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Perception Effects of Local Government Subsidies: The Case of International Carbon Offsetting by Citizens in Kitakyushu, Japan

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ABSTRACT

This paper examined whether a local government could promote international environmental cooperation through individual citizens' carbon offsetting, in particular focusing on the perception effects of local government subsidies. The social survey was conducted for adult citizens in Kitakyushu city, Japan, who drive privately-owned vehicles, asking if they pay for offset using carbon credits generated from a hypothetical climate change mitigation project in a developing country. Randomised split sample allocation regarding price and subsidies conditions was applied. The study confirmed not only price effects but perception effects, regarding citizens' selecting carbon offsetting to offset one ton of carbon dioxide emissions from driving because the local government provided subsidies: Subsidies had both effects of motivation crowding-in and crowding-out for individuals who have specific interests or experiences in developing countries.

Keywords: perception; carbon offset; local government; subsidies; citizen; motivation crowding-in

1. Introduction

Perception effects of local government subsidies have been proposed and identified in several contexts. On one hand, the analysis of economic compensation when constructing local noxious facilities such as nuclear power plants and incinerators is one of them (Frey et al. 1996). Frey et al. show that economic compensation is perceived as a bribe before the construction of a noxious facility and actually decreases the level of acceptance by those communities asked to host the facility. They revealed that it is not perceived so much as a bribe when a public facility with good amenities is developed as compensation compared with the case of monetary compensation. This perception effect is called “motivation crowding-out”: price incentives do not necessarily increase the public goods provision as opposed to the original intention (Frey and Oberholzer-Gee 1997).

On the other hand, the effects of subsidies to increase demand for emerging environmental goods and services market tend to be considered to provide only economic incentives to nurture such a market (e.g., Chang 2011), though it should be as effective as possible since governmental subsidies ought to maximise mobilising private markets under the given expenditure towards an exit at a later stage when the market spontaneously maintains itself to avoid any distortion. Yet, local government subsidies for international carbon offset as a means of international cooperation with developing countries may go beyond such provision of economic incentive. In fact, citizens may consider that local government support of specific carbon offsetting provides credibility as a basis of utilising such unfamiliar services, and therefore subsidies might encourage

more purchases than in the case of simple price reduction without local government subsidies. Such effect might be called “motivation crowding-in.”

This paper aims to examine the perception effects of local governmental subsidies that might contribute the incremental development of environmental markets that may not realise without citizens’ positive perception value, or trust, with local government. Currently, no local governments in Japan have adopted such policies yet, contrary to the fact that, among 47 prefectures and some 1,800 cities/towns/villages, several local governments are providing various subsidies to promote new environmental goods and services (Kankyo Bijinesu 2012):

- 12 prefectures and 38 cities/towns have provided subsidies for household purchases of light emitting diode (LED),
- 31 prefectures and 857 cities/towns/villages for household photovoltaic (PV) systems,
- 15 prefectures and 117 cities/towns for solar water heaters (SWHs), and
- two (2) prefectures and 67 cities/towns/villages for environmentally friendly vehicles including electric vehicles and plug-in hybrid vehicles.

Therefore, contingent valuation is needed to investigate such effects. Once such positive perception effects are confirmed, collaboration between private offset providers and local governments would extend carbon offset

market in Japan to contribute to low carbon development in developing countries with subsidies that have psychological multiplier effect. To this end, a social survey was conducted in a Japanese city to ask if citizens would pay to offset the carbon from greenhouse gas (GHG) emissions from driving, based on a hypothetical climate change mitigation project in Vietnam.

2. Methodology

To understand citizens' attitudes to carbon offsetting and the effects of local governmental subsidies, a social survey was conducted. Adult citizens in Kitakyushu city, Japan, who registered in a private internet survey panel, were studied in January 2012. Kitakyushu city is one of 20 designated cities in Japan and has a population of around one million. The city is typical in Japan in the sense that most of the citizens rely on vehicles for daily transportation and that public transport is not a major mode of transportation. The city is well-known for its commitment to low-carbon development and international environmental cooperation (Nakamura and Kato 2011).

