

Changes in a Preference on Housing Tenure and Demographic Transitions: A Case Study of Chungnam Province

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Abstract

This study analyzes drastic changes in owner-occupancy due to the financial crisis in 2008 in the Chungnam housing market. The significant decline of the housing owner-occupancy rate in Chungnam in the late 2000s is affected by the changes in the preference for housing owner-occupancy or conditions of housing markets rather than a demographic transition, which is different from the phenomena in the first half of the 2000s irrelevant to the financial crisis. About 2/3 of the change in owner-occupancy in the late 2000s could be explained by the change in preferences. Under the assumption that owner-occupancy contributes to residential stability, in order to strengthen it, along with the long-term demographic transition such as increase in single-person households, rise of the female head rate, and low fertility/aging, the short-term preference or changes in housing market conditions should be considered in housing-related policy development.

Key-words ▪ Owner-occupancy, Preference, Demographic transition

I. Introduction

Recently, Korean housing markets are sustained in the overall recession such as shrinking of housing sales and shift of demand for purchase into demand for lease, which causes non-homeowners' burden of high leasing prices and transaction costs accompanied with frequent moving, for example, moving expenses, brokerage commissions, costs of interior repair, costs for changing an address, and so on. The recession in housing markets delays the recovery of private consumption and makes a

harmful influence on the stabilization of the financial market, and ultimately acts as a risk factor to the overall macro-economy. Therefore, policy efforts for the improvement of the owner-occupancy rate to enhance residential stability of the working-class people are required with revitalization of housing markets.¹⁾

The Korean housing owner-occupancy rates are as follows: 71.7% in 1970, 58.6% in 1980, 49.9% in 1990, 53.3% in 1995, 54.2% in 2000, 55.6% in 2005, and 54.2% in 2010 (National Bureau of Statistics, e-Nara Index). The reason

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that the rate steadily decreased until 1990 and slightly increased to 53.3% in 1995 is the improvement of conditions for housing owner-occupancy by the policy like the 2 million-house-building plan. On the other hand, the owner-occupancy rate of developed countries is static at the 60% level. Examining figures of some countries, it is 71% in United Kingdom (2007), 66.4% in United States (the first quarter of 2011), 61.2% in Japan (2008), and 54.1% in France (2004).²⁾

In order to regain vitality in domestic housing markets that are stagnant in the aftermath of collapse of U.S. housing prices (18%) in 2008, recently the Korean government implemented a policy of a permanent real estate acquisition tax cut followed by the temporary one. It is expected that the policy is helpful in increasing the owner-occupancy rate distinctly. However, these policies entail undesirable results by causing deterioration of the central government or local governments' revenue. These government policies should be developed considering demographic transitions as well as the changes in the preference for housing owner-occupancy or those in the housing market conditions. By investigating which factor most significantly affects the decision on housing tenure among the changes, the right direction for establishing relevant policies, namely budget-efficient policy, can be suggested.

This study empirically analyzes whether the change in the homeownership rate was caused either by demographic transitions or by the

change in the preference for housing owner-occupancy using national census data collected over several years for housing in the Chungnam province. Lately, in the type of Korean household, the proportion of two-generation households or single-person households is on the rapid rise moving from the extended families, which impacts the demand for housing. On the other hand, the preference for housing changes over time, and development of housing finance-related institutions or policies and changes in macroeconomic environments also affect the demand for owner-occupied houses. In most previous studies, determinants on housing tenure are estimated at a certain time point or over multiple time points within a certain period, while in this study the changes in the homeownership rate for a certain period are analyzed by being distinguished into those by the change in the preference for housing owner-occupancy and those by demographic transition. In this aspect, this study is differentiated from other studies (for example, Park, 2013 among others). Especially, studies that analyzed changes of owner-occupancy in Korean housing markets in the period of the late 2000s in which the global financial crisis induced by the 2007 U.S. subprime mortgage crisis are quite limited.

Korea is implementing various policies related to housing not only at the central government level but also at the local government level, and the effectiveness of these housing policies can be improved based on information about

local housing markets and a more accurate prediction of future changes. Therefore, prediction results on the changes in Chungnam housing demands suggested by this study and application of these methods to other regions will take a considerably important action in the relevant policy development process. In particular, by classifying changes in housing demand into the change due to the demographic transition and due to the change in the preference for housing owner-occupancy, the prediction on their future will enable a more accurate prediction on future housing demand and provide useful information in establishing housing policies.

The rest of the paper is organized as follows: Section 2 explains theoretical backgrounds on homeownership decision and quantitative methods required for analyzing housing demand, and suggests the regression equation for the housing tenure choice. Section 3 describes data and variables utilized in the empirical analyses. Section 4 discusses empirical results and the robustness. Section 5 summarizes the empirical findings of this study, and suggests policy implications.

II. Theoretical Backgrounds and Analytic Method

Many theoretical reviews and empirical analyses have been performed on the decision-making for housing owner-occupancy or ownership. First, Henderson and Ioannides

(1983) recognizes housing as not only investment goods contributing to the asset-portfolio of the household but also consumer goods providing residential services. They claim that when investment demand for housing exceeds consumption demand, the possibility of ownership increases while in the opposite case renting is more desirable.

