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The Impact of Environmental Protection Tax on Plastic Bag Use: A Case Study of Vietnam*

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Abstract

The study investigates the impact of the environmental protection tax, along with other factors such as attitude, subjective norm, environmental concern, and the availability of substitutes on the use of plastic bags in Vietnam. To achieve this objective, a questionnaire was prepared for data collection. The questionnaire employed a 5-point Likert scale with “completely disagree” at 1 and “completely agree” at 5. A total of 327 questionnaires were returned. However, only 291 valid responders were used in the analysis. The Cronbach’s Alpha and the exploratory factor analysis were applied to test the scale reliability and discover the structure of the scales. Afterwards, we conducted the confirmatory factor analysis and the structural equation modeling to analyze collected data. The study shows that attitude is an important factor influencing the plastic bag use of consumers. Other factors that also lead to a decline in plastic bags are subjective norm and environmental concern. Meanwhile, the availability of substitutes does not affect consumers’ green behavior. Moreover, the major findings of the research suggest the relationship between the environmental protection tax and the use of plastic bags is not statistically significant. In other words, tax policy may fail to change the habit of using plastic bags in Vietnam.

Keywords: Plastic Bag Use, Environmental Tax, Attitude, Subjective Norm, Environmental Concern

JEL Classification Code: H23, D70, Q56

1. Introduction

Environmental pollution from plastic bag waste is a problem attracting the attention of many countries around the world. Due to their convenience and low cost, plastic bags have long been widely used in daily activities. The consumption of plastic bags is constantly increasing, leading to a large volume of plastic bags being produced and discharged into

the environment. Plastic bags are non-biodegradable wastes in natural conditions. Hence, when they are treated by landfilling, they will negatively affect the soil and water environment. On the other hand, if plastic bags are processed by burning, they will create exhaust gases containing dioxins and furans, which harm human health. If this waste is discharged into ponds, lakes, rivers or oceans, it will damage aquatic organisms and severely affect the marine ecosystem as well as disrupt the natural environment. These negative impacts force the governments to conduct environmental protection policies to reduce the plastic bag waste.

There are a number of measures that the authorities can employ to manage environmental issues. Among these measures, tax is considered as an effective economic tool, which has been applied by many countries around the world (Earth Policy Institute, 2014; Welsh Government, 2016; Smithers, 2020). An environmental protection tax policy regulates the production, sales and consumption of products, which are harmful to the environment in order to reduce environmental pollution. This, in turn, may promote the production and consumption of environmentally friendly products.

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Vietnam generates about 3.27 million tons of plastic waste each year, much of which is not properly processed (Jambeck et al., 2015). Meanwhile, according to the Ministry of Natural Resources and Environment, on average, each Vietnamese household uses approximately one kilogram of plastic bags/month. Particularly in Hanoi and Ho Chi Minh City, around 80 tons of plastic and nylon have been discharged into the environment every day (Ministry of Natural Resources and Environment, 2019). The use of plastic bags is considered a habit of many Vietnamese people because these bags are cheap, popular and convenient (Nguyen, 2018). However, this waste can seriously threaten human health, the ecosystem and the sustainable development of the country.

In such a context, the Vietnamese government has enacted policies to promote the green consumption behavior of individuals. Vietnam's Law on Environmental Protection Tax, which came into effect from January 1, 2012, is a legal document that directly regulates products that cause environmental pollution including plastic bags. Afterwards, in early 2019, the Ministry of Finance raised taxes on plastic bags. However, the impact of the tax policy is still controversial. Furthermore, the revenue from the tax seems to be disproportionate to the damage caused by this waste.

To the best of the authors' knowledge, there is no current study that analyzes the impact of the environmental protection tax on plastic bags consumption in Vietnam. The paper fills this gap by providing an assessment of whether this tax policy changes consumers' habit as regards using plastic bags. Findings from the research can provide useful information about the effectiveness of the tax policy.

