SENIOR RESEARCH

The effect of tax and subsidy on plastic uses in Thailand

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Abstract

This research studies on impacts of the implementation of plastic bag policy in Thailand. Using data analysis combining with the Ordinary Least Squares regression (OLS), the study attempts to extract consumer insights, response and statistical relationships between consumer data and plastics bag policies. There are 266 observations of plastic uses data collecting by the personal interview method. As a result, data analyses show that subsidy is able to reduce the plastic bag usage more than tax at a low level (1 baht). In contrast, tax is more effective at higher levels (3 baht and 5 baht). Furthermore, female is more sensitive to subsidy compared to male while a family with a high number of members is less sensitive to tax. In addition, regression results indicate that demographic factors such as education and place of living have significant relationships with tax while a behavioral factor like environmental awareness has a significant relationship with subsidy.

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Introduction

Nowadays, there is a rapid widespread of environmental awareness which occurs from human activities through the environment destruction such as global warming, climate change, and wastes all around the world. In the production of plastic which requires burning fossil fuels creates a huge amount of carbon dioxide in the atmosphere. As a result, the heat in the earth cannot spread out from the world causing severe climate change worldwide.

Another dimension, the plastic biodegradation takes time and along the process, it also threatens the environment. There is an excessive use of plastic bags that creates the damage toward the nature, especially in the ocean. Moreover, it also causes a huge amount of dead living things and wastes in the environment which consequentially affect other surroundings. Therefore, to lower the amount of plastic bag uses is one of the policies that many countries implement to tackle these issues.

Each country tries to adapt this fundamental policy with different element of dimensions. For example, in some countries are allowed to use only specific types of plastics which are biodegradable. On the other hand, using of plastic bags in some countries has been banned. This implementation is also depended on patterns of norm emergence in each country. For the sustainable development and a better standard of living, every human must take these issues into account.

In Thailand, there is a campaign to reduce the amount of plastic bag use in many grocery stores with the agreement between customers and stores. For example, if customer rejects to take the plastic bag, they will receive the discount point in their member cards. On the other hand, in some store, the store would not provide plastic bags to customers.

Thus, to legally implement the policy in Thailand, knowing the consumer preference is the most important process since every consumer who uses plastic bags might change their behaviors or increase their environmental aspects.

This research attempts to study about the implementation of plastic bag policy in Thailand with two purposes. The first purpose is to measure consumer willingness to pay and willingness to accept for reducing plastic consumption. The second purpose is to provide useful information for policy makers about the implementation of the plastic bag policy in Thailand. The scope of study focuses on Thai citizen based on the hypothesis that the plastic bag policy can create incentives for consumers to reduce the plastic bag consumption by using tax and subsidy.

Literature Review

Since plastic bags create severe negative impacts in the long run, many policies have been implemented in order to solve the problem. The literature reviews of this topic can be divided into three parts which are methodology, plastic bag policy studies in developed countries, and plastic bag policy studies in developing countries.

There is a various method of plastic bag policy implementation including direct data analysis and statistical analysis. Studies using direct data analysis mainly focus on the data collection and provide useful insights. For example, Asmuni, Hussin, Khalili, & Zain (2015) conducted an observatory study to conduct the analysis which randomly observed stores by 45 observers. Similarly, Convery, McDonnell, & Ferreira (2007) conducted an in-depth interview analysis and survey to collect data from face-to-face with 7 leaders in each sector and a random telephone survey from 100 households. On the other hand, Dikgang, Leiman, & Visser (2012) analyzed secondary data using plastic bag data collected from retail stores from 2003 to 2008.

The other group of studies used a statistical method in their analysis including an analysis of variance (ANOVA) and a negative binomial model. Poortinga, Whitmarsh, & Suffolk (2013) and Martinhoa, Balaia, & Pires (2017) applied analysis of variance (ANOVA) and chi-square to analyze data from telephone surveys and face-to-face survey respectively, while He (2012) used the negative binomial model to find effects of the environmental policy on plastic bag consumption.

Plastic bag policy studies in developed countries show that price signaling and acceptance of main stakeholders are keys of success according to Convery, McDonnell, & Ferreira (2007). The study conducted an in-depth interview and survey to collect data from face-to-face with 7 leaders in each sector and the random telephone survey from 100 households in Ireland. Consequently, the results indicate that the price signaling is positively significant and another reason for the successful tax implementation in Ireland is the acceptance of main stakeholders in each sector. Furthermore, Poortinga, Whitmarsh, & Suffolk (2013) shows that taxation is not the only solution. In contrast, raising awareness is also needed to be taken into consideration since they conducted a research to study about the impact on carrier bag charge in Wales comparing with England where no charge has introduced. In both countries, there is an increase in own bag use but in Wales, it has much more impact comparing with England because the policy also raises awareness for Welsh people. However, Martinhoa, Balaia, & Pires (2017) researched on consumer behavior after 4-month of implementing plastic bag tax in Portugal and found that tax policy has an effective implementation but fails to raise

the awareness of environmental issues. Results show that there is a decrease in the use of plastic bag by 74% along with 61% increasing in reusing plastic bags; in contrast, it has no effect on increase awareness or impact of using plastic bags.

Plastic bag policy studies in developing countries analyze the impact of the policy in China, Malaysia, and South Africa. He (2012) researched on the result of the implementation of the Chinese plastic bag regulation and found that the Chinese plastic bag regulation has an impact on consumer behavior by reducing 49% in the use of new bags. This indicates the succeed in policy implementation and raising awareness among the citizens regardless of the constraint of having an open market where it is hard to regulate. Furthermore, Asmuni et. al. (2015) studied on how the No Plastic Bag Day Program (NPBD) in Malaysia affects the consumer's' behavior. It is found that the NPBD program plays an important role on reducing the use of plastic bags since plastic bags' consumption reduced by 52.3%. However, according to Dikgang, Leiman & Visser (2012), the plastic bag tax policy is effective in the short run but not sustainable in South Africa since the plastic bag price is inelastic in the long run. This indicates that that regarding the same policy implementation as in Ireland, it yields the different outcome with unsustainability in the long run.

According to literatures, there is no optimal policy to solve the plastic bag problem. Furthermore, it is necessary to include social factors such as cultures and norms to design an optimal policy for each country. In addition, the important condition to solve the problem in the long-run is not only the suitable policy for each country but also the awareness of consumers.
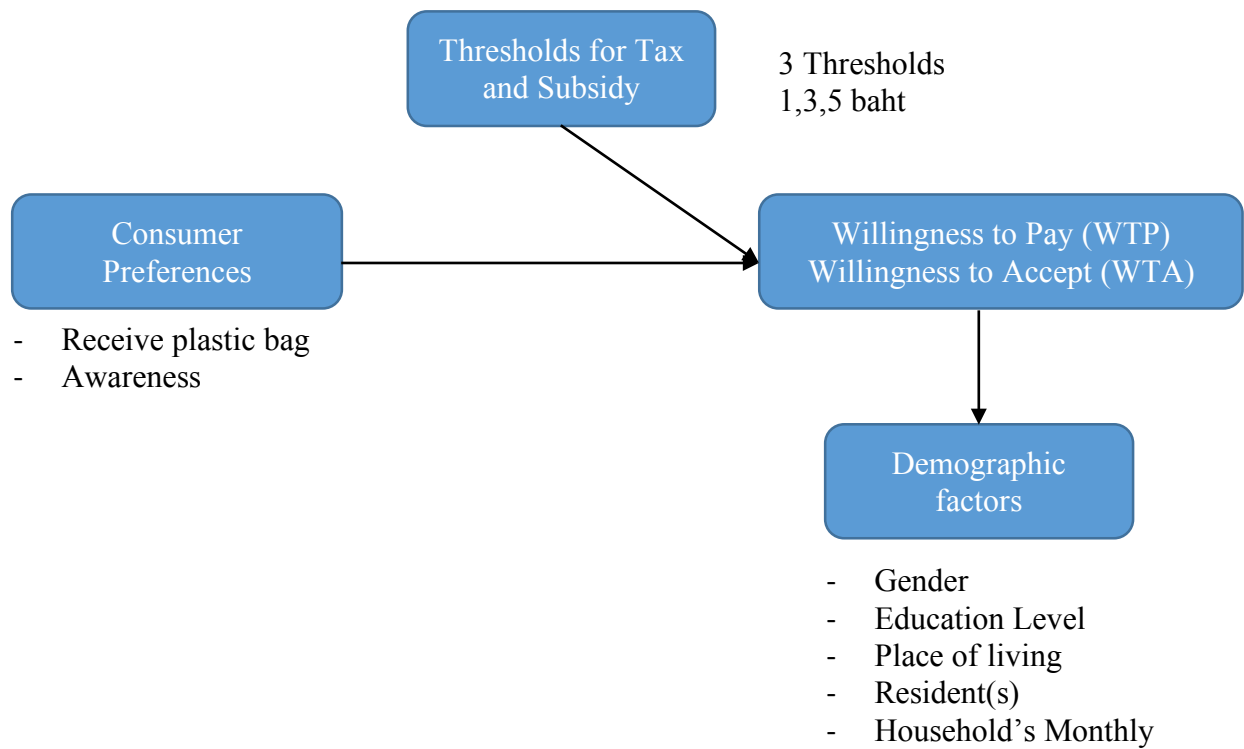
Conceptual framework