On the other hand, decision-making on housing owner-occupancy is also affected by the user cost of owner-occupied housing. Additionally, the user cost is a function of depreciation, maintenance, property taxes, expected capital gains, interest rates, marginal income tax rates (Laidler, 1969; Aaron, 1970; Rosen, 1979), as well as real estate brokerage commissions and legal expenses accompanied by housing ownership (Rosenthal, 1988).

Gabriel and Rosenthal (2005) analyzes changes of owner-occupancy in United States across the period of 1983 to 2001. Their results show that the owner-occupancy rate increases considerably in the 1990s, but the gap between whites and minorities still remains significantly. In addition, they show that the most increases in the owner-occupancy rate are explained by household characteristics, and 2/3 of the gaps between whites and minorities in the owner-occupancy rate are caused by differences in the household attributes.³⁾

In this study, determinants of owner-occupancy are estimated using following regression equation.

$$own_j = \beta_0 + Z_j\gamma + \sum_h \kappa_h area_j + \epsilon_j$$

Here, the dependent variable, own_j is a binary variable representing whether the house of household j is owner-occupied or not. Z_j is a matrix containing variables such as characteristics of household heads, households, and residence. The characteristics of household heads include gender, age, educational attainments, and marital status, while characteristics of households include a dummy variable indicating single-person household and an interaction term between a dummy variable indicating a multi-person household and its household size measured by the number of household members. Characteristics of residence include types of residence: detached house, apartment, and the remaining categories (for example, townhouse, multiplex house, etc.) and number of rooms. $area_j$ is a dummy variable representing the city or county that the house is located in. ϵ_j is the usual error term.

The decomposition method suggested by Blinder (1973, 1976) and Oaxaca (1973) is utilized to decompose shifts of owner-occupancy rates over a certain period based on results of the housing owner-occupancy probability estimation by year into those induced by demographic transition and those by the change in the preference for housing owner-occupancy or conditions of the housing markets.

$$\begin{aligned} \overline{F(X_1\beta_1)} - \overline{F(X_0\beta_0)} &= [\overline{F(X_1\beta_1)} - \overline{F(X_0\beta_1)}] \\ &+ [\overline{F(X_0\beta_1)} - \overline{F(X_0\beta_0)}] \end{aligned}$$

Here, $\overline{F(\bullet)}$ is a mean of individual household estimates for the probability of housing owner-occupancy.⁴⁾ X_t denotes a matrix of characteristics of household head, household, and residence at time t . β_t indicates a vector of the coefficients obtained from the regression of housing tenure choice at time t .

III. Data and Variables

1) Data

Our data for the analysis on the Chungnam province are drawn upon for the years 2000, 2005, and 2010 from Population and Housing Census.⁵⁾ Looking at the distribution of households by years included in the analysis, in terms of the type of housing tenure, the owner-occupancy rate changed from 70.4% in 2000 to 75.6% in 2005 and 65.2% in 2010. Especially, the decline in the owner-occupancy rate in 2010 appears to be offset by the increase in the proportion of the monthly rental (see Table A1a in the appendix).

Among changes in the household distribution by number of household members, the most remarkable feature is the increase in single-person households. The proportion of single-person household was only 17.1% and 17.9% in 2000 and 2005 respectively, but it

Table 1. Summary Statistics

Variable	Year	Mean	Std. Dev.	Max.
Age	2000	49.78	15.27	102
	2005	52.55	15.10	103
	2010	51.57	16.33	106
Schooling years	2000	9.01	4.81	23
	2005	9.56	4.86	23
	2010	10.39	4.69	23
Household size (only for households w/ at least two persons)	2000	3.42	1.26	16
	2005	3.24	1.19	14
	2010	3.12	1.13	16

increased to 27.2% in 2010. On the other hand, the proportion of more than four-person households shows a decrease lately, which is induced by the change in the family composition accompanying with the recent trend of low fertility (see Table A1b in the appendix).

In the distribution of household heads by marital status, the proportion of household heads who have a spouse showed a decrease to 67.4% in 2010, which is a 7.8%p decrease compared to the proportion in 2005, while the proportion of unmarried household heads increased more than twice from 5.6% in 2005 to 12.6% in 2010. These results are consistent with the rising trend of the proportion of single-person households. Additionally, it can be seen that the divorce rate somewhat increases as time goes on (see Table A1c in the appendix).

Examining the distribution of households by type of residence, the proportion of apartments increased consistently during the analysis period while that of detached houses decreased (see Table A1d in the appendix).

Among household heads, the proportion of

females slightly increased from 18.4% in 2000 to 19.6% in 2005 and subsequently rose sharply up to 24.8% in 2010, which shows that there was a considerable change in the gender distribution of household heads. It is thought that the result was affected by the increase in single-person households with the increase in unmarried or divorced household heads (see Table A1e in the appendix).

In terms of the household heads' schooling years, the proportion of more than high school graduation (12 years) increases from 17.3% in 2000 to 21.1% in 2005 and continues to rise up to 27.9% in 2010 (see Table A1f in the appendix).

