A Comparative Statistical Data Analysis of Energy-Saving Consciousness in the UK and Japan Using the Hybrid Approach to the Neural Network and Linear Regression

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Abstract In this research, relationship between people's consciousness of environment capabilities of energy-saving in the UK and Japan, is investigated by using same questionnaires. The statistical analysis of the comparison is derived by using a hybrid approach to neural network and linear regression.

1. Introduction.

The Chapter 1 is consisting of the comparison analysis between the UK and Japan's Energy-saving using the Act, Scheme, Subsidy, and Economics. The Chapter 2 is consisting of the Analysis of the questionnaires; Overview of the questionnaire, Statistical Analysis for answers in sections I, II, and III, Free question's (IV) answer, and Summary. The Chapter 3 is consisting of the Conclusion and Proposal. We showed the Questionnaire and its result of a Hybrid Approach to Neural Network and Linear Regression. We analyzed our data using the R-system nnet function and Excel.

2. The questionnaire contents and the UK's 67 questionnaires result using a Hybrid Approach to Neural Network and Linear Regression.

2.1 Questionnaire Contents. Our questionnaire consists of four parts; Personal data, Residence data, The Energy-saving and Actions, and Free questionnaire. It has the 79 ticks Yes/No of 22 answers. Now we have UK'67 answers and Japan's 169 answers.

2.2 Result and Conclusion. A Hybrid approach to Neural Network and Linear Regression was proposed by M. Asano, Tsubaki, and Yoshizawa, in 2002. The objective variable is the weighted mean of the energy-saving actions. The UK's 67 questionnaires results showed that the energy-saving consciousness which are obtained from Law, Education and Information, forces the Energy-saving Actions.

Table1. Result of the Hybrid approach to Neural Network and Linear Regression.

Regression Statistics						
Multiple R	0.7636					
R square	0.5832					
Adjusted R square	0.5173					
Standard Error	0.1675					
Observations	67					

AVONA	df	ss	Ms	F	Significance F
Regression	9	2.24	0.249	8.86	3.37E-08
Residual	57	1.60	0.028		
Total	66	3.84			

	Intercept	2'nd output value of the middle layer	Status in your residence	How many people live with you?	Age group	Have you heard 'Green Deal'?	Q1 Do yo know how to Energy-saving?	Q2 Have you heard of 'Pay-As-You-Save'?	Q3 Have you heard of the Energy-saving Label?	Q4 Do you know the worldwide mark or energy-saving?
Coefficients	0.132	0.417	0.080	0.068	0.172	-0.012	0.100	-0.054	0.067	0.010
Standard Error	0.049	0.078	0.025	0.028	0.026	0.028	0.023	0.028	0.032	0.028
t Stat	2.667	5.313	3.260	2.423	6.672	-0.413	4.436	-1.939	2.082	0.354

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(1) Asano, M., Tsubaki, H., Yoshizawa, T. (2002). Effectiveness of neural network to regression with structural changes. *Applied Statistic Models in Business and Industry*, *18*, 189 – 193.