Figure 1: Conceptual Framework

The conceptual framework above shows the way to measure plastic bag policy in Thailand. According to Dunn et al. (2014), older and lower-to-middle income individuals are more likely to switch to reusable bags when they face with a tax on plastic bags. On the other hand, lower-to-middle income individuals and women are more likely to switch away from using plastic bags when provided with a subsidy for reusable bags. Thus, consumer preferences and demographic factors are included in the model to find the consumer characteristic.

Data

Primary data will be collected via a survey by personal interview. Using face-to-face interview is more effective because person would be rational to answer in each question since it can be controlled the sample that are favor to complete the survey.

From the survey, there are 266 observations which are collected from Phaya Thai area, covered the area at Siam and Victory Monument during February in 2018. The survey begins with the consumer preference, such as their plastic bag use behaviors following by the option of the policy implementation, WTP and WTA, at 3 thresholds. After that respondents would answer questions which indirectly ask to range their awareness rating and the general information, as known as demographics in this research, which will be kept strictly confidential.

Data collected from the survey can be divided into three categories of variables which are dependent variables, independent variables, and control variables. Dependent variables include willingness to pay (WTP) and willingness to accept (WTA). These variables will be used to measure consumer preference of tax and subsidy. The second group of variables is independent variables including gender, age and income. Independent variables will be used to measure impacts of them against the dependent variable. In addition, the control variables will be used to control the impact of the consumer behavior in the past on dependent variables.

To elaborate the definition of WTP and WTA, there are 4 categories to be arranged. WTP equals 0,1,3, and 5, and WTA equals 0,1,3, and 5. The respondent who rejects to pay tax at 1 baht in order to receive 1 plastic bag will be classified that WTP is equal to 0. If the respondent begins to reject to pay tax at 3 baht, he/she will be classified that WTP is equal to 1. Following by WTP equals 3 if he/she rejects to pay tax at 5 baht and WTP is 5 if he/she is willing to pay tax at 5 baht.

On the other hand, the respondent will be classified that WTA is equal to 0 when respondent who receives subsidy at 1 baht and further on in order to reject taking 1 plastic bag. If he/she starts to receive subsidy at the rate 3 baht, WTA will equal to 3. Following by WTA equals 5 if he/she receives subsidy at 5 baht, and if he/she is not willing to receive at any three rates, WTA is equal to 0.

Variable type	Variable	Variable in survey	Measurement
Dependent variable	WTP	4 levels	Categorical
Dependent variable	WTA	4 levels	Categorical
Independent Variable	Gender	Gender (Male, Female)	Dummy
Independent Variable	Education	8 levels	Categorical
Independent Variable	Place	Residence (House, Dormitory, Condominium)	Dummy
Independent Variable	Resident	4 levels	Categorical
Independent Variable	Income	5 levels	Categorical
Control	Receive	4 levels	Categorical
Control	Awareness	4 levels	Categorical

Table 1: Conceptual Framework

Methodology

  The methodology can be divided into two parts. The first part is about using a survey to extract insights of plastic bag uses behavior which obtains impacts of providing subsidy and tax by using data analysis. The second part is about gaining insights of factors whether they cause consumers to change the behavior toward the implementation of policies.

  In the survey, there are 3 thresholds to measure willingness to pay (WTP) and willingness to accept (WTA) of consumers which are payment and subsidy of 1 baht 3 baht 5 baht per one plastic bag. 3 thresholds of WTP and WTA will show the sensitivity of consumer to change in tax and subsidy and be able to compare the effectiveness between tax and subsidy policies.

  After that, Ordinary Least Squares (OLS) Regression is applied for finding the relationship among demographics, preferences, and WTP or WTA. The model will be as follows:

$$Y = \alpha + \beta_1 awareness + \beta_2 education + \beta_3 place + \beta_4 receive + \beta_5 gender + \beta_6 resident + \beta_7 income$$

Where,	*Y*	=	WTP and WTA
	awareness	=	Awareness
	education	=	Educational level
	place	=	Place of living
	receive	=	Receiving of plastic bags
	gender	=	Gender
	resident	=	Number of residents
	income	=	Household's monthly income

  Results from the model combining with WTP and WTA will be used for analysis, comparison, and creating policy recommendation for implementing the plastic bag policy in Thailand.

Results

The results will be divided into two dimensions. The first dimension is the data analysis or to summarize statistics which will be extracted insights of plastic usage behavior from the effect of tax and subsidy. Another dimension is using OLS model to find the relationship among demographics, preferences, and WTP and WTA. It can also gain the insights of factors which support the result from the data analysis that the effect of tax and subsidy has an impact on changing consumer behavior.

1. Data Analysis

This part of results contains 2 analyses which are overall policies' impacts following by demographic and behavioral impacts on plastic bag usage. The first part of analysis will illustrate the way how consumers respond to the policy implementation both in tax and subsidy. The second part will focus on each variable to see whether demographic and behavioral factors affect the decision-making of receiving a plastic bag.
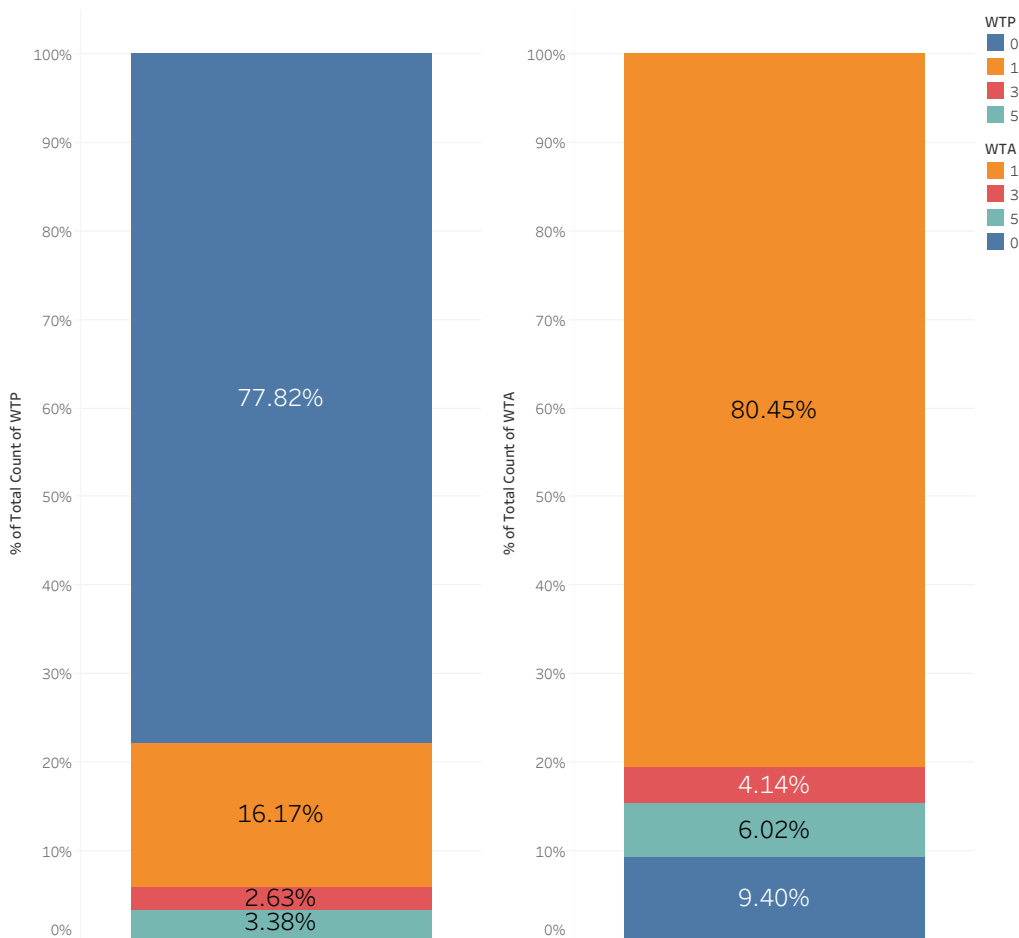
Figure 2: The effect of WTP and WTA on consumers

The chart illustrates the effect of willingness to pay (WTA) and willingness to accept (WTA) on consumers in Bangkok in 2018. Measurement units are in percentage.

