

Public Acceptability of Personal Carbon Trading in China: an Empirical Research

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Abstract

The global warming that is caused by a large number of greenhouse gases emissions has been a giant challenge of human society and sustainable development. China is the biggest carbon emissions country in the world. In order to solve this problem, implementation of an innovative policy is necessary. Personal carbon trading (PCT) is latest idea on the subject of new policy to control the carbon emission. But whether a new policy can be implemented, it depends on its public acceptability. In this article we discussed public acceptability of PCT by exploring the influencing factors and its level of acceptance in China. We designed a questionnaire with five aspects to collect data from three main cities of China. We applied ordinal logistic regression model to investigate the factors which influence public acceptability. The pre dominant results show that acceptability is affected by eight factors such as education, income, perceived threat to humans and the environment in the municipality, perceived level of personal carbon emissions, perceived fair, anticipated behavior to save carbon quotas for traveling, infringement of freedom and anticipated behavior to save carbon quotas for selling. Mostly have positive impact on public acceptability except last two factors. Moreover our results do not support the highly acceptance of PCT in China. There is a considerable validation to conduct this study, because empirical evidence—in developing countries—is limited. It is obvious that this dimension of understanding is necessary for promotion of new idea as new effective policy implementation to control the carbon emission.

Keywords: Personal carbon trading, personal carbon allowances, carbon emissions, public acceptability, ordered logistic regression, climate change

1. Introduction

The world's total carbon dioxide emissions are growing rapidly every year and to be expected more in future, many countries are facing a huge challenge of carbon dioxide emissions(GCP, 2013).In 2013, it has been reached to 36 billion tons, which increased by 2.1% in the world. China, which is the largest developing country in the world, occupied 27% of total amount of emissions increased by 5.9 % and has become the largest emissions country in the world (GCP, 2013). China was also the biggest energy consumer country in 2013 as it occupied 22.4% of total consumption in the world (BP, 2014). In future, there is no doubt that the amount of carbon emissions will increase rapidly if China maintains a high growth rate in economy.

However, there is not any effective policy for reducing carbon emissions in China. The carbon tax plan is still verifying under the State Council. The central government approved seven pilot cities for carbon trading in November2011, which are Beijing, Shanghai, Chongqing, Tianjin, Guangzhou, Shenzhen and Wuhan. It aims to establish a unified carbon trading market in the future as well as keep pace with the international carbon trading market. To reduce emissions and keep the sustainable economical development, more efficient policy ideas and actions are required to reduce carbon dioxide emissions in China.

Personal Carbon Trading (PCT), which is regarded as an extended system of carbon trading system at corporate level, is a good policy idea proposed in 1990s (Fleming, 1996; Hillman, 1998).As a general term, PCT is made use of summarizing all kinds of downstream cap-and-trade policies, which was looked as a potential and novel tool to reduce carbon emissions from family energy consumption and transportation at the personal level (Fawcett and Parag, 2010). But at beginning it didn't attract scholar's wide concentration. In 2004/2005, some scholars had stepped into this field; In 2006/2007, environment secretary of the UK showed his great interest in PCT, and after that it provoked widespread media attention. The Environmental Audit Committee (EAC) pointed out in report, 2007-2008, that reducing carbon emission from industry and business enterprises only was futile because it couldn't make UK to reach its carbon emissions reduction target of 2050.

In the report it was thought that individual and family's carbon emissions must be considered (EAC, 2008). However, DEFRA (Department for Environment, Food and Rural Affairs) claimed that it was not right time to put this idea in PCT as according report in the middle of 2008(DEFRA, 2008), which made the PCT

ignored by society directly. On the contrary, it didn't reduce researchers' interest.

PCT have many schemes, TEQs (Tradable Energy Quotas) and PCAs (Personal Carbon Allowances) are the most famous of them. They were proposed by Hillman (1998) and Fleming (1997). A lot of scholars developed the two schemes later (Fawcett, 2005; Starkey and Anderson, 2005). Although there are differences in the aspect of scheme coverage and original carbon emissions, they all have the following common features (Owen et al., 2008; Fawcett, 2010):

- Family energy use and personal transportation.
- Distribution of carbon quotas to everyone freely.
- The quotas are tradable.
- The quotas are reducing year after year.

