	1.860 .063
	Location	-.045	.047	-.031	-.960 .338
	Sum price sensitivity	.257	.088	.351	2.926 .004
	Mod price sensitivity x subjective norms	-.035	.024	-.268	-1.478 .140

a. Dependent Variable: sum purchase intention

4.4.4 Perceived Convenience as moderator

Next, perceived convenience were tested as moderator to moderate; attitude toward behavior to purchase intention, perceived behavioral control toward purchase intention, and subjective norm toward purchase intention.

Table 4. 11 Perceived convenience moderate attitude

		Coefficients					
Model		Unstandardized Coefficients		Standardized Coefficients			
		B	Std. Error	Beta	t	Sig.	
1	(Constant)	1.045	.181		5.778	.000	
	Sum attitude	.386	.040	.384	9.686	.000	
	Sum perceived behavioral control	.200	.050	.189	4.005	.000	
	Sum subjective norm	.130	.035	.158	3.686	.000	
	Age	.006	.001	.141	4.270	.000	
	Gender	.093	.046	.066	2.022	.044	
	Location	-.049	.048	-.034	-1.033	.302	
	2	(Constant)	-1.107	.621		-1.782	.075
		Sum attitude	.845	.139	.841	6.083	.000
Sum perceived behavioral control		.178	.053	.168	3.361	.001	
Sum subjective norms		.119	.036	.145	3.334	.001	
Age		.007	.001	.166	4.914	.000	
Gender		.085	.046	.060	1.874	.061	
Location		-.034	.048	-.024	-.725	.469	
Sum perceived convenience		.648	.167	.766	3.877	.000	
Mod perceived convenience x attitude		-.134	.038	-.963	-3.488	.001	

a. Dependent Variable: sum purchase intention

Table 4. 12 Perceived convenience moderate perceived behavioral control

		Coefficients				
		Unstandardized Coefficients		Standardized Coefficients		
Model		B	Std. Error	Beta	t	Sig.
1	(Constant)	1.045	.181		5.778	.000
	Sum attitude	.386	.040	.384	9.686	.000
	Sum perceived behavioral control	.200	.050	.189	4.005	.000
	Sum subjective norm	.130	.035	.158	3.686	.000
	Age	.006	.001	.141	4.270	.000
	Gender	.093	.046	.066	2.022	.044
	Location	-.049	.048	-.034	-1.033	.302
2	(Constant)	-.612	.589		-1.038	.300
	Sum attitude	.366	.040	.365	9.192	.000
	Sum perceived behavioral control	.604	.166	.570	3.631	.000
	Sum subjective norms	.128	.036	.154	3.518	.000
	Age	.007	.001	.160	4.709	.000
	Gender	.077	.046	.055	1.680	.094
	Location	-.043	.048	-.030	-.905	.366
	Sum perceived convenience	.493	.152	.583	3.252	.001
	Mod perceived convenience x perceived control behavior	-.113	.040	-.817	-2.815	.005

a. Dependent Variable: sum purchase intention

Table 4. 13 Perceived convenience moderate subjective norms

		Coefficients				
		Unstandardized Coefficients		Standardized Coefficients		
Model		B	Std. Error	Beta	t	Sig.
1	(Constant)	1.045	.181		5.778	.000
	Sum attitude	.386	.040	.384	9.686	.000
	Sum perceived behavioral control	.200	.050	.189	4.005	.000
	Sum subjective norm	.130	.035	.158	3.686	.000
	Age	.006	.001	.141	4.270	.000
	Gender	.093	.046	.066	2.022	.044
	Location	-.049	.048	-.034	-1.033	.302
2	(Constant)	.900	.454		1.984	.048
	Sum attitude	.380	.040	.378	9.476	.000
	Sum perceived behavioral control	.162	.054	.152	2.994	.003
	Sum subjective norms	.132	.127	.160	1.043	.297
	Age	.007	.001	.161	4.709	.000
	Gender	.092	.046	.065	1.992	.047
	Location	-.054	.048	-.037	-1.129	.259
	Sum perceived convenience Mod perceived convenience x subjective norms	.095	.113	.112	.838	.402
	-.005	.031	-.038	-.157	.876	

a. Dependent Variable: sum purchase intention

4.4.5 Product involvement concern moderator

Next, product involvement was also tested as moderator to moderate; attitude toward behavior to purchase intention, perceived behavioral control toward purchase intention, and subjective norm toward purchase intention.

Table 4. 14 Product involvement moderate attitude

		Coefficients				
		Unstandardized		Standardized		
		Coefficients		Coefficients		
Model		B	Std. Error	Beta	t	Sig.
1	(Constant)	1.045	.181		5.778	.000
	Sum attitude	.386	.040	.384	9.686	.000
	Sum perceived behavioral control	.200	.050	.189	4.005	.000
	Sum subjective norm	.130	.035	.158	3.686	.000
	Age	.006	.001	.141	4.270	.000
	Gender	.093	.046	.066	2.022	.044
	Location	-.049	.048	-.034	-1.033	.302
2	(Constant)	-1.603	.793		-2.020	.044
	Sum attitude	.813	.185	.809	4.393	.000
	Sum perceived behavioral control	.146	.048	.138	3.041	.002
	Sum subjective norms	.093	.035	.112	2.680	.008
	Age	.006	.001	.131	4.159	.000
	Gender	.079	.044	.056	1.798	.073
	Location	-.021	.046	-.014	-.449	.653
	Sum product involvement	.864	.211	.733	4.091	.000
	Mod product involvement x attitude	-.131	.049	-.814	-2.684	.007

a. Dependent Variable: sum purchase intention

Table 4. 15 Product involvement moderate perceived behavioral control

		Coefficients				
		Unstandardized Coefficients		Standardized Coefficients		
	Model	B	Std. Error	Beta	t	Sig.
1	(Constant)	1.045	.181		5.778	.000
	Sum attitude	.386	.040	.384	9.686	.000
	Sum perceived behavioral control	.200	.050	.189	4.005	.000
	Sum subjective norm	.130	.035	.158	3.686	.000
	Age	.006	.001	.141	4.270	.000
	Gender	.093	.046	.066	2.022	.044
	Location	-.049	.048	-.034	-1.033	.302
2	(Constant)	-1.039	.658		-1.581	.115
	Sum attitude	.315	.039	.313	8.034	.000
	Sum perceived behavioral control	.564	.179	.533	3.152	.002
	Sum subjective norms	.091	.035	.111	2.639	.009
	Age	.005	.001	.125	3.969	.000
	Gender	.077	.044	.054	1.745	.082
	Location	-.026	.046	-.018	-.580	.562
	Sum product involvement	.710	.173	.602	4.099	.000
	Mod product involvement x perceived behavioral control	-.107	.045	-.628	-2.390	.017

a. Dependent Variable: sum purchase intention

Table 4. 16 Product involvement moderate subjective norm

		Coefficients				
		Unstandardized Coefficients		Standardized Coefficients		
	Model	B	Std. Error	Beta	t	Sig.
1	(Constant)	1.045	.181		5.778	.000
	Sum attitude	.386	.040	.384	9.686	.000
	Sum perceived behavioral control	.200	.050	.189	4.005	.000
	Sum subjective norm	.130	.035	.158	3.686	.000
	Age	.006	.001	.141	4.270	.000
	Gender	.093	.046	.066	2.022	.044
	Location	-.049	.048	-.034	-1.033	.302
2	(Constant)	-.172	.575		-.299	.765
	Sum attitude	.324	.039	.322	8.299	.000
	Sum perceived behavioral control	.154	.048	.146	3.196	.001
	Sum subjective norms	.266	.162	.323	1.646	.100
	Age	.006	.001	.128	4.051	.000
	Gender	.080	.044	.056	1.799	.073
	Location	-.030	.046	-.021	-.662	.508
	Sum product involvement	.474	.147	.402	3.224	.001
	Mod product involvement x subjective norms	-.047	.040	-.313	-1.174	.241

a. Dependent Variable: sum purchase intention

4.4.6 Age and Gender as moderator

Lastly, the analysis added age and gender as the moderator as there were some chances that age and gender could moderate the purchase intention for Thais.