From figure 2, it is clear that policy implementation both in tax and subsidy are able to change human behavior to reduce the amount of receiving plastic bags. The graph is also shows that at the rate 1 baht, the subsidy has more impact than tax.

However, at the rate 3 baht, there is a dramatically increase for 16.17% in order to response the tax policy. This increases the rate of plastic bags rejection up to 93.99%, while subsidy gently increases only 4% which will be resulting in 84.59% in total.

In summary, if the policy is implemented at the rate 1 baht, the subsidy policy is more effective than tax. On the other hand, at the rate 3 baht, the tax policy has much more impact than the subsidy policy. Further than these two rates, there is only a little change in consumer behavior.
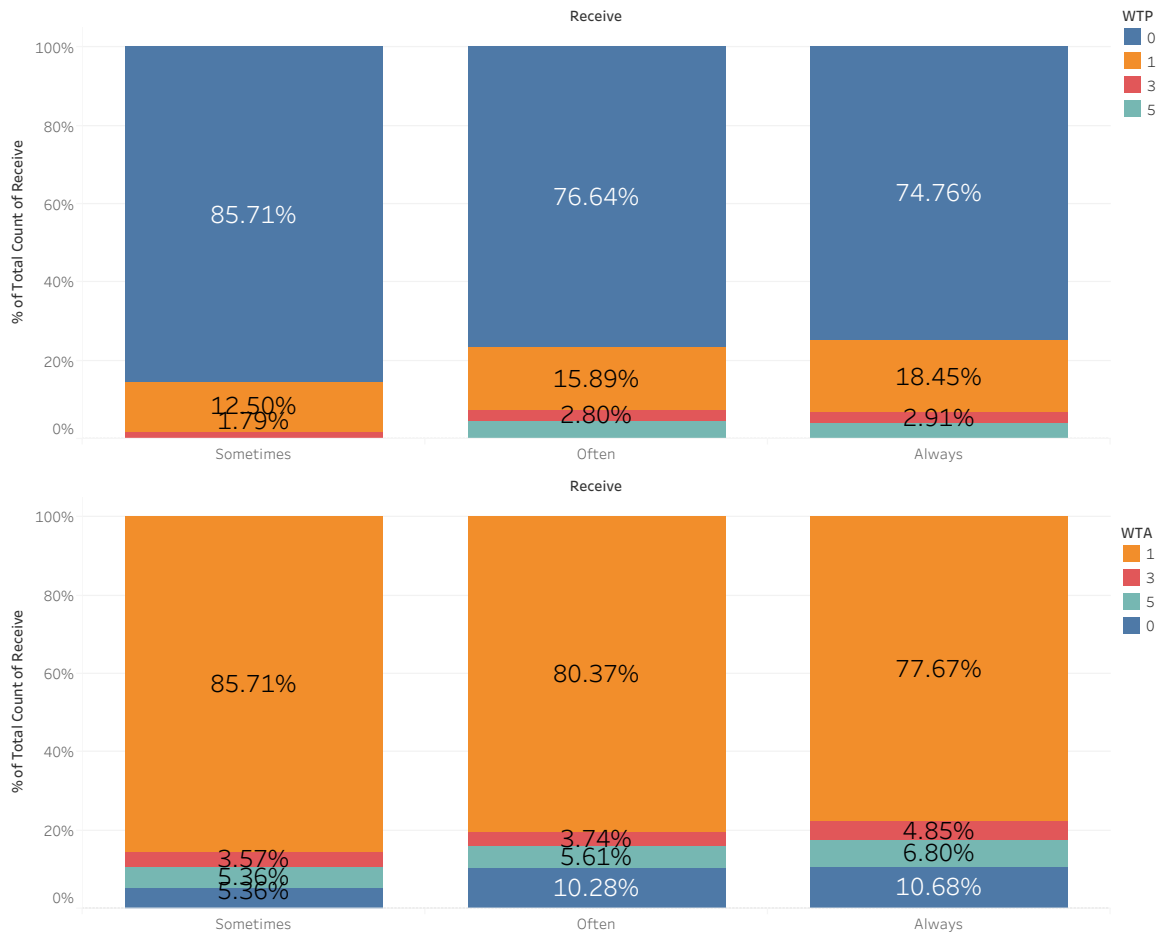
Figure 3: The effect of receiving plastic bags on WTP and WTA

From figure 3, there is a clear trend in their previous consumer behaviors. In the tax policy, every tax rate has the same result since the one who usually receives plastic bags would have a higher rate of WTP. Meaning that the more frequency they receive, the higher rate of tax they need to face so they will refuse to receive plastic bags.

In contrast, in the subsidy policy, it also has the same result since the one who has more receiving plastic bags rate would have a higher rate of WTA. Meaning that the more frequency they receive, the higher rate of subsidy they want to stop receiving plastic bags.

Thus, consumer preferences has the same response in both policies at the positive relationship. The more frequency they receive plastic bags, the higher rate of both policies is needed to implement.
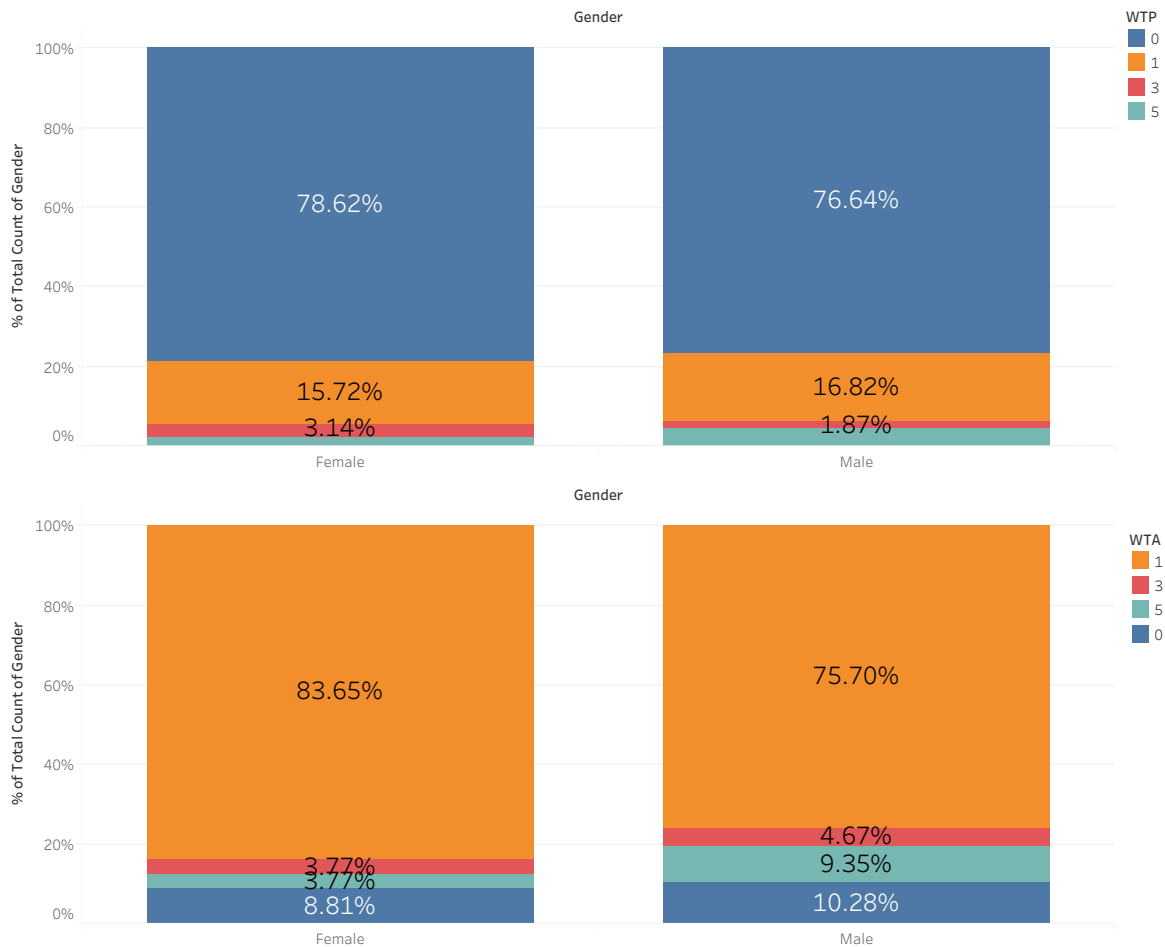
Figure 4: The effect of gender on WTP and WTA

According to figure 4, it can be seen that it has no clear illustration in the case of the tax policy. In both female and male have the similar response toward the policy.