2) Variables

The explanatory variables contained in the regression equation to analyze the determinants of housing owner-occupancy include household heads' socio-demographics, attributes of households, and characteristics of residence. Additionally in order to control for the difference in conditions of the housing markets among regions, dummy variables for each and every city or county where the house in

question locates are included in the regression equation.

Household heads' socio-demographics include gender, age, educational attainments, and marital status. Recently, the proportion of male heads is decreasing while the average age is about 50 or so. The educational attainments measured in years of schooling were slightly elevated from middle school graduation in 2000 to high school drop-out (one year completed) in 2010. The marital status is categorized into single, married with spouse, widowed, and divorced, and in the regression equation, the case of widowed or divorced is set to the reference group. As attributes of households, a dummy variable indicating whether it is a single-person household or not and an interaction term between a dummy variable for multi-person household and the number of household members are included in the regression equation. The average number of household members of the multi-person households is 3.42 persons in 2000, 3.24 persons in 2005, and 3.12 persons in 2010, which shows that the size of households becomes smaller over time. As characteristics of residence, type of residence and number of rooms are included in the regression equation, and the type of residence is categorized into detached house, apartment, and all other types such as town house, multiplex house, and house in the non-residential building.⁶⁾

IV. Empirical Results

1) Analysis on all types of residence

Table 2 shows the estimation results of the probit model for the probability of owner-occupancy targeting residents of all types of residence.⁷⁾ In general, the probability of owner-occupancy is higher with male and relatively old-aged household heads, while it is lower with widowed or divorced household heads compared to those unmarried or married with spouse.

The probability of owner-occupancy for the unmarried reveals a different trend from that of the married with spouse depending on the period. In 2000 the former showed a higher probability of owner-occupancy, while in 2005 the latter showed a relatively high probability, and in 2010 the phenomena became intensified. Meanwhile, among the characteristics of household heads, education reveals opposed effects in the probability of owner-occupancy among analysis time points. In 2000 and 2010, the higher the education level of household heads, the lower the probability of owner-occupancy, but in 2005 an opposite result appeared.

In terms of attributes of households, single-person households have a relatively low probability of housing owner-occupancy, and the phenomenon becomes more intense in 2010. There exists a positive relationship between the probability of owner-occupancy and the household size. However, the marginal effect of the household size measured by the number of household members decreases from 0.034 in 2000 and 0.027 in 2005 to 0.014 in 2010.

Table 2. Marginal effects on the probability of housing owner-occupancy for all types of residence

	2000	2005	2010
Household head			
Male	0.0747** (14.50)	0.0436** (10.85)	0.0478** (15.08)
Age	0.0118** (26.02)	0.0094** (27.62)	0.0111** (32.98)
Schooling years	-0.0046** (-6.89)	0.0013+ (1.81)	-0.0058** (-8.11)
Single	0.0322** (3.38)	0.0331** (5.56)	0.0464** (7.03)
Married with spouse	-0.0010 (-0.16)	0.0297** (4.80)	0.0679** (11.82)
Household			
Single-person household	-0.0368** (-4.67)	-0.0350** (-6.07)	-0.0609** (-9.08)
Multi-person household	0.0349** (14.25)	0.0273** (18.95)	0.0146** (6.79)
Residence			
Detached house	0.1265** (9.63)	0.1481** (15.21)	0.0557** (4.64)
Apartment	-0.0173 (-0.90)	-0.0516** (-2.97)	-0.0151 (-0.94)
Number of rooms	0.1251** (23.56)	0.0282** (5.71)	0.1706** (35.01)

Note: Numbers in parentheses are robust t-values in which the error terms are assumed to be correlated each other within Eup, Myun, and Dong (administrative districts). +, *, and ** indicate statistical significance at the 10%, 5%, and 1% level, respectively. The omitted categories are Widowed or Divorced for the marital status and town house, multiplex house, and so on for the type of residence.

Examining the difference in the homeownership rate depending on characteristics of residence, a detached house shows a relatively high probability of owner-occupancy compared to other types of residence. However, in case of apartments, the likelihood of owner-occupancy is relatively low, but the difference is statistically significant only in 2005. The number of rooms within the residence shows a positive and statistically significant influence on the probability of owner-occupancy.

Table 3 shows the simulation results for the change in the probability of

owner-occupancy depending on demographic transitions and changes in the preference for housing owner-occupancy or conditions of housing markets utilizing regression results in given years for the probability of housing owner-occupancy provided in Table A2 in the appendix.

First, in order to assess the degree to which changes in household socio-economic status contributed to the decrease in the probability of housing owner-occupancy, after individual explanatory variables' effects on the housing owner-occupancy are fixed to estimates of a particular year shown in Table A2, the annual

Table 3. Changes in the probability of housing owner-occupancy for all types of residence

		Preference		
		2000	2005	2010
Population	2000	0.7004 (0.28)	0.7481 (0.22)	0.5289 (0.28)
	2005	0.7321 (0.25)	0.7556 (0.21)	0.5612 (0.26)
	2010	0.7632 (0.26)	0.7399 (0.22)	0.6501 (0.28)

Note: Numbers in parentheses indicate standard deviations.

demographic structure data are substituted, and then the change in the probability of housing owner-occupancy induced only by demographic transition is calculated under the state in that the preference for housing owner-occupancy is held constant.