Table 4. 17 Age moderate attitude

		Coefficients					
		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	
	Model	B	Std. Error	Beta			
1	(Constant)	1.045	.181		5.778	.000	
	Sum attitude	.386	.040	.384	9.686	.000	
	Sum perceived behavioral control	.200	.050	.189	4.005	.000	
	Sum subjective norm	.130	.035	.158	3.686	.000	
	Age	.006	.001	.141	4.270	.000	
	Gender	.093	.046	.066	2.022	.044	
	Location	-.049	.048	-.034	-1.033	.302	
	2	(Constant)	.650	.355		1.833	.067
		Sum attitude	.476	.080	.474	5.939	.000
Sum perceived behavioral control		.197	.050	.186	3.943	.000	
Sum subjective norms		.134	.036	.163	3.784	.000	
Age		.018	.009	.408	1.953	.051	
Gender		.094	.046	.067	2.047	.041	
Location		-.048	.048	-.033	-.997	.319	
	Mod age x attitude	-.003	.002	-.300	-1.294	.196	

a. Dependent Variable: sum purchase intention

Table 4. 18 Age moderate perceived behavioral control

		Coefficients				
		Unstandardized Coefficients		Standardized Coefficients		
Model		B	Std. Error	Beta	t	Sig.
1	(Constant)	1.045	.181		5.778	.000
	Sum attitude	.386	.040	.384	9.686	.000
	Sum perceived behavioral control	.200	.050	.189	4.005	.000
	Sum subjective norm	.130	.035	.158	3.686	.000
	Age	.006	.001	.141	4.270	.000
	Gender	.093	.046	.066	2.022	.044
	Location	-.049	.048	-.034	-1.033	.302
2	(Constant)	.435	.335		1.299	.194
	Sum attitude	.385	.040	.383	9.678	.000
	Sum perceived behavioral control	.358	.088	.338	4.050	.000
	Sum subjective norms	.131	.035	.159	3.711	.000
	Age	.023	.008	.543	2.871	.004
	Gender	.097	.046	.069	2.113	.035
	Location	-.042	.048	-.029	-.869	.385
	Mod age x perceived behavioral control	-.005	.002	-.448	-2.159	.031

a. Dependent Variable: sum purchase intention

Table 4. 19 Age moderate subjective norms

		Coefficients				
		Unstandardized		Standardized		
		Coefficients		Coefficients		
Model		B	Std. Error	Beta	t	Sig.
1	(Constant)	1.045	.181		5.778	.000
	Sum attitude	.386	.040	.384	9.686	.000
	Sum perceived behavioral control	.200	.050	.189	4.005	.000
	Sum subjective norm	.130	.035	.158	3.686	.000
	Age	.006	.001	.141	4.270	.000
	Gender	.093	.046	.066	2.022	.044
	Location	-.049	.048	-.034	-1.033	.302
2	(Constant)	.473	.283		1.672	.095
	Sum attitude	.391	.040	.389	9.853	.000
	Sum perceived behavioral control	.190	.050	.179	3.799	.000
	Sum subjective norms	.295	.072	.357	4.102	.000
	Age	.022	.006	.515	3.520	.000
	Gender	.093	.046	.066	2.022	.044
	Location	-.050	.048	-.035	-1.061	.289
	Mod age x subjective norms	-.004	.002	-.435	-2.624	.009

a. Dependent Variable: sum purchase intention

Table 4. 20 Gender moderate attitude

		Coefficients				
		Unstandardized Coefficients		Standardized Coefficients		
Model		B	Std. Error	Beta	t	Sig.
1	(Constant)	1.045	.181		5.778	.000
	Sum attitude	.386	.040	.384	9.686	.000
	Sum perceived behavioral control	.200	.050	.189	4.005	.000
	Sum subjective norm	.130	.035	.158	3.686	.000
	Age	.006	.001	.141	4.270	.000
	Gender	.093	.046	.066	2.022	.044
	Location	-.049	.048	-.034	-1.033	.302
2	(Constant)	.508	.489		1.037	.300
	Sum attitude	.513	.114	.511	4.483	.000
	Sum perceived behavioral control	.200	.050	.189	4.002	.000
	Sum subjective norms	.129	.035	.157	3.653	.000
	Age	.006	.001	.142	4.291	.000
	Gender	.427	.286	.302	1.493	.136
	Location	-.048	.048	-.033	-1.010	.313
	Mod gender x attitude	-.078	.066	-.278	-1.183	.237

a. Dependent Variable: sum purchase intention

Table 4. 21 Gender moderate perceived behavioral control

		Coefficients				
		Unstandardized Coefficients		Standardized Coefficients		
Model		B	Std. Error	Beta	t	Sig.
1	(Constant)	1.045	.181		5.778	.000
	Sum attitude	.386	.040	.384	9.686	.000
	Sum perceived behavioral control	.200	.050	.189	4.005	.000
	Sum subjective norm	.130	.035	.158	3.686	.000
	Age	.006	.001	.141	4.270	.000
	Gender	.093	.046	.066	2.022	.044
	Location	-.049	.048	-.034	-1.033	.302
2	(Constant)	.540	.448		1.206	.229
	Sum attitude	.385	.040	.383	9.670	.000
	Sum perceived behavioral control	.337	.122	.318	2.771	.006
	Sum subjective norms	.132	.035	.160	3.725	.000
	Age	.006	.001	.142	4.312	.000
	Gender	.411	.262	.291	1.570	.117
	Location	-.051	.048	-.035	-1.071	.285
	Mod gender x perceived behavioral control	-.086	.070	-.273	-1.233	.218

a. Dependent Variable: sum purchase intention

Table 4. 22 Gender moderate subjective norms

		Coefficients				
		Unstandardized Coefficients		Standardized Coefficients		
Model		B	Std. Error	Beta	t	Sig.
1	(Constant)	1.045	.181		5.778	.000
	Sum attitude	.386	.040	.384	9.686	.000
	Sum perceived behavioral control	.200	.050	.189	4.005	.000
	Sum subjective norm	.130	.035	.158	3.686	.000
	Age	.006	.001	.141	4.270	.000
	Gender	.093	.046	.066	2.022	.044
	Location	-.049	.048	-.034	-1.033	.302
2	(Constant)	.957	.352		2.721	.007
	Sum attitude	.386	.040	.384	9.658	.000
	Sum perceived behavioral control	.200	.050	.189	4.000	.000
	Sum subjective norms	.157	.098	.190	1.607	.109
	Age	.006	.001	.141	4.261	.000
	Gender	.150	.198	.106	.757	.449
	Location	-.050	.048	-.035	-1.045	.296
	Mod gender x subjective norms	-.016	.055	-.055	-.293	.770

a. Dependent Variable: sum purchase intention

4.5 Analysis Summary

Table 4. 23 SPSS Summary Table

Paths	Hypothesis	β	T Value	P-Value	Result
Attitude toward behavior toward purchase intention	H1	0.417	10.494	0.000	Supported
Perceived behavioral control toward purchase intention	H2	0.201	4.207	0.000	Supported
Subjective norms toward purchase intention	H3	0.143	3.361	0.001	Supported
Environmental Concern moderate attitude toward behavior	H4A	-0.061	-.205	0.663	Not supported
Environmental Concern moderate perceived behavioral control	H4B	-0.388	-1.325	0.127	Not supported
Environmental Concern moderates subjective norms	H4C	-0.059	-0.210	0.726	Not supported
Price Sensitivity moderate attitude toward behavior	H5A	-0.832	-3.147	0.001	Supported
Price Sensitivity moderate perceived behavioral control	H5B	-0.375	-1.655	0.161	Not supported
Price Sensitivity moderate subjective norms	H5C	-0.295	-1.615	0.140	Not supported
Perceived convenience moderate attitude toward behavior	H6A	-0.947	-3.385	0.001	Supported
Perceived convenience moderate attitude toward behavior	H6B	-0.892	-3.041	0.005	Supported
Perceived Convenience moderates subjective norms	H6C	-0.059	-0.238	0.876	Not supported
Product involvement moderate attitude toward behavior	H7A	-0.850	-2.778	0.007	Supported
Product involvement moderates perceived behavioral control	H7B	-0.734	-2.777	0.017	Supported