However, in the subsidy policy, female has more sensitivity toward subsidy which means women tend to stop receiving plastic bags when store provides some cash. In contrast, male has the same response with the tax policy. As an increase in the rate of subsidy, male tends to change their consumer behavior by rejecting plastic bags at the higher rate.

In conclusion, both genders have the same response in the tax policy. On the other hand, in the subsidy policy, female is more sensitive than male at rate 1 baht. Male will highly change their behavior as the rate increases.
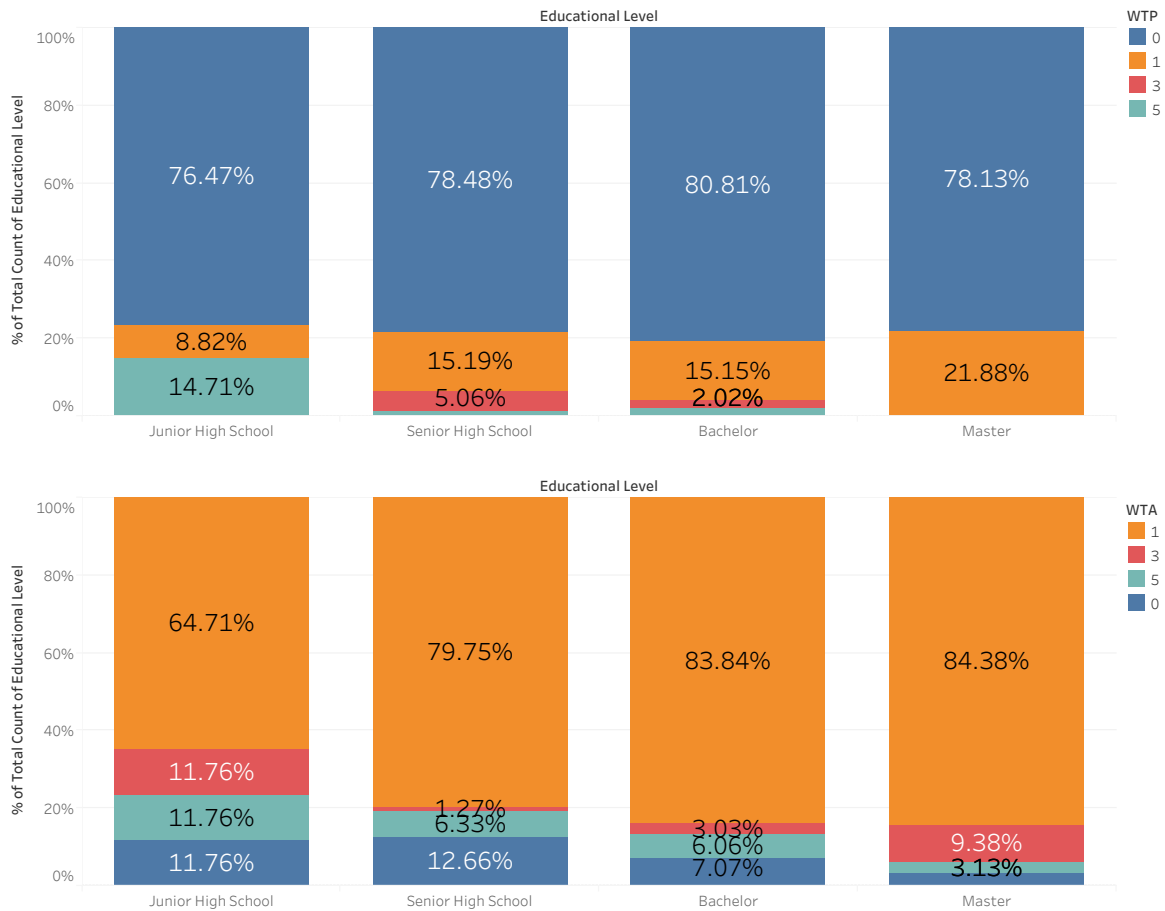
Figure 5: The effect of educational level on WTP and WTA

In figure 5, there is an unclear trend in the tax policy which can be seen in the master's degree. In spite of the master's degree, there is a positive relationship in the tax policy. In other words, it can be seen that the more educational level consumer has, the lower rate of WTP they will be. Similar to the subsidy policy, there is also a positive relationship. The upward trend implies the lower rate of WTA for the consumer who has a higher level of educational.

Overall, although there is an unclear illustration within tax policy, it can be concluded that master's degree can be able to categorize as a high educational level since its insignificant level with the bachelor's degree. The insight is that the higher of the educational level, the lower amount of times they receive plastic bags.
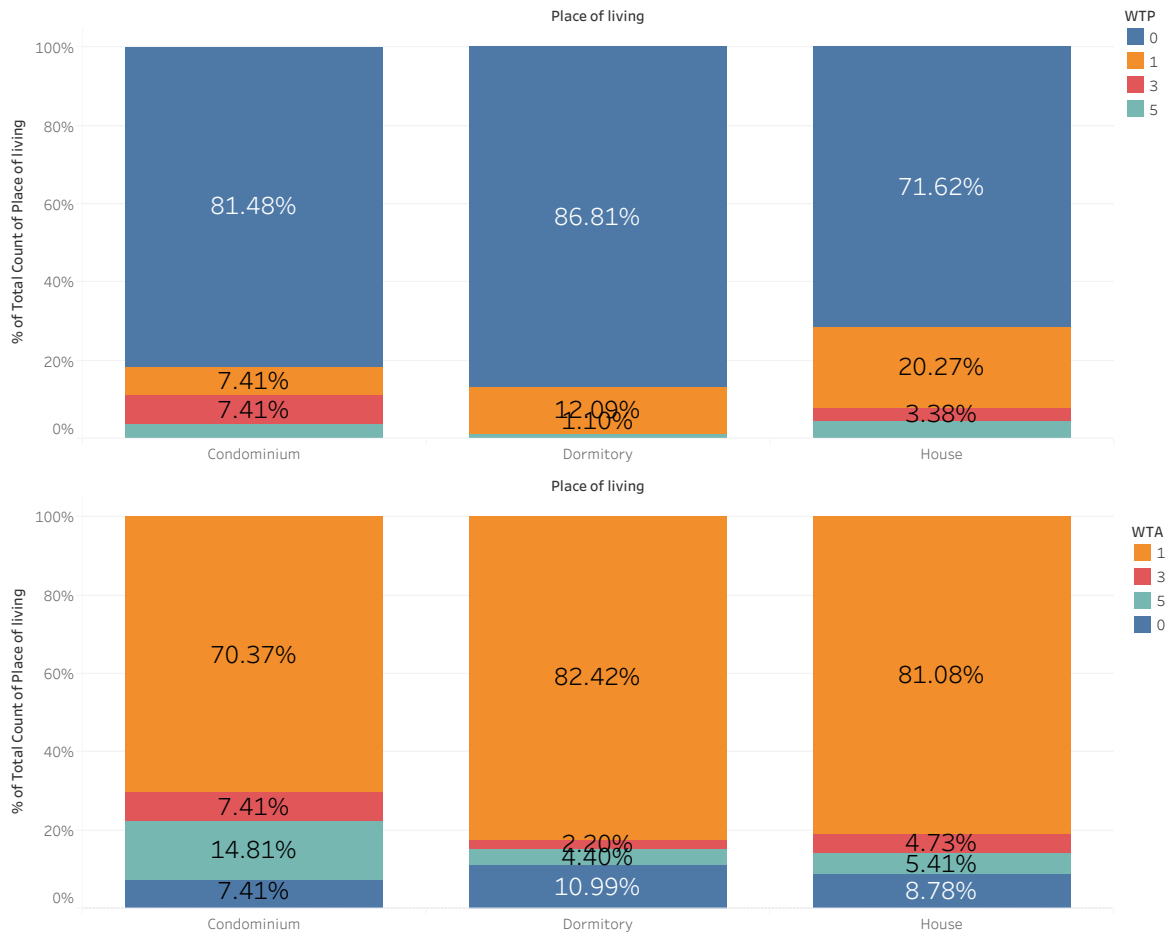
Figure 6: The effect of place of living on WTP and WTA

According to figure 6, it is obvious to be seen that the most sensitive group in both policies is the consumer who lives in the dormitory. In contrast, the others have the significant diffence in response toward policies.

