

# The Effects of Taxpayer's Environmental Morale on the Willingness to Pay Environmental Tax for Sustainable Environment

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## Abstract

This study examines the association between environmental morale and taxpayer's willingness to pay environmental tax for the sustainable environment and investigate whether the environmental morale of these taxpayers increases their degree of willingness to pay environmental tax rather than their degree of willingness to pay ordinary tax in China, Japan and Korea. This study finds a positive relationship among environmental morale and tax morale (willingness to pay tax) measures. These findings are mostly consistent with separate country-level evidences from surveys on China, Japan and Korea. However, there are some differences among the countries: Only Chinese respondents perceive that taxes can be raised if the proceeds are used to prevent environmental pollution and they would sacrifice part of their income for the environments. This suggests that the environmental morale of Chinese taxpayers toward a concrete environmental field (i.e., water quality, sewage and sanitation) has a positive influence on their willingness to pay environmental tax for the sustainable environment.

**Keywords:** Sustainable Environment; Sustainable Environmental Morale; Sustainable Environmental Tax Morale; Ordinary Tax Morale.

## INTRODUCTION

The governments of developed countries have been seeking to impose additional taxes to promote environmental awareness [1]. For example, carbon and automobile taxes can be imposed to reduce CO<sub>2</sub> emission [2,3]; green value-added tax can be collected to prevent global warming, reduce environmental pollution, and change environmental tax systems, such as subsidies for improving energy utilization or for developing renewable energy sources [4]. These environmental tax systems aim to develop a pleasant and

healthy environment for people. However, the reorganization of the current tax system to support the foundation and construction of green growth, and thus enhance quality of life, requires a paradigm change regarding the tax system.

In recent years, three northeastern Asian countries, China, Japan, and Korea, have experienced relatively more dynamic and extensive economic development compared to other countries. China has adopted a capitalistic market economy and has implemented economic growth policies while maintaining its authoritative socialism. Japan has achieved capitalistic growth while maintaining its democracy. And Korea has tried to jump up the economy slope ("Han-river miracle") since 1970s [5]. However, the organizational changes induced by economic development have significantly changed the values that dominate these countries. In addition, these countries have tried to solve environmental problems, the side effects of economic development, by levying environmental taxes on corporate or individual. However, visual effects are insignificant [6]. So it is needed to consider whether environmental morale is related to environmental tax morale.

By analyzing the relationship between various environmental morale and environmental tax morale in China, Japan, and Korea, this study aims to investigate whether environmental morale affects the environmental tax morale over the ordinary tax morale. In short, we investigate the relationship among the willingness to pay environmental tax and environmental morale related to behaviors, such as conducting environment protection activities, purchasing green products in order to reducing the environment pollutions, and participating the environmental campaign. Taxpayers with higher environmental morale are willing to pay environmental taxes given their intention to purchase green products and to participate in environmental activities [3,7,8].

Accordingly, based on the assumption that taxpayers with

higher environmental morale have higher intention to pay environmental taxes than other ordinary taxes, this study presents two hypotheses. First, taxpayers with high environmental morale have higher intention to pay environmental taxes than those with lower or no environmental morale. Given that these taxpayers often take part in environmental activities [8,9], they are willing to sacrifice a part of their income for environmental protection and for environmental pollution reduction. Second, taxpayers with higher environmental morale have a greater willingness to pay environmental taxes excess of ordinary taxes. Taxpayers who show greater interest toward environmental activities have higher environmental tax morale over ordinary tax morale.

This study has policy implications in the field of tax research. First, campaigns and programs are essential enhance environmental morale, which, in turn, contributes to a greater willingness to pay environmental taxes. Second, government should try to raise the environmental morale level of taxpayers before imposing environmental taxes on reducing pollutions. Third, by clarifying the relationship between environmental morale and environmental tax morale, a research topic yet unexplored in either local or international research, this study contributes to interdisciplinary taxation studies in the fields of environmental economics and science.

