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ARTICLE

Urban resettlement in residential redevelopment projects: considering desire to resettle and willingness to pay

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Abstract In this study, we estimate the association of original residents' resettlement preferences with demographic and socioeconomic characteristics of households matched with local development initiatives accounting for spatial structure and cluster effects. We develop theoretically driven empirical models of recent residential redevelopment projects within a South Korean metropolitan area. Multilevel analysis, categorical data models, and spatial data analysis are employed using survey data collected from former residents matched with secondary data. Results suggest that due to a higher likelihood of housing value increases after redevelopment projects, original residents are more willing to resettle. Additionally, original residents' willingness to pay for the resettlement is associated with their economic status. Together with the collaboration among original residents, local or central government agencies, and redevelopment corporations, appropriate housing prices to reduce the original dwellers' financial burden should be considered.

Keywords Multilevel analysis · Resettlement determinants · Socio-spatial differentials · Spatial clustering · Willingness to pay

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1 Introduction

The effectiveness of urban renewal is a central global issue of policy and planning importance. Redevelopment of deteriorated residential settings can "create new economic opportunity for revalorization of underdeveloped urban space" (Smith 2011, p. 236). That said determinants of urban renewal success are complex. As noted more than 50 years ago by Jane Jacobs, urban renewal will "… not rest soundly on reasoned investment of public tax subsidies, but on vast involuntary subsidies wrought out of helpless site victims" (Jacobs 1961 as cited in Pritchett 2008, p. 272). Neighborhood renewal and relocation of current inhabitants often go hand in hand. The relocation of original residents from redeveloped areas often creates the effect of lowering social cohesion and social ties within neighborhoods (Schwartz 2010). Also, redevelopment often fails to provide improvement in existing social, economic, and environmental status of those relocated individuals; ultimately leading to redeveloped space surrounded by societal breakdown reflective of physical and social decay.

Similar to the social and economic processes in countries such as Brazil and China, rapid industrialization and urbanization have occurred in South Korea since the 1960s. As might be predicted, populations and industries have concentrated within major metropolitan areas. These include Seoul, Busan, Ulsan, Daegu, Gwangju, and Incheon. Such an influx of populations into South Korean cities has created severe shortages of housing and a lower quality of housing units.

As a primary city for relocation of refugees during the Korean War (1950–1953), Busan in particular, exhibits an abundance of deteriorated dwellings and residential districts due to the lack of timely and appropriate redevelopment activities (Busan Metropolitan City 2011a). In an effort to improve housing conditions and deteriorated residential districts, government authorities have targeted residential redevelopment with less focus on "social factors such as tenure shift and residential or neighborhood change" (Ha 2004, p. 382).

Traditional residential redevelopment projects rely on the demolition of old residential areas with a particular focus on illegally occupied housing (Squires 2011