The consumer who lives in the condominium is sensitive to tax but not in the subsidy policy comparing with other groups while the one who lives in his/her own house is sensitive to the subsidy policy but not in the tax policy.

In summary, both policies have the most effective implementation toward the consumer who lives in the dormitory.
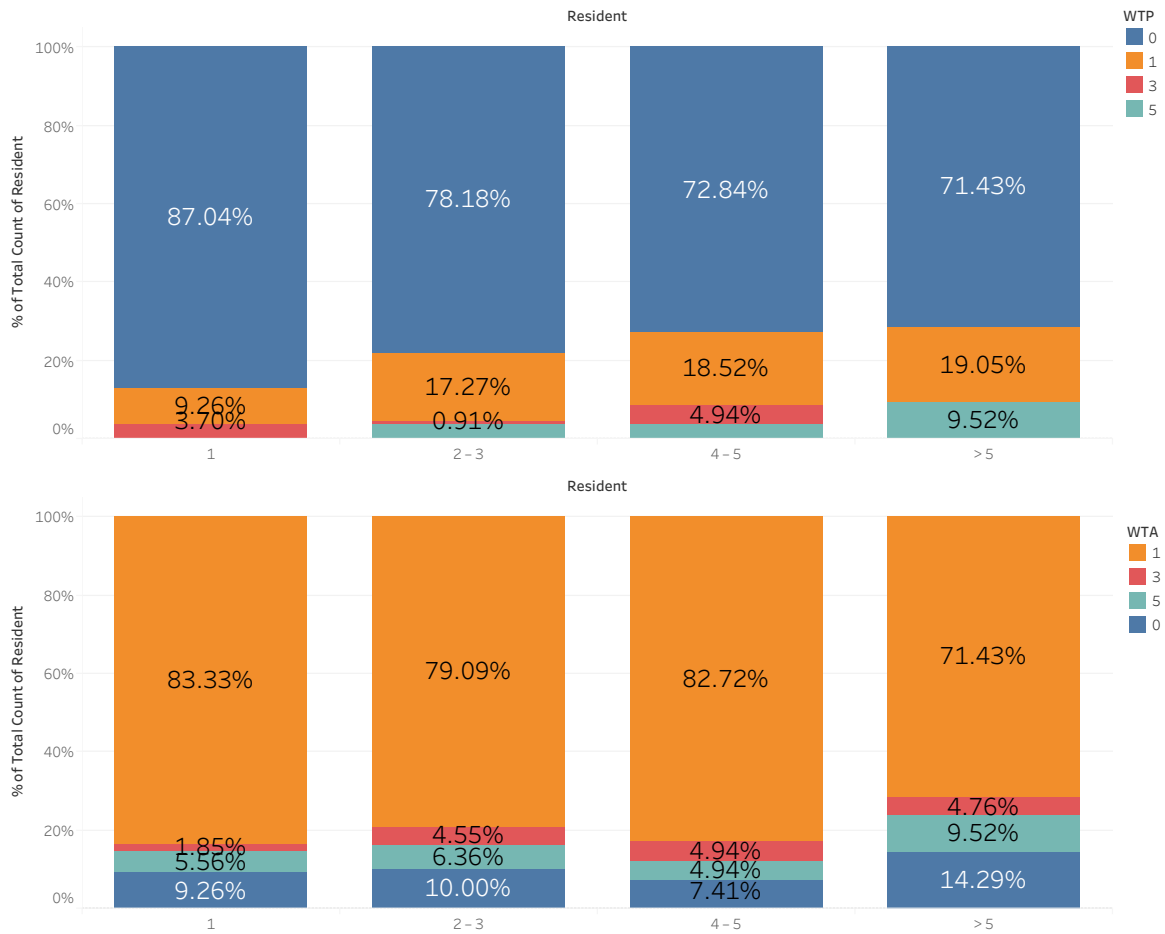
Figure 7: The effect of resident(s) on WTP and WTA

From figure 7, in spite of a positive relationship between resident and the tax policy, there is still an unclear relationship in the subsidy policy. On the other hand, there is an upward trend in the tax policy. In other words, it can be concluded that the more residents in their place of living, the lower rate of WTP they will be.

Overall, although there is an unclear trend within the subsidy policy, it can still be concluded in the tax policy that the higher number of residents, the less sensitivity they will have to policy.
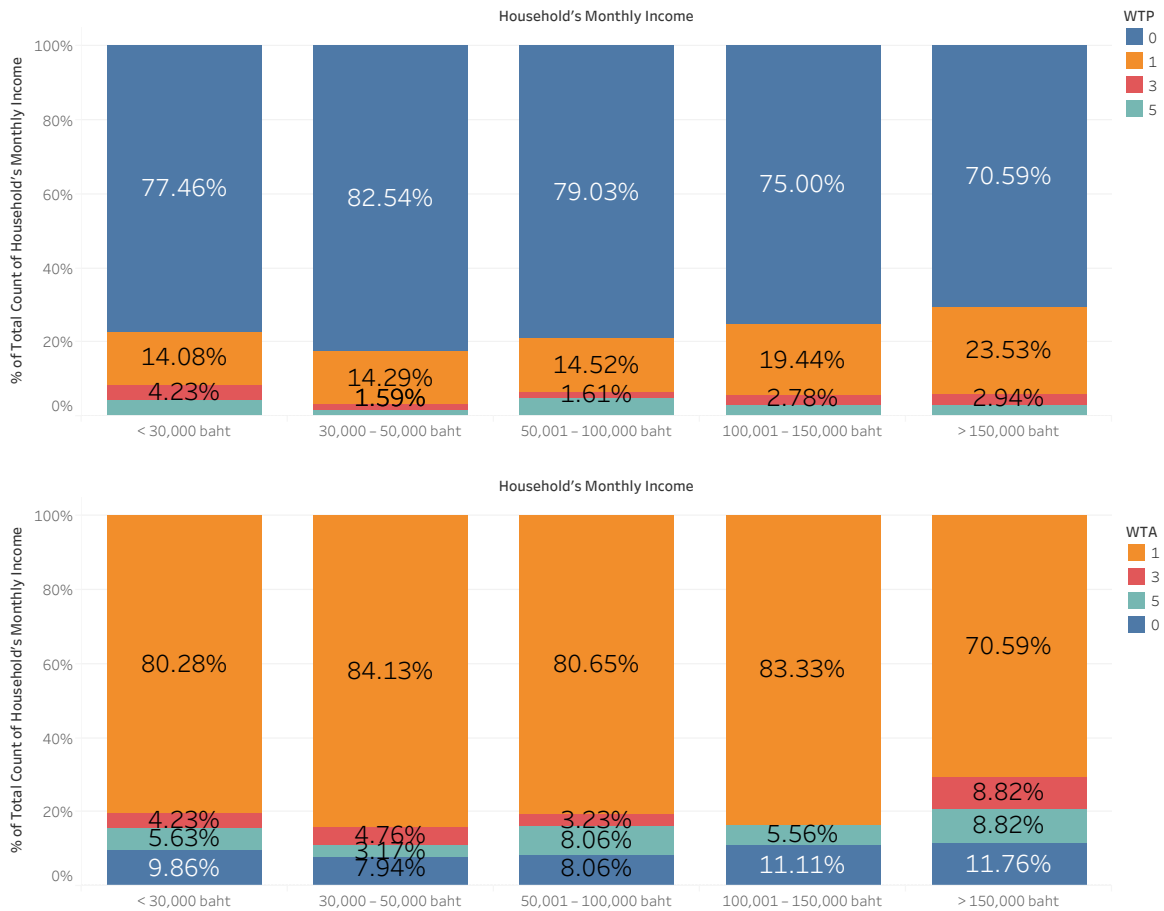
Figure 8: The effect of household's monthly income on WTP and WTA

According to figure 8, it can be seen that there have no clear illustration in both policies. Although in the tax policy has a positive relationship. It is not able to conclude because of the first group, the consumer who has a household's monthly income lower than 30,000 baht. However, the chart indicates that the consumer who has an income higher than 150,000 baht are less sensitivity to policies.