## **THEORETICAL BACKGROUND AND HYPOTHESIS DEVELOPMENT**

### *A. Environmental Morale and Environmental Behavior*

Environmental morale can be defined as a conglomerate of internalized norms and intrinsic motivation [10]. And a crucial question is how intrinsic motivation and internalized norms are influenced by extrinsic motivation. Accordingly Environmental morale can affect individuals' behavior as potential polluters, users of common pool resources, consumers of environmentally friendly products, workers, investors, environmental activists, donors or volunteers of environmental organizations, voters on environmental issues and fellow citizens monitoring and sanctioning other polluters [11-13].

The oldest model of pro-environmental behavior were based on a linear progression of environmental knowledge leading to environmental awareness and concern (environmental attitudes), which in turn was thought to lead to pro-environmental behavior [14]. This model showed that educating individuals about environmental issues would automatically result in more pro-environmental behavior [15]. Especially, environmental morale is often associated with pro-environmental attitudes or preferences that increase the demand for a clean environment. Often this results in greater demand for private environmental goods which is in turn reflected in market prices [13,17,18].

In based on the stakeholder theory, Freeman [18] documents that firms have relationships with various stakeholders both affect and are affected by the actions of the firm. Many literatures approach to focus on consumer as stakeholder of firms activities [19].

And also, by triple bottom line, companies have been tying actions and taking responsibility to reduce the environmental pollution of their operations including their supply chain. Measuring and benchmarking the environmental problems of business operations is fundamental to setting company targets to reduce the pollutions [20]. Most of companies recognize the importance of corporate social responsibility activities, such as reduction of the pollution and compliance with environmental tax, to attract customer's attention and focus on different facets of these activities with the pursuit of profit, one of the most fundamental purposes of corporate management [21]. In this context we try to review the literature relating with environmental morale, behavior and tax morale.

The general approach in the literature on environmental morale is focused on its consequence on environmental behavior. Environmental morale refers to the acknowledgment and willingness of an individual to resolve or contribute to the resolution of environmental problems. The concept covers a broad range of issues comprising the awareness of environmental problems, pro-environmental attitudes, and values of an individual [3]. Environmental morale is considered as the most significant factor in motivating individuals' environmental behavior [22] as it is an environment-friendly or ecological value that serves to motivate individuals to improve general environmental problems. Chan [23] emphasizes the role of socio-psychological concepts—such as emotion, knowledge, and recognition—of an individual's responsibility about the environment. Some empirical studies use the environmental morale as a predictor of individual's pro-environmental behavior [24]. Such socio-psychological concepts can affect the environmental behavior of an individual as well as one's willingness to participate in environmental activities. Studies in environmental psychology consider environmental interest and knowledge of an individual as determinants of an individual's environmental behavior and recognize an individual's awareness of environment protection as a construct of environmental morale.

Most previous studies argue that environmental behavior, as a result of environmental morale, affects customer's purchase patterns. Environmental behavior refers to activities that change the probability for individuals to utilize environmental materials and energy, while pro-environmental behavior refers to the behavior that is beneficial or less damaging to the environment [25]. Yoon [9] define pro-environmental behavior as consumption or activity that is beneficial to the environment in consideration of the effect of consumption on

the environment.

However, Kho [8] argues that environmental morale cannot induce pro-environmental behavior. Given that pro-environmental behavior aims for environmental conservation and ecological balance, the effect of such behavior on the community and the environment should be considered [7]. Therefore, the disadvantages that arise in such behaviors should be tolerated in order for any pro-environmental behavior to be considered genuine [26]. The pro-environmental behavior of an individual is determined by one's attitude toward the environment rather than by external factors [27]. This attitude, which arises from the limited anthropocentric growth of an individual, his harmonious relationship with nature, and his interest toward ecological topics, can influence the anticipation of pro-environmental behavior and behavioral intention [3]. A concrete and firm attitude toward the environment increases the anticipation and practicality of pro-environmental behavior and behavioral intention [28]. Therefore, such behavior can be viewed as a social behavior that encompasses the personal beliefs, attitude, and intention of an individual to reduce pollution and to protect the environment [29].