The number of the respondents for the umbrella survey that studied other issues as well was 2125, out of which 1642 citizens used privately owned cars in their daily lives. These citizens using private vehicles were targeted for this current study. The questionnaire first explained the GHG emissions from vehicles with different amount of fuel consumption, and then introduced a hypothetical carbon offset opportunity, namely, offsetting from a climate change mitigation project in Da Nang city, Vietnam, on the assumption that Kitakyushu city government were to collaborate with Da Nang city. The project would

consider reducing the emissions of methane, one of the GHGs, through recycling household and industrial organic waste and to improve the local waste and wastewater management in Da Nang city (See Fig. 1 for schematic diagram).

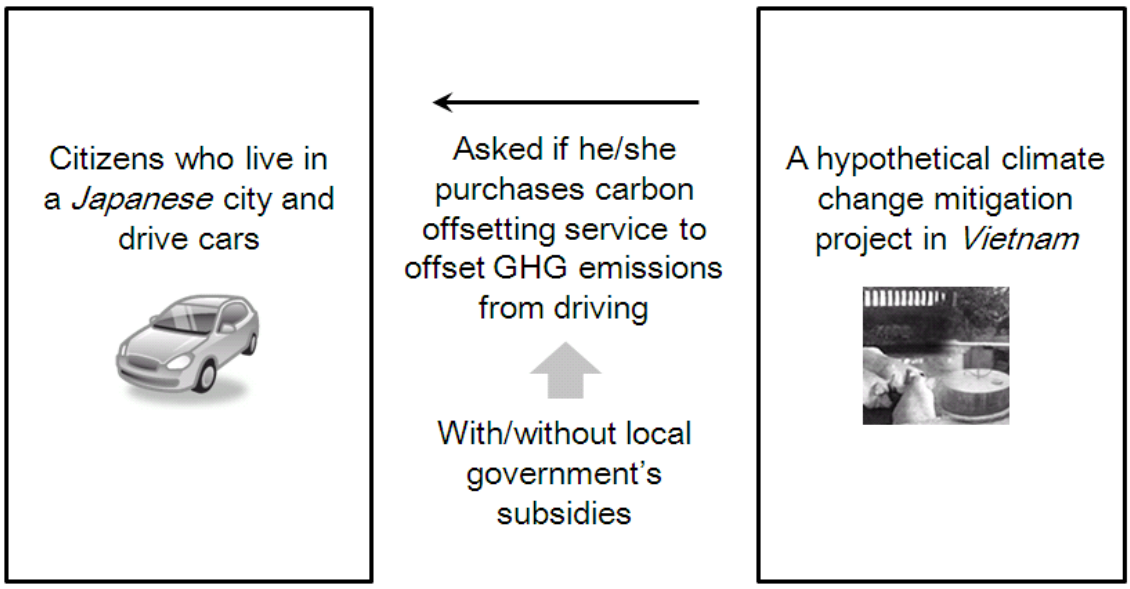

Fig. 1. Schematic diagram of the survey conducted

The respondents were asked if they were willing to use offsetting to offset one ton of carbon dioxide (CO_2) emissions from their utilisation of vehicles. Three different patterns of the questionnaire regarding the combination among price and subsidies were created and randomly assigned (See Table 1). The actual market price is around Japanese Yen (JPY) 5000 to offset one ton of CO_2 emissions (Carbon Offset Japan 2008, PEAR Carbon Offset Initiatives 2008). The higher price in the questionnaire was set at almost the same value as the market price while the lower price was set at around half of the market price. In addition, there were questions on individual attributes

such as gender, age group, household income group, annual driving distance, overseas experience, and attitudes towards international environmental cooperation. The effects of subsidies were statistically examined.

Table 1. Different patterns of the questionnaire

Pattern	Total cost of offset	Self-born cost	Subsidies amount
A	JPY 5000	JPY 5000	None
B	JPY 5000	JPY 2500	JPY 2500
C	JPY 2500	JPY 2500	None

Table 2 shows the distribution of the individual attributes of the respondents who drive private vehicles. Around 60% are male. The respondents who are in their 20s to 50s make up 90.1% of the total. Kitakyushu city's citizen registry indicated that males made up 46.5% of the population and citizens in their 20s to 50s accounted for 43.7% of the adult population in Kitakyushu city as of September 2011. The survey respondents are younger than the actual population structure as expected for an internet survey, although additionally, senior citizens might drive less than younger citizens.