New policies often face a lot of barriers and need to overcome all kinds of obstacles, PCT as a concept tool to reduce carbon emissions faces barriers more than usual new policies (Rarag and Eyre, 2010). Public acceptability is exactly thorny one of these barriers. The implementation of new policies depends on their public acceptability (Bristow et al., 2010). A lot of factors influence the acceptability, such as political context and social factors.

Consequently, we consider that there is a significant reason to conduct this study, because empirical evidence—in developing countries—is limited and especially in China no one has explored accessibility of PCT which is selected as the focus of our study because it is obvious that this dimension of understanding is necessary for promotion of new idea as new effective policy implementation to control the carbon emission in China. It is expect that this study will further contribute to a better understanding of how policy and practice can be formulated to offer appropriate incentives and support in order to enhance idea of PCT.

1.1 Review of determinants of public acceptability

Social acceptability is the major topic in the study of PCT, and its level has been considered as a standard of policy implementation by government. Social acceptability can be divided into public and political acceptability, this paper is concentrated to former one. Previous research in current area had been focused on several factors influencing public acceptability, such as: personal, political and social factors. Our study is focused on five aspects influencing public acceptability, such as environmental problem awareness, knowledge of PCT, trust to government, anticipated behaviors to PCT and demographic characteristics.

1.1.1 Environmental problem awareness

Public acceptability depends on people's awareness about environmental problems (Schade and Schlag, 2000). If people realize the environmental problems by considering one policy can solve them, they would more likely to accept the policy (Schade and Schlag, 2000; Schade and Schlag, 2003). Eriksson and Garvill (2006) did a survey about acceptability of policy, which included three policies(improving public transportation, Strengthening information publicity, increasing the fuel tax) about traffic demand management in Sweden. They found that environmental problem awareness had potential influence on acceptability of policy.

Environmental problem awareness also affected the public acceptability of PCT. Scholars discovered that people who care about environmental problem, supported for PCT more and tended to reduce carbon emissions more, comparing with those who don't care about environmental problems (Capstick and Lewis, 2010; Low, 2005; Keene, 2007).

1.1.2 Knowledge of personal carbon trading

In this part, this article reviewed literature about the knowledge of PCT in four aspects: cognition, perceived fairness, perceived effectiveness and perceived infringement on freedom. The cognition of PCT was analyzed in three aspects: perceived degree of personal carbon emissions; the extent of knowing PCT; whether it's a good policy. Information reserves might have effect on behaviors (Wallace et al., 2010), so the extent of knowing PCT might affect acceptability. The existing research had shown that people with high perceived degree of PCEs supported for PCT more than those people with low PCEs (Howell, 2007; Capstick and Lewis, 2009; Bristow et al., 2010).

Fairness and effectiveness, both are very important factors for public acceptability. In the field of climate policy, fairness has become more attractive to scholars (Jagers et al., 2010). People who felt fairer and more effective would accept the policy more (Eriksson et al., 2008). The first research about fairness and efficiency of PCT was appeared in unpublished paper (Low, 2005). After that, Siveter (2006) hypothesized five important factors (including fair) that affected public acceptability of PCT. Jagers et al. (2010) found the relationship between public acceptability and fair. Later on, Andersson et al. (2011) discovered that the perceived fairness of income redistribution and fairness of redistribution between countryside and urban area would influence public acceptability of PCT.

Infringement on freedom means that how a policy involves in people's choice of daily life and travel. If

people feel that the policy would infringe their freedom, they would reduce the acceptability of the policy. Concerning to Baron and Jurney (1993) and Jakobsson et al. (2000), high price of transportation charge led to high infringement on freedom, and high infringement resulted in low acceptability. The influence of infringement on freedom is different from country to country such as America, England and Japan (Schmöcker et al, 2012; Kim et al, 2013).

1.1.3 Trusts to Government

Trust to government is also a major determinant factor of policy acceptability which has been widely investigated. According to Hardin (1999) survey, if people trust government and believe that policies are fair and effective, so the rate of acceptability among those people is higher than others. Trust to government affect the perceived risk and interest, and then affected acceptability (Siegrist, 2000). Trust to government can be divided into general trust and special trust. General trust refers to trust propensity of mankind in general, while special trust refers to the specific circumstances of trust (Yamagishi and Yamagishi, 1994). The influence of general trust and special trust is dissimilar in different countries. Concerning to Kim et al. (2013), the special trust of government had positive impact on acceptability of environmental tax in UK students; However, both general trust and special trust had positive impact on the policy acceptability in American students.