### *B. Tax Morale (willingness to pay tax)*

Consumption Tax morale refers to the intrinsic willingness of an individual to pay taxes [30]. It can also be used to measure the tax compliance of taxpayers [31,32]. Previous studies have identified several factors that influence the tax compliance of an individual. These factors can generally be classified into personal factors (i.e., taxpayer knowledge and ethics, degree of protection taxpayers receive from tax agents), and environmental factors (i.e., tax rate, additional taxes, intermediate pre-payment, and decision-making aid) [33]. Previous studies examine the effects of these factors on the judgment and decision making of taxpayers in an experimental environment, an approach that is different from the methods employed in this study (i.e., international comparative analysis through surveys).

Torgler [34] compares and analyses the tax morale in Korea, China, Japan, Taiwan, and the Philippines. By analyzing the effects of demographic variables (i.e., gender, age, marital status, and social status), employment, national dummy variable, and trust in jurisdiction and the government, Torgler [34] reveals that self-employed and unemployed individuals have low tax morale because of their distrust toward their government. Additional analysis on country fixed effects implies higher tax morale in China and Japan and relatively lower tax morale in Korea and the Philippines.

These literatures have focused the relationship among environmental morale and behavior, this study has several differentiations. First, this study focuses on the relationship between environmental morale and tax morale. Generally

government adopts the environmental tax, such as carbon tax, green value added tax and CO<sub>2</sub> emission tax, in order to regulate the environmental pollutions but its correction effects is not clear. Therefore it needed to figure out why the environmental tax can't reduce the environmental problems and whether environmental morale affects tax morale. Second, the difference between ordinary tax moral and environmental tax morale is used in this paper. There are no previous studies that included this measure. The difference between tax morale (i.e., the degree of compliance with tax law) and environmental tax morale (i.e., the degree of compliance with environmental tax law) can be related with environmental morale. Generally, it is accepted that relationship between cognitive (professed knowledge of environmental issues), affective (environmental concern), and conative (verbal commitment) components of attitudes with pro-environmental behavior [22].

### *C. Hypothesis Development*

In our model of the determinants of a taxpayer's willingness to pay tax (tax morale) we consider the factors suggested by Choi [33] that individual factors, task-related factors, and environmental factors. First, individual factors, as demographic variables, consist of gender, age, children#, education levels, employment status, social class, and income levels. Second task-related factors include attitude (government policy, comparing the economic growth) and confidence (government, the environmental protection movement). Finally environmental factors are related to environmental morale as interest variable in this study.

An individual's the ETM (willingness to pay environmental tax, or environmental tax morale) is different from her/his OTM (willingness to pay ordinary tax, or ordinary tax morale) because of one's diverse interest or awareness toward specific tax items [35]. This study expects that the individual's EM (environmental morale) influences her/his pro-environmental behavior, which, in turn, influences ETM. Individuals with high EM have higher EM than OTM. However, individuals with low ETM have the same levels of OTM and ETM. The following hypotheses are developed based on the differences among EM, OTM, and ETM:

Hypothesis 1. The environmental morale of an individual is positively related to her/his environmental tax morale.

Hypothesis 2. The environmental morale of an individual has a relationship with the differences between her/his ordinary tax morale and environmental tax morale.

## **METHODOLOGIES AND DATA**

### *A. Research Model*

Equations (1) and (2) show the empirical models of this study.

The models are used to examine how the EM of taxpayers affects their ETM as well as the differences between their OTM and ETM. In equation (1), the ETM of an individual is the dependent variable and his environmental interest is included as the determinant of EM. If the coefficient on EM,  $\beta$ , is positive then the empirical tests support our hypothesis 1. In equation (2), the difference between the OTM and ETM of an individual is used as the dependent variable. It takes a value of 1 if taxpayers have tax morale lower than the country average and 0 otherwise. Although the selected countries—China, Japan, and Korea—generally have high tax morale, the analysis focuses on the average tax morale of these countries to pinpoint the difference in the tax morale of individuals. Such difference is useful when examining the effects of EM on the ETM of an individual.

