An Empirical Study On Willingness To Pay In Taiwan

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Overview

In the policy of "nuclear-free homeland", Taiwan will phase out all nuclear generations by 2025 and correspondingly the share of renewable generation will be increased to 20%. However the cost of renewable is higher than traditional generation, and thus the electricity price will rise and the habits of electricity consumption will be changed. We used 41 5-point Likert-type items to evaluate the factors which will influence the habit of consumption from 1200 respondents in 2016. By factor analysis, we extracted 6 factors from these 41 items and deployed linear regression on these 6 factors to find out their relationship. The empirical study showed that the perception of renewable energy, risk of climate change, risk of nuclear energy and the understanding of energy issue will influence the concern of electricity expense. It was impressed that public trust in government had no effect on the habits of electricity consumption.

Methods

(1) Item analysis: summarize the characteristics of the questionnaires from 1200 respondents.

(2) Factor Analysis: Using factor analysis, we can identify extracted factors to explain most of the variance observed in a large number of variables.

  (i) Kaiser-Meyer-Olkin (KMO) statistic: The KMO value is a statistic that indicates the portion of variance in the variables that might be caused by the underlying factors.

  (ii) Barlett's test of Sphericity: We use Barlett's test of Sphericity to test the variables which are not related and suitable to the structure.

  (iii) Principal Components Analysis extraction method: The principal components analysis extraction method can form uncorrelated linear combinations of the observed variables.

  (iv) Varimax with Kaiser Normalization rotation method: We implement Vaimax rotation in the principal component analysis to reduce the dimensions.

(3) Linear Regression: We extract 6 factorrs by factor analysis and use the linear regression to find out the relationship of these six dimensions..

Results

The 6 factors we extract are: G1 "The perception of renewable energy", G2 "Perception of the risk of ecological environment", G3 "The risk of nuclear energy", G4 "The concern of electricity expense", G5 "Public trust to government" and G6 "Understanding of energy issues". We consider the G4 "The concern of electricity expense" as the explained variable and the rests as explanatory variable. Main results are as below:

(1) All the demographic characteristics, except the age below 29 years old (Y29) in the model are not significant or their effects are small. The negative significant coefficient of Y29 means the respondents who are younger than 29 years old are less conscious to save energy or not aware how much of the bill they pay.

(2) The factor G5 "Public trust to government" is not significant to the explained variable G4 "The concern of electricity expense". It seems the public do not trust the ability of government to take care the energy disaster issus.

Conclusions

We use web-based questionnaire to investigate “The concern of electricity expense”. By factor analysis, we get 6 dimensions from 41 items. The regression results show that the most important positive factors to influence people’s consumption behavior of knowing the expense of electricity and saving the energy are “the perception of renewable energy” which means the knowledge of renewable knowledge and “the perception of the risk of ecological environment” which implies people know the electricity generation will affect the environment. Regarding the demographic characteristics, only the age younger than 29 has negative effect on “the habits of electricity consumption” and other characteristics do not have any influence on it.

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