2. Literature Review

2.1. Attitude (ATT)

Attitude toward the behavior is defined as “the degree to which a person has a favorable or unfavorable evaluation of the behavior in question” (Ajzen, 1991, p.188). The theory of reasoned action (TRA developed by Fishbein (1967) is one of the first theories to include “attitude” to explain human behavior. The theory was then modified and extended by Ajzen and Fishbein (1975). The authors state that personal attitude can affect people's behavior through behavioral intention. This statement is also expressed in the theory of planned behavior (TPB) developed by Ajzen (1991). Notably, it is concluded that individual attitude is a vital factor that can adjust one's behavior.

Afterwards, various studies have developed conceptual frameworks to examine the green intention and behavior of consumers. Kotchen and Reiling (2000) claim that attitude is a vital determinant of individuals' intention and behavior. Other authors indicate that consumers' attitude is positively related to pro-environmental intention (Paul, Modi, &

Patel, 2016; Pham, 2020). Similarly, Nguyen, Nguyen, Trinh, Tran, & Cao (2020) suggest the attitude toward buying green can enhance the intention to purchase green products of consumers. In terms of green behavior, Mostafa (2009) believes that individuals' environmental attitude and environmental concern are important factors that can influence the green purchase behavior. Birgelen, Semeijn, and Keicher (2009) support this conclusion by showing that if consumers have positive attitude towards environmental protection, they prefer beverages with environmentally friendly packaging. Zhao, Gao, Wu, Wang, and Zhu (2014) study the factors influencing green consumption behavior in China. The authors propose that attitude is the most important predictor of pro-environmental behavior. Meanwhile, Le (2018) examines 237 people in Vietnam to explore factors that impact biodegradable bag consumption. The author concludes that eco-friendly attitude and subjective norm can enhance the use of biodegradable bag. Based on these findings, the following hypothesis is formulated:

H1. The attitude is positively associated with a decline in plastic bag use.

2.2. Subjective Norm (SN)

The TRA and TPB models indicate that subjective norm is another factor that influences individuals' behavior. Subjective norm refers to “the perceived social pressure to perform or not to perform the behavior” (Ajzen, 1991, p.188). Subjective norm can be influenced by factors such as culture, education and social interactions. (Ajzen, 1991; Hee, 2000)

Previous studies suggest subjective norm can be a predictor of environmental behavior. For instance, Biel and Thøgersen (2007) advocate subjective norm as a construct used to predict green consumption. Meanwhile, Smith and Paladino (2010) argue that environmental concern and subjective norm are main drivers of consumers' green purchase behavior. Other studies conclude that subjective norm has a positive impact on green purchase behavior (Eze & Ndubisi, 2013; Welsch & Kühling, 2009).

Meanwhile, there are still debates about the impact of subjective norm on pro-environmental behavior in Vietnam. Some researchers show that subjective norm can enhance individuals' green consumption (Le, 2018; Ho & Phan, 2018). However, Hoang, Huynh, and Huynh (2018) challenge these claims by indicating that this factor may not affect consumers' green behavior. This paper expects that subjective norm positively affects green behavior, therefore the following hypothesis is developed:

H2. The subjective norm is positively associated with a decline in plastic bag use.

2.3. Environmental Concern (EC)

Previous studies show that environmental concern is another factor that can affect pro-environmental behavior. Environmental concern is referred as “the degree to which people are aware of problems regarding the environment and support efforts to solve them and or indicate the willingness to contribute personally to their solution” (Dunlap & Jones, 2002, p.485). In a number of studies, this factor has been shown to directly affect green purchasing behavior (e.g., Hines, Hungerford, & Tomera, 1987; Kim & Choi, 2005). Meanwhile, other authors suggest environmental concern is an important determinant of green consumption (Mostafa, 2009; Paul, Modi & Patel, 2016).