In Table 3, the first row shows the probability of owner-occupancy by year obtained by substituting the annual demographic data after fixing the preference for owner-occupancy or housing market conditions to the estimate of year 2000.⁹⁾ Therefore, according to the results of the first column, the probability of housing owner-occupancy induced by demographic transition increased to 0.7321 (3.17%p) in 2005 and 0.7632 (6.28%p) in 2010 based on 0.7004 in 2000. The preference for housing owner-occupancy in 2000 appears in the first column of Table A2, and it shows that the probability of owner-occupancy is relatively higher when the household head is male, older, less educated, or unmarried; the household has more household members; or the residence belongs to a detached house or has more

rooms. In particular, the marginal effects of male household head, single-person household, household size, detached house, and number of rooms are relatively larger. On the other hand, the demographic structure over 2005 and 2010 since 2000 reveals changes such as decline in the male household head rate, increase in average age and education, increase in the unmarried rate, increase in single-person household rate, shrink of household size, decrease in the detached house rate, and so on. Among these changes, increases in average age and the unmarried rate are considered as major causes of the increase in the probability of housing owner-occupancy.

In order to analyze the change in the probability of housing owner-occupancy induced by changes in the preference for housing owner-occupancy or housing market conditions, after fixing the demographic structure to that in a particular year, the annual estimates of the preference or market conditions provided in Table A2 are applied, and the probability of housing owner-occupancy is calculated.

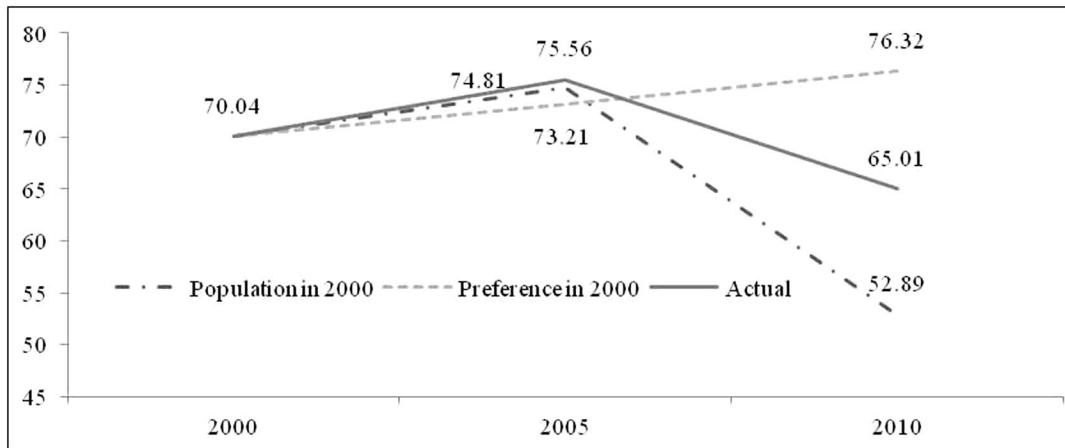


Figure 1. Changes in the probability of housing owner-occupancy (%) for all types of residence

In Table 3, the first row suggests the probability of owner-occupancy by year obtained by substituting each annual estimate for effects of factors determining the owner-occupancy after fixing the demographic structure to that in 2000. According to the results, the probability of housing owner-occupancy induced by changes in the preference or market conditions increases to 0.7481 (4.77%p) in 2005 while it decreases to 0.5289 (17.15%p) in 2010 compared to 0.7004 in 2000.

The changes in the preference for housing owner-occupancy or market conditions can be analyzed by the annual changes of estimates suggested by Table A2 and Table 2. Male household head, age, single-person household, number of household members, and detached house have lower probabilities of housing owner-occupancy in 2010 compared to those in 2000 while the case of married with spouse or

unmarried household heads significantly increases the probability of housing owner-occupancy in 2010 than in 2000 compared to the case of widowed or divorced household heads.

Figure 1 shows the probability of housing owner-occupancy induced by the demographic transition and changes in the preference of housing owner-occupancy with the actual change. The actual owner-occupancy rate rose by 5.43%p between 2000 and 2005. According to the results in Table 3, it is assumed that the owner-occupancy rate is affected more significantly by the change in the preference rather than by the demographic transition. On the other hand, the actual owner-occupancy rate fell by 10.56%p from 75.57% to 65.01%, and it is because the 22.19%p downward pressure of the probability of owner-occupancy from 74.87% to 52.68% induced by changes in the preference or housing market conditions overwhelmed the 3.31%p upward pressure of

Table 4. Results of decomposition method for all types of residence

Period	Estimates of probability of owner-occupancy (%)			Results of decomposition method (%p)		
	t ₀	Preference (t ₁) * population (t ₀)	t ₁	Change in the probability of owner-occupancy	Effect of demographic transition	Effect of preference or conditions
2000~2005	70.04	74.81	75.56	5.52	0.75	4.77
2005~2010	75.56	56.12	65.01	-10.55	8.89	-19.44

the probability of owner-occupancy from 73.19% to 76.50% induced by the demographic transition in that period.