Table 4. 24 SPSS Summary Table (Cont)

Paths	Hypothesis	β	T Value	P-Value	Result
Product Involvement moderates subjective norms	H7C	-0.423	-1.570	0.241	Not supported
Age moderate attitude toward behavior	H8A	-0.296	-1.275	0.196	Not supported
Age moderates perceived behavioral control	H8B	-0.441	-2.218	0.031	Supported
Age moderate subjective norms	H8C	-0.435	-2.618	0.009	Supported
Gender moderate attitude toward behavior	H8D	-0.267	-1.117	0.237	Not supported
Gender moderates perceived behavioral control	H8E	-0.230	-1.022	0.218	Not supported
Gender moderate subjective norms	H8F	-0.057	-0.299	0.770	Not supported

4.6 Result and Analysis

4.6.1 P-Values

The analysis used SPSS program to analyze by multiple regression analysis for each hypothesis and found that 10 out of 21 hypotheses were supported in purchase intention of Thais toward circular economy product. In addition, the paper also used demographic (age, gender, education) as controlled variable.

First of all, H1: attitude toward behavior has the relationship toward purchase intention. This hypothesis was supported (p-value < 0.01). Furthermore, H2: perceived behavioral control has the relationship toward purchase intention. H2 was also supported (p-value < 0.01). In addition, H3: subjective norms has the relationship toward purchase intention. Therefore, H3 was also supported (p-value < 0.01).

Furthermore, the moderators ran in the multiple linear regression for analysis. The results were; environmental concern did not moderate any independent variable toward purchase intention as H4A, H4B, and H4C were predicted (p-value > 0.05).

While for price sensitivity as moderator, the analysis found that H5A: price sensitivity can moderate attitude toward behavior toward purchase intention as H5A were supported ($p\text{-value} < 0.01$). In contrast, H5B: price sensitivity can moderate perceived behavioral control and H5C: price sensitivity can moderate subjective norms were not supported ($p\text{-value} > 0.05$).

In the analysis of perceived convenience as moderator, H6A: perceived convenience can moderate attitude toward behavior toward purchase intention and H6B: perceived convenience can moderate perceived behavioral control toward purchase intention, these 2 hypotheses were supported ($p\text{-value} < .01$) while H6C: perceived convenience can moderate subjective norms was not supported.

In addition, the product involvement as moderator was also tested. And the result was H7A: product involvement can moderate attitude toward behavior for purchase intention and H7B: product involvement can moderate perceived behavioral control toward purchase intention were supported ($p\text{-value} < 0.01$ and $p\text{-value} < 0.05$ respectively). In contrast, H7C: product involvement can moderate subjective norms toward purchase intention was not supported ($p\text{-value} > 0.05$)

Lastly, for age and gender as moderator, H8B: age can moderate perceived behavioral control toward purchase intention and H8C: age can moderate subjective norms toward purchase intention were supported ($p\text{-value} < 0.05$ and $p\text{-value} < 0.01$ respectively). On the other hand, H8A : age can moderate attitude toward behavior, H8D: gender can moderate attitude toward behavior, H8E: gender can moderate perceived behavioral control and H8F: gender can moderate subjective norms were all rejected ($p\text{-value} > 0.05$)

4.6.2 R SQUARE

R Square (the coefficient of determination) is the measurement that measure the strength of the theoretical framework toward the dependent variable

We selected those hypotheses that were proved and supported then analyzed. The R Square of 3 variables; toward behavior, perceived control behavior and subjective norm have toward purchase intention was 41.4%. (For H1, H2, and H3)

4.6.3 The relationship of the moderator

Although the results has shown that some of hypotheses were supported. But for better understanding, the further analysis could the relationship of each moderator and independent variables toward purchase intention.

The method were divide each moderator into 2 groups; below the mean for one group and another group would be equal and more than the mean. Then plot the linear equation ($y= ax+b$) from the result of the analysis to see the relationship.

First, analysis from moderators which found that it could moderate attitude toward behavior.

4.6.3.1 Price sensitivity and attitude. Divided price sensitivity(PS) group in different category PS 1 was below 3.3649 and PS 2 was 3.3649 and above (compared to mean of price sensitivity which was 3.3649).

Table 4. 25 Relationship of price sensitivity (lower) that moderates Attitude

		Coefficients				
		Unstandardized Coefficients		Standardized Coefficients		
Model		B	Std. Error	Beta	t	Sig.
1	(Constant)	1.659	.193		8.578	.000
	sum_attitude	.554	.047	.563	11.873	.000

a. Dependent Variable: sum_purchase intention

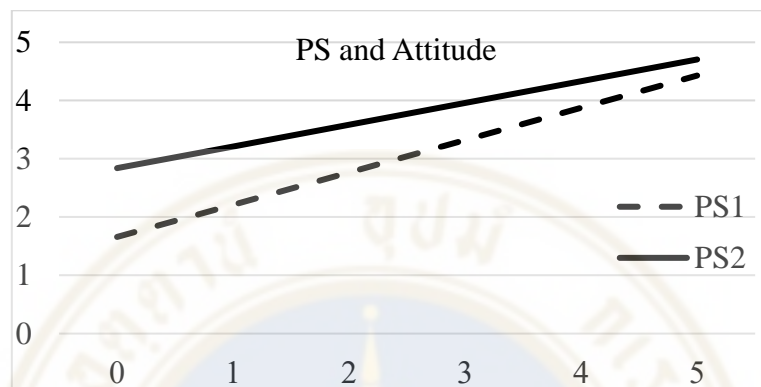
Table 4. 26 Relationship of price sensitivity (higher) that moderates Attitude

		Coefficients				
		Unstandardized Coefficients		Standardize d Coefficients		
Model		B	Std. Error	Beta	t	Sig.
1	(Constant)	2.840	.234		12.160	.000
	sum_attitude	.373	.051	.419	7.304	.000

a. Dependent Variable: sum_purchase intention

From the table 4.24 Purchase intention of lower price sensitivity (PS1) was ; purchase intention = $1.659 + .554a$ while, for group 2 according to table 4.25, equation of price sensitivity 2 (PS 2); purchase intention = $2.840 + .373a$, find the relationship with attitude toward purchase intention. Then plotted the graph as figure 4.1 shows.

Figure 4. 1 The relationship of Price Sensitivity and Attitude



From figure 4.1 shows that although the higher price sensitivity showed higher purchase intention, but both groups showed the same direction as the higher attitude, the higher purchase intention.

4.6.3.2 Perceived convenience and attitude. Divided perceived convenience group in different category perceived convenience 1 is below 3.7925 and perceived convenience 2 is 3.7925 and above then find the relationship with attitude toward purchase intention.