PCT is downstream and cap-and-trade policy. Therefore, government is a very important participant in PCT, and trust to government will affect acceptability. The government has to take a lot of steps for implementation of PCT, such as the setting of total carbon quotas, distribution of quotas and grant of quotas. So some scholars worried that it meant the model like Soviet state control, which let people remind of the tough days and war (Levett, 2005).

Public attitudes of carbon reduction schemes are related with their trust to government and government intervention, and the way PCT was put up, would affect their attitude obviously (Owen et al, 2008). It may get better effectiveness when avoid to use sensitive words like "distribution" in the interpretation of PCT (Howell, 2007).

1.1.4 Anticipated behaviors to policy

The gap between attitudes and behaviors was a major problem in attracting people to climate change (Lorenzoni et al., 2007; Wallace, 2009). There is no definitive explanation about the gap (Kollmus and Agyeman, 2002). Some factors affected behaviors, including attitudes, money, other people and sometimes attitudes are also influenced by behaviors (Shipworth, 2000). However, Anable et al. (2006) thought that a combination of changing attitudes and behaviors is desirable for transport policies.

In addition, actual carbon emissions may not be mainly influenced by behaviors. Behavior change about energy efficiency may be affected by attitudes, but it did not mean this would translate into reduced carbon emissions (Brandon and Lewis, 1999). It may be explained by the difference between one-off behaviors and habitual behaviors regarding reducing household carbon emissions, which was investigated by previous studies (Wallace et al., 2010; Shipworth, 2000; Barr et al., 2005).

The support for PCT is related with three variables, which were "beliefs about subsidies for energy efficiency and renewable energy", "respondents' preparedness to choose a low-carbon mode of transport" and "selling carbon quotas" (Wallace, 2009; Wallace et al., 2010). Generally speaking, the more active attitudes towards new energy and more willing to use public transportation or bike, is the more support of PCT. Although there was no significant correlation between the number of personal carbon allowance and the support of PCT, the quantity of selling carbon quotas appeared to be negatively related to the support of personal carbon allowance (Wallace, 2009; Wallace et al., 2010). The correlation between mentioned three factors and the support for PCT was significantly associated and was gradually enhanced.

1.1.5 Demographic characteristics

Demographic characteristics as a factor of policy acceptability have been widely demonstrated. Even for same thing, different people have different attitudes. Some demographic characteristics are one of reasons that lead to these differences, such as gender, age, education, income and so on.

In this field of PCT, the previous research shown that there was no relationship between a college degree and acceptability of PCT (Andersson et al, 2011). But it didn't mean education had no relationship with PCT. Dresner and Ekins (2004) found that personal consumption level is determined by economic conditions, and the carbon emissions of poor people are less than the carbon emissions of rich people. Therefore, public acceptability may be different between high-income people and low-income people. Personal income was negative correlated with public acceptability; it meant that people with high income support for PCT more (Andersson et al, 2011). Parag and Eyre (2010) made similar conclusion. Even there were no studies showed that age and gender had significant impact on the acceptability of PCT, they are still important demographic characteristics.

1.2 objectives and Motivations

China is the second largest economy and the biggest emissions country in the world in 2013. To face the huge challenge of reducing carbon dioxide emissions, China need new policy ideas to deal with it. PCT, which has been discussed in some European scholars, is a good policy idea. Concerning to achieve reductions of carbon emission, PCT is a potentially influential and original instrument (DEFRA, 2008). To some extent, whether anew policy can be implemented, it depends on its public acceptability (Bristow et al., 2010). Therefore, this paper examines the public acceptability of PCT aiming to find out the influencing factors and its suitability in China. Furthermore the previous research about the relationship between acceptability and environmental problem is not focused to quantitative analysis in the field of PCT. There is no any paper about the impact of infringement on freedom on acceptability in the area of PCT. Therefore, this paper tries to do quantitative research.

The discussion and research about PCT are mainly in Europe, which exclude almost all Asian researchers and institutions. This paper is the first comprehensive research about factors of public acceptance as well as the first research about acceptability of PCT in China.

2. Method

2.1 Measures

This paper designed a questionnaire from 5aspects: environmental problem awareness;knowledge of personal carbon trading; trust of government; anticipated behaviors to the PCT; demographic characteristics. We applied ordered logistic regression to find out the main factors that influenced public acceptability.