Consequently, the demographic transition during the analysis period from 2000 to 2010 played a role of increasing the probability of housing owner-occupancy while the changes in the preference for housing owner-occupancy or housing market conditions played an opposite role. The effect of the former is greater than the effect of the latter, and the probability of housing owner-occupancy ultimately decreased.

Table 4 displays the results of the decomposition method for changes of the probability of housing owner-occupancy targeting residents of all types of residence. In the first half of the 2000s, the probability of owner-occupancy increased by 5.52%p, and 0.75%p of it is induced by the demographic transition, and the remaining 4.77%p is induced by changes in the preference of housing owner-occupancy or housing market conditions.

On the other hand, in the second half of the

2000s, the probability of owner-occupancy decreased by 10.55%p, and during the period the demographic transition increased the probability of owner-occupancy by 8.89%p, but deterioration of the preference or conditions decreased the probability of owner-occupancy by 19.44%p. Consequently, it means that due to the economic recession in 2008 the preference of housing owner-occupancy or conditions of housing markets changed negatively compared to the previous period.

2) Analysis on Apartment

Table 5 shows the estimation results for apartments only.⁹⁾ By restricting samples to apartments, we can partly control for physical differences of housing units. One of the characteristics of housing discerned from other goods is heterogeneity, and it means that the marginal effects of explanatory variables can be different depending on the type of residence.

Comparing to results in Table A2 including all types of residence in the analysis, the estimation results are qualitatively similar except for education level, married with spouse,

Table 5. Marginal effects on the probability of housing owner-occupancy for apartment

	2000	2005	2010
Household head			
Male	0.0898** (18.98)	0.0624** (13.00)	0.0535** (17.42)
Age	0.0132** (31.70)	0.0112** (28.03)	0.0118** (40.48)
Schooling years	-0.0093** (-10.03)	-0.0048** (-5.26)	-0.0073** (-9.90)
Single	0.0621** (6.24)	0.0564** (8.66)	0.0594** (9.21)
Married with spouse	-0.0047 (-0.68)	0.0292** (3.97)	0.0694** (11.69)
Household			
Single-person household	-0.0322** (-4.11)	-0.0367** (-6.36)	-0.0608** (-8.87)
Multi-person household * Household size	0.0381** (16.18)	0.0271** (18.52)	0.0139** (6.26)
Residence			
Number of rooms	0.1276** (22.03)	0.0494** (8.15)	0.1679** (34.56)

Note: Numbers in parentheses are robust t-values in which the error terms are assumed to be correlated each other within Eup, Myun, and Dong (administrative districts). *, **, and *** indicate statistical significance at the 10%, 5%, and 1% level, respectively. The omitted category is Widowed or Divorced for the marital status.

and single-person household. Educational attainments do not have a statistically significant effect on decision making for housing owner-occupancy over the all analysis period, while single-person households have a relatively lower probability of owner-occupancy and it is statistically significant only in 2005 and 2010. The propensity of apartment owner-occupancy is higher with male household heads, but the gap shrinks over time from 8.98%p in 2000 to 5.35%p in 2010. On the other hand, although age of household heads reveals a positive effect on the apartment owner-occupancy, its marginal effect maintains almost a consistent level during the analysis period.

As the educational attainments of the household head increase, the probability of apartment owner-occupancy decreases, and the marginal effects somewhat differ depending on the analysis points. In terms of the probability of apartment owner-occupancy depending on the marital status, the cases of unmarried or married with spouse have relatively higher probabilities compared to widowed or divorced cases, and the marginal effect of unmarried household heads does not show a significant change over the analysis period, while the marginal effect of married household heads having spouse increases over time.

Examining the difference of the probability of apartment owner-occupancy depending on

Table 6. Changes in the probability of housing owner-occupancy for apartment

		Preference		
		2000	2005	2010
Population	2000	0.5339 (0.22)	0.5772 (0.19)	0.3499 (0.18)
	2005	0.5662 (0.23)	0.6080 (0.19)	0.3770 (0.19)
	2010	0.7429 (0.20)	0.6996 (0.18)	0.6010 (0.20)

Note: The probability is calculated only with apartment residents. Numbers in parentheses indicate standard deviations.

characteristics of households, single-person households have relatively lower probability of owner-occupancy, and especially in 2010 its marginal effect is -6.08%p which is almost twice compared to the figures in 2000 and 2005. On the other hand, in case of multi-person households, the larger the number of household members the higher the probability of owner-occupancy, but the effect of household size on the homeownership rate becomes smaller over time during the analysis period.

It is estimated that whenever adding one more person to the household, the probability of owner-occupancy increases by 3.81%p in 2000 while only 1.39%p in 2010. Meanwhile, the probability of owner-occupancy depending on the size of residence measured by the number of rooms in the apartment, shows a positive relationship, and its marginal effect is the largest in 2010.

Table 6 shows the simulation results for the change in the probability of owner-occupancy for apartment depending

on demographic transition and changes in the preference for housing owner-occupancy or conditions of housing markets based on the probit model estimation results in Table A3 for apartment.

Figure 2 suggests the probability of housing owner-occupancy induced by demographic transition and changes in the preference of housing owner-occupancy accompanying with the actual change.