Table 2. Individual attributes of the respondents

Gender	Percents
Male	58.2
Female	41.8
Age group	Percents
20s	6.9
30s	28.4
40s	33.9
50s	21.0
60s	8.8
70s and over	1.1
Household income group	Percents
less than 2 million JPY	7.2
2 to 5 million JPY	38.5
5 to 10 million JPY	43.9
10 to 15 million JPY	7.8
15 to 20 million JPY	1.7
Over 20 million JPY	0.9
Have visited Vietnam	Percents
No	92.3
Yes	7.7
Have visited developing countries other than Vietnam	Percents
No	73.0
Yes	27.0
Concern about international development	Percents
No	10.3
No, if anything	17.5
Hard to say	36.5
Yes, if anything	30.0
Yes	5.7
Concerned about climate change	Percents
No	2.6
No, if anything	6.7
Hard to say	14.7
Yes, if anything	57.4
Yes	18.6
Knowledge on carbon offset	Percents
Do not know	33.9
Have heard of it	54.9
Know well	11.2
Experience of carbon offset	Percents
No	97.8
Yes	2.2

Number of climate change mitigation actions	
taken in daily lives	Percents
0	6.8
1	4.0
2	8.3
3	11.2
4	10.4
5	11.4
6	11.3
7	9.6
8	9.1
9	6.5
10	4.6
11	3.3
12	1.8
13	0.8
14	0.3
15	0.5
17	0.1
18	0.1
Support of the city's international environmental cooperation	Percents
Do not support	2.4
Do not support, if any	3.6
Hard to say	14.0
Support, if any	34.9
Support	41.5
Do not know	3.5
Annual driving distance	Percents
less than 2000 km	27.4
2000 to 10000km	40.1
Over 10000km	32.5
Purpose of driving: commuting	Percents
No	53.2
Yes	46.8
Purpose of driving: taking passengers	Percents
No	71.3
Yes	28.7
Purpose of driving: work	Percents
No	81.1
Yes	18.9
Purpose of driving: leisure	Percents
No	35.6
Yes	64.4

The annual driving distances are widely distributed, from less than 2,000 km to more than 10,000 km. The average annual distance of driving is 6,790 km.

The respondents who drive more than 7,620 km a year, which is equivalent to one ton CO_2 emissions a year from the vehicle, comprised of 38.6% of the total respondents who drive cars, according to the calculation using average fuel consumption of a Japanese gasoline-based passenger car, 18.1 km/litre, as of 2009 (Nihon Jidosha Kogyo Kai 2012). It is estimated that the necessary expenditure per year for a Japanese car owner who drives a gasoline-based small passenger car for 10,000 km (fuel consumption of 14 km/litre), including vehicle taxes, a mandatory insurance and fuels, is around JPY 142,000 (Ishikawa Ken Jidosha Seibi Shinkokai 2012). The individual who drives a gasoline-based car for 10,000 km emits 1.3 ton of CO_2. For this hypothetical driver, therefore, carbon offsetting of one ton of CO_2 emissions presented in the survey implies the additional payment of 1.8 to 3.5% of annual expenditure to operate a vehicle, depending on the offset price presented in the survey and how many years ago the vehicle was purchased.

The major objectives for driving included individual commuting and taking other passengers (two major options were asked to choose out of four alternatives). Among the respondents, 11.2% had good knowledge of carbon offset, while 54.9% had heard about it and 35.9% did not know what it was. The respondents who actually used carbon offsetting comprised only 2.2% of the total. It was confirmed that carbon offsetting was still an unfamiliar environmental item for the respondents.

3. Hypothesis

In the field of small-and-medium enterprise (SME) development, on the other hand, receiving governmental subsidies serves to increase the credibility

of the recipient corporation/products (Nihon Sogo Kenkyujo 2011). For instance, Japanese SMEs are seeking a co-benefit from the authoritative effect of governmental economic support. This could be applicable for individuals in particular the environmental goods/services are new and unfamiliar to them, and would not seem very credible as they are. Therefore the hypothesis to be tested is that perception effect of "motivation crowding-in" is detected with regards to subsidies for environmental goods and services in particular when the credibility of the goods is crucial as is the case for carbon offset.

