Spatial Dimensions in Stated Preference Methods: Exploring Spatial Heterogeneity in People's Preferences

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Abstract

In environmental policy, it is crucial that the value of the environment be incorporated into policy-making processes. Two methods exist for quantitatively evaluating the value of the environment: the revealed preference method, which infers the value of the environment based on economic behavior, and the stated preference method, which directly evaluates the value of the environment through data expressed by individuals. This study aims to analyze the spatial heterogeneity of individuals' preferences for the environment via the expressed preference method. It is well-known that individuals' preferences for the environment are spatially heterogeneous, with certain preferences concentrated in specific regions. Understanding this spatial heterogeneity of preferences can contribute to developing efficient environmental policies. Historically, spatial heterogeneity of preferences has been analyzed through revealed preference methods. However, these methods are limited since they cannot evaluate the non-use value of the environment. Therefore, this study employs geographic information system (GIS) data in stated preference methods to analyze the spatial heterogeneity of individuals' preferences for the environment. In Chapter 1, the issues addressed in this thesis are presented, as well as an overview of prior studies on ecosystem services provided by the natural environment and the valuation of the environment. Three research questions are presented, and the relationship between the thesis structure and the research questions is outlined. In Chapter 2, an econometric model for assessing the value of the environment is presented. The stated preference method frequently employs choice experiments, in which individuals choose their most preferred option from multiple alternatives. This choice data is then analyzed using a discrete choice model. This chapter presents an overview of research results from discrete

choice models and examines methods for analyzing spatial effects in stated preference methods. In Chapter 3, spatial heterogeneity in consumer preferences for eco-labels is evaluated. A model is proposed to analyze the spatial heterogeneity of preferences by incorporating a spatial weighting matrix into the preference parameters of the utility function. Empirical data from a choice experiment on eco-labeled rice is used to demonstrate the existence of spatial heterogeneity in preferences for eco-labels, and the policy implications of this study are discussed. In Chapter 4, spatial heterogeneity in housing choice is analyzed. Individuals are assumed to consider the environment surrounding their residences when making housing location decisions. This chapter investigates the effects of distance to agricultural land, distance to satoyama, the richness of biodiversity, and rent on housing choice, demonstrating the existence of spatial heterogeneity in housing preferences. In Chapter 5, spatial heterogeneity in preferences for multiple landscapes is examined. By combining a choice experiment and GIS data for Ishikawa Prefecture, this chapter evaluates the impact of the proportion of agricultural land, forest, wasteland, and residential land on landscape value perceived by individuals. The results of the analysis using a mixed logit model indicate the existence of spatial heterogeneity in individual preference for landscapes and suggest the possibility of spatial sorting phenomena as a cause of spatial heterogeneity. In Chapter 6, spatial heterogeneity in preferences for future land use scenarios in Ishikawa Prefecture is analyzed. Four types of future land use scenarios are used, and the results indicate the existence of spatial heterogeneity in preferences for these scenarios. In particular, individuals in two sub-regions in Ishikawa Prefecture show heterogeneous preferences for future land use scenarios and tax payments. This result suggests the potential conflict in political decision-making processes. Finally, in Chapter 7, the conclusion of the thesis is presented, highlighting the policy implications of this study and suggesting avenues for future research.