Table 7 suggests the results of the decomposition method for changes in the probability of housing owner-occupancy targeting apartment residents. In the first half of the 2000s, the probability of owner-occupancy increased by 7.41%p, and 3.08%p of it is induced by the demographic transition, and the remaining 4.33%p is induced by changes in the preference of housing owner-occupancy or housing market conditions. Comparing to the analysis results targeting all types of residence, it is revealed that population appropriate to apartment owner-occupancy relatively increased.

In the second half of the 2000s, the

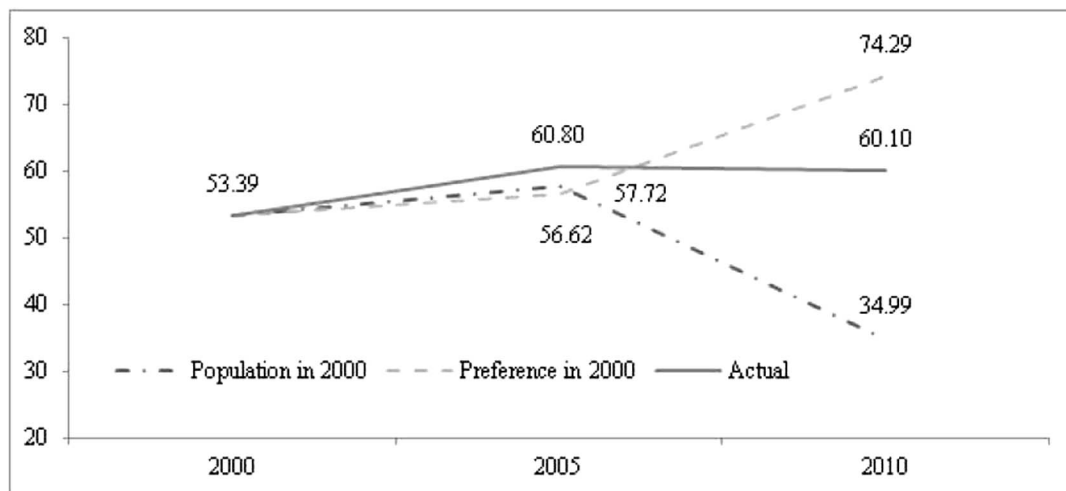


Figure 2. Changes in the probability of housing owner-occupancy (%) for apartment

Table 7. Results of decomposition method for apartment

Period	Estimates of probability of owner-occupancy (%)			Results of decomposition method (%p)		
	t_0	Preference (t_1) * population (t_0)	t_1	Change in the probability of owner-occupancy	Effect of demographic transition	Effect of preference or conditions
2000~2005	53.39	57.72	60.80	7.41	3.08	4.33
2005~2010	60.80	37.70	60.10	-0.70	22.40	-23.10

probability of owner-occupancy decreased by 0.70%p, and during that period the demographic transition increased it by 22.40%p, but deterioration of the preference or housing market conditions decreased the probability of owner-occupancy by 23.10%p. It suggests that the relatively smaller decline in the probability of owner-occupancy can be explained by the demographic shifts that boost the homeownership rate of apartment.

V. Conclusion

This study empirically analyzes the causes of

the change in the probability of housing owner-occupancy in Chungnam province in 2000s, assuming that the decision on housing owner-occupancy is affected by the preference for owner-occupancy or conditions of housing markets together with the residents' demographics.¹⁰⁾ According to empirical results based on the 2000, 2005, and 2010 Population & Housing Census, considerable changes are observed in the first half and the second half of the 2000s in housing owner-occupancy, and especially, the decline of the homeownership rate in the second half is induced mainly by the decrease in the preference for housing

owner-occupancy rather than by demographic shifts. Owner-occupancy of housing is one of the important political issues in that it contributes to individuals' residential stability. However, housing owner-occupancy is affected by demographic transition along with changes in the preference for housing owner-occupancy or housing market conditions, and introduction of housing-related policies in accordance with these changes is required.

For example, the recent drastic growth of single-person households means the need for policies inducing supply of appropriate housing for this population like small houses. Demographic shifts such as the increase in single-person households, the aging of household heads and the rising of female heads, the rapid decrease in more than four-person households, and the gradual increment of multi-cultural households should be considered in the long-term housing policy since these changes appear relatively over a long period of time. It is expected that short-term actions can be taken to the preference for housing owner-occupancy or conditions of housing markets through improvement of related institutions and revitalization of housing finance markets.

The study has relatively less concerns about estimation errors due to sampling in the aspect that it considers changes in the demographic structure by utilizing census data. However, the analysis is limited to Chungnam province in Korea, and housing policy related roles of local governments are limited, which suggests that it

is possible to derive more meaningful policy implications through future analysis using national data.

Note1. Coulson and Li (2013) measures the external benefits of homeownership in the form of higher housing prices in neighborhoods with higher ownership rates and lower vacancies. Their estimates indicate that a housing transition from renting to owning creates approximately \$1,300 in measured benefits. Also, as the external benefits of homeownership, better maintenance and appearance (Galster, 1983; Harding et al., 2000, among others), children's higher educational attainments (Green and White, 1997; Haurin et al., 2002), and more involvement in local organizations and communities (DiPasquale and Glaeser, 1999) are suggested in the related literature.