4. Results and discussion: The economic and perception effects of subsidies[1]

Table 3 shows the selection results for different offset prices with/without local government subsidies. The table shows that 24.6% of the respondents answered that they would conduct carbon offsetting with the self-born payment of JPY 5000/ton CO_2 without subsidies (pattern A) while 31.6% answered that they would conduct carbon offsetting with the self-born payment of JPY 2500/ton CO_2 with subsidies of JPY 2500 (pattern B). The chi-squared test of independence regarding distribution in two patterns of A and B in Table 3 rejects the hypothesis of independence at a significance level of 5% ($p=0.011$). Therefore the intended positive economic effect of local governmental subsidies on carbon offsetting is observed.

[1] For other study results such as willingness to pay without subsidies, effects of individual attributes on offset/no offset choice and reasons for conducting/not conducting offset are shown in Appendix.

Table 3. Selection results on carbon offsetting by cost and subsidies

Cost and subsidies		Offset	No offset	Total
A. Total cost JPY 5000, no subsidies	Frequency	130	398	528
	Ratio	24.6%	75.4%	100.0%
B. Total cost JPY 5000, subsidies JPY 2500, self-born cost JPY 2500	Frequency	172	372	544
	Ratio	31.6%	68.4%	100.0%
C. Total cost JPY 2500, no subsidies	Frequency	173	397	570
	Ratio	30.4%	69.6%	100.0%

On the other hand, there was no verification of whether Kitakyushu city's subsidies had a perception effect on carbon offset selection, according to the two patterns of B and C where the self-born cost is equally JPY 2500/ton CO_2. When the chi-squared test of independence regarding distribution in two patterns of B and C in Table 3 is applied, the hypothesis of independence is not rejected at the significance level of 5% (p=0.648).

To investigate the effects of subsidies by individual attributes, discrete choice analysis (logit model) is applied to examine the relationship between conducting/not conducting carbon offsetting, as well as presence/absence of subsidies and individual attributes, using two patterns of B and C where the same amount of self-born cost is presented to the respondents. The observed term of the utility functions for the two alternatives, that is, no offset (V_0) and offset (V_1), are defined as follows, using the cross-terms of subsidies and

individual attributes:

No offset: $V_0 = 0$, (1)

Offset: $V_1 = ASC_1 + (\theta_1 + \gamma_1 \, Sub) \, X$, (2)

where ASC_1 is an alternative specific constant, *Sub* is a dummy variable to represent subsidies (1 for pattern B (with subsidies) and 0 for pattern C (no subsidies)), X is an individual attributes vector, θ_1 and γ_1 are parameters to be estimated.

Table 4 presents the results of estimation. Model 1 indicates the result when all individual attributes are used as variables while Model 2 shows the result when the variables whose coefficients are significant at 5% level are used in the model. The following interpretation and discussion are based on the results of Model 2.

The estimation results of parameters in Model 2 show that the statistically significant effects of subsidies were detected in two different manners. First, the respondents who are more concerned about problems in developing countries (measured by five-scale variable) have statistically significantly stronger preference to conduct international carbon offsetting when they could receive local governmental subsidies, under the condition of the same self-born cost. Second, the respondents who have visited developing countries other than Vietnam (dummy variable), which is the location of the climate change mitigation project that generates credits for carbon offsetting, have statistically significantly lower preference to conduct offsetting when they could receive subsidies. Apart from the effects of subsidies, there are positive

effects of higher household income and higher concern about climate change on more carbon offsetting, regardless of the presence/absence of subsidies under the condition of the same self-born cost.

On the contrary, neither experience of carbon offset nor its knowledge had statistically significant interaction with presence/absence of subsidies when the self-born cost is the same. Familiarity to the goods was not correlated with perception effects of subsidies, opposed to the hypothesis described in the section 3.