Table 4. 27 Relationship of perceived convenience (lower) that moderates attitude

		Coefficients				
		Unstandardized Coefficients		Standardized Coefficients		
Model		B	Std. Error	Beta	t	Sig.
1	(Constant)	1.617	.198		8.166	.000
	sum_attitude	.579	.047	.589	12.213	.000

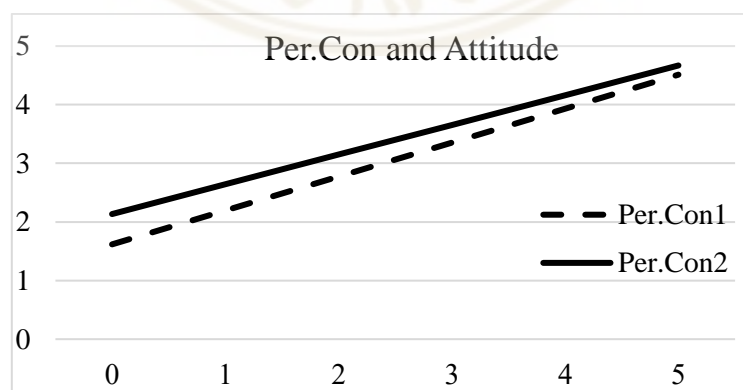
a. Dependent Variable: sum_purchase intention

Table 4. 28 Relationship of perceived convenience (higher) that moderates attitude

		Coefficients				
		Unstandardized Coefficients		Standardized Coefficients		
Model		B	Std. Error	Beta	t	Sig.
1	(Constant)	2.134	.240		8.899	.000
	sum_attitude	.507	.053	.499	9.539	.000

a. Dependent Variable: sum_purchase intention

From the table 4.26, it shows that the purchase intention of lower perceived convenience(Per.con1) ; purchase intention = 1.617 + .579a while, for group 2 (Per.con2) according to table 4.27, equation of higher price sensitivity, purchase intention = 2.134 + .507a. Then plotted the graph as figure 4.2 shows.

Figure 4. 2 The relationship of Perceived Convenience and Attitude

From figure 4.2 shows that although the higher perceived convenience showed higher purchase intention, but both groups showed the same direction as the higher attitude, the higher purchase intention.

4.6.3.3 Product involvement and attitude. Divided product involvement by mean into 2 groups in different category product involvement 1 was below 3.8643 and perceived convenience 2 was 3.8643 and above (compared to mean of product involvement which was 3.8643) and find the relationship with attitude toward purchase intention.

Table 4. 29 Relationship of product involvement (lower) that moderates attitude

		Coefficients				
		Unstandardized Coefficients		Standardized Coefficients		
Model		B	Std. Error	Beta	t	Sig.
1	(Constant)	1.568	.211		7.414	.000
	sum_attitude	.581	.052	.581	11.187	.000

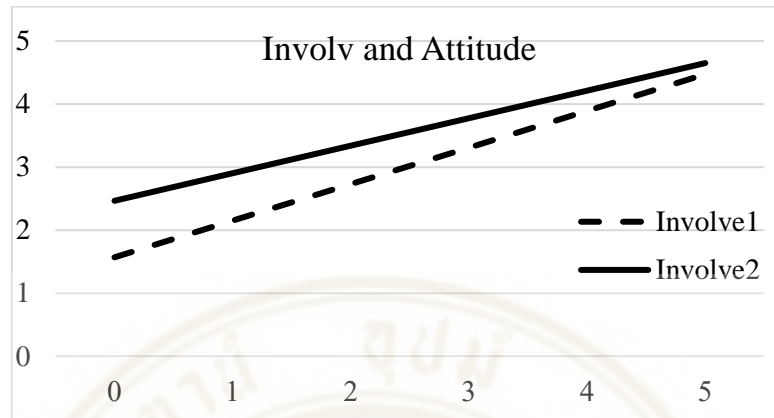
a. Dependent Variable: sum_purchase intention

Table 4. 30 Relationship of product involvement (higher) that moderates attitude

		Coefficients				
		Unstandardized Coefficients		Standardized Coefficients		
Model		B	Std. Error	Beta	t	Sig.
1	(Constant)	2.465	.228		10.813	.000
	sum_attitude	.437	.050	.444	8.719	.000

a. Dependent Variable: sum_purchase intention

From the table 4.28 equation of purchase intention of lower involvement (involve 1) was; purchase intention = 1.568 + .581a while, for group 2 according to table 4.29, equation of involvement 2 : purchase intention = 2.465 + .437a, find the relationship with attitude toward purchase intention. Then plotted the graph as figure 4.3 shows.

Figure 4. 3 The Relationship of Product Involvement and Attitude

From figure 4.3 shows that although the higher product involvement showed higher purchase intention, but both groups showed the same direction as the higher attitude, the higher purchase intention.

4.6.3.4 Perceived convenience and perceived behavioral control. According to the mean value of perceived convenience which was 3.7925 Divided perceived convenience group in different category perceived convenience 1 was below 3.7925 and perceived convenience 2 was 3.7925 and above.

Table 4. 31 Relationship of perceived convenience (lower) that moderates PBC

		Coefficients				
		Unstandardized Coefficients		Standardized Coefficients		
Model		B	Std. Error	Beta	t	Sig.
1	(Constant)	1.676	.233		7.182	.000
	sum_Perceived behavioral control	.674	.067	.515	10.083	.000

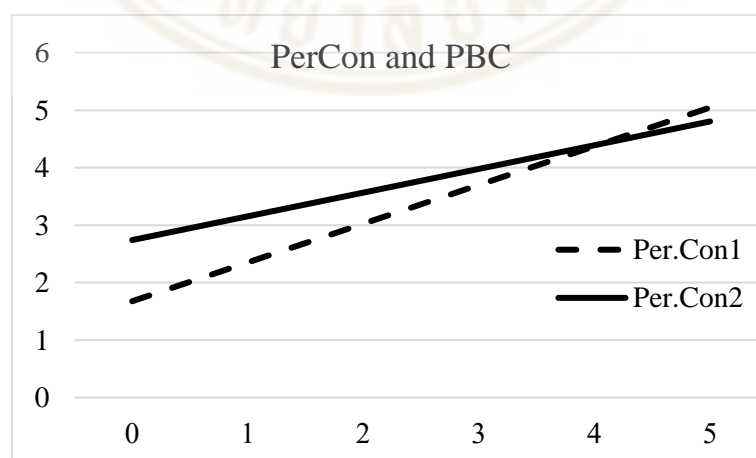
a. Dependent Variable: sum_purchase intention

Table 4. 32 Relationship of perceived convenience (higher) that moderates PBC

		Coefficients				
		Unstandardized Coefficients		Standardized Coefficients		
Model		B	Std. Error	Beta	t	Sig.
1	(Constant)	2.740	.215		12.718	.000
	sum_Perceived behavioral control	.413	.053	.427	7.806	.000

a. Dependent Variable: sum_purchase intention

From the table 4.30 equation of purchase intention of lower perceived convenience (per.con1) was ; purchase intention = 1.617 + .579a. While, for group 2 according to table 4.31, equation of higher perceived convenience (per.con2) , purchase intention = 2.740 + .413a, then find the relationship with perceived behavioral control toward purchase intention. Then plotted the graph to see the relationship as figure 4.4 shows.

Figure 4. 4 The Relationship of Perceived Convenience and PBC

From figure 4.4 shows that although the higher perceived convenience showed higher purchase intention, but both groups showed the same direction as the higher perceived behavioral control, the higher purchase intention. Furthermore, once it reaches one point, the higher perceived behavioral control would push purchase intention of lower perceived convenience group (Per.Con1) to be higher than higher perceived convenience group (Per.Con2) .