EM is the variable of interest in equation (2). If the coefficient on EM,  $\beta$ , is positive the empirical tests support our hypothesis 2.

$$ETM_i = \alpha_1 + \sum \beta_i (EM)_i + Controls_i + \varepsilon_i \quad (1)$$

$$Tax\ Morale\ Difference_i = \alpha_1 + \sum \beta_i (EM)_i + Controls_i + \varepsilon_i \quad (2)$$

### B. Variables Measurement

#### • Tax Morale (OTM, ETM)

Tax morale can be classified into OTM and ETM. In the case of OTM, a respondent's degree of agreement with the statement, "Justifiable cheating on taxes" is measured on a 10-point scale [34]. "Justifiable cheating on taxes" refers to how much of the evaded taxes can be justified by the taxpayer. In the case of ETM, a respondent's degree of agreement with the statements, "Taxes can be raised if the proceeds are used to prevent environmental pollution" (ETM 1) and "I would sacrifice part of my income for the environment" (ETM 2), is measured on a 4-point scale. The dependent variable in equation (2), TM difference, is defined as follows:

Tax Morale Difference: 1 if OTM is below average and ETM (average of ETM 1 and ETM 2) is above average and 0 otherwise;

Tax Morale Difference 1: 1 if OTM is below average and ETM 1 is above average and 0 otherwise;

Tax Morale Difference 2: 1 if OTM is below average and ETM 2 is above average and 0 otherwise.

#### • Environmental Morale

The EM can be defined as the willingness of an individual to acknowledge or reduce environmental pollution. This study classifies EM into two groups. The first group refers to the severity of environmental problems, such as (1) water quality, (2) sewage and sanitation, (3) global warming or greenhouse effect, (4) biodiversity or extinction of plant or animal species, and (5) pollution of rivers, lakes, and oceans.

The responses of taxpayers to these five items are measured on a four-point scale to determine the overall EM of taxpayers. The severity of pollution is measured based on these five items rather than on the personal opinions of the respondents to avoid bias. The second group measures the respondent's degree of agreement to the statement, "It is important to a person looking after the environment" on a seven-point scale. A greater degree of agreement to this statement implies higher EM.

#### • Controls

The control variables in equations (1) and (2) can be classified into three perspectives, namely, attitude toward environmental problems, confidence in the organization and demographics. First, a respondent's degree of agreement to the statements, "The government should reduce environmental pollution" and "Environment protection is more important than economic growth," is measured on a four-point scale. Given that the government is perceived as passive on environmental issues by prioritizing economic development, the agreement of the respondent to these two statements may affect the dependent variables. Second, the reliance of taxpayers on agencies or organizations is examined. A high reliance positively affects the EM and ETM of the taxpayer. Third, the demographic variables, such as gender, age, family size, education, employment type, social status, and income, and their effects on EM and ETM are examined [36, 37].

### C. Data Source and Sample Distribution

The World Values Survey which is conducted every five years, is used to analyze the present situation in China, Japan, and Korea. Specifically, we use the 2007 survey of China and the 2005 survey of Japan and Korea, the object of this survey is individual.

The China, Japan, and Korea surveys have 2,015 (45.8% male and 54.2% female), 1,096 (44.1% male and 55.9% female), and 1,200 (49.4% male and 50.6% female) respondents, respectively. These respondents are mostly in their 30s to 60s. About 4.6% of total respondents in China are in their 80s, and 1.9% of the respondents in the Japan survey are in their teens. With regard to education, 16.5% and 32.2% of the respondents in China have middle school and college degrees, respectively; 48.8% and 24.5% of the respondents in Japan have high school and college degrees, respectively; and 42.9% and 38.6% of the respondents in Korea have high school and college degrees, respectively. And also with regard to employment, 38.7% and 26.5% of the respondents, in China, work full-time and are retired, respectively; 38.4%, 17.9%, and 15.5% of the respondents in Japan work full-time, stay at home, and work part-time, respectively; and 35.1%, 21.8%, and 11.8% of the respondents in Korea work full-time, stay at

home, and are still studying, respectively.

## EMPIRICAL RESULTS

### A. Descriptive Statistics of the Variables

Table 1 shows the descriptive statistics of the main variables, namely, OTM, ETM, and EM. The average OTM and ETM 1–ETM 2 in China, Japan, and Korea are distributed at 6.9 to 7.5 (69.2%~75.4% of 10 points), 2.1 to 2.3 (53%~58.3% of 4 points), and 2.4 to 2.5 (61.1%~62.8% of 4 points), respectively. Table 1 shows the distribution of EM 1 and EM 2 at 2.1 to 3.1.