All questions in previous studies were in English. Therefore, this paper designed questionnaire using translation method to conduct research in China. The questionnaire had 21 questions concerning to five aspects. Most of the questions are on a seven point scale (1 = strongly disagree, 4 = unsure, 7 = strongly agree).

Environmental problem awareness: according to Eriksson et al (2008), this study investigated environmental problem awareness of personal carbon emissions (PCEs) from three levels, such as country level, municipality level and personal level. To what extent problem from PCEs is a threat to human and environment in China (country level), in the municipality (municipality level), and to health and happiness of respondents and their family (personal level)? Respondents answer questions on a seven point scale (1 = strongly disagree, 4 = unsure, 7 = strongly agree)

Knowledge of personal carbon trading: this part contained 6 questions that respondents' perceived degree of PCEs (1=extremely lower than the average, 4= equal to the average, 7= extremely higher than the average), whether respondents known PCT before read introduction to it (1=never heard, 3=unsure, 5=strongly know), after reading introduction whether respondents think PCT is a good policy (1 = strongly disagree, 4 = unsure, 7 = strongly agree). And respondents answered perceived effectiveness of PCT to reduce carbon emissions, perceived fairness of PCT, perceived Infringement on freedom (Schmöcker et al., 2012; Kim et al., 2013) , which are all on a seven point scale (1 = strongly disagree, 4 = unsure, 7 = strongly agree).

Anticipated behaviors to PCT: personal carbon trading mainly covers personal transportation and household energy usage. Therefore, the questionnaire had four questions about transportation and household energy usage. If such a system was in place, make your home energy-efficient, use public transport or cycle, keep as many quotas as possible for flying or car use, try to use as few quotas as possible so you could sell them (Wallace, 2009; Wallace et al., 2010) . The former two questions are about carbon reduction actions, others are about carbon trading actions. These questions are all on a seven point scale (1 = strongly disagree, 4 = unsure, 7 = strongly agree).

Trust to government as a determinant of policy acceptance has been widely proved (Schmöcker et al., 2012;Kim et al., 2013) . Trust to government is divided into general trust to government and special trust to government, (Yamagishi and Yamagishi, 1994). In the questionnaire, there were two questions about general trust, In general whether respondents trusted the government and respected the government. And one question about specific trust, trust the government to introduce PCT. These questions are on a seven point scale (1 = strongly disagree, 4 = unsure, 7 = strongly agree).

Demographic characteristics: Previous studies have indicated that gender, age, education and income characteristics can affect the acceptance of the policy. Therefore, this questionnaire was also designed to check the effect these variables on public acceptability of PCT. (Gender is on a binary scale, age is on six point scale, education is on five point scale, income is on eight point scale.)

Table 1. Age and annual family income (RMB) of respondents

Age	Freq.	Percent	Cum.	Family income	Freq.	Percent	Cum.
18-24	7	3.32	3.32	<20000	2	.95	.95
25-34	62	29.38	32.7	20001-40000	1	.47	1.42
35-44	85	40.28	72.99	40001-60000	10	4.74	6.16
45-54	43	20.38	93.36	60001-80000	32	15.17	21.33
55-64	12	5.69	99.05	80001-100000	89	42.18	63.51
>65	2	.95	100	100001-120000	60	28.44	91.94
Total	211	100		120001-150000	14	6.64	98.58
				>150000	3	1.42	100
				Total	211	100	

2.2 Procedure and participants

From March 21th to April 7th in 2014, the study was carried out in three cities, Hangzhou, Zhengzhou and Guiyang in China. Questionnaires were redistributed randomly. More than five hundred questionnaires were sent out. 302 Respondents answered questionnaires (the answered rate was less than 60 percent), and 211 respondents completed full questionnaires. In 211 samples, 56.87 percent was male, 43.13 percent were female. 23.22 percent finished high school, 29.38 percent got bachelor degree, and 47.40 percent got Graduate degree and remaining just finished middle school. Most of respondents' age (90.04 percent) was from 25 to 54 and annual family income was mainly from 60001-120000 RMB (85.78 percent). Table 1 showed detailed data.

3. Results

3.1 Analyses

Through the descriptive analysis of samples, it was found that the acceptance level of PCT was maximum 7 and minimum value 1, with a mean of 3.72, and the standard deviation was 1.98. It is revealed that the acceptance of PCT was not high (figure 1 showed detailed acceptance). The respondents who didn't support PCT were occupied 53.09 percent of the total number of respondents, neutral respondents accounted 11.37 percent, and supporter was 35.55 percent. It means almost one third percent people from taken samples support PCT, considerably less than the opposition.