4.6.3.5 Product involvement and perceived behavioral control.

According to the mean value of product involvement which was 3.8643 divided product involvement group in different category product involvement 1 was below 3.8643 and product involvement 2 was 3.8643 and above (mean of product involvement was 3.8643)

Table 4. 33 Relationship of product involvement (lower) that moderates PBC

		Coefficients				
		Unstandardized Coefficients		Standardized Coefficients		
Model		B	Std. Error	Beta	t	Sig.
1	(Constant)	1.811	.229		7.894	.000
	Sum	.594	.064	.508	9.230	.000
	perceived behavioral control					

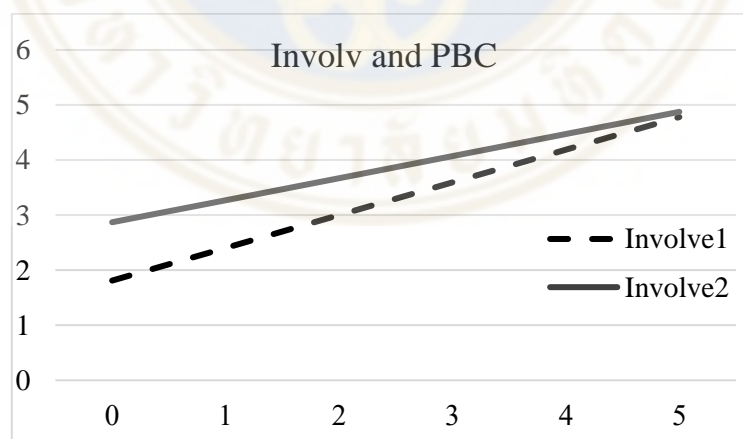
a. Dependent Variable: sum purchase intention

Table 4. 34 Relationship of product involvement (higher) that moderates PBC

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	2.871	.180		15.940	.000
	Sum	.401	.046	.447	8.804	.000
	perceived behavioral control					

a. Dependent Variable: sum purchase intention

From the table 4.32 equation of purchase intention of lower involvement (involve1) was; purchase intention = 1.811 + .594a while, for group 2 according to table 4.33, equation of higher product involvement (involve2) , purchase intention = 2.871 + .401a, then find the relationship with perceived behavioral control toward purchase intention. After that the analysis, the graph was completed as figure 4.5

Figure 4. 5 The Relationship of Product Involvement and PBC

From figure 4.5, it shows that although the higher product involvement showed higher purchase intention, both groups showed the same direction as the higher perceived behavioral control, the higher purchase intention. Furthermore, once it reaches one point, the higher perceived behavioral control would push purchase

intention of lower product involvement group (Involve1) to be almost equal with higher product involvement (Involve2) .

4.6.3.6 Age and perceived behavioral control. According to the mean value of age which was 35 years old divide age group in different category age 1 was below 35 years old and age 2 was 35 and above.

Table 4. 35 Relationship of age (>35) that moderates PBC

		Coefficients				
		Unstandardized Coefficients		Standardized Coefficients		
Model		B	Std. Error	Beta	t	Sig.
1	(Constant)	1.867	.182		10.281	.000
	Sum	.603	.048	.565	12.442	.000
	perceived behavioral control					

a. Dependent Variable: sum purchase intention

Table 4. 36 Relationship of age (≥ 35) that moderates PBC

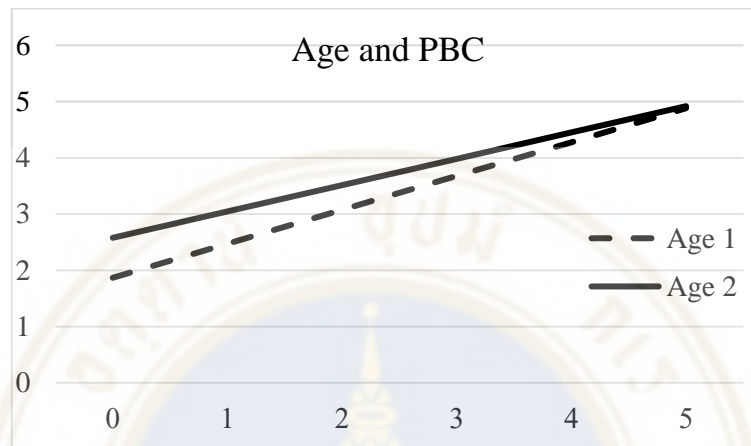
		Coefficients				
		Unstandardized Coefficients		Standardized Coefficients		
Model		B	Std. Error	Beta	t	Sig.
1	(Constant)	2.578	.227		11.332	.000
	Sum	.468	.059	.467	7.921	.000
	perceived behavioral control					

a. Dependent Variable: sum purchase intention

From the table 4.34 equation of purchase intention of younger age group (age 1) was purchase intention= 1.867 + .603a. While, for group 2 according to table

4.35, equation of older age (age2) , purchase intention = $2.578 + .468a$, then find the relationship with perceived behavioral control toward purchase intention. After the analysis, the figure 4.6 was shown as an analysis graph.

Figure 4. 6 The Relationship of Age and PBC



From figure 4.6 shows that although the older age group showed higher purchase intention, both groups showed the same direction as the higher perceived behavioral control, the higher purchase intention. Furthermore, once it reaches one point, the higher perceived behavioral control would push purchase intention of younger age group (age 1) to be equal with higher age group (age 2).

4.6.3.7 Age and subjective norm. According to the mean value of age which was 35 years old, divided age group in different category age 1 was below 35 years old and age 2 was 35 and above. This could imply that perceived behavioral control could effectively lift the purchase intention among younger age group. The younger generation may want something to purchase the product that is easily to purchase.

Table 4. 37 Relationship of age (> 35) that moderates subjective norms

		Coefficients				
		Unstandardized Coefficients		Standardized Coefficients		
Model		B	Std. Error	Beta	t	Sig.
1	(Constant)	2.646	.149		17.775	.000
	Sum subjective norms	.411	.041	.481	9.968	.000

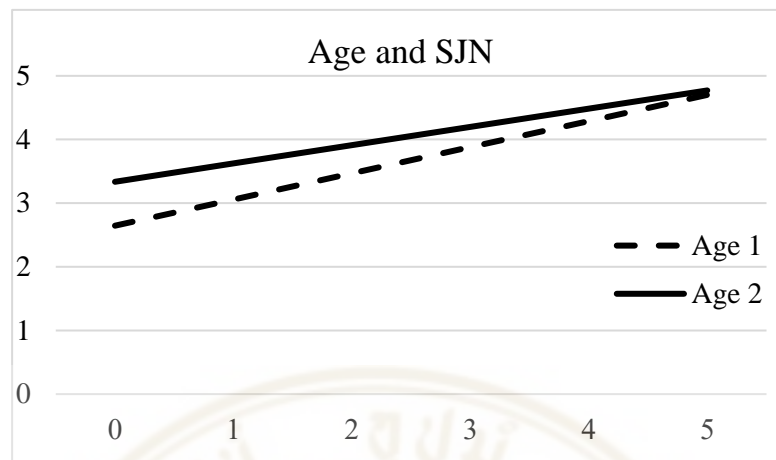
a. Dependent Variable: sum purchase intention

Table 4. 38 Relationship of age (≥ 35) that moderates subjective norms

		Coefficients				
		Unstandardized Coefficients		Standardized Coefficients		
Model		B	Std. Error	Beta	t	Sig.
1	(Constant)	3.336	.166		20.062	.000
	Sum subjective norms	.287	.046	.387	6.302	.000

a. Dependent Variable: sum purchase intention

From the table 4.36 equation of purchase intention of younger age group (age 1) was ; purchase intention = 2.646 + .411a. While, for group 2 according to table 4.37, equation of older age (age 2), purchase intention = 3.336 + .287a, then find the relationship with subjective norms toward purchase intention. After the analysis, the figure 4.7 was shown as an analysis graph.

Figure 4. 7 The Relationship of Age and Subjective Norms

From figure 4.7 shows that although the older age group showed higher purchase intention, both groups showed the same direction as the higher subjective norm, the higher purchase intention. Furthermore, once it reaches one point, the higher subjective norms would push purchase intention younger age group (age 1) to be equal with higher age group (age 2). This could imply that social pressure could effectively lift the purchase intention among younger age group.

CHAPTER V

CONCLUSION AND RECOMMENDATIONS

5.1 Conclusion and Managerial Implications

According to the result, the results have found that attitude toward behavior, perceived behavioral control, and the subjective norm has a relationship with the purchase intention. While age, price sensitivity, perceived convenience, and product involvement can moderate some of the variables toward purchase intention. Hence, several implications are recommended to both public and private sectors to take actions and shift customer perception toward purchasing circular economy products/services in Thailand.

