Influencing Factors on Farmers' Participation Decision for New Technology Pilot Projects in South Korea: Focusing on Innovative Attitude of Farmers and Information Channels

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Introduction

- Technical innovations are one of important factors to cause the economic and productivity growth (Acosta et al., 2015; Kogan et al., 2017). In the agricultural sector, there is a delay of technology adoption even though technical innovations are beneficial to farmers, which is a question to many researchers (Liu, 2013).
- National Institute of Agricultural Science (NAS) of Rural Development Administration (RDA) in South Korea have developed new agricultural technology and aimed to distribute these technologies to farmers. To effectively disseminate new agricultural technologies, NAS is required to control a risk factor that is considered as a main hurdle to distribute new technologies in many previous studies such as Liu (2013), Mariano et al. (2012), and Pamuk et al. (2014). To control risk factors in new agricultural technologies, NAS operates pilot projects of new agricultural technologies for improving the productivity and income of farmers.
- NAS promotes farmers to participate pilot projects of new agricultural technologies by supporting 100% of operating costs from the central government (50%) and local governments (50%) as a form of matching funds.
- NAS in Korea find that there are difficulties in deriving good case studies from performing pilot projects for new agricultural technologies. One possible explanation is that adverse selection of selecting participants for new pilot projects. Due to 100% supports for new pilot projects, farmers tend to apply to pilot projects regardless of usefulness or farmers' characteristics.

Objectives

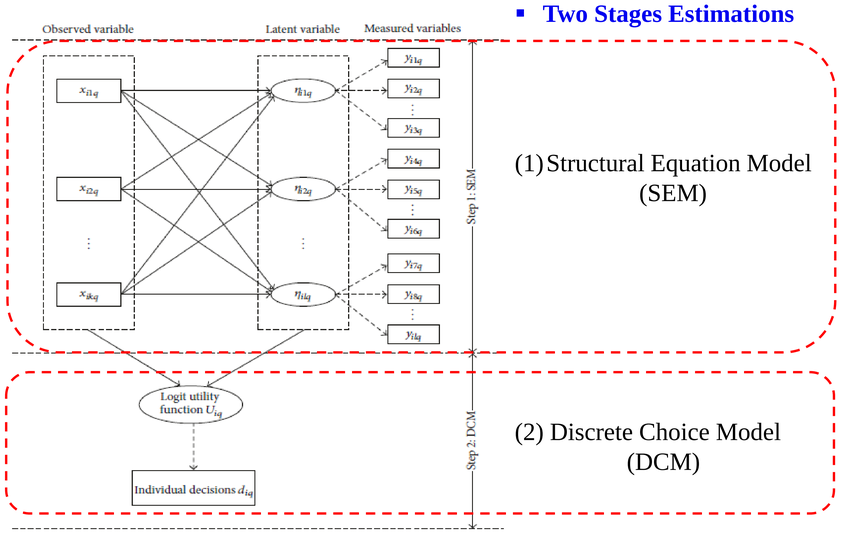
- This paper examines the adverse selection in determinants for farmers' participating on the pilot projects for new agricultural technologies in Korea based on the theory of reasoned action (TRA).
  - ✓ Investigating the effect of attributes from TRA on the pilot projects adoption intention of farmers.
  - ✓ Exploring the impact of attributes from TRA on the actual adoption choice of farmers.
  - ✓ By comparing the effect of attributes on intention and actual choice, we can check the existence of adverse selection in the new agricultural technology pilot project in Korea.
- This research introduces the hybrid choice model that is popular in transportation choices literature into the study area of technology adoption.

Survey Data (2017)

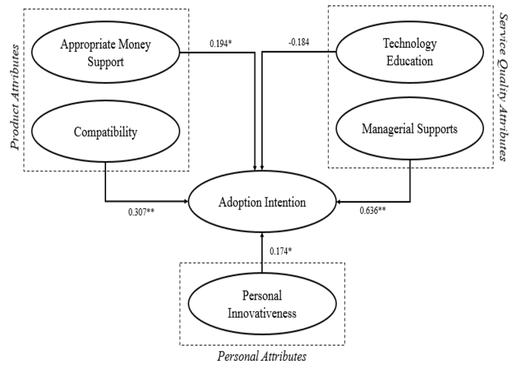
	Chlorella Projects	Coronal Heating Projects
Adopter	N=28	N=16
Non-Adopter	N=112	N=72
Total	N=140	N=88

Methodology (Hybrid Choice Model)

- **Two Stages Estimations**



Results (SEM)



- Our structural equation model results show that attributes based on TRA are positively associated with the adoption intention of new agricultural pilot project except for the construct of technology education..
- To be specific, we find that the managerial support that is one of service quality attributes is the most important factors for adoption intention among latent variables for product attributes, service quality attributes, and personal attributes.

Results (DCM)

	Coef.	Marginal Effect	Odd Ratio
Constant	-4.09*	-	0.02*
Age	0.03	0.01	1.04
Project (1: Coronal Heating Project, 0: Chlorella Project)	0.49	0.08	1.64
Farming Experience	-0.06**	-0.01**	0.94**
Gender (1: Male, 0: Female)	0.54	0.08	1.72
Household Size (count)	0.1	0.02	1.11
Farm Size (ha)	0	0	1
Return to the Farm and Rural in 5 years (1: Yes; 0: No)	-0.93	-0.14	0.39
Participation in Subsidy Programs in 5 years (1: Yes; 0: No)	0.94	0.14	2.55
High School Graduates (1: Yes; 0: No)	0.43	0.07	1.53
College Graduates (1: Yes; 0: No)	1.02	0.16	2.78
More than Graduates School (1: Yes; 0: No)	15.75	2.4	6910593
Farm Gross Income	0	0	1
Farming Education Participation (hours/year)	0	0	1
Personal Innovation	0.18	0.03	1.19
Technical Education	-0.59	-0.09	0.55
Managerial Supports	0.82	0.13	2.27
Appropriate Money Support	-0.22	-0.03	0.8
Compatibility	-0.11	-0.02	0.9
Loglikelihood		-78.36	

- The results of hybrid choice model present that all suggested attributes are not related to actual farmers' choice of agricultural technology pilot project. This hybrid choice model result is opposite to the result of structural equation model. This contradictory result implies that the participation intention of farmers and the actual participation of farmers for pilot projects do not move to the same direction according to attributes from TRA. Therefore, we can conclude that the adverse selection problem is exists in the choice of new agricultural technology pilot projects

Conclusions and Implications

- First, policy makers in Korea should focus on the managerial support rather than other attributes due to relatively high relationship with the adoption intention of pilot projects.
- Second, the government officers in NAS should develop the solution of adverse selection problem in new agricultural technology pilot projects

Further Information
Please contact jse229@korea.kr for more information.

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