**Table 1:** Descriptive Statistics for Tax and Environmental Morales

	China (2007)		Japan (2005)		Korea (2005)	
	Mean	SD	Mean	SD	Mean	SD
OTM (10 Ps)	6.918	1.934	7.544	1.320	7.336	1.453
ETM1 (4 Ps)	2.330	0.852	2.314	0.704	2.118	0.635
ETM2 (4 Ps)	2.444	0.886	2.511	0.758	2.503	0.711
EM1_1 (4 Ps)	2.790	1.247	2.410	0.888	2.574	0.662
EM1_2 (4 Ps)	2.834	1.199	2.598	0.860	2.485	0.693
EM1_3 (4 Ps)	1.601	0.719	1.306	0.500	1.527	0.559
EM1_4 (4 Ps)	1.676	0.693	1.613	0.632	1.647	0.578
EM1_5 (4 Ps)	1.395	0.570	1.450	0.553	1.594	0.569
EM2 (4 Ps)	2.195	1.008	3.194	1.105	3.143	1.282

Note 1. Definitions of variables are as follows;

OTM: the degree of “justifiable cheating on taxes?”

ETM1 is the degree of “I would sacrifice part of my income for the environment”

ETM2: the degree of “Taxes can be raised if the proceeds are used to prevent environmental pollution”

EM1: the average of each sub EM1 as follows;

EM1\_1: the degree of “Environmental problems in your community: Poor water quality”

EM1\_2: the degree of “Environmental problems in your community: Poor sewage and sanitation”

EM1\_3: the degree of “Environmental problems in the world: Global warming or the greenhouse effect”

EM1\_4: the degree of “Environmental problems in the world:

Loss of plant or animal species or biodiversity”

EM1\_5: the degree of “Environmental problems in the world: Pollution of rivers, lakes and oceans”.

EM2: the degree of “It is important to this person looking after the environment”.

### B. Results of Regression

#### • Test of Hypothesis 1: Effect of EM on ETM

Model (1) in Table 2 shows the effect of EM on ETM. The effect is measured by the respondent’s degree of agreement on the statement “I would sacrifice part of my income for the environment.” Both EM 1 and EM 2 show a statistically significant positive coefficient, implying that taxpayers with higher EM are more willing to pay environmental taxes. Gender (GENDER) and number of children (Children#) do not have a statistically significant effect on ETM. Age (AGE) and social status (SOCIAL) have positive coefficients, whereas education (EDU), employment (EMPLY), and income (INCOME) have negative coefficients. Therefore, older taxpayers with high social status are more willing to pay environmental taxes, whereas self-employed taxpayers with high education level and income are less willing to pay such taxes.

Model (2) in Table 2 shows the effect of EM on ETM, which is measured by the respondent’s degree of agreement on the statement “Taxes can be raised if the proceeds are used to prevent environmental pollution.” EM 1 and EM 2 show a statistically significant positive coefficient when they are individually included in the model. This result suggests that taxpayers with higher EM are more willing to pay environmental taxes for environmental sustainability. Children# and EMPLY do not have a statistically significant effect on ETM. GENDER and SOCIAL show a positive coefficient, whereas education and income show a negative coefficient.

**Table 2:** OLS Regression of Environmental Morale on Environmental Tax Morale in Pooled Sample

Variables	Predicted sign	Model (1)	Model (2)
		Coeff.(t value)	Coeff.(t value)
Intercept	+/-	1.872***(12.41)	2.195***13.46
EM1	+	0.082***(3.04)	0.054*(1.86)
EM2	+	0.135***(12.09)	0.102***(8.51)
GENDER	+/-	0.003(0.10)	0.048*(1.65)

AGE	+/-	0.003***(2.87)	-0.001(-0.45)
Children#	+/-	-0.013(-1.04)	-0.006(-0.44)
EDU	+/-	-0.045***(-5.79)	-0.038***(-4.56)
EMPLY	+/-	-0.035***(-5.47)	-0.005(-0.77)
SOCIAL	+/-	0.044**(2.26)	0.046**(2.20)
INCOME	+/-	-0.02**(-2.49)	-0.036***(-4.26)
<i>F value</i>		28.17	20.04
<i>Adj. R<sup>2</sup></i>		0.089	0.064
<i># of observed</i>		3,537	
<i>VIF(less than #)</i>		1.586	