Overall, although its illustration is unclear, it can still focus on the general consumer who is in between the extreme group which are the lowest and the highest income in the tax policy. As consumer has a higher household's monthly income, they tend to have a lower rate of WTP.
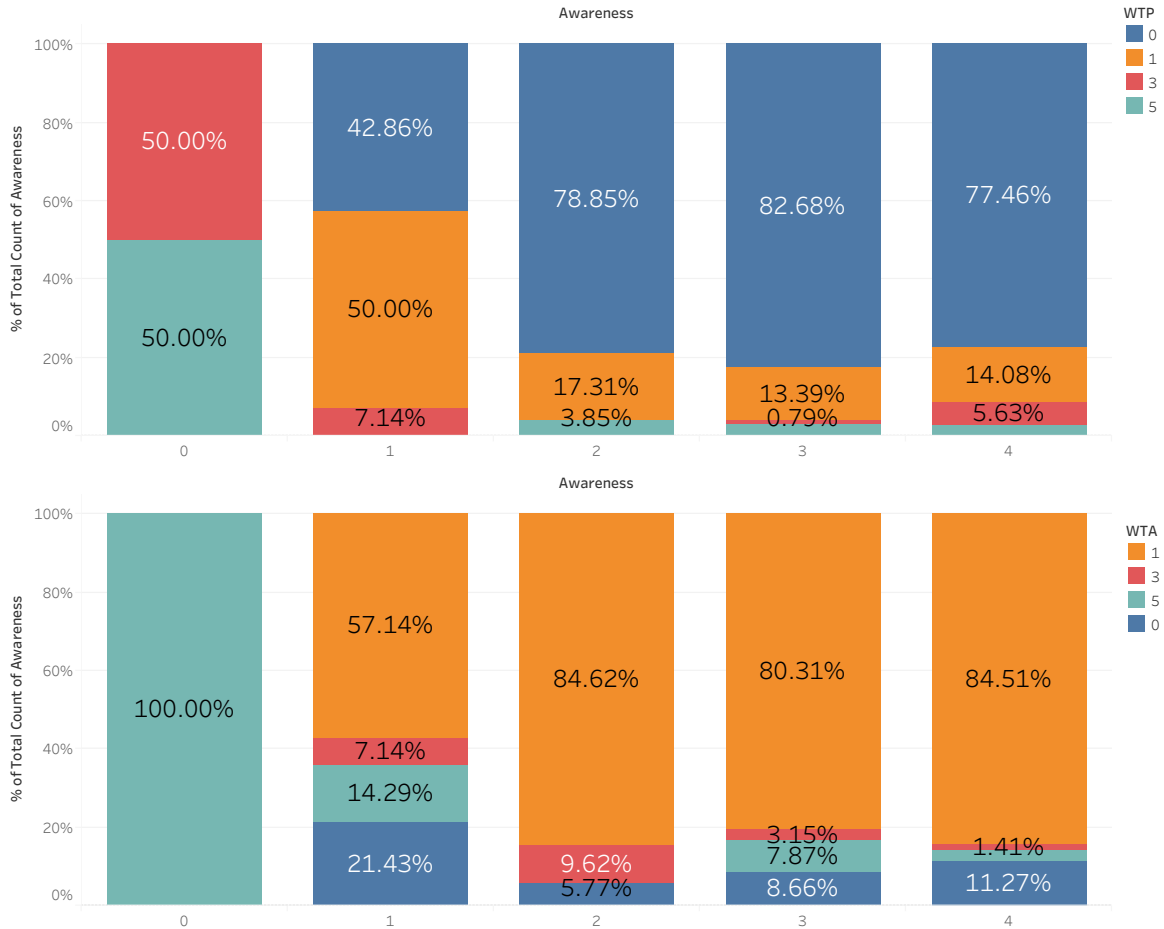
Figure 9: The effect of awareness on WTP and WTA

The way to calculate the awareness is the questions that each consumer will get 1 mark for each correct answer. There are four questions which are 1. "Do you reuse plastic bags?", 2. "Do you leave the tap on while brushing your teeth?", 3. "Which one do you usually take when you are travelling between floors?", and 4. "Do you normally bring your own containers?". The answer which will get the mark are 1. "Yes", 2. "No", 3. "Ladders", and "Yes".

According to figure 9, there is a huge change between consumer who has low awareness rate and consumer who has high awareness rate. Consumers who have lower awareness would have higher rate of WTP and WTA. In contrast, as the rate of awareness is higher, consumers tend to have less WTP and WTA.

Even though there is no a clear trend, it can be seen as an overall picture that those who has a high awareness rate would tend to refuse receiving plastic bags as policies are implemented.

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2. Regression

Regressions are divided into three parts which are willingness to pay (WTP) regressions, willingness to accept (WTP) regressions, and conclusion. Furthermore, results of the regressions are checked for the robustness by using robust standard errors and testing by dropping or adding covariates.

VARIABLES	(1) Model 1	(2) Model 2	(3) Model 3	(4) Model 4	(5) Model 5	(6) Model 6	(7) Model 7
education	-0.0677*	-0.0836**	-0.0759**	-0.0797**	-0.0785**	-0.0758**	-0.0747**
	(0.0356)	(0.0370)	(0.0364)	(0.0372)	(0.0367)	(0.0347)	(0.0348)
dormitory		-0.418***	-0.432***	-0.425***	-0.426***	-0.369**	-0.395**
		(0.126)	(0.129)	(0.129)	(0.130)	(0.171)	(0.177)
condominium		-0.105	-0.160	-0.145	-0.156	-0.121	-0.0630
		(0.249)	(0.247)	(0.246)	(0.245)	(0.261)	(0.254)
awareness			-0.121	-0.108	-0.107	-0.110	-0.0972
			(0.0982)	(0.0999)	(0.100)	(0.101)	(0.103)
receive				0.115	0.121	0.121	0.133*
				(0.0750)	(0.0765)	(0.0763)	(0.0751)
female					-0.0887	-0.0925	-0.0938
					(0.130)	(0.132)	(0.132)
resident						0.0505	0.0738
						(0.101)	(0.0985)
income							-0.0540
							(0.0513)
Constant	0.715***	0.940***	1.271***	0.881*	0.909**	0.772	0.783
	(0.199)	(0.237)	(0.381)	(0.452)	(0.458)	(0.478)	(0.478)
Observations	266	266	266	266	266	266	266
R-squared	0.015	0.048	0.058	0.065	0.066	0.068	0.071

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 2: Regression results of WTP

Table 2 shows the robustness of the WTP regressions. It is obvious that signs of all coefficients are consistent in all models indicating the robustness of relationships and finding from these models. Education and dormitory are statistically significant at 95% and 99% confidence level.

Furthermore, regression results indicate that education and dormitory have strong relationships with WTP for plastic bag uses. Table 2 also shows the negative relationship between education and WTP. Meaning that consumer with higher educational level tends to be very sensitive to the tax policy since they refuse to pay for plastic bags. Similarly, dormitory

also has the negative relationship to WTP. This indicates that consumer who lives in dormitory will not pay for a plastic bag if the tax policy has been implemented.

The results are also shown that consumer with 1 step higher level of educational will have a lower WTP than consumer who has a lower level of education by approximately 0.08 baht. Furthermore, consumer who lives in dormitory tends to have a lower WTP compared to those who live in the house by approximately 0.4 baht. In addition, the constants of each model also show WTP of base-group people, who have 0 in all variables, will have approximately 0.9 baht of WTP for a plastic bag.

Regression results of WTP are not only consistent across models but also consistent with data analysis in the earlier part. It can be seen that education, dormitory, condominium, awareness, female and income have negative relationships with WTP for a plastic bag while receive and resident have positive relationship.

