



The effects of housing preference for an apartment on residential location choice in Seoul: A random bidding land use simulation approach

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ABSTRACT

This study evaluates the impact of medium- and high-income households' preference for apartments on residential location choice by constructing a random utility-based land use simulation model of the Seoul metropolitan area. The simulation results imply that apartment preference of medium- and high-income groups would have contributed to providing more apartment units (about 14.2% of total apartment units supplied), more housing units in the suburbs (61,000 more housing units in the suburbs), and higher apartment rent premiums in wealthy communities than the assumed housing market under the counterfactual scenario in terms of housing type, location, and rents.

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Introduction

Housing choice is a serious matter for households because it affects family finances as well as quality of life. Buying or renting a house involves not only spending a large proportion of family income, but also choices of neighborhood, location, and environmental characteristics affecting the household's living conditions and quality of life. Therefore, housing choice has been an important research topic in urban economics and planning for a long time. One economic theory suggests that a household chooses a dwelling with the best combination of features that maximize the household's utility, subject to its budget constraints, weighing housing cost against transportation cost (Alonso, 1964). On the other hand, some argue that households choose housing locations based on quality and the cost of public services such as health, education, and local taxes, through a 'vote with their feet' (Tiebout, 1956; Friedman, 1981; Reshovsky, 1979).

Among the wide range of factors that come into play in the choice of housing location, there are several critical factors: (1) household characteristics, such as household income and size, ethnicity, age, etc.; (2) housing characteristics, including housing type, tenure, housing price and cost; and (3) location characteristics, such as accessibility, public services and local taxes, pollution and amenities, and neighborhood factors (Montgomery and Curtis, 2006).

Recently, preference for housing type has been a key issue in the debate surrounding the implementation of smart growth strategies (Litman, 2009; Myers and Gearin, 2001). Critics claim that Americans' preference for single-family homes is so strong that smart growth strategies supporting higher residential density cannot be implemented successfully, as they would impose significant costs on consumer housing by reducing the supply of single-family houses (Cox, 2001; Gordon and Richardson, 1997; Pisarski, 2009; Downs, 2005).

On the other hand, smart growth proponents argue that household preference for large suburban single-family houses is declining, as demographic and economic factors in the housing market—including the aging population, smaller households, rising fuel prices, etc.—are changing (Hughes and Seneca, 2004; Leinberger, 2008; Litman, 2005; Myers and Ryu, 2008; Myers and Gearin, 2001; Reconnecting America, 2004; Pitkin and Myers, 2008; Thomas, 2010; ULI, 2009). Litman (2009) concludes, after reviewing various market surveys on consumer housing preferences in the U.S., that multi-family dwellings such as apartments and condominiums are becoming more attractive when they offer accessibility and amenity advantages.

Given the important role of household preference in dwelling type in determining housing location, this study aims to investigate the effects of household preference for particular dwelling types, specifically apartments, on housing locations in the Seoul metropolitan area (hereafter SMA). In doing so, we first analyze household preference in dwelling type by income group in the SMA by estimating the household utility functions for housing location choices, using a multinomial logit model. Second, using bid-rent

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theory, we empirically construct a random utility-based urban land-use simulation model called the Seoul Residential Location Model (SRLM), which represents the housing market with endogenous prices and a market clearing mechanism.

Third, we analyze the effects of dwelling preference on housing location choice by comparing two different scenarios: (1) the baseline scenario taking into account the difference in housing preference by income group and (2) a hypothetical scenario in which there is no difference in housing preference among income groups. This counterfactual approach makes it possible to subtract the singular effects of housing preference on residential location choice from the current residential location pattern, while controlling for other factors that influence residential location choice.

This paper is divided into four sections. The first describes the literature review and how this research is distinct from other existing studies. The second presents the theoretical structure of the SRLM and the procedures used in the empirical model construction and parameter calibration. The third section estimates the effects of consumer housing preference as related to apartments on the housing market, in terms of housing units supplied and monthly rent by housing type. The fourth suggests interpretations and qualifications of the analysis results associated with the past and current housing market conditions of the SMA. We end with our conclusions and a discussion of policy implications arising from the present analysis.

Literature review

There is a large volume of research on the determinants of housing location choice. This review, however, highlights areas where the existing research most closely relates to this study, rather than being a comprehensive review of residential location choice. This narrows the scope of the review to two main bodies of literature: the relationship between housing preference and residential location choice, and urban residential location choice models.

