Promoting the wiser use of paratransit systems and re-designing the currently ill-functioned public transportation systems to achieve the sustainable transportation system in developing cities, this research focuses on the comprehensive analysis of paratransit systems from both demand and supply sides. It involves several sub-issues as follows.

Chapter 1 describes the background, motivations, objectives, methodologies and contributions.

Chapter 2 gives a literature review of existing studies relating this research. First, missing data issues are examined in terms of missing mechanism, imputation methods and application of imputation methods in the transportation field. And then paratransit in developing countries nowadays is examined mainly with respect to behavior analysis, regulation and incorporation in formal transportation systems and the cause-effect relationship among perception on service quality, loyalty and future existence. Finally, the concept of quality of life mainly is examined in the transportation field.

Chapter 3 attempts to present the current usage of paratransit in developing cities. First of all, the missing data problem is identified across 14 developing cities, which shows the current profile of item nonresponse problem in the context of developing countries. Secondly, the significant differences of model choice models between with imputation and without imputation based on person trip data collected in three representative developing cities are identified, which reveals that the serious bias in the model estimation without imputation. Thirdly, the exhaustive chi-squared automatic interaction detection method is applied to systematically distinguish the differences of users and non-users of paratransit and the influencing factors of travel pattern in
three developing cities representing various shares and diversity of paratransit, where the missing values are corrected by EM imputation. The results discover different influencing factors to the usage of paratransit in different cities, while travel patterns among cities are found to share common influential factors.

Chapter 4 explores paratransit drivers’ stated job choice behavior. The stated preference survey under different competitive situations is designed to capture such behavior in Jabodetabek metropolitan area (JMA), Indonesia. The cross-tabulation analysis is conducted to roughly describe the relationship between various policy interventions and job choice. Dogit model is further adopted to precisely examine the significant factors on job choice. The results confirm that new ojek driver job is the captive job for three types of paratransit drivers. Policy factors in terms of social and environmental aspects are also identified.

Chapter 5 focuses on how to wisely use various types of paratransit vehicles. A stated preference survey about examining the impact of the availability of paratransit as access/egress/main mode and the influence of availability of private car is also conducted in JMA, Indonesia. Dogit model incorporating the influences of availability is established to capture paratransit users’ mode choice behavior. The results reveal paratransit with small size have no or obviously negatively impact on the usage of main modes, however, paratransit with big size promotes the usage of main mode bus. Further train, angkot, bus, BRT, MRT and car are identified as captive modes with different magnitudes of captivity.

Chapter 6 deals with the issue of quality of life in the paratransit drivers. The multiple imputation is applied to correct the data bias, while overcoming the uncertainty of imputation introduced by comparing the single imputation. The structural equation model is also used to generally clarify the cause-effect relationships among personal characteristics, job choice reasons, paratransit business and their quality of life in four typical types of paratransit drivers in JMA, Indonesia, respectively. The results show the different characteristics of such cause-effect relationships.

Chapter 7 intends to identify the important influential factors on quality of life from the perspective of paratransit users. The structure equation model is adopted to especially examine the complex cause-effect relationship among perception on service quality of paratransit, happiness during travel and life satisfaction. The results confirm the assumed relationship among the three latent variables. Moreover, different impacts of various latent variables on life satisfaction are identified, which contributes to policies making towards the consistent improved quality of life for paratransit users.

Chapter 8 summarizes the research findings and also discusses future research issues.

備考 論文の要旨はA4判用紙を使用し，4,000字以内とする。ただし，英文の場合は1,500語以内とする。
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