

**Title** : The Effect of Mass Rapid Rail Transit on Residential Location Pattern in Bangkok  
**Name** : Panda Ketraungroch  
**Faculty** : Economics  
**Advisor** : Prof. Dr. Praipol Koomsup  
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## **ABSTRACT**

This study investigates how residential location patterns among different income households in Bangkok changes as a consequence of transport innovation. Using comparative static approach, the model employs two data sets collected by the Socio Economic Survey (SES) in 1998 and 2004 for the pre- and post-rapid rail transit system respectively.

The study follows the theoretical framework of LeRoy and Sonstelie (1983) which extended the Alonso's model to analyse the influence of two competing modes on the change in residential location pattern. Provided that an individual chooses residential location and commuting mode simultaneously, the estimation is based on the multinomial logit approach in reverse which is developed on Ellickson's technique to determine bid-rent function underlying residential location equilibrium. This analysis permits us to observe the change in residential location patterns without strictly assuming that the income elasticity of housing demand must be greater than that of marginal commuting costs.

The empirical results show that residential location patterns chosen by households who face two competing alternative choices among transit, bus and automobile in 1998 and 2004 are similar. That is, automobile, as an alternative to the bus transit, allows the higher income groups to enjoy time cost saving advantages and encourages them to locate in a more distant area.

When comparing different competing transit choices in 2004; namely buses versus automobiles as case 1 and buses versus rapid rail transit as case 2, it can be observed that if the alternative transport mode is rapid rail transit, households whose

monthly income is 5,000-15,000 Baht are more likely to enjoy time cost saving, which in turn will locate themselves on a more distant area. Yet, households whose monthly income is greater than 15,000 Baht can enjoy time cost saving advantages and tend to locate on farther area regardless of the alternative transit. These findings imply that as lower monetary cost and faster speed of rapid rail transit relative to automobile transit, households whose monthly income is 5,000 to 15,000 Baht, who initially commuted by bus are more likely to switch to rapid rail transit and tend to change their residential location toward a more distant area.

The comparison of other competing transit choices in 2004; namely buses versus rapid rail transit as case 2 and automobiles versus rapid rail transit as case 3 reveals that households whose monthly income is greater than 15,000 Baht are more likely to enjoy significant advantages on more distant areas if and only if rapid transit competes with the initial bus transit. However rapid rail transit seems to give distinct advantages only for households whose monthly income is 5,000- 15,000 Baht in more distant areas if rapid rail transit competes with automobile which yields higher commuting costs.

It can be noticed that high time cost saving given by rapid rail transit instead bus transit makes it possible to induce an individual to switch from buses to rapid rail. Therefore, rapid rail transit affect on high income groups significantly when compared rapid rail transit to bus transit. While just a little time cost saving of rapid rail transit relative to automobile, it might not persuade mode switching of the high income groups who commuted by automobile and insignificantly influence their residential location changes.

However, empirical evidences yield insignificant differences in bid-rent gradients when comparing rapid rail transit to other modes. This may be explained by non-ubiquitous of rapid rail network in Bangkok that does not equally allow all income groups to switch to rapid rail transit. The findings of negative significant constant terms also poses the possibility that other variables which may influence differences in bid-rent gradient of the higher income group relative to the reference group are omitted, such as age, education level, family size, family composition, and life style. Factors may be in further to come.