VARIABLES	(1) Model 1	(2) Model 2	(3) Model 3	(4) Model 4	(5) Model 5	(6) Model 6	(7) Model 7
awareness	-0.202**	-0.204**	-0.187*	-0.187*	-0.186*	-0.189*	-0.192*
	(0.100)	(0.103)	(0.100)	(0.0992)	(0.0995)	(0.0999)	(0.102)
education		0.00615	0.00285	0.00288	0.00570	0.00837	0.00817
		(0.0373)	(0.0379)	(0.0385)	(0.0385)	(0.0372)	(0.0375)
dormitory			-0.141	-0.141	-0.144	-0.0889	-0.0838
			(0.140)	(0.140)	(0.141)	(0.156)	(0.158)
condominium			0.353	0.353	0.327	0.361	0.350
			(0.300)	(0.300)	(0.301)	(0.299)	(0.307)
receive				-0.000661	0.0137	0.0135	0.0110
				(0.0862)	(0.0892)	(0.0891)	(0.0899)
female					-0.209	-0.213	-0.212
					(0.150)	(0.152)	(0.152)
resident						0.0486	0.0439
						(0.0926)	(0.100)
income							0.0109
							(0.0647)
Constant	1.823***	1.801***	1.780***	1.782***	1.849***	1.717***	1.714***
	(0.320)	(0.336)	(0.367)	(0.409)	(0.409)	(0.405)	(0.405)
Observations	266	266	266	266	266	266	266
R-squared	0.026	0.026	0.042	0.042	0.051	0.052	0.052

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 3: Regression results of WTA

In the same way, WTA regressions are robust since signs of all coefficients are consistent in all models. Awareness is statistically significant at 95% confidence level in first two models and 90% confidence level in the rest.

The regression results indicate that awareness has a strong relationship with willingness to accept for a plastic bag. Table 3 shows the negative relationship between awareness and WTA. Meaning that consumer with a higher level of awareness is very sensitive to the subsidy policy. This means that the high awareness group tends to accept a low level of subsidy and will stop using the plastic bags.

The results also point out that consumer with 1 higher level of the awareness will have lower WTA than those who have a lower awareness by approximately 0.2 baht. In addition, the constants of each model also show that WTA of base-group people, who have 0 in all variables, will have approximately 1.7 baht of WTA for a plastic bag.

In addition, Regression results of WTA is not only consistent across models but also consistent with data analysis in the earlier part. As can be seen that awareness, dormitory and female have negative relationships with WTP for a plastic bag while condominium has a positive relationship. However, relationship of some variables remain unclear since coefficients are very low and insignificant.

In conclusion, results of WTP regressions provide more clear pictures from the statistic and econometric point of view. Differences can be seen in three main points. First, WTP models have a stronger level of significant. Second, WTP models have a higher level of R-squared. Lastly, many variables in WTA models have an unclear relationship. This means variables in WTP models are able to explain the dependent variable better comparing with WTA models. In other words, relationships in WTP models are more clear.

The reason behind those different outcomes under tax and subsidy policies could mainly be the loss aversion. The theory of loss aversion has illustrated that people tend avoiding losing more than gaining equivalent things. This means that most of people think it is better to not pay money than to gain the same amount of money. The principle is applicable in economics. Kahneman & Tversky (1992) have suggested that losses are psychologically twice powerful compared to gains.

One important intuition behind these results is that demographic factors such as place of living and education has more impact on influencing WTP while the behavioral factor likes awareness has more impact on WTA. These findings indicate that tax might be better at forcing people to reduce a plastic bag usage. On the other hand, subsidy could play an important role

in encouraging people, who have some environmental awareness, to reduce plastic bag usage because they have lower WTA and tend to accept a low level of subsidy.

Conclusion

This research is mainly focusing on 3 purposes. First, measuring consumer willingness to pay (WTP) and willingness to accept (WTA) for reducing plastic consumption. Second, finding impacts of demographic and behavioral factors on WTP and WTA. Last, providing useful information for policy makers on impacts of the plastic bag policy in Thailand.

Key findings of this research can be summarized as follows:

1. Subsidy is able to reduce the plastic bag usage more than tax at a low level (1 baht). On the other hand, tax is more effective at higher levels (3 baht and 5 baht).
2. Female is more sensitive to subsidy compared to male.
3. Families with a high number of members are less sensitive to tax.
4. Demographic factors such as education and place of living have significant relationships with WTP.
5. A behavioral factor likes environmental awareness has a significant relationship with WTA.

The research will be beneficial to the policy makers for taking both demographic and behavioral factors into the plastic bag policy design. Furthermore, results also indicate groups of people who will be affected by policies in various situations. However, it is still not conclusive whether tax or subsidy policy is more suitable for Thailand but at least, this research provides the level of appropriate policy.

For further research, there are rooms for studying on this topic. One interesting topic is benefit and cost effectiveness of plastic bag policies since this paper provides only impacts of policies on consumer behavior. Another topic is economic impacts of plastic bag policies. This is because the reduction on plastic bag uses will create an impact on the economy through plastic industry which is able to affect the employment and the consumption of the country.

In conclusion, to tackle on plastic bag uses in Thailand is necessary. In contrast, the implementation requires the impact assessment from many aspects. This research provides many significant impacts and insights of the policies on the consumer side and will be the first step to design the plastic bag policy in Thailand to be more tangible.

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Appendix A: A survey on plastic bag uses in Thai

แบบสอบถามพฤติกรรมการใช้ถุงพลาสติก

ข้อมูลในแบบสอบถามฉบับนี้ ใช้ประกอบการวิจัยเพื่อใช้ในการศึกษาเท่านั้น โดยผู้วิจัยใคร่ขอ
ความกรุณาให้ผู้ตอบแบบสอบถามตอบคำถามตามความเป็นจริง เพื่อเป็นประโยชน์ต่อการวิเคราะห์

แบบสอบถามชุดนี้มีจำนวน 4 หน้า เวลาที่ใช้ในการตอบแบบสอบถามทั้งหมดประมาณ 4 นาที โดย
คำตอบในแบบสอบถามฉบับนี้เป็นความคิดเห็นส่วนบุคคล ไม่มีคำตอบที่ถูกหรือผิดแต่อย่างใด อีกทั้ง<u>ข้อมูล
ของผู้ตอบแบบสอบถามทั้งหมดจะถูกเก็บเป็นความลับ และจะไม่ถูกนำมาแสดงในส่วนงานวิจัย</u>

ผู้วิจัยขอขอบพระคุณเป็นอย่างสูงสำหรับความกรุณาและการสละเวลาในการตอบแบบสอบถาม

<u>คำชี้แจง</u> โปรดทำเครื่องหมาย ✓ ลงใน ☐ หรือเติมข้อความลงในช่องว่าง

ส่วนที่ 1: แบบสอบถามพฤติกรรมการใช้ถุงพลาสติก

1. ในเดือนที่แล้ว คุณรับถุงพลาสติกจากร้านค้าบ่อยแค่ไหน

    ☐ ทุกครั้ง ☐ เป็นส่วนใหญ่ ☐ เป็นบางครั้ง ☐ ไม่เคย

2. คุณได้นำถุงพลาสติกมาใช้ซ้ำหรือไม่

    ☐ ใช้ ☐ ไม่ได้ใช้ (ข้ามไปตอบข้อที่ 4)

