

The Influence of Toll Road Construction on Residential Location Decision: A Case Study in Indonesia

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Extended Abstract

Introduction

The construction of major road infrastructure (e.g. motorway) has been long indicated to stimulate land use changes, not only along the corridor of the road but also spill over to the areas nearby. Several studies have been investigated the effect of the construction of a major road on land use development and found the evidence of urban growth along the corridor of the motorway or on the proximity to the motorway exit.

However, not many studies focused on the intermediate process before the urban growth or land use development have taken place. Residential relocation decision is a critical component of land use dynamics. Models of land use dynamics need to consider residential location decision of households to be able to forecast future population demographics and land use patterns.

This study provides a better understanding of how major infrastructure, such a toll road, stimulates land use development by investigating the influence of toll road construction on residential location choice.

Studies on residential relocation and travel behaviour due to the toll road or motorway construction in the context of developing countries are limited in the literature. Although, several studies have found significant deviations from developed countries. Therefore, in this study, a case of Cipularang toll road in Indonesia will be investigated. As it is connecting one of two most prominent cities there, Jakarta and Bandung. A joint stated choice and revealed preference experiment is distributed to 1,623 respondents, in the corridor of the toll road and areas which experienced highest residential development in the past 13 years (from 2005, the year when the toll road is publicly opened).

Methods

In the survey, we collected data about socio-economic, dwelling, as well as people satisfaction towards their current houses. Six (6) choice cards were presented to the respondents. In each choice card, the respondent was asked to choose between hypothetical house A or house B, in which each alternative has different attributes, in terms of land tax or rent, travel cost and time to work, as well as proximity to toll road gates. We also included the current house as the third alternatives, in which each attribute is assumed as the existing condition and will be fixed in the estimation. Except for

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proximity to the toll road gates, each attribute is pivoted to four levels (-75%, -25%, +25%, +75%). Proximity to the toll road gates is differentiated to less than 2 km, 2-5 km, 5 -10 km and more than 10 km.

The mixed logit model is used to investigate the residential location choice, incorporated not only alternatives' attributes, but also socio-demographic, housing characteristic, neighbourhood characteristics and travel-related variables. In addition to that, the hybrid choice model is also estimated to represent observed and unobserved (latent) factors simultaneously, including satisfaction with the accessibility and satisfaction with the housing size and neighbourhood comfortability.

Unobserved factors are constructed from several psychometric indicators selected from a factor analysis. The indicators are based on Likert questions in the survey which asked the respondents to give their level of satisfaction to specific characteristics of their current housing and neighbourhood.

Results and Discussions

Our preliminary results show that both observable and latent variables are essential in the decision to relocate and to choose a residential location. Variations in the latent variables significantly improved the model fit. Most of the observable factors are remain relevant after the addition of the unobserved factors. Both latent variables also significantly affect the decision of residential location. Dissatisfaction with accessibility level and size or comfortability of the current housing and neighbourhood influenced people to relocate.

Based on the estimated value of the attributes in the stated choice experiment, we find that the respondents valued travel time negatively, but not with travel cost and rent. It can be interpreted that people are willing to pay higher rent and travel cost, as long as they can reach their destinations faster. We also find that the respondents who live within close vicinity to the toll road gates will likely to retain their residency. Several socio-demographic variables are also estimated to significantly influence the decision to relocate, such as income, gender and number of household member.

The findings from this research explain the urban development which tends to occur along or close to the corridor of major road infrastructure. The research provides not only empirical evidence and reflections on the case of Indonesia, but also provides conceptual and methodological insights that are relevant for other cases in developing countries.

Keywords: residential location choice, hybrid choice model, stated choice