Considering that the dependent variable is ordinal variable, this paper applied the ordered logistic regression to analyze factors affecting the acceptance of PCT. Use Stata 12.1 software to do the model, and got inspection and fitting of the model as well as the results of the model (see table 2). Maximum likelihood estimation of the model was -375.51075, the P value was 0.000 (less than 0.05), it showed that the model was very significant.

3.2 Factors influencing the acceptability of PCT

As shown in table 2, regarding to the demographic characteristics, both of income (coef. = .2851, S.E. = .1245, p = .022) and education (coef. = .5340, S.E. = .1339, p = .000) are significant and positively effect on acceptability of PCT. It means that respondents with high income or education have higher acceptability than those people with low income or education. Moreover there is no relationship exist between age, gender and acceptability of PCT.

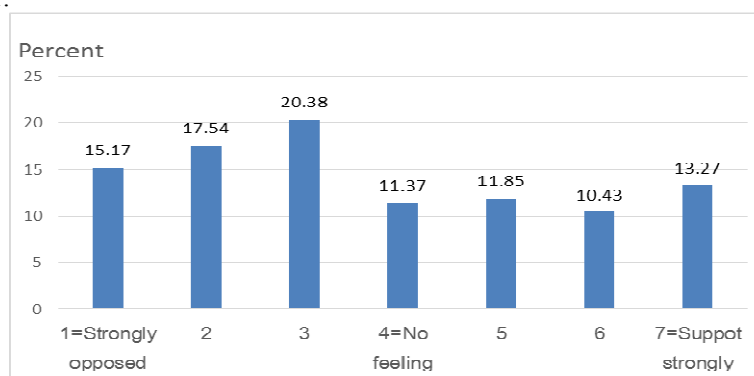


Figure 1. Support for personal carbon trading

With respect to environmental problem awareness, the indicator of "PCEs are perceived to be a threat to humans and the environment in the municipality" is significant and positively effect on acceptability of PCT

(coef. = .1338, S.E. = .0690, p = .052), which is a municipality level variable. It implies if respondents feel that PCEs are a threat to human and environment in the municipality, their acceptability of PCT is higher. There are no relationships exist between other two factors (PCEs are a threat to health and happiness of respondents and their family or in China) and acceptability of PCT. Only the variable in municipality level is significant, country and personal level variables are insignificant.

Table 2. Results of ordered logistic regression

Y=Acceptability	Coef.	Std. Err.	z	P>z	[95% Conf. Interval]	
x1=Gender	-.19611	.25824	-.76	.448	-.70225	.3100362
x2=Age	.047049	.132138	.36	.722	-.21194	.306034
x3=Education	.534093***	.133906	3.99	.000	.271642	.7965433
x4=Income	.285079*	.124486	2.29	.022	.041092	.5290657
x5=In China, PCEs are perceived to be a threat to humans and the environment	.00615	.066175	.09	.926	-.12355	.1358497
x6=in the municipality, PCEs are perceived to be a threat to humans and the environment	.133814*	.069004	1.94	.052	-.00143	.2690584
x7=PCEs are perceived to be a threat to the health and well-being of you and your family	.032853	.064003	.51	.608	-.09259	.1582956
x8=To what extent do you perceive your carbon emissions	.224097***	.069612	3.22	.001	.087661	.3605331
x9=To what extent do you know PCT	-.07949	.094454	-.84	.400	-.26462	.105631
x10=PCT is a good policy	.12356	.073954	1.67	.095	-.02139	.2685077
x11=PCT is effective to improving environment	-.11038	.065389	-1.69	.091	-.23854	.0177825
x12=PCT is fair	.148519*	.073645	2.02	.044	.004178	.2928603
x13=PCT infringes on your freedom	-.15407*	.0683	-2.26	.024	-.28794	-.0202038
x14=You respect the government	.060372	.069903	.86	.388	-.07664	.1973801
x15=In general you trust the government	.115085	.072039	1.60	.110	-.02611	.256279
x16=Trust the government to introduce PCT	-.09028	.069488	-1.30	.194	-.22647	.0459156
x17=If such a system was in place, make your home energy-efficient	-.0014	.068446	-.02	.984	-.13555	.1327516
x18=If such a system -----, use public transport or cycle	-.04892	.073452	-.67	.505	-.19288	.0950429
x19=If such a system -----, keep as many quotas as possible for flying or car use	.219406**	.07148	3.07	.002	.079308	.3595045
x20=If such a system -----, Try to use as few quotas as possible so you could sell them	-.15345*	.071955	-2.13	.033	-.29448	-.0124244
/cut1	2.675799	1.100008			.519824	4.831774
/cut2	3.871332	1.10679			1.702063	6.040601
/cut3	4.91985	1.123972			2.716906	7.122795
/cut4	5.482911	1.134902			3.258544	7.707278
/cut5	6.136931	1.148262			3.886379	8.387483
/cut6	6.928088	1.167977			4.638896	9.21728