Hansla, Gamble, Juliusson, and Garling (2008) use this factor to predict consumers’ green behavior. The authors show that environmental concern and green behavior have a significant positive relationship. Similarly, Hu, Parsa, and Self (2010) argue that environmental concern can enhance individuals to patronize green restaurants. Lee and Lim (2020) examine the effect of environmental concern on green supply chain management and consumer purchasing behavior. The authors suggest consumers’ environmental concerns are positively related to a company’s internal environmental management image and eco-design image, which in turn can encourage consumer-purchasing behavior.

Other studies show that environmental concern can promote pro-environmental behavior in Vietnam. Luong (2013) surveys the plastic bag consumption of residents in Hanoi in daily activities. The author suggests environmental concern is an important factor affecting people’s readiness to pay for plastic bag use. Hoang (2016) examines green consumption intention and behavior in Vietnam. The author indicates that environmental concern can promote consumers’ green behavior through their intentions. Hoang, Huynh, and Huynh (2018) claim that green consumption behavior is affected by two main factors, namely attitude towards behavior and environmental concern. Thus, the hypothesis is proposed as follow:

H3. The environmental concern is positively associated with a decline in plastic bag use.

2.4. The Availability of Substitutes (AS)

The availability of green products used as a substitute for plastic bags may impact green purchase behavior. De Pelsmacker, Driesen, and Rayp (2005) indicate reasons that can deter green behavior, namely, the unavailability of green products and lack of information. Young, Hwang, Donald, and Otaes (2010) show that green consumption can be prevented by barriers such as lack of information and time, high prices and lack of availability of green products. A study

by Gleim, Smith, Andrews, and Cronin (2013) advocate this statement. The authors suggest if consumers propose that green products are unavailable or are overvalued, their pro-environmental behavior will be negatively affected. The authors also claim that factors such as time and effort to find and evaluate green substitutes can hinder green consumption.

The availability of substitutes is considered in many studies on green behavior in Vietnam. However, the impact of this factor is still controversial. Vu, Nguyen, and Nguyen (2012) propose that the availability of green products can be a predictor of green behavior. Meanwhile, Hoang (2016) argues that the availability of substitutes is positively related to customers’ green purchase behavior. Nevertheless, other studies indicate that this factor may not influence individuals’ pro-environmental behavior in Vietnam (Hoang, Huynh, & Huynh, 2018; Le, 2018). Based on these claims, the authors suggest the following hypothesis:

H4. The availability of substitutes is positively associated with a decline in plastic bag use.

2.5. Environmental Protection Tax (EPT)

Research on factors influencing green consumer behavior has received increasing attention in recent years. However, little empirical research has examined the effect of environmental protection policy on consumers’ green behaviors. Among these studies, it is shown that the efficacy of levies on plastic bags is very potential. In 2002, Ireland issued a tax policy on plastic bags, which led to an immediate decline in the use of plastic bags, from approximately 328 bags to 21 bags per capita. The tax was then increased from €0.15 in 2002 to €0.44 in 2009 while the bag use dropped to 14 per capita in 2014 (Earth Policy Institute, 2014). In October 2011, the Welsh government introduced a five pence levy on carrier bags. This policy caused carrier bags consumption to decrease by approximately 70% between October 2011 and January 2015 (Welsh Government, 2016). Similarly, a five pence levy on plastic bags was introduced in England in 2015. Consequently, the consumption of plastic bags at major supermarkets has declined by 95% since the introduction of five pence charge (Smithers, 2020). To summarize, the environmental protection tax should be positively related to a reduction in plastic bag use. Hence, we propose the following hypothesis in the model:

H5. The environmental protection tax is positively associated with a decline in plastic bag use.

Based on previous studies and assessment of the factors affecting green consumption behavior in Vietnam, the study formulates the research model as described in Figure 1.