Note 1. Definitions of Variables are as note of Table 2 and additional variables are as follows;

GENDER = 1 if taxpayer is female, 0 otherwise

AGE = Age of taxpayer (10~80)

EDU = Highest educational level attained (1~4)

EMPLY = 1 if taxpayer is self-employed, 0 otherwise

SOCIAL = Level of social class that taxpayer thinks (1~4)

INCOME= Income level (1~5)

Note 2. \*, \*\*, and \*\*\* denote statistical significance at 10, 5, and 1% levels, respectively (two-tailed).

Table 3 shows the effects of EM on ETM 2 among the three countries. In China, the model that includes each or both EM 1 and EM 2 shows a statistically significant positive coefficient (0.098 and 0.112,  $p < 0.05$  or  $0.01$ ), which indicates that both EM 1 (EM in each environmental field) and EM 2 (importance of environmentalists) positively affect ETM. Similar to the results in Table 6, taxpayers with higher EM are more willing to pay environmental taxes for sustainable environment. Unlike in Japan and Korea, INCOME does not have a statistically significant effect in the ETM of taxpayers in China. The coefficient on EM 2 is positive and significant, 0.123 ( $p < 0.01$ , in Japan, which implies that EM 2 has a greater effect on ETM compared with EM 1. In Japan, AGE has a negative coefficient and social status (SOCIAL) has a positive coefficient, implying that younger Japanese taxpayers with high social status are more willing to pay environmental taxes for environmental sustainability.

EM 2 loads positively, 0.098 ( $p < 0.01$ ), in Korea. This finding implies that Korean taxpayers who acknowledge the importance of environmentalists are more willing to pay environmental taxes compared to those who do not acknowledge such importance. The coefficient on

employment (EMPLY) is negative and significant in all countries, which indicates that self-employed taxpayers have low ETM. In sum, although EM generally has a positive effect on ETM, ETM 1 produces other effects on ETM in China. The control variables show different effects on the ETM of each country. Therefore, these three countries have different levels of ETM, though they share a common cultural heritage.

**Table 3:** OLS Regression of Environmental Morale on Environmental Tax Morale (ETM 2)

Variables	Pred. sign	China	Japan	Korea
		Coefficient ( <i>t</i> value)	Coefficient ( <i>t</i> value)	Coefficient ( <i>t</i> value)
<i>Intercept</i>	+/-	1.957***(6.08)	2.291***(7.11)	2.37***(8.67)
<i>EM1</i>	+	0.098**(2.01)	0.027(0.46)	0.001(0.03)
<i>EM2</i>	+	0.112***(3.93)	0.123***(4.83)	0.098***(6.09)
<i>GENDER</i>	+/-	0.012(0.20)	0.051(0.89)	0.074*(1.82)
<i>AGE</i>	+/-	0.005**(2.27)	-0.008***(-3.61)	-0.002(-0.65)
<i>Children#</i>	+/-	-0.004(-0.18)	0.027(0.99)	-0.009(-0.39)
<i>EDU</i>	+/-	-0.045***(-3.11)	-0.041**(-2.23)	-0.034**(-2.31)
<i>EMPLY</i>	+/-	-0.005(-0.23)	0.011(0.64)	-0.016*(-1.87)
<i>SOCIAL</i>	+/-	0.044(0.95)	0.076**(2.08)	0.043(1.30)
<i>INCOME</i>	+/-	-0.027(-1.37)	-0.034***(-2.90)	-0.057***(-3.26)
<i>F value</i>		5.17	8.65	10.38
<i>Adj. R<sup>2</sup></i>		0.042	0.104	0.074
<i># of observed</i>		1,241	1,096	1,200
<i>VIF(less than #)</i>		1.591	1.512	2.849

Note 1. \*, \*\*, and \*\*\* denote statistical significance at 10, 5, and 1% levels, respectively (two-tailed).