3. ในเดือนที่แล้ว คุณได้นำถุงพลาสติกมาใช้ซ้ำบ่อยแค่ไหน

    ☐ ทุกครั้ง ☐ เป็นส่วนใหญ่ ☐ เป็นบางครั้ง

4. หากคุณต้องจ่ายเงิน 1 บาท เพื่อรับถุงพลาสติก 1 ใบ คุณจะรับถุงหรือไม่

    ☐ รับ ☐ ไม่รับ

    ความมั่นใจในคำตอบของคุณคือ

ไม่มั่นใจ 0	1	2	3	4	5	6	7	8	9	มั่นใจมาก 10

5. หากคุณต้องจ่ายเงิน 3 บาท เพื่อรับถุงพลาสติก 1 ใบ คุณจะรับถุงหรือไม่

☐ รับ   ☐ ไม่รับ

ความมั่นใจในคำตอบของคุณคือ

ไม่มั่นใจ 0	1	2	3	4	5	6	7	8	9	มั่นใจมาก 10

6. หากคุณต้องจ่ายเงิน 5 บาท เพื่อรับถุงพลาสติก 1 ใบ คุณจะรับถุงหรือไม่

☐ รับ   ☐ ไม่รับ

ความมั่นใจในคำตอบของคุณคือ

ไม่มั่นใจ 0	1	2	3	4	5	6	7	8	9	มั่นใจมาก 10

7. หากคุณได้รับเงิน 1 บาท ต่อการไม่รับถุงพลาสติก 1 ใบ คุณจะรับข้อเสนอนี้หรือไม่

☐ รับ   ☐ ไม่รับ

ความมั่นใจในคำตอบของคุณคือ

ไม่มั่นใจ 0	1	2	3	4	5	6	7	8	9	มั่นใจมาก 10

8. หากคุณได้รับเงิน 3 บาท ต่อการไม่รับถุงพลาสติก 1 ใบ คุณจะรับข้อเสนอนี้หรือไม่

☐ รับ   ☐ ไม่รับ

ความมั่นใจในคำตอบของคุณคือ

ไม่มั่นใจ 0	1	2	3	4	5	6	7	8	9	มั่นใจมาก 10

9. หากคุณได้รับเงิน 5 บาท ต่อการไม่รับถุงพลาสติก 1 ใบ คุณจะรับข้อเสนอนี้หรือไม่

☐ รับ   ☐ ไม่รับ

ความมั่นใจในคำตอบของคุณคือ

ไม่มั่นใจ 0	1	2	3	4	5	6	7	8	9	มั่นใจมาก 10

10. คุณเปิดน้ำทิ้งไว้ระหว่างแปรงฟันหรือไม่

□ เปิด □ ไม่เปิด

11. โดยปกติแล้ว คุณเดินทางด้วยวิธีใดเมื่อต้องการไปยังชั้นที่อยู่<u>ติดกัน</u>บนอาคาร

□ ลิฟต์ □ บันได

12. โดยปกติแล้ว คุณพกภาชนะส่วนตัวไปข้างนอกหรือไม่

□ ใช่ คือ

□ กระติกน้ำ □ แก้ว □ กล่องใส่อาหาร □ อื่น ๆ.............
□ ไม่ใช่

- -

ส่วนที่ 2: ข้อมูลทั่วไป

1. เพศ

□ ชาย □ หญิง □ อื่น ๆ....................

2. อายุ

.... ปี

3. สถานภาพ

□ โสด □ สมรส □ อื่น ๆ....................

4. วุฒิการศึกษา

*<u>หมายเหตุ</u> ให้ทำเครื่องหมายในช่องที่สำเร็จการศึกษาแล้ว ตัวอย่างเช่น หากกำลังศึกษาอยู่ในระดับปริญญาตรี ให้ทำเครื่องหมายในช่อง ☑ มัธยมศึกษาตอนปลาย

□ ต่ำกว่ามัธยมศึกษา □ มัธยมศึกษาตอนต้น □ มัธยมศึกษาตอนปลาย

□ ปวช./ปวส. □ อนุปริญญา □ ปริญญาตรี

□ ปริญญาโท □ ปริญญาเอก

5. อาชีพ

- ☐ นักเรียน/ นิสิต/ นักศึกษา
- ☐ ข้าราชการ/ พนักงานรัฐวิสาหกิจ
- ☐ พนักงานบริษัท
- ☐ ธุรกิจส่วนตัว/ ค้าขาย
- ☐ รับจ้างอิสระ
- ☐ ครู/ อาจารย์
- ☐ เกษตรกรรม/ ปศุสัตว์/ ประมง
- ☐ พ่อบ้าน/ แม่บ้าน
- ☐ เกษียณ/ ว่างงาน
- ☐ อื่น ๆ ....

6. ที่พักอาศัยปัจจุบัน

- ☐ บ้าน
- ☐ หอพัก
- ☐ คอนโดมิเนียม
- ☐ อื่น ๆ ....

7. จำนวนผู้พักอาศัย

- ☐ อยู่คนเดียว
- ☐ 2 – 3 คน
- ☐ 4 – 5 คน
- ☐ มากกว่า 5 คน

8. รายได้ของครอบครัวต่อเดือน

- ☐ ต่ำกว่า 30,000 บาท
- ☐ 30,000 – 50,000 บาท
- ☐ 50,001 – 100,000 บาท
- ☐ 100,001 – 150,000 บาท
- ☐ มากกว่า 150,000 บาท

ขอบคุณที่สละเวลาในการทำแบบสอบถามค่ะ ✎

Appendix B: A survey on plastic Bag uses in English

SURVEY ON PLASTIC BAG USES

All information in this survey will be used only for educational research purpose. Please answer each question as accurately as possible for the analysis.

This survey contains 4 pages and takes approximately 4 minutes to complete. There is no right or wrong answer as all answers provided in this survey are personal opinions. <u>Your answers will be kept strictly confidential and will not be reported in the research.</u>

I would like to kindly thank you for your cooperation and your time taking on this survey.

<u>Instruction</u>: Please tick in the box or fill in the blank.

Part 1: Plastic Bag Usage

1. Last month, how often do you take plastic bags?

   ☐ Always   ☐ Very often   ☐ Sometimes   ☐ Never

2. Do you reuse plastic bags?

   ☐ Yes   ☐ No (Skip Question 3)

3. How often did you reuse plastic bags in last month?

   ☐ Always   ☐ Very often   ☐ Sometimes

4. If you have to pay 1 baht for 1 plastic bag, will you take plastic bag?

   ☐ Yes   ☐ No

   Confidence level of your answer

Not confident 0	1	2	3	4	5	6	7	8	9	Confident 10

5. If you have to pay 3 baht for 1 plastic bag, will you take plastic bag?

☐ Yes ☐ No

Confidence level of your answer

Not confident 0	1	2	3	4	5	6	7	8	9	Confident 10

6. If you have to pay 5 baht for 1 plastic bag, will you take plastic bag?

☐ Yes ☐ No

Confidence level of your answer

Not confident 0	1	2	3	4	5	6	7	8	9	Confident 10

7. If you receive 1 baht for refusing 1 plastic bag, will you accept this offer?

☐ Yes ☐ No

Confidence level of your answer

Not confident 0	1	2	3	4	5	6	7	8	9	Confident 10

8. If you receive 3 baht for refusing 1 plastic bag, will you accept this offer?

☐ Yes ☐ No

Confidence level of your answer

Not confident 0	1	2	3	4	5	6	7	8	9	Confident 10

9. If you receive 5 baht for refusing 1 plastic bag, will you accept this offer?

☐ Yes ☐ No

Confidence level of your answer

Not confident 0	1	2	3	4	5	6	7	8	9	Confident 10

10. Do you leave the tap on while brushing your teeth?

☐ Yes ☐ No

11. Which one do you usually take when you are travelling <u>between floors</u>?

☐ Elevator ☐ Stairs

12. Do you normally bring your own containers?

☐ Yes,

☐ Water bottle ☐ Tumbler ☐ Food container

☐ Others…………………

☐ No

- -

Part 2: Demographic Information

1. Gender

☐ Male ☐ Female ☐ Others…………………

2. Age

………………………

3. Status

☐ Single ☐ Married ☐ Others…………………

4. Educational Level

> ***<u>Remark</u>** Please tick in the box for your current educational level.
>
> For example: If you are studying in Bachelor degree, please tick ☑ Senior high school.

☐ Lower than Junior high school ☐ Junior high school ☐ Senior high school

☐ Vocational degree ☐ Diploma ☐ Bachelor's degree

☐ Master's degree ☐ Ph.D. ☐ Others………….

5. Occupation

☐ Student   ☐ Government Official/ State enterprise employee

☐ Private employee   ☐ Business owner/ Merchant

☐ Freelancer   ☐ Teacher/ Professor

☐ Agriculturist/ Rancher/ Fisherman   ☐ Homemaker

☐ Retiree/ Unemployed   ☐ Others…………………

6. Residence

☐ House   ☐ Dormitory   ☐ Condominium   ☐ Others………

7. Number of resident(s)

☐ 1   ☐ 2 – 3   ☐ 4 – 5   ☐ More than 5

8. Household's monthly income

☐ Less than 30,000 baht   ☐ 30,000 – 50,000 baht

☐ 50,001 – 100,000 baht   ☐ 100,001 – 150,000 baht

☐ More than 150,000 baht

Thank you for taking the time to complete this survey✎