First of all, building an attitude toward purchasing a circular economy product is needed. Since attitude toward behavior plays the most significant role in leading toward purchase intention. Hence, marketers need to create a positive attitude for customers. Let the customers perceived that purchasing the circular economy product is a favorable effort. Han, Hsu, & Chwen, (2011) and Han, Hsu, & Lee, (2009) said that it is the job of marketers to create the favorable mindset for customers toward the product by increase the positive attitude toward the product first. Therefore, proper marketing communication strategies and actions will help this part and lift the attitude of customers. If they perceive that purchasing circular economy products/services is good, it is likely for them to buy the products/services. Besides, the communication may include the branding of products/services also since Mohd Suki (2016) and Hartmann, Apaolaza, & Sainz, (2005) found that brand could positively change the attitude of customers in green products. Kuan-Siew, & Hazen (2016) supported the thought by recommend that in the emerging market like ASEAN, changing attitude toward behavior first is very important since they may not used to with the green products (as well as circular economy products). Moreover, as the price sensitivity and product involvement can moderate the attitude toward behavior toward purchase intention.

Hence, the products should be at a cheaper cost (lower profit margin) at the beginning to create a familiarity and positive attitude with consumers. Bong Ko, & Jin (2017) which recommended on reasonable pricing in their paper. Therefore, in Thailand if the market sets circular economy products as reasonable price for green products, this could lead to purchase and trial then switching, and if the customers have a positive attitude after this also help to shape the subjective norm. According to this implication, public sectors can help the private sector by providing subsidies or exemptions to reduce the cost of production and subsequently reduce the selling price of end product. This subsidy program can help throughout the entire supply chain, not only manufacturer but for the most appropriate party which could be suppliers or distributors. Lastly, product involvement can moderate attitude toward behavior and purchase intention. This variable will be a benefit on how the private sector designs the product for customers. This study could help them to design the product to fit with the customers. They can design the product with high involvement to let customers keep it for longer period of time as affective involvement, which aligns with the concept of a circular economy as Chapman (2012) said that the durability could also mean the emotional durability. Therefore, the design of the product could help to create positive attitude from the customers. Alternatively, they can provide very outstanding features of products to earn the cognitive involvement. Furthermore, on top of the implications above, the company will need to make the convenience of purchase products in a positive way as perceived convenience can moderate attitude toward behavior and purchase intention.

Second, perceived control behavior, which means that easiness of customers to perform purchase the circular economy products. In the SPSS, the program analyzes further in the details of results from respondents answer the questionnaire in each question, the data can find that the lowest mean of perceived behavioral control in this questionnaire is the availability of store purchases. This indicates that the availability of the products/services is the constraint to purchase. Verma, & Chandra (2017) suggested that create the control beliefs for customers will lead to persuasion in perceived behavioral control. Therefore, the availability of the products/services will be the key factor that marketers should consider to convince and create a belief. A variety of distribution channels and touchpoints that customers can access are required to promote the circular economy. This is the same implication from the recommendation from.

Furthermore, some moderators affect perceived behavioral control, like age, product involvement, and perceived convenience are significant. Therefore, to increase perceived behavioral control, the company should consider their products/service before entering the market also study the customers' behavior in the specific age group, which channel they should penetrate to in order to make a proper strategy to reach to target market. Paul, Modi, & Patel (2015), Wang, Wiegerinck, Krikke, & Zhang (2013) and Chan & Lau (2002) also recommended that mode of acquisition and variety of products could help the perceived behavioral control from the customers, to enhance this, both public and private sectors need to give the hand and collaborate each other to push circular economy products to the market. Bong Ko, & Jin (2017) recommended the implication of boosting confidence for the users by provide accessibility that purchase circular economy product is easy and does not required much effort. In this case, marketers need to design mode of acquisition to be easy to access and While perceived convenience can moderate perceived behavioral control toward purchase intention, this also explains further that in order to increase purchase intention, not only numbers of the stores and touchpoints. The business side also need the store and touchpoints to be under the customer-friendly concept and simplify the use process as Thais always like something convenient to them.

Third, subjective norm or the social pressure toward purchase circular economy products. Since Nuttavuthisit & Thøgersen (2017) said that in Eastern culture, which included Thailand, social norm plays significant role toward social. And Chan & Lau (2002) found subjective norm is very influential toward purchase intention in Chinese customers but in this research as a Thai customers context, this variable has the lowest influential power toward purchase intention, but it is still the factor that marketers should consider. Therefore, the public sector can help promote and shape Thais' norm since it is very less influenced if marketers use the private sector to promote. The public sector can help shape up the norm of Thais. Provide more knowledge about the cause of environmental problem and solution concept, including circular economy products/services. Key opinion leaders and influencers could also be part to promote. Create familiarity with customers. Bong Ko, & Jin (2017) also supported the idea of public movement and valuable campaign to earn more acceptance in shifting to the new behavior. Reward and compliments may also include in the implication since it helps

remind people that perform this action is useful and lead to more acceptance of using circular economy products in society. Chaudhary, & Bisai (2018) suggested that it is a chance for the corporate and organizations to step and conduct the corporate social responsibility campaign, this can lead to be more acceptance in the circular economy movement, both internal and external parties will earn benefits. Rettie, Burchell & Barnham (2014) also suggested that each product should position itself differently depending the norm and the products. Marketers have to be concerned on what kind of product category they try to promote toward them, but the most important thing is trying to make people perceived and accept as normal in their society. In this case, make people accept that buying circular economy product as normal things. Furthermore, age can moderate the subjective norm toward a purchase behavior. This emphasizes that the norm in Thailand is also linked with age. Therefore, marketer can use it as the impact of a social norm in the specific age group. Study and explore each group of customers by age and offer the unique value proposition for them to adopt.

5.2 Recommendations

5.2.1 Limitation

There are some limitations when this research paper has conducted. First, the circular economy concept is very new in Thailand. There are some possibilities that the whole concept does not thoroughly understand respondents. Some may mislead to the green economy or other concepts. Although the questionnaire has put a brief explanation in the introduction, it may not be enough to let respondents understand the whole concept. Therefore, this may lead to some errors.

Second, the questionnaire has conducted from April to June 2020 in Thailand, which affected by the pandemic of Covid-19. Therefore, there are some limitations to the research. For example, the physical questionnaire cannot be distributed or conducted the research. It is harder to access respondents without a convenience random sampling method by snowball technique. These are examples of the limitation during the pandemic of Covid-19.

Third, the circular economy concept is very broad. The concept covers a wide range of products or even services. Therefore, the questionnaire has to use an example of products in order to illustrate to our respondents. This may lead to limitations as the preferences of respondents are varied. All these limitations will be noted and improve in future research.

5.2.2 Future Research

First of all, there is a need to conduct another research in purchase intention in the next 2-3 years. Since the circular economy knowledge of customers will increase through time, I believe that higher knowledge will lead to different purchase intentions. In addition, there will be new circular economy products or services that become famous and change purchase intention. There are some papers such as Hazen, Mollenkopf & Wang, (2016) and Wang, Wiegerinck, Krikke, & Zhang, (2013) which said that customer knowledge affects with purchase intention.

Second, according to the questionnaire, this paper has explored the purchase intention. In perceived behavioral control part is focus on purchasing the products only. Therefore, the future research papers could also explore perceived behavioral control in terms of how respondents use the products instead of buying the product. This may be another variable that need to be explored.

Third, in the future, there will be new products and services from the restorative design, which provide superior in some dimensions. This could also lead to different purchase intentions.

Fourth, as product as a service and sharing economy are part of the circular economy concept. The future research paper can study sharing economy of service business models. Since during the time the research has conducted the research, circular economy concept is quite new and conduct complicated business model may lead to error. Another factor is the pandemic of Covid-19 that may bias the respondents.