* p<.05; ** p<.01; *** p<.001

About knowledge of PCT, three indicators are significant, which are perceived degree of PCEs (coef. = .2241, S.E. = .0696, p = .001), perceived fairness of PCT (coef. = .1485, S.E. = .0736, p = .044), and perceived infringement on freedom (coef. = .1541, S.E. = .0683, p = .024). The perceived degree of PCEs and perceived fairness have positive impact on the acceptability of PCT, when the perceived infringement on freedom affects acceptability negatively. It implies that if respondents who feel high perceived fairness of PCT or high perceived PCEs, they have higher acceptability of PCT. However, respondents with high infringement on freedom will reduce to support for PCT.

On trust to government, the results show that all indicators (you respect the government, in general, you trust the government and trust the government to introduce PCT) are not significant at the 5% level of significance. Therefore, there are no obvious relationships exist between trust to government and acceptability of PCT. However, one indicator (in general you trust the government) is significant at level of 10% (coef. = .1151, S.E. = .0720, p = .110). Concerning to anticipated behaviors to PCT, two indicators (“make your home energy-efficient” and “use public transport or cycle”) of expected carbon reduction actions have no obvious relationships with acceptability of PCT. However, two indicators (“keep as many quotas as possible for flying or car use” and “try to use as few quotas as possible so you could sell them”) reflecting expected carbon trading actions are significant. As follows, if such a system is in place, respondents who will “keep as many quotas as possible for flying or car use”, will support PCT more (coef. = .2194, S.E. = .0715, p = .002). On the contrary, if

respondents try to use as few quotas as possible, their acceptability of PCT is lower (coef. = -.1534, S.E. = .0720, $p = .033$).

4. Discussion and conclusion

This study has been conducted in China to find out the level of public acceptability about Personal Carbon Trading (PCT). Our results show that level of public acceptability about Personal Carbon Trading (PCT) was not high. Almost one-third respondents supported PCT whereas remaining ones oppose for PCT by exceeding 50 percent. Our results were similar previous studies of Institute of Public Policy Research (IPPR, 2008, 2009a, 2009b) in UK, which explored the quantitative research in the support for PCT. They investigated low level of acceptability about PCT. But our results were against Bristow et al. (2008a, 2008b) and Wallace et al (2010) that proved through their studies that support for personal carbon allowances (PCAs) was more than two-fifths and exceeded opposition.

About the demographic characteristics, education has positive effect on PCT which does not support the previous studies, which investigated insignificant relation between degree and public acceptability of PCT (Andersson et al., 2011). People who have high education often have a lot of knowledge and know about problems threatening to human beings. Therefore, they may have strong environmental problem awareness, and they support the new policy that can solve problems more strongly.

Income have positive effects on PCT and it is against previous studies (Dresner and Ekins, 2004; Andersson et al., 2011), which concluded negative relationship between income and acceptability. In previous research, they explained that people who have high income often have high consumption level and high carbon emissions, and PCT will affect their consumption level, so the relationship is negative. But the conclusion of this paper is on the contrary. The reason may be the differences of innate idea between Chinese people and westerners. In China, the idea of collectivism is deep. When people think about public problems, they will more or less consider collective factor. Income is also positively related with education ($r=.147, p=.011$) in our study. It means that the high income crowds often have a high level of education, so they have more collective bias when they consider the public problems.