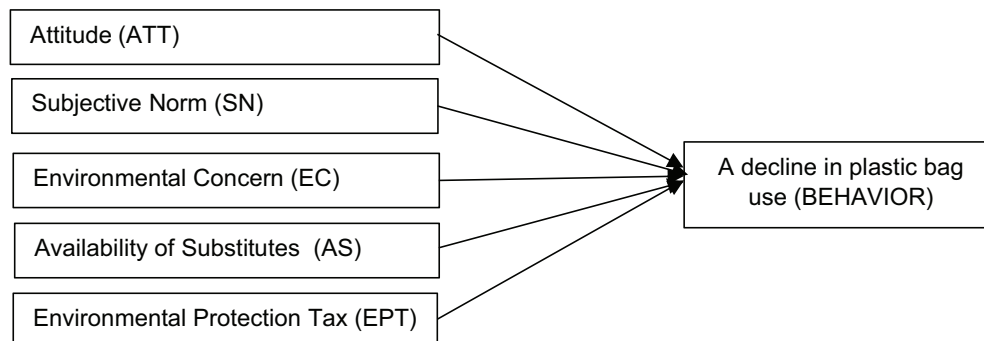


Figure 1: Research model

3. Research Methodology

A questionnaire used to collect data was designed with two parts. Part 1 included assessments of individuals on the research features (attitude, subjective norm, environmental concern, the availability of substitutes, the environmental protection tax policy and the plastic bag use). These indicators were measured using a five-point Likert scale, with “completely disagree” at 1 and “completely agree” at 5. Part 2 included personal information (gender, age and income).

The collected data was processed using the statistical analysis software SPSS and Amos. First, Cronbach’s Alpha was measured to test the scale reliability. Afterwards, we conducted the Exploratory Factor Analysis (EFA) using the Principle Axis Factoring (PAF) and Promax methods to uncover the structure of the scales. In other words, this analysis was implemented to ensure that each variable loaded on only one factor. The Confirmatory Factor Analysis (CFA) was then implemented to verify the study model. Finally, the Structural Equation Modeling (SEM) was applied to determine the factors influencing the consumption behavior of plastic bags.

4. Results and Discussion

4.1. Description of Research Sample

There were 327 questionnaires returned. However, after data screening, only 291 valid responders were employed in the analysis. Table 1 describes the information of participants in the survey. Notably, the sample consists of 115 male responders (39.5%) and 176 female responders (60.5%). There are 105 responders (36.1%) aged 18 to 22; 87 responders (29.9%) aged 23 to 29; 65 responders (22.3%)

aged 30 to 39, and 34 responders aged 40 and older. Most respondents (93.1%) report that their monthly income is less than or equal to VND20 million.

4.2. Results and Discussion

To assess the quality of the questionnaire, we first test the scale’s reliability. Cronbach’s Alpha (α) values of the variables should be higher than the minimum 0.7 standard (Hair, Anderson, Tatham, & Black, 1998). The results show that all variables reach the 0.7 standard and their corrected item-total correlations are higher than 0.3. Hence, the variables are eligible to be analyzed in the next steps.

Next, we implement the EFA analysis to verify the structure of the scales. Factors excluded from the study model are SN2, SN3, SN4, EC1, EC3, EPT1 and EPT2. The final EFA results indicate that KMO and the Bartlett values reach 0.894 (>0.5) and Sig. = 0.000 (<0.05), respectively. At the Eigenvalues = 1.050 (>1), the corresponding total variance is 61.325% ($>50\%$). Moreover, the factor loadings of variables range from 0.518 to 0.932, which are higher than 0.5. Thus, all variables are interrelated and groups of factors can be used for further analysis. Results from the EFA analysis are exhibited in table 2 and table 3.

We then conduct the CFA analysis to test the differentiation and reliability of the structure. After adjusting the covariance between errors of variables based on modification indices, it is shown that the chi-square/df=2.525 < 3 , p-value=0.000, TLI=0.901, CFI=0.920 > 0.9 and RMSEA=0.073 < 0.8 . These indicators all satisfy the applicable conditions, thus the research model can be considered as consistent with the collected data.