Note2. In some foreign countries, owner-occupancy is not distinguished from homeownership, thus some figures may not reflect the owner-occupancy rate correctly.

Note3. There are several papers on this topic using Korean data. For example, Park (2013) analyzes determinants of the housing tenure choice during the period of 1990 to 2010, using a multinomial logit model. According to the results, the choice of rent shows high associations with characteristics of households besides family, such as low education level, instable occupation, termination of marriage, and single-person household. And they indicate that moving to residence dependent upon public transportation increases the probability of living in an old house. Jin et al. (2010) empirically analyzes characteristics of changes in owner-occupancy or the housing tenure trend in the metropolitan area across the period of late 1990s to early 2000s. According to their results, in terms of the probability of owner-occupancy, the gaps induced by

education and occupation decrease while those by gender or marital status increase. And it is suggested that changes by area in the capital regions and changes by age cohort are also different. Jung (2013) analyzes determinants of changes in housing tenure from owner-occupancy to renting targeting the households whose household heads are older than 55. The empirical results reveal that the shifts of such housing tenure choices appear distinctly in their late age, more than 75 years old, and the major determinants of such changes are demographic characteristics such as the marital status of household heads and changes in the marital status, health status of household heads and spouses, and turnover of household heads.

- Note4. The decomposition method is based on Gabriel and Rosenthal (2005) and Jin et al. (2010).
- Note5. The original data are available for use through the micro-data utilization center at the National Bureau of Statistics or the remote use service.
- Note6. Non-residential buildings include commercial building, factory, inn, and so on.
- Note7. Table A2 in the appendix provides the estimated coefficients of explanatory variables, and free housing such as company housing is excluded from the analysis.
- Note8. Namely, by estimating the probability of owner-occupancy by year using estimation coefficients of explanatory variables and annual demographic data from analysis results of data in 2000 of Table 2a, the change in the probability of owner-occupancy is calculated depending on demographic transitions.
- Note9. Table A3 in the appendix provides the estimated coefficients of explanatory variables.
- Note10. The decision on housing owner-occupancy would also be affected partly by the supply side of the housing market. However, it is not easy to take it into account in this study because the

endogeneity of housing price and the filtering process of existing housing units have to be considered. This issue is definitely worthy of being tackled in the future.

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Appendix

Table A1a Distribution of households by housing tenure

Housing tenure	2000		2005		2010	
	# of HHs	%	# of HHs	%	# of HHs	%
Own	388,688	70.43	413,143	75.64	455,911	65.24
Chonseil	90,038	16.31	74,296	13.60	110,256	15.78
Monthly rent w/ deposit	46,489	8.42	46,821	8.57	100,457	14.37
Monthly rent w/o deposit	14,890	2.70	6,534	1.20	17,622	2.52
Rented room	11,781	2.13	5,428	0.99	14,618	2.09
Total	551,886	100.00	546,222	100.00	698,864	100.00

Note. As a type of housing tenure, there is free occupancy such as company housing, official residence, relative's house, etc. However, they are excluded from this study. Chonseil is a unique kind of rental contract in Korea. The tenant pays an upfront deposit, typically from 40% to 70% of the property value, to the landlord, and the landlord repays the deposit to the tenant upon the contract termination (Kim, 2013).

Table A1b Distribution of households by household size

# of HH members	2000		2005		2010	
	# of HHs	%	# of HHs	%	# of HHs	%
1	94,524	17.13	98,090	17.96	190,580	27.27
2	137,033	24.83	158,081	28.94	196,994	28.19
3	106,230	19.25	105,790	19.37	127,225	18.20
4	134,031	24.29	123,751	22.66	128,133	18.33
5	54,205	9.82	43,015	7.88	41,277	5.91
6	17,339	3.14	12,074	2.21	10,571	1.51
7	6,134	1.11	3,975	0.73	3,038	0.43
8	1,701	0.31	1,028	0.19	709	0.10
9	467	0.08	282	0.05	225	0.03
10	154	0.03	94	0.02	71	0.01
11	51	0.01	28	0.01	27	0.00
12	9	0.00	11	0.00	10	0.00
13	7	0.00	1	0.00	2	0.00
14	0	0.00	2	0.00	1	0.00
16	1	0.00	0	0.00	1	0.00

Table A1c Distribution of household heads by marital status

Marital status	2000		2005		2010	
	# of HH heads	%	# of HH heads	%	# of HH heads	%
Single	39,860	7.22	30,896	5.66	88,368	12.64
Married	418,803	75.89	410,933	75.24	471,207	67.42
Widow	79,112	14.34	85,613	15.67	100,948	14.44
Divorced	14,044	2.55	18,736	3.43	38,338	5.49

Table A1d Distribution of households by type of residence

Type of residence	2000		2005		2010	
	# of HHs	%	# of HHs	%	# of HHs	%
Detached house	341,685	61.91	295,953	54.18	358,197	51.25
Apartment	150,213	27.22	203,758	37.30	288,613	41.30
Town house	25,820	4.68	19,942	3.65	20,086	2.87
Multiplex house	6,975	1.26	15,884	2.91	15,952	2.28
House in non-residential building	25,435	4.61	8,510	1.56	8,061	1.15
Officetel	429	0.08	926	0.17	2,568	0.37
Hotel room	151	0.03	200	0.04	678	0.10
Dormitory & social facility	30	0.01	8	0.00	264	0.04
Other	1,148	0.21	1,041	0.19	4,445	0.64