The results suggest that subsidies could have perception effects to increase the probability of conducting carbon offsetting when subsides are provided for the citizens who have concern about international development, while subsidies might cause negative sentiment among citizens who have visited other developing countries than the country where the offset project is conducted. In the former case, the combination of private payment and local governmental subsidies might have perceived as “matching fund,” or collaboration between citizens and local government towards shared objective, rather than pure private isolated purchase of goods and services under subsidies. For the latter case, it may imply that citizens who have closer experience of developing countries would like to select offset projects in other countries than Vietnam, the country used in the experimental survey.

Table 4. Estimation results of discrete choice models for offsetting

Variables	Model 1		Model 2	
	Coefficient	t-value	Coefficient	t-value
Linear term				
Alternative specific constant	-3.940 **	-5.871	-2.971 **	-7.301
Female	0.289	1.419		
Age group	0.127	1.451		
Household income group	0.253 *	2.323	0.173 *	2.286
Number of climate change mitigation actions	-0.007	-0.207		
Knowledge on carbon offset	-0.131	-0.791		
Experience of carbon offset	-0.041	-0.053		
Concern about climate change	0.295 *	2.205	0.430 **	4.875
Have visited developing countries other than Vietnam	0.253	1.083		
Have visited Vietnam	-0.169	-0.474		
Concern about international development	0.173	1.616		
Support of the city's international environmental cooperation	0.000	0.542		
Annual distance of driving	0.001	0.082		
Purpose of driving: commuting	0.192	0.769		
Purpose of driving: taking passengers	-0.110	-0.412		
Purpose of driving: work	0.173	0.636		
Purpose of driving: leisure	-0.228	-1.002		
Cross-term with *Subsidies dummy*				
x Female	-0.074	-0.278		
x Age group	-0.074	-0.641		
x Household income group	-0.162	-1.064		
x Number of climate change mitigation actions	0.041	0.815		
x Knowledge on carbon offset	0.116	0.485		
x Experience of carbon offset	0.756	0.745		
x Concern about climate change	0.140	0.719		
x Have visited Vietnam	-0.889	-2.597		
x Have visited developing countries other than Vietnam	0.481	0.943	-0.582 **	-3.102
x Concern about international development	0.089 **	0.589	0.262 **	3.433
x Support of the city's international environmental cooperation	0.000	-0.396		
x Annual distance of driving	0.002	0.134		
x Purpose of driving: commuting	0.058	0.170		
x Purpose of driving: taking passengers	0.262	0.707		
x Purpose of driving: work	-0.204	-0.510		
x Purpose of driving: leisure	0.227	0.701		
Sample size	1114		1114	
Akaike Information Criterion	1369		1334	

*: $p < 0.05$; **: $p < 0.01$

5. Conclusion

The study detected perception effects of subsidies towards conducting individual voluntary international carbon offsetting, using an experimental social survey. In addition to the usually intended economic effects, subsidies could

have perception effects, i.e. motivation crowding-in and crowd-out, depending on relevant attitudes and experiences of individuals. The study also confirmed that familiarity to unfamiliar goods, i.e. knowledge and experience of carbon offset, does not affect such perception effects of subsidies. If the credits for carbon offset are generated from projects with GHG mitigation methodologies that are appealing to users in developing countries that are also preferred by users, then local government subsidies might lead to further advancement of carbon offset market that can also contribute to low carbon development in developing countries, which has incremental effect of market generation.

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Appendix

A1. Willingness to pay without subsidies

Before estimating the willingness-to-pay for offsetting in the case of no subsidies, the external scope test was applied. If the respondents pay to offset one ton of CO_2 emissions based on their moral satisfaction, or "warm glow", the demand for offsetting one ton of CO_2 would not change when the price differs (Kahneman and Knetsch 1992). The survey results show the ratio of conducting offset decreases from 30.4% to 24.6% when the price of offsetting increases from JPY 2500 to 5000 (See Table 3). The chi-test of independence for the distribution of two patterns of A and C rejects the hypothesis of independence at a significance level of 5% (p=0.034). Hence the survey results used here are valid for contingent valuation.