Furthermore, there are new moderators since attitude toward behavior can influence purchase intention. Therefore, future research paper can also explore that branding or country of origin of the product can influence the attitude or not since (Hsu, Chang, & Yansritakul (2017) found that country of origin affects purchase intention and Mohd Suki (2016) found that brand positioning affects purchase intention.

Lastly, since the circular economy concept is about “make-use-return.” Therefore, the future research paper can also explore the behavior of customers to return the product to the loop. As Jena and Sarmah (2015) found that perceived benefits and social awareness can lead to return intention; therefore, from this point, the future research paper can learn how Thais take action toward returning the waste into the loop.



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APPENDIX

Appendix A: Cronbach's Alpha Test

Variables	Attribute	N	%	Cronbach's Alpha	N of Items
Product Involvement	Valid	559	100	.798	8
	Excluded	0	0		
	Total	559	100		
Purchase Intention	Valid	559	100	.891	5
	Excluded	0	0		
	Total	559	100		
Attitude Toward Behavior	Valid	559	100	.858	3
	Excluded	0	0		
	Total	559	100		
Perceived Behavioral Control	Valid	559	100	.825	7
	Excluded	0	0		
	Total	559	100		
Subjective Norm	Valid	559	100	.882	4
	Excluded	0	0		
	Total	559	100		
Perceived Convenience	Valid	559	100	.861	4
	Excluded	0	0		
	Total	559	100		
Price Sensitivity	Valid	559	100	.889	3
	Excluded	0	0		
	Total	559	100		
Environmental Concern	Valid	559	100	.866	5
	Excluded	0	0		
	Total	559	100		

APPENDIX B: Descriptive Statistics

Descriptive Statistics					
	N	Minimu m	Maximu m	Mean	Std. Deviation
Sum attitude	559	2.00	5.00	4.2922	.67505
Sum perceived behavioral control	559	1.86	5.00	3.7345	.64013
Sum subjective norms	559	1.00	5.00	3.5326	.82179
Sum perceceived convenience	559	1.25	5.00	3.7925	.80160
Sum price sensitivity	559	1.00	5.00	3.3649	.92855
Sum environmental concern	559	2.20	5.00	4.3971	.61916
Sum product involvement	559	2.00	5.00	4.0107	.68456
Sum purchase intention	559	1.00	5.00	4.1993	.67839
Valid N (listwise)	559				

APPENDIX C: ANOVA table for multiple regression

ANOVA						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	107.024	3	35.675	132.195	.000 ^b
	Residual	149.775	555	.270		
	Total	256.800	558			

a. Dependent Variable: sum_purchase intention

b. Predictors: (Constant), sum_subjective norms, sum_attitude, sum_perceived behavioral control

APPENDIX D: ANOVA - add age as the moderator (Age and Attitude toward Behavior)

ANOVA ^a						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	112.738	6	18.790	71.996	.000 ^b
	Residual	144.062	552	.261		
	Total	256.800	558			
2	Regression	113.175	7	16.168	62.026	.000 ^c
	Residual	143.625	551	.261		
	Total	256.800	558			

a. Dependent Variable: sum_purchase intention

b. Predictors: (Constant), location, sum_perceived behavioral control, age, gender, sum_attitude, sum_subjective norms

c. Predictors: (Constant), location, sum_perceived behavioral control, age, gender, sum_attitude, sum_subjective norms, moderator_age x attitude

APPENDIX E: ANOVA - add age as the moderator (Age and Perceived Behavioral Control)

ANOVA						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	112.738	6	18.790	71.996	.000 ^b
	Residual	144.062	552	.261		
	Total	256.800	558			
2	Regression	113.946	7	16.278	62.786	.000 ^c
	Residual	142.853	551	.259		
	Total	256.800	558			

a. Dependent Variable: sum_purchase intention

b. Predictors: (Constant), location, sum_perceived behavioral control, age, gender, sum_attitude, sum_subjective norms

c. Predictors: (Constant), Location, sum_perceived behavioral control, age, Gender, sum_attitude, sum_subjective norms, moderator_age x perceived behavioral control

APPENDIX F: ANOVA - add age as the moderator (Age and Subjective Norm)

ANOVA							
	Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression		112.738	6	18.790	71.996	.000 ^b
	Residual		144.062	552	.261		
	Total		256.800	558			
2	Regression		114.517	7	16.360	63.353	.000 ^c
	Residual		142.283	551	.258		
	Total		256.800	558			

a. Dependent Variable: sum_purchase intention

b. Predictors: (Constant), location, sum_perceived behavioral control, age, gender, sum_attitude, sum_subjective norms

c. Predictors: (Constant), location, sum_perceived behavioral control, age, gender, sum_attitude, sum_subjective norms, moderator_age x subjective norms

APPENDIX G: ANOVA - add gender as a moderator (Gender and Attitude)

ANOVA							
	Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression		112.738	6	18.790	71.996	.000 ^b
	Residual		144.062	552	.261		
	Total		256.800	558			
2	Regression		113.103	7	16.158	61.955	.000 ^c
	Residual		143.697	551	.261		
	Total		256.800	558			

a. Dependent Variable: sum_purchase intention

b. Predictors: (Constant), location, sum_perceived behavioral control, age, gender, sum_attitude, sum_subjective norms

c. Predictors: (Constant), location, sum_perceived behavioral control, Age, gender, sum_attitude, sum_subjective norms, moderator_gender x attitude

APPENDIX H: ANOVA - add gender as a moderator (Gender and Perceived Behavior Control)

ANOVA							
	Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression		112.738	6	18.790	71.996	.000 ^b
	Residual		144.062	552	.261		
	Total		256.800	558			
2	Regression		113.134	7	16.162	61.986	.000 ^c
	Residual		143.665	551	.261		
	Total		256.800	558			

a. Dependent Variable: sum_purchase intention

b. Predictors: (Constant), location, sum_perceived behavioral control, age, Gender, sum_attitude, sum_subjective norms

c. Predictors: (Constant), location, sum_perceived behavioral control, age, Gender, sum_attitude, sum_subjective norms, moderator_gender x perceived behavioral control

APPENDIX I: ANOVA - add gender as a moderator (Gender and Subjective Norm)

ANOVA							
	Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression		112.738	6	18.790	71.996	.000 ^b
	Residual		144.062	552	.261		
	Total		256.800	558			
2	Regression		112.761	7	16.109	61.621	.000 ^c
	Residual		144.039	551	.261		
	Total		256.800	558			

a. Dependent Variable: sum_purchase intention

b. Predictors: (Constant), location, sum_perceived behavioral control, age, gender, sum_attitude, sum_subjective norms

c. Predictors: (Constant), Location, sum_perceived behavioral control, Age, Gender, sum_attitude, sum_subjective norms, Mod_genx x subjective norms

APPENDIX J: ANOVA - add Environmental Concern as a moderator (EC and Attitude)

ANOVA							
	Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression		112.738	6	18.790	71.996	.000 ^b
	Residual		144.062	552	.261		
	Total		256.800	558			
2	Regression		140.657	8	17.582	83.261	.000 ^c
	Residual		116.142	550	.211		
	Total		256.800	558			

a. Dependent Variable: sum_purchase intention

b. Predictors: (Constant), location, sum_perceived behavioral control age, gender, sum_attitude, sum_subjective norms

c. Predictors: (Constant), location, sum_perceived behavioral control, age, gender, sum_attitude, sum_subjective norms, sum_environmental concern, moderator_environmental concern x attitude

APPENDIX K: ANOVA - add Environmental Concern as a moderator (EC and PBC)

ANOVA ^a							
	Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression		112.738	6	18.790	71.996	.000 ^b
	Residual		144.062	552	.261		
	Total		256.800	558			
2	Regression		141.108	8	17.638	83.853	.000 ^c
	Residual		115.692	550	.210		
	Total		256.800	558			

a. Dependent Variable: sum_purchase intention

b. Predictors: (Constant), location, sum_perceived behavioral control, age, gender, sum_attitude, sum_subjective norms

c. Predictors: (Constant), location, sum_perceived behavioral control, age, Gender, sum_attitude, sum_subjective norms, sum_environmental concern, moderator_environmental concern x perceived behavioral control