Review of housing preference and residential location

A wide range of research has discussed various factors influencing housing location choices, such as school quality (Bayoh et al., 2006; Kim et al., 2005; Morrow-Jones et al., 2004; Vogt and Marans, 2004); racial and ethnic factors (Zavadny, 1999; Dunlevy, 1991; Bartel, 1989; Buckley, 1996; Guo and Bhat, 2007); density and land-use patterns (Myers and Gearin, 2001; Morrow-Jones et al., 2004); and proximity to recreational and natural sites (Colwell et al., 2002; Kaplan and Austin, 2004; Vogt and Marans, 2004). Recently, Montgomery and Curtis (2006) reviewed approximately 30 journal articles that were published after 2001 regarding housing mobility and location choice, classifying the variables influencing housing choices into four groups: (1) demographic factors such as income, age, and household size; (2) social factors, including school quality, ethnicity, and crime; (3) location and neighborhood factors, such as accessibility, density and amenity, local service quality and taxes; and (4) housing cost and affordability.

There has been extensive research on the role of household preference and lifestyle in housing location choice (Walker and Li, 2007; Lee et al., 2008; O'Sullivan, 2009). For instance, a high-income household is more likely than a low-income household to choose large, high-quality housing, simply because the high-income household has a larger housing budget. At the same time, even though two households may have the same income and housing budget, their dwelling choices may not be alike, due to difference in their preferences for dwelling type (O'Sullivan, 2009). The conventional wisdom about typical housing preference in the U.S. includes the following five criteria: "suburban location and design; single-family detached unit style; location within a

low-density neighborhood; ease of automobile use; and lowest cost" (Myers and Gearin, 2001, pp. 635–636).

Walker and Li (2007) explored the impact of lifestyle on residential location decisions and found that lifestyle played a key role in residential location choice, although there was an interesting mix of preferences for both suburban and urban neighborhood characteristics.

The reasons for household location choice have been examined by asking people's housing preference (Ahluwalia, 1999; Malizia and Exline, 2000; Myers and Gearin, 2001; Litman, 2009; National Association of Realtors, 2000). For example, Myers and Gearin (2001) reviewed various surveys on housing and neighborhood preferences, with results showing an increasing demand for denser, more walkable residential environments in the U.S. A substantial share of respondents, 24–31%, preferred the townhouse or the condominium as alternatives to the residential style of the single-family home. Lee et al. (2008) examined location preferences of multi-family housing residents and found that combinations of demographic and lifestyle characteristics best explained location preferences—in particular, preferences for specific parking, security, and exercise features. Larco (2010) analyzed the demographic composition and transportation behavior of suburban residents living in multi-family housing in the U.S. and found that "suburban multifamily housing contributes to smart-growth goals as it places density near commercial areas and houses a population that makes a significant percentage of non-auto-oriented trips" (p. 69).

In sum, the relevant literature shows that the housing preference for large, suburban, single-family housing has been dominant in North American cities, with multi-family dwellings gaining popularity due to changes in demographic factors, such as the aging population and smaller households, as long as they offer accessibility and amenity advantages.

Review of urban residential location models

Understanding the determinants of housing location choice by surveying homebuyers and/or by using statistical models, such as regression analysis, is not sufficient to evaluate and forecast the effects of change in a specific factor influencing housing location choice. Such understanding requires the development of computer-based simulation models in order to conduct 'what-if' simulations. However, it is not easy to construct a comprehensive residential location-choice model, since urban subsystems¹ are highly interdependent and complex.

Residential location modeling has long been a major concern in the field of urban economics and planning. Three key elements of residential location modeling include housing, where people live, and how they choose their location (Pagliara and Wilson, 2010). Although theories behind the current state-of-the-art residential location models have a long history,² reaching back to Von Thunen's agricultural land-use model in 1826, contemporary residential location modeling originates from Alonso (1964), who laid the foundation for an economic analysis by applying Von Thunen's bid-rent theory to a residential location choice model (Pagliara and Wilson, 2010).

¹ Wegener (2004) classified urban subsystems into eight components according to the speed of change: very slow change (networks, land use); slow change (workplaces, housing); fast change (employment, population); immediate change (goods transport, travel).

² Timmermans (2003) suggested three development phases of integrated urban models: (1) aggregate spatial interaction-based models such as the Lowry–Garin model and ITLUP (Putman, 1991); (2) utility-maximizing multinomial logit-based models including MEPLAN, TRANUS, UrbanSim, and MUSSA; and (3) activity-based, micro-simulation models such as ILUTE and Cellular Automata.

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