Table A1e Distribution of household heads by gender

Gender	2000		2005		2010	
	# of HH heads	%	# of HH heads	%	# of HH heads	%
Female	101,864	18.46	107,346	19.65	173,616	24.84
Male	450,022	81.54	438,876	80.35	525,248	75.16

Table A1f Distribution of household heads by schooling years

Schooling years	2000		2005		2010	
	# of HH heads	%	# of HH heads	%	# of HH heads	%
0	69,278	12.55	59,774	10.94	56,737	8.12
3	7,787	1.41	6,209	1.14	10,293	1.47
6	138,078	25.02	127,323	23.31	126,201	18.06
7.5	4,533	0.82	3,117	0.57	5,690	0.81
9	69,914	12.67	64,954	11.89	71,675	10.26
10.5	5,204	0.94	2,769	0.51	6,432	0.92
11	6,125	1.11	3,459	0.63	12,096	1.73
12	155,528	28.18	163,221	29.88	214,805	30.74
14	41,032	7.43	40,339	7.39	85,108	12.18
16	43,432	7.87	60,270	11.03	85,973	12.30
17	2,812	0.51	2,730	0.50	4,825	0.69
18	5,807	1.05	8,935	1.64	13,793	1.97
20.5	713	0.13	889	0.16	1,708	0.24
23	1,643	0.30	2,233	0.41	3,528	0.50

Table A2 Probit model results for the probability of housing owner-occupancy for all types of residence

	2000	2005	2010
Household head			
Male	0.2402** (16.08)	0.1587** (11.26)	0.1354** (15.32)
Age	0.0403** (40.48)	0.0358** (35.85)	0.0321** (37.09)
Schooling years	-0.0158** (-6.61)	0.0051* (1.84)	-0.0167** (-7.80)
Single	0.1138** (3.28)	0.1330** (5.44)	0.1376** (7.02)
Married with spouse	-0.0034 (-0.16)	0.1099** (5.08)	0.1924** (12.43)
Household			
Single-person household	-0.1213** (-4.87)	-0.1280** (-6.34)	-0.1720** (-9.43)
Multi-person household * Household size	0.1188** (15.48)	0.1035** (19.52)	0.0421** (6.74)
Residence			
Detached house	0.4153** (8.94)	0.5517** (14.00)	0.1604** (4.50)
Apartment	-0.0584 (-0.91)	-0.1917** (-3.15)	-0.0436 (-0.94)
Number of rooms	0.4252** (23.90)	0.1070** (5.87)	0.4911** (40.31)
Constant	-3.6412** (-48.17)	-2.2992** (-27.39)	-3.4106** (-36.58)
Fixed effect			
City/County	16	16	16
Log pseudo-likelihood	-214,167.90	-230,049.45	-306,463.38
Pseudo R ²	0.3609	0.2415	0.3212
Number of observations	551,886	546,222	698,864

Note: The actual coefficients, not the partial derivatives, are reported. Numbers in parentheses are robust t-values in which the error terms are assumed to be correlated each other within Eup, Myun, and Dong (administrative districts). *, **, and *** indicate statistical significance at the 10%, 5%, and 1% level, respectively. The omitted categories are Widowed or Divorced for the marital status and town house, multiplex house, and so on for the type of residence.

Table A3 Probit model results for the probability of housing owner-occupancy for apartment

	2000	2005	2010
Household head			
Male	0.1274** (4.45)	0.0941** (5.74)	0.0852** (6.85)
Age	0.0316** (20.09)	0.0249** (19.26)	0.0240** (24.20)
Schooling years	-0.0031 (-0.77)	0.0046 (1.49)	0.0030 (0.85)
Single	0.3810** (9.18)	0.3124** (13.20)	0.3101** (13.82)
Married with spouse	0.1362** (3.00)	0.1349** (4.25)	0.2530** (12.74)
Household			
Single-person household	0.0317 (0.98)	-0.0716** (-2.85)	-0.1264** (-4.84)
Multi-person household * Household size	0.1977** (16.96)	0.1045** (13.15)	0.0949** (12.45)
Residence			
Number of rooms	0.7429** (10.73)	0.7705** (20.56)	0.4445** (15.00)
Constant	-4.7290** (-31.92)	-3.7114** (-19.43)	-3.3333** (-24.30)
Fixed effect			
City/County	16	16	16
Log pseudo-likelihood	-83,424.78	-116,702.73	-173,150.47
Pseudo R ²	0.1984	0.1681	0.1156
Number of Observations	150,213	203,758	288,613

Note: The actual coefficients, not the partial derivatives, are reported. Numbers in parentheses are robust t-values in which the error terms are assumed to be correlated each other within Eup, Myun, and Dong (administrative districts). *, **, and *** indicate statistical significance at the 10%, 5%, and 1% level, respectively. The omitted category is Widowed or Divorced for the marital status.

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