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主 論 文 の 要 旨

論文題目 **Study on Option Price of Public Transport: Theory, Evaluation Method, and Case Study in Japan**
(公共交通のオプション価格に関する研究：日本における理論、評価方法、ケーススタディ)

氏 名 鄭 巽

論 文 内 容 の 要 旨

Population decline is a pressing issue facing Japan and other developed countries. Elderly's daily travel demand should be met in aging society. Both bus and taxi service are essential travel options for elderly people. Besides, they serve as backup systems when nature emergency happens. For the reasons above, there is a need to maintain bus and taxi service. On the other hand, on-road transport service in Japan is facing operation difficulty. The population decline along with the increase of vehicle ownership lead to the shrink of bus and taxi demand. Currently, over 70% of bus companies are surviving with the aid of subsidy. The subsidy expenditure is a burden for local government, and it is necessary to consider whether the subsidy is equitable. The contradiction is lying between the desire for maintaining on-road public transport service and the difficulty to continue the service. For this reason, there is a need to estimate the value of public transport service.

This study aimed to contribute in the following three main perspectives: 1) study on features, demand and performances on maintaining willingness issue for Japanese on-road public transport service. 2) Evaluate the value of Japanese on-road public transport service. 3) Discuss the result of the estimation.

In the first section, this study aims to grasp the current situation of Japanese on-road transport service. In previous studies, most of the researches on transportation value are focusing on

railway service. For bus and taxi service, only few study could be found. According to the study, aging situation, declination of driver, deregulation of abolition policy, trend of owning private vehicle, are potential reasons lead to the operation difficulty of public on-road transport. From a policy point of view, the author understood the importance to evaluate the public transport as a support material to decide whether the company should continue the service or not. Moreover, combining a new transportation mode with ride-sharing and implementing new operation system such as auto-taxi service, value comparison can be made through different travel modes. The study should discuss the possible approach to evaluate non-market goods, and attempt to design a method to evaluate low-demand public transport.

For the second purpose, the study should estimate the probable value of four target modes (bus, taxi, ride-sharing, and auto-taxi). In many cases, researchers use choice model to estimate the utility of travel mode. By comparing the situation that choice options include and not include the target travel mode, the utility of the target model could be estimated. From the utility function, the value of target model could be obtained. In this study, four target modes are low-demand travel modes. It is difficult to applied mode choice model to estimate the utility of them. For this reason, the study aims at finding an estimation approach available for low-demand mode. In this case, the study uses a counting model to derive use probability. With this use probability, the utility of target mode could be estimated directly. For the estimation, the study compares three model structures. The three model structures are random valuation method (RVM) model, random utility maximization (RUM) model, and RUM (with a regret component). In this study, the features of three model structures should be compared. From the estimation test results, the criterion for comparing model fitness to data should be decided. And the fittest model structure should be used to estimate OP for four modes.

Finally, the estimation discussion should be referable for policy decision. The discussion on model structures should focus on structure features and applicability. The estimation results should find out area travel features and influential characters to target modes. The calculation results of OP should indicate the value of target modes. And the discussion on OP results should be referable for deciding the maintenance issue of the target modes.