With respect to environmental problems awareness, the municipality level indicator of "PCEs are perceived to be a threat to humans and the environment in the municipality" is significant and positively effect on acceptability of PCT. When people realize that PCEs are a threat to human and environment in the municipality, rather than a threat to human and environment in China (country level indicator) or to health and happiness of respondents and their family (personal level indicator), their acceptability of PCT is higher. It reflects the idea of collectivism. There are no direct conclusions about the environmental problem awareness affecting acceptability of PCT, but there are some similar conclusions. The previous studies proved that people were aware of the present and the future environmental problems, people are more willing to accept new policy (Schade and Schlag, 2000; Schade and Schlag, 2003). Our study is similar to previous research.

Concerning to knowledge of PCT, the perceived degree of PCEs has positive impact on acceptability of PCT, which was against previous research results such as in the Howell (2007), Capstick and Lewis (2009) and Bristow et al. (2010) survey, which examined through their research that people with the high carbon emissions had lower acceptability than those people with low carbon emissions. They think that the implementation of this policy will reduce their standard of living, so they are opposed to PCT. Our conclusion is on the contrary, the reason may be that they underestimated the effects of carbon trading implementation.

Secondly, the perception of fairness has positive relation with acceptability, which is similar to former research studies (Jagerset al., 2010; Andersson et al., 2011). People with high perceived fairness of PCT will increase their acceptability. It indicates that when government formulates or implements new public policies, fairness is a factor that must be considered.

Thirdly, the perceived infringement on freedom is passive related with acceptability. There is not any study about the perceived infringement on freedom in the research area of PCT. However, some articles about acceptability of new policy have confirmed that the acceptance of the policy is inversely proportional to the perceived infringement on freedom (Schmöcker et al., 2012; Kim et al., 2013). Our study has the similar results to former studies, when people feel the implementation of the new policy would infringe on their freedom, as a result public acceptability will be low. Therefore, policy like PCT that will violate freedom of people, should explain details of policy to people before implementation. When government explains PCT to people, avoid to using sensitive words like "distribution" which may get better effect (Howell, 2007).

In the aspect of trust to government, there are no any indicators that have an impact on acceptability of PCT. This result is also different from previous studies. Former scholars believed that the trust to government or politicians had significant effect on the support of PCT (Owen et al., 2008; Jagerset al., 2010). However, our study was carried out in China when the former studies were mostly in European countries. There are a lot of differences between China and European countries with context to social and culture which can make the result be dissimilar. Another reason may be limitation of samples which respondents' education is higher than the

national average. But if we let significant level is at the 10%, the indicator of “in general trust to government” has a certain relationship with acceptability of PCT.

Regarded to anticipated behaviors, if PCT were carried out, people who would prefer storing carbon quotas for traveling would support PCT more. This shows that in order to have a travel, people would be willing to use less carbon quotas at ordinary life, and they would be willing to support for PCT. These people may be concerned about Environment more than those people who may not be willing to storing carbon quotas for travel. Previous studies didn't find the significant relationship between storing carbon quotas for traveling with acceptability of PCT (Wallace, 2009; Wallace et al., 2010). If PCT were in place, if people would prefer trying to use as few quotas as possible for selling, they would support PCT less. It showed that people may support PCT, but in order to maintain the quality of life, weren't willing to save carbon quotas and sell them, which is similar to previous studies (Wallace, 2009; Wallace et al., 2010).

Concerning to our study of what influences the acceptability of PCT, it could be an attractive way that might make government conquer public opposition. When government explores new policies, acceptability and factors influencing it must be considered, because original policies may led to new constraints. PCT as a new idea of policy may be a potential tool to solve the problem of the global warming and can encourage government to explore new PCT program. However, there are a lot of challenges when a new policy is proposed. And public acceptability which is influenced by various factors is exactly troublesome one of challenges.

This article is an exploratory study that tries to find out some factors having impact on public acceptability of PCT. Future research can explore this area more in detail, in China and worldwide. The extensive research methods is supported to use to evaluate PCT policies, including boundaries of the scheme, allocation rules, range of use and terms of trade. How people can get carbon units, how they can use and how they trade them with other peoples, which should be researched. Before designing policies, calculating carbon footprint and carbon emission should be also researched. Finally, without experimenting for PCT in some countries, it is hard to attract political and public interest. Moreover research in small countries can provide good evidence for implementation of PCT. For Example a small island named Norfolk Island in the South Pacific approximately 1500km from Australia east coast and 1200km from northern New Zealand, which has about 1800 residents (Webb et al, 2014). We are looking forward to see some experiment that PCT can be tried out in few small countries just around the corner, because a small country might be more appropriate to experimenting for PCT (Jagerset al., 2010).

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