Table 1: Description of research sample

Gender	Number of people	Percentage
Female	176	60.5%
Male	115	39.5%
Total	291	100%
Age	Number of people	Percentage
From 18 to 22 years old	105	36.1%
From 23 to 29 years old	87	29.9%
From 30 to 39 years old	65	22.3%
40 years old and above	34	11.7%
Total	291	100%
Income	Number of people	Percentage
Under 5 million VND	126	43.3%
From 5 million to 10 million VND	108	37.1%
From 10 million to 20 million VND	37	12.7%
Over 20 million VND	20	6.9%
Total	291	100%

Table 2: Total Variance Explained

Factor	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings^a
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total
1	7.987	38.035	38.035	7.629	36.329	36.329	6.999
2	1.948	9.278	47.313	1.630	7.764	44.093	3.504
3	1.786	8.505	55.819	1.411	6.717	50.810	4.670
4	1.409	6.710	62.528	1.010	4.809	55.619	2.447
5	1.074	5.113	67.641	.645	3.070	58.689	2.577
6	1.050	4.998	72.639	.554	2.636	61.325	3.059
7	.662	3.152	75.792				

Table 3: Pattern Matrix

	Factor					
	1	2	3	4	5	6
BEHAVIOR4	.910					
BEHAVIOR3	.859					
BEHAVIOR5	.836					
BEHAVIOR6	.770					
BEHAVIOR2	.724					

Table 3: (Continued)

	Factor					
	1	2	3	4	5	6
BEHAVIOR8	.720					
BEHAVIOR1	.711					
BEHAVIOR7	.566					
EPT4		.932				
EPT5		.840				
EPT3		.554				
ATT2			.822			
ATT1			.765			
ATT3			.579			
AS3				.826		
AS1				.707		
AS2				.609		
SN1					.696	
SN5					.609	
EC2						.569
EC4						.518

Table 4: Composite reliability and Average variance extracted of factors

Factor	Composite reliability (CR)	Average variance extracted (AVE)
Behavior	0.924	0.604
Attitude	0.799	0.571
Subjective norm	0.643	0.475
Environmental concern	0.666	0.528
Availability of substitutes	0.760	0.513
Environmental protection tax	0.852	0.663

Also, we estimate the composite reliability (CR) and the average variance extracted (AVE) to test the reliability of the scale. Generally, the CR should be greater than 0.7, however the CR values of 0.60 to 0.70 are also considered acceptable (Nunnally & Bernstein, 1994; Hair, Sarstedt, Hopkins, & Kuppelwieser, 2014). Meanwhile, the AVE should be higher than 0.50. If the AVE is below 0.5 but the CR is above the acceptable level of 0.6, the convergent validity of the construct is acceptable (Fornell & Larcker, 1981; Lam, 2012). Table 4 exhibits the results of these analyses. Generally, the CR and AVE of all factors satisfy the above requirements. Therefore, they are kept in the research model.

Next, we test the discriminant validity of the scales. All correlation coefficients are lower than 1 and statistically significant ($p < 0.05$). Furthermore, the square root of the AVE is more potent than the corresponding variables

correlation. Hence, these constructs satisfy the discriminant validity requirements.

Based on the above tests, we run the SEM model to determine the factors affecting the consumption behavior of plastic bags. The regression results show that p-values of two factors, namely the availability of substitutes and the environmental protection tax are greater than 0.05. Hence, the availability of substitutes and the environmental protection tax have no effect on the use of plastic bags. In other words, hypotheses H4 and H5 are not supported, and thus they are excluded from the model.

We then rerun the SEM model, which removes the above factors. It is shown that p-values of attitude, subjective norm and environmental concern are all lower than 0.05. Also, the C.R. values of these factors are 5.967, 3.507 and 2.714, respectively. Hence, it can be concluded that the results are statistically significant.

Moreover, non-standardized weights of attitude, subjective norm and environmental concern have positive signs. Among these factors, attitude is the most influential factor in individuals' plastic bag use. Indeed, the regression weight of attitude after removing the availability of substitutes and the environmental protection tax is .496. Meanwhile, the regression weights of subjective norm and environmental concern are .224 and .352, respectively. Therefore, attitude, subjective norm and environmental concern are positively associated with the decline in plastic bag use.