The Turnbull method was used to estimate the average willingness-to-pay among the population that the samples represent, even though this population would be different from the adult driving population in the city since the samples were not randomly drawn from the adult citizens in the city (Turnbull 1976). The selection results for patterns A and C in Table 3 are used. Neither pattern includes local government subsidies. Here the floor estimate of the average willingness-to-pay is used following the recommendation to estimate the benefits in a conservative manner in valuation (Arrow et al. 1993). The floor estimate of the average willingness-to-pay is calculated as follows (See Fig. A1 for illustrative explanation):

The floor estimate = 2500 0.304 + (5000 2500) 0.246 = JPY 1375 (A1)

The 95% confidence interval for the above floor estimate is also calculated as follows, based on the method obtained by Haab and McConell (1997):

[1271.0, 1479.0] (A2)

It should be noted that the floor estimate of the average willingness-to-pay is calculated here. The computed value is highly likely to be underestimated vis-à-vis the true average value since the maximum acceptance rate in this survey design is around 30% at most, and it is assumed that nobody exhibits willingness-to-pay beyond JPY 5000.

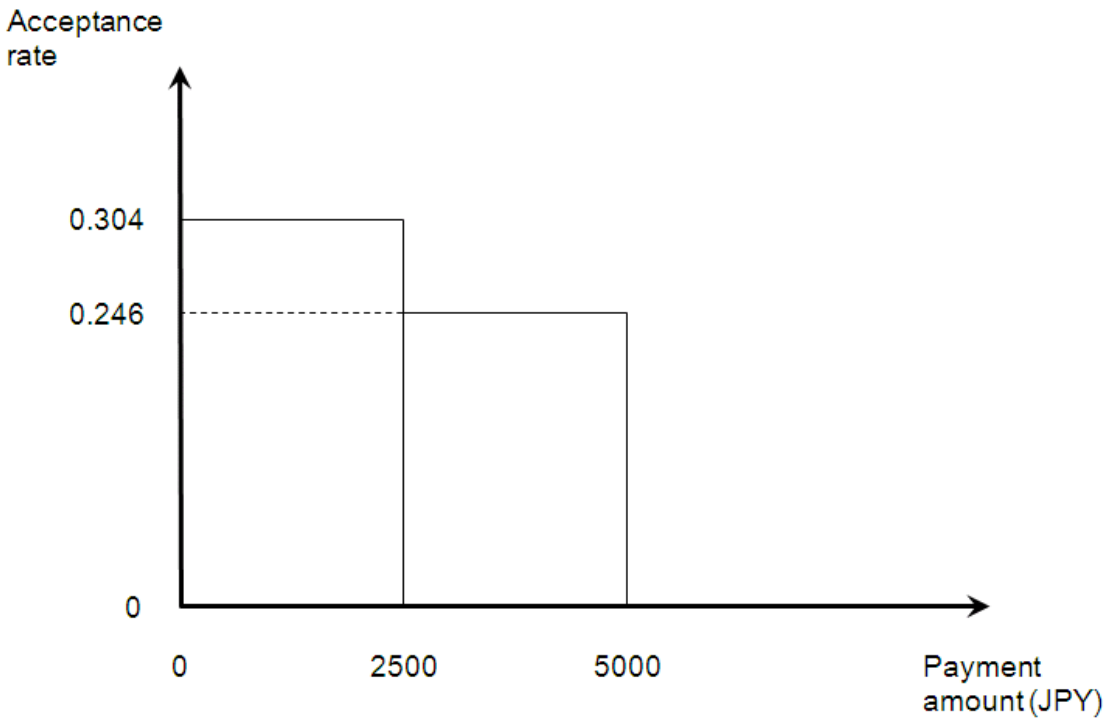

Fig. A1 Turnbull method to calculate the floor estimate of the average willingness-to-pay

Note: The floor estimate of the average willingness-to-pay is calculated as a sum of two areas of rectangular, i.e., 2500 0.304 + (5000 2500) 0.246.