• *Test of Hypothesis 2: Effect of EM on the Difference between ETM and OTM*

We examine the influence of tax morale in the environmental field and the importance of environment protectors on the willingness to pay environmental taxes or on ETM. The effect of EM on ETM can be precisely described by determining whether the EM of a taxpayer increases ETM rather than OTM. The Tax Morale Difference equals 1 if the ETM is higher than the country average and OTM is lower than the country average and 0 otherwise. ETM 1 and ETM 2 are defined as Tax Morale Difference 1 and Tax Morale Difference 2 for the analysis respectively.

Model (1) in Table 4 shows the effect of EM on ETM by using Tax Morale Difference 1 as the dependent variable. Both EM 1 and EM 2 have a positive and significant coefficient, respectively 0.279 ( $p < 0.05$ ) and 0.469 ( $p < 0.01$ ). This table suggest that taxpayers with higher tax morale in the

environmental field and who acknowledge the importance of environmentalists have higher ETM than OTM for the specific environmental sustainability. This can be explained by the compliance of these taxpayers to ordinary taxes and specific-purpose taxes. Specifically, taxpayers who do not acknowledge the importance of specific-purpose taxes do not show any difference in their morale toward specific-purpose and ordinary taxes. However, taxpayers who acknowledge the importance of specific-purpose taxes tend to form a higher morale toward specific-purpose taxes than toward ordinary taxes. GENDER, EDU and EMPLOY have a significantly negative coefficient, in which self-employed female taxpayers with high educational levels have low ETM. The other control variables do not show any statistical significance.

Model (2) in Table 4 shows the effects of EM on ETM when using Tax Morale Difference 2 as the dependent variable. Unlike Model (1), EM 1 does not show statistical significance as in Model (2) when EM 1 and EM 2 are both included in the model. However, EM 1 shows a statistically significant positive coefficient (0.293,  $p < 0.05$ ) if such variable is included in the model, given that the influence of EM 1 as a dependent variable is reduced by its inclusion in EM 2. Unlike in Model (1), GENDER and EMPLOY do not load with a statistically significant coefficient, whereas AGE and Children# load with a statistically significant negative coefficient. And the marginal effects of EM 2 (0.469 and 0.293,  $p < 0.01$ ) are larger than those of EM 1 (0.279 and 0.191,  $p < 0.05$  or not significant).

**Table 4:** OLS Regression of Environmental Morale on Environmental Tax Morale (ETM 2)

Variables	Pred. sign	Model (1)	Model (2)
		Coefficient (Wald $\chi^2$ )	Coefficient (Wald $\chi^2$ )
<i>Intercept</i>	+/-	-2.625***(-11.25)	-1.405**(-4.95)
<i>EM1</i>	+	0.279**(3.40)	0.191(2.45)
<i>EM2</i>	+	0.469***(-58.12)	0.293***(-35.59)
<i>GENDER</i>	+/-	-0.39***(-6.66)	-0.049(-0.16)
<i>AGE</i>	+/-	-0.006(-0.90)	-0.012**(-5.69)
<i>Children#</i>	+/-	-0.059(-0.68)	-0.124**(-4.56)
<i>EDU</i>	+/-	-0.145***(-11.97)	-0.098***(-8.22)
<i>EMPLY</i>	+/-	-0.069*(-3.64)	-0.004(-0.02)
<i>SOCIAL</i>	+/-	0.031(0.09)	-0.106(-1.54)

<i>INCOME</i>	+/-	-0.029(-0.47)	-0.053(-2.34)
<i>Likelihood Ratio</i>		102.155***	77.105***
<i>Percent Concordant</i>		69.3	63.4
<i>Percent Discordant</i>		29.6	35.5
<i># of observed</i>		3,537	

Note 1. \*, \*\*, and \*\*\* denote statistical significance at 10, 5, and 1% levels, respectively (two-tailed).