APPENDIX L: ANOVA - add Environmental Concern as a moderator (EC and SJN)

ANOVA^a

	Model	Sum of Squares	df	Mean Square	F	Sig.
1	Regression	112.738	6	18.790	71.996	.000 ^b
	Residual	144.062	552	.261		
	Total	256.800	558			
2	Regression	140.643	8	17.580	83.243	.000 ^c
	Residual	116.157	550	.211		
	Total	256.800	558			

a. Dependent Variable: sum_purchase intention

b. Predictors: (Constant), location, sum_perceived behavioral control, age, gender, sum_attitude, sum_subjective norms

c. Predictors: (Constant), Location, sum_perceived behavioral control, age, gender, sum_attitude, sum_subjective norms, sum_environmental concern, moderator_environmental concern x subjective norms

APPENDIX M: ANOVA - add Price Sensitivity as a moderator (Price Sensitivity and Attitude)

ANOVA

	Model	Sum of Squares	df	Mean Square	F	Sig.
1	Regression	112.738	6	18.790	71.996	.000 ^b
	Residual	144.062	552	.261		
	Total	256.800	558			
2	Regression	121.687	8	15.211	61.919	.000 ^c
	Residual	135.112	550	.246		
	Total	256.800	558			

a. Dependent Variable: sum_purchase intention

b. Predictors: (Constant), location, sum_perceived behavioral control, age, gender, sum_attitude, sum_subjective norms

c. Predictors: (Constant), location, sum_perceived behavioral control, age, gender, sum_attitude, sum_subjective norms, sum_price sensitivity, moderator_price sensitivity x attitude

APPENDIX N: ANOVA - add Price Sensitivity as a moderator (Price Sensitivity and PBC)

ANOVA						
	Model	Sum of Squares	df	Mean Square	F	Sig.
1	Regression	112.738	6	18.790	71.996	.000 ^b
	Residual	144.062	552	.261		
	Total	256.800	558			
2	Regression	119.228	8	14.903	59.583	.000 ^c
	Residual	137.572	550	.250		
	Total	256.800	558			

a. Dependent Variable: sum_purchase intention

b. Predictors: (Constant), location, sum_perceived behavioral control, age, gender, sum_attitude, sum_subjective norms

c. Predictors: (Constant), location, sum_perceived behavioral control, age, gender, sum_attitude, sum_subjective norms, sum_price sensitivity, moderator_price sensitivity x perceived behavioral controls

APPENDIX O: ANOVA - add Price Sensitivity as a moderator (Price Sensitivity and SJN)

ANOVA						
	Model	Sum of Squares	df	Mean Square	F	Sig.
1	Regression	112.738	6	18.790	71.996	.000 ^b
	Residual	144.062	552	.261		
	Total	256.800	558			
2	Regression	119.281	8	14.910	59.632	.000 ^c
	Residual	137.519	550	.250		
	Total	256.800	558			

a. Dependent Variable: sum_purchase intention

b. Predictors: (Constant), location, sum_perceived behavioral control, age, gender, sum_attitude, sum_subjective norms

c. Predictors: (Constant), location, sum_perceived behavioral control, age, gender, sum_attitude, sum_subjective norms, sum_price sensitivity, moderator_price sensitivity x subjective

APPENDIX P: ANOVA - add Perceived Convenience as a moderator (PC and Attitude)

ANOVA						
	Model	Sum of Squares	df	Mean Square	F	Sig.
1	Regression	112.738	6	18.790	71.996	.000 ^b
	Residual	144.062	552	.261		
	Total	256.800	558			
2	Regression	117.095	8	14.637	57.623	.000 ^c
	Residual	139.705	550	.254		
	Total	256.800	558			

a. Dependent Variable: sum_purchase intention

b. Predictors: (Constant), Location, sum_perceived behavioral control, Age, gender, sum_attitude, sum_subjective norms

c. Predictors: (Constant), Location, sum_perceived behavioral control, Age, gender, sum_attitude, sum_subjective norms, sum_perceived_convenience, Mod_perceived convenience x attitude

APPENDIX Q: ANOVA - add Perceived Convenience as a moderator (PC and PBC)

ANOVA						
	Model	Sum of Squares	df	Mean Square	F	Sig.
1	Regression	112.738	6	18.790	71.996	.000 ^b
	Residual	144.062	552	.261		
	Total	256.800	558			
2	Regression	116.031	8	14.504	56.669	.000 ^c
	Residual	140.768	550	.256		
	Total	256.800	558			

a. Dependent Variable: sum_purchase intention

b. Predictors: (Constant), location, sum_perceived behavioral control, Age, gender, sum_attitude, sum_subjective norms

c. Predictors: (Constant), location, sum_perceived behavioral control, Age, gender, sum_attitude, sum_subjective norms, sum_perceived_convenience, moderator_perceived convenience x perceived behavioral control

APPENDIX R: ANOVA - Add Perceived Convenience as a moderator (PC and SJN)

ANOVA						
	Model	Sum of Squares	df	Mean Square	F	Sig.
1	Regression	112.738	6	18.790	71.996	.000 ^b
	Residual	144.062	552	.261		
	Total	256.800	558			
2	Regression	114.010	8	14.251	54.893	.000 ^c
	Residual	142.790	550	.260		
	Total	256.800	558			

a. Dependent Variable: sum_purchase intention

b. Predictors: (Constant), location, sum_perceived behavioral control, age, gender, sum_attitude, sum_subjective norms

c. Predictors: (Constant), location, sum_perceived behavioral control, age, gender, sum_attitude, sum_subjectivenorm, sum_perceived_convenience, moderator_perceived convenience x subjective norms

APPENDIX S: ANOVA - add product involvement as a moderator (PI and ATT)

ANOVA						
	Model	Sum of Squares	df	Mean Square	F	Sig.
1	Regression	112.738	6	18.790	71.996	.000 ^b
	Residual	144.062	552	.261		
	Total	256.800	558			
2	Regression	127.079	8	15.885	67.350	.000 ^c
	Residual	129.721	550	.236		
	Total	256.800	558			

a. Dependent Variable: sum_purchase intention

b. Predictors: (Constant), Location, sum_perceived behavioral control, age, gender, sum_attitude, sum_subjective norms

c. Predictors: (Constant), Location, sum_perceived behavioral control, age, gender, sum_attitude, sum_subjective norms sum_product involvement, moderator product involvement x attitude

APPENDIX T: ANOVA - add Product Involvement as a moderator (PI and PBC)

ANOVA						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	112.738	6	18.790	71.996	.000 ^b
	Residual	144.062	552	.261		
	Total	256.800	558			
2	Regression	126.730	8	15.841	66.984	.000 ^c
	Residual	130.070	550	.236		
	Total	256.800	558			

a. Dependent Variable: sum_purchase intention

b. Predictors: (Constant), location, sum_perceived behavioral control, age, gender, sum_attitude, sum_subjective norms

c. Predictors: (Constant), location, sum_perceived behavioral control, age, gender, sum_attitude, sum_subjective norms, sum_product involvement, moderator product involvement x perceived behavioral control

APPENDIX U: ANOVA - add Product Involvement as a moderator (PI and SJN)

ANOVA						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	112.738	6	18.790	71.996	.000 ^b
	Residual	144.062	552	.261		
	Total	256.800	558			
2	Regression	125.707	8	15.713	65.926	.000 ^c
	Residual	131.092	550	.238		
	Total	256.800	558			

a. Dependent Variable: sum_purchase intention

b. Predictors: (Constant), location, sum_perceived behavioral control, age, gender, sum_attitude, sum_subjective norms.

c. Predictors: (Constant), location, sum_perceived behavioral control, age, gender, sum_attitude, sum_subjective norms, sum_product involvement, moderator product involvement x subjective norms