In the contingent valuation, the protest zero answers shall be carefully treated (Halstead et al. 1992, Bateman et al. 2002). When the respondents answered "no"' for the payment for goods concerned in the survey because they thought other payment vehicles or policies should be applied to realise the societal value, such responses shall be removed from the valuation. As discussed in detail in the following sub-section in 3.4., the reasons for no carbon offsetting are presented in Table 6. Among various reasons for not conducting carbon offset, the possible protest "no" would be a rejection of carbon offsetting by the respondents who stated "because I did not know mechanisms/effects." Those respondents might have responded "yes" if they had received further explanation of carbon offset mechanisms. However, intangible transaction mechanisms of the carbon offsetting can be understood as part of its nature and this cannot be changed by a simple explanation. Therefore, the answers by those respondents shall also be incorporated into the valuation, given the characteristics of the carbon offsetting, which is an environmental item to be valued in the current survey.

A2. Effects of individual attributes on choosing/not choosing offset

Discrete choice model (logit model) is applied to examine the relationship between conducting/not conducting carbon offsetting, as well as price and individual attributes. More specifically, the observed term of the utility functions for the two alternatives, that is, no offset (V0) and offset (V1), are defined as follows:

$$\text{No offset: } V0 = 0, \tag{A3}$$

$$\text{Offset: } V1 = ASC1 + \beta 1\, P + \theta 1\, X, \tag{A4}$$

where ASC1 is an alternative specific constant, P is self-born amount of cost, X is an individual attributes vector, β1 and θ1 are parameters to be estimated.

Table A1 presents the results of estimation. Model 1 indicates the result when all individual attributes are used as variables while Model 2 shows the result when the variables whose coefficients are significant at 5% level are used in the model.

Table A1 Estimation results of discrete choice models for offsetting

	Model 1		Model 2	
Variables	Coefficient	p-value	Coefficient	p-value
Alternative specific constant	-3.375	0.000	-2.957	0.000
Self-born cost	-0.306	0.015	-0.313	0.012
Female	0.252	0.050		
Age	0.084	0.132		
Household income	0.208	0.002	0.202	0.002
Number of climate change mitigation actions	0.045	0.023	0.046	0.011
Knowledge on carbon offset	-0.061	0.534		
Experience of carbon offset	0.114	0.763		
Concern about international development	0.258	0.000	0.240	0.000
Have visited Vietnam	-0.065	0.780		
Have visited developing countries other than Vietnam	-0.171	0.228		
Support of the city's international environmental cooperation	0.225	0.001	0.223	0.001
Annual distance of driving	-0.003	0.687		
Purpose of driving: commuting	0.204	0.183		
Purpose of driving: taking passengers	-0.087	0.577		
Purpose of driving: work	0.170	0.319		
Purpose of driving: leisure	-0.084	0.562		
Sample size	1584		1584	
Log-likelihood	-915.1		-922.3	

- The above estimation results confirm the following propositions at a significance level of 5%.
- The respondents do not conduct offset on average
- The respondents conduct offset less when the price increases
- The respondents with higher household income conduct offset more

- The respondents who are engaged in a larger number of climate change mitigation actions in daily lives conduct offset more
- The respondents who are concerned about international development conduct offset more
- The respondents who support the idea of the city's international environmental cooperation conduct offset more

Other individual attributes did not show a statistically significant relationship with offsetting. These attributes included gender , age, knowledge of carbon offsetting, experience of carbon offsetting, experience of visiting Viet Nam, experience of visiting developing countries (other than Viet Nam), annual driving distance, and objectives of driving.

A3. Reasons for conducting/not conducting offset

The reasons for conducting/not conducting offset were obtained through open questions and were classified according to the researcher judgement. There were 10 categories derived for the reasons of conducting offset and 19 derived for the reasons of not conducting offset, respectively. Table A2 shows the reasons for offsetting according to three patterns of price and subsidies, while Table A3 shows the reasons for not offsetting according to three patterns. The reasons are listed in order of ratio from high to low, and similar reasons are closely located to each other in the tables.