And also, table 5 shows the effect of EM on the difference between OTM and ETM 1. EM 1 does not show any statistical significance in China and Japan. However, EM 1 and EM 2 has significantly positive coefficients, respectively 0.680 ( $p < 0.05$ ) and 0.638 ( $p < 0.01$ ), in Korea. Therefore, taxpayers who highly recognize the importance of environmentalists develop their ETM rather than their OTM for environmental sustainability. Moreover, the OTM of taxpayers with high EM in each environmental field is almost the same as their ETM. The coefficient on AGE is negative (-0.062,  $p < 0.1$  in Japan), which implies that the ETM of older taxpayers is lower than their OTM. The results of the remaining control variables are the same as those presented in table 7. With the marginal effect of EM 1 and 2 on ETM 1, this effect of EM 1, 0.068 ( $p < 0.1$ ), is statistically significant in only Korea. And magnitude of marginal effects is the largest in Japan, 0.661 ( $p < 0.01$ ).

**Table 5:** Logistic Regression of Environmental Morale on Tax Morale Difference (ETM 1) in Sub-Samples

Variables	Pred. sign	China	Japan	Korea
		Coefficient (Wald $\chi^2$ )	Coefficient (Wald $\chi^2$ )	Coefficient (Wald $\chi^2$ )
<i>Intercept</i>	+/-	-0.955(-0.60)	-5.068(-8.83)	-5.184***(-9.23)
<i>EM1</i>	+	0.007(0.54)	0.199(0.39)	0.680**(4.56)
<i>EM2</i>	+	0.625***(-30.97)	0.661***(-16.81)	0.638***(-36.12)
<i>GENDER</i>	+/-	-0.724***(-8.91)	-0.602*(-3.42)	-0.046(-0.03)
<i>AGE</i>	+/-	-0.008(-0.95)	-0.036***(-7.99)	0.002(0.02)
<i>Children#</i>	+/-	-0.075(-0.56)	0.103(0.49)	0.055(0.14)
<i>EDU</i>	+/-	-0.073(-1.38)	0.021(0.04)	-0.104(-1.44)
<i>EMPLY</i>	+/-	-0.021(-0.09)	0.191** (6.32)	-0.145**(-6.25)
<i>SOCIAL</i>	+/-	-0.065(-0.12)	0.536**(-6.60)	0.032(0.02)
<i>INCOME</i>	+/-	-0.151*(-3.42)	0.05(0.62)	-0.061(-0.39)
<i>Likelihood Ratio</i>		56.363***	48.36***	61.111***
<i>Percent Con.</i>		71.00	75.1	75.30
<i>Percent Disc.</i>		28.20	24.00	23.80
<i># of observed</i>		1,241	1,096	1,200

Note 1. \*, \*\*, and \*\*\* denote statistical significance at 10, 5, and 1% levels, respectively (two-tailed).

## CONCLUSIONS

Northeastern Asian countries have recently witnessed remarkable economic development which has been accompanied by a growing interest on environmental issues. This study examines the relation between the environmental morale and taxpayer's willingness to pay environmental tax for environmental sustainability and whether the environmental morale of these taxpayers increases their willingness to pay environmental tax rather than their ordinary tax for sustainable environment in China, Japan and Korea.

And results analyzing the marginal effects of environmental morale on tax morale difference are as follows. First, the marginal effects of EM 2 (looking after the environment) are larger than those of EM 1 (water quality, sewage and sanitation, global warming or greenhouse). And the marginal effect of EM 1 is statistically significant in only Korea and the magnitude of marginal effects is the largest in Japan. The result of this study have a contribution that individual's environmental morale can enhance the willingness to pay the environmental tax excess other taxes, in the context of many literatures related to environmental moral and behavior.

There are certain limitations of this paper. Only 3 countries samples, China, Japan and Korea, are included in analysis and the different scales over the variables are used to measure the difference between ordinary tax morale and environmental tax morale. However, this paper has several policy implications. First, In order to promote the environmental tax morale of taxpayers, the nation's environmental morale should be encouraged and then campaigns and education programs on the importance of environmentalists should be considered. Second, government should try to raise the environmental morale level of taxpayers before imposing environmental taxes on reducing pollutions. And finally, by clarifying the relationship between environmental morale and environmental tax morale, a research topic yet unexplored in either local or international research, this study contributes to interdisciplinary taxation studies in the fields of environmental economics and science.

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