Paratransit users' willingness to pay for reducing negative effects of paratransit in a developing city

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It is crucial to reduce negative effects of paratransit such as traffic congestion, air pollution and so on in developing countries. As a demand part, paratransit users' willingness to pay (WTP) to reduce such negative effects is one of the keys. The purpose of this study is to examine influencing factors on WTP using structural equation model (SEM). One questionnaire survey with 702 respondents was conducted to measure WTP, which as extra fare was asked for a single trip by using a paratransit vehicle, in Jabodetabek metropolitan area, Indonesia, in February, 2010. The influencing factors include personal characteristics, current paratransit usages, service quality perception and users' quality of life. To authors' best knowledge, it is the first study to clarify the cause-effect structure between WTP about paratransit and the influencing factors based on the SEM analysis, which could contribute to better understanding of infrastructure planning in developing countries.

Key Words : willingness to pay, structural equation model, paratransit, service quality, life satisfactioin

Aiming to consistently bring all the positive points of paratransit into play and promote the wise usage of paratransit in developing countries in future, it is quite necessary and crucial to reduce the negative effects of paratransit such as causing traffic congestion, traffic accidents, environmental pollution and so on. As a demand part, paratransit users' desire to reduce such negative effects is one of the keys to realize sustainable paratransit. The purpose of this study focuses on examining the desire, and further identifying and evaluating the potential influencing factors. Therefore this study designs and implements a questionnaire survey that measures the desire of reducing the negative effect of paratransit in the form of willingness to pay (WTP), and then applies a structural equation model (SEM) to examine the complex cause-effect relationship among WTP and the relevantly potential influencing factors.

WTP as extra fare is asked for a single trip of 4000 Indonesian rupiah (Rp) by using a paratransit vehicle regardless of four representative vehicle types that are becak (manpower-bicycle with three wheels), ojek (motorcycle taxi), bajaj (auto-rickshaw) and angkot (mini-bus). The equal scales from 0 Rp, 50 Rp to more than 200 Rp taken as six options of WTP are offered for paratransit users' to choose. The relevantly potential influencing factors includes the usage of four types of paratransit, i.e., usage frequencies of each type of paratransit and the corresponding functions as access, egress and/or main mode, individual characteristics such as age, gender, occupation, education level, perception on service quality (SQ) of each type of paratransit and paratransit users' quality of life (QOL). Specifically, SQ consists of travel fare, travel time, punctuality, convenience, traffic safety, security (criminal),
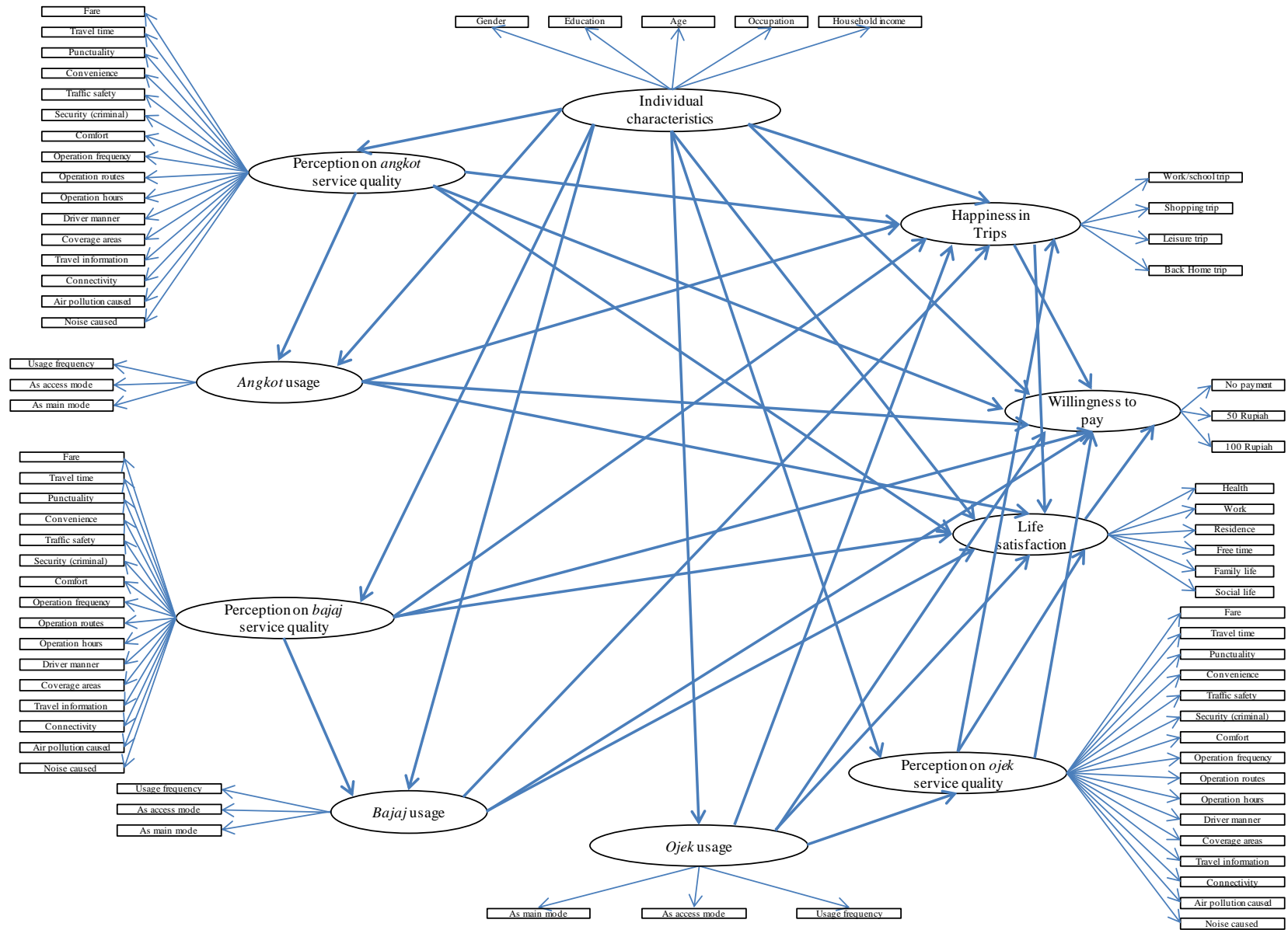
Fig.1 The cause-effect relationship among WTP and influencing factors

comfort, operation frequency, operation routes, operation hours, driver manner, coverage areas, travel information connectivity to other travel modes, air pollution caused and noise caused. QOL is measured with respect to life satisfaction about different life domains including health, work, residence, free time, family life and social life, and happiness perceived from participation in daily activities in the respect of work, school, shopping, recreation & leisure, and back to home activities. A questionnaire survey was conducted to users of four representative paratransit services in Jabodetabek metropolitan area, Indonesia, in the February of 2010. As a result, 702 respondents were collected in the survey.

To the authors' best knowledge, it is the first study to focus on WTP to reduce the negative effects of paratransit. The cause-effect structure among WTP and the above-mentioned influencing factors are clarified based on the SEM analysis, which is depicted in Figure 1 and contributes to the promotion of sound usage of paratransit in future.

Because the estimation is still being adjusted, the final result will be presented in Spring Conference and is not shown currently.