Table A2 Distribution of reasons for conducting offset for driving

	A. Total cost 5000 JPY, no subsidies		B. Total cost 5000 JPY, subsidies 2500 JPY		C. Total cost 2500 JPY, no subsidies	
Reasoning	Frequency	Ratio	Frequency	Ratio	Frequency	Ratio
For the environment	64	49.2%	57	33.1%	52	30.1%
For the future	7	5.4%	3	1.7%	5	2.9%
Would like to contribute to the society	4	3.1%	15	8.7%	19	11.0%
It is necessary	8	6.2%	9	5.2%	18	10.4%
It is a duty	6	4.6%	11	6.4%	6	3.5%
I need to drive a car	3	2.3%	2	1.2%	3	1.7%
Because this is my emissions	12	9.2%	20	11.6%	17	9.8%
To raise awareness to reduce the emissions	1	0.8%	3	1.7%	14	8.1%
Because it is economically feasible	9	6.9%	16	9.3%	25	14.5%
Because of the subsidies	na	na	4	2.3%	na	na
Others	16	12.3%	32	18.6%	14	8.1%
Total	130	100.0%	172	100.0%	173	100.0%

Table A3 Distribution of reasons for not conducting offset for driving

	A. Total cost 5000 JPY, no subsidies		B. Total cost 5000 JPY, subsidies 2500 JPY		C. Total cost 2500 JPY, no subsidies	
Reasoning	Frequency	Ratio	Frequency	Ratio	Frequency	Ratio
It is expensive	118	29.6%	98	26.3%	99	24.9%
I do not want to pay	23	5.8%	28	7.5%	30	7.6%
It is not a duty	7	1.8%	3	0.8%	4	1.0%
Procedures seem troublesome	3	0.8%	3	0.8%	5	1.3%
There is no necessity	19	4.8%	20	5.4%	18	4.5%
There is no scientific evidences	5	1.3%	3	0.8%	6	1.5%
It is not credible	2	0.5%	20	5.4%	17	4.3%
It is about past emissions	14	3.5%	14	3.8%	5	1.3%
It should be not solved by paying money	19	4.8%	5	1.3%	17	4.3%
There is no difference in emissions amount	7	1.8%	11	3.0%	12	3.0%
I will reduce emissions myself	14	3.5%	12	3.2%	21	5.3%
I am using environmentally friendly vehicles	4	1.0%	3	0.8%	1	0.3%
I am already paying vehicle/fuel taxes	10	2.5%	12	3.2%	21	5.3%
It is not fair	6	1.5%	5	1.3%	1	0.3%
It is useless unless everybody does	9	2.3%	1	0.3%	2	0.5%
It should be not be born by individuals	8	2.0%	6	1.6%	8	2.0%
It shall be dealt with tax	6	1.5%	7	1.9%	2	0.5%
Government shall deal with this	4	1.0%	3	0.8%	4	1.0%
Corporate shall deal with this	5	1.3%	3	0.8%	3	0.8%
I do not know mechanisms/effects	59	14.8%	63	16.9%	57	14.4%
I do not know if the cost is relevant	5	1.3%	6	1.6%	1	0.3%
Others	51	12.8%	46	12.4%	63	15.9%
Total	398	100.0%	372	100.0%	397	100.0%

In terms of reasons given for offsetting, “for the sake of the environment” dominated the results with a ratio of between 30% and 50%. The ratio of those giving this reason is higher when the self-born cost is JPY 5000/ton CO_2. The reason of “because it is my own emissions” was given by around 10%. The reasons of “economically feasible” and “I would like to contribute to the society” comprise from 9% to 15% and from 9% to 11% respectively when the self-born cost is JPY 2500/ton CO_2. The sum of the ratios for the reasons of “it is necessary” and “it is a duty” exceeds 10% in all cases of self-born costs. The reason of “to raise awareness of emissions reduction myself” comprises up to 8.1% in the case of price of JPY 2500 /ton CO_2 without subsidies. Moreover the reason of “because of subsidies” when subsidies are paid comprised 2.3%. There were no reasons explicitly stating higher credibility of carbon offsetting because of coordination by the local government where the respondent resides.

Regarding the reasons for not offsetting, the reason of “because it is expensive” was given by around 30%, which was a high ratio. This tendency does not depend on the amount of self-born cost. The reason of “because the mechanisms and effects are unclear” comprised around 15%. Other reasons included the following: 5% for “it is not necessary”; 5% for “it is not credible” in the case of JPY 2500 of self-born cost, 4% for “money shall not be used to reduce emissions” when subsidies are not used, and “I already pay the fuel/vehicle taxes” in the case of JPY 2500 of self-born cost.

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