Furthermore, the value of R-Square for the overall model is 0.611, which means that 61.1% of the decrease in plastic bag use can be explained by factors in the constructs while the remaining 38.9% is affected by other factors that are not mentioned in the model.

The results of this study are consistent with earlier research that indicates a strong positive relationship between attitude and green consumption behavior (Kotchen & Reiling, 2000; Mostafa, 2009; Zhao, Gao, Wu, Wang, & Zhu, 2014; Paul, Modi, & Patel, 2016; Le, 2018). Similarly, researchers claim that subjective norm positively affects pro-environmental behavior (Smith & Paladino, 2010; Welsch & Kühling, 2009; Eze & Ndubisi, 2013; Paul, Modi, & Patel, 2016; Le, 2018; Ho & Phan, 2018). In a number of studies, it is shown that environmental concern can enhance green behavior (Hines, Hungerford, & Tomera, 1987; Kim & Choi, 2005; Mostafa, 2009; Hu, Parsa, & Self, 2010; Paul, Modi, & Patel, 2016). Luong (2013) and Hoang, Huynh, and Huynh (2018) support this statement by saying that the factor is positively related to green consumption in Vietnam.

Also, the study indicates that the availability of substitutes does not affect consumers' green behavior. This result is similar to that of Hoang, Huynh, and Huynh (2018) and Le (2018). Notably, the authors suggest the factor is not associated with pro-environmental behavior in Vietnam. The major finding of the study is that the environmental protection tax may not foster a decline in plastic bag use of individuals. Although this is contrary to the initial prediction, it is consistent with reviews by local experts (Tuoi Tre reporters, 2019; Do, 2019). In other

words, the environmental protection tax may fail to change the habit of using plastic bags in Vietnam. Indeed, despite the environmental protection tax, the price of plastic bags is very cheap, ranging from VND18,000–45,000/kg (Tuoi Tre reporters, 2019). Consequently, the use of plastic bags is still very popular in Vietnam. On average, a Vietnamese household uses one kilogram of plastic bags/month (Ministry of Natural Resources and Environment, 2019). This leads to negative consequences for the living environment of the local people and it will take a long time to deal with such pollution problem (ANTV reporters, 2019).

5. Conclusion

The research examines factors that affect the consumption of plastic bags in Vietnam. Notably, it is shown that the attitude seems to be the most influential factor in plastic bag use, as predicted by previous studies. Other factors that can also enhance green behavior of consumers are subjective norm and environmental concern. In contrast, the availability of substitutes may not encourage individuals to use green products. Moreover, the study suggests the environmental protection tax that Vietnam is applying has not promoted the reduction of plastic bag use. As a result, plastic bags are still very popular in Vietnam due to their convenience and cheap prices. This in turn can cause enormous harm to the local people's living environment.

Thus, in order to change consumer behavior toward plastic bag use, the government may need to consider more appropriate adjustments. This can include changes in taxable subjects and tax rates to limit the production and consumption of plastic bags. In addition, the government should focus on the management and supervision of stakeholders to ensure that the tax policy is implemented effectively. Finally, it is necessary to increase communication and education activities, which can positively impact individuals' attitudes, subjective norms and environmental concern. This will help the community better understand the harms of non-biodegradable plastic bags, thereby encouraging them to use more environmentally friendly products.

Table 5: The outcomes of hypothesis testing

	Hypotheses	Estimate	S.E.	C.R.	P	Results
Attitude → A decline in plastic bag use (Behavior)	H1	.464	.083	5.558	***	Supported
Subjective norm → A decline in plastic bag use (Behavior)	H2	.204	.072	2.840	.005	Supported
Environmental concern → A decline in plastic bag use (Behavior)	H3	.359	.131	2.748	.006	Supported
Availability of substitutes → A decline in plastic bag use (Behavior)	H4	-.001	.041	-.033	.973	Not supported
Environmental protection tax → A decline in plastic bag use (Behavior)	H5	.067	.039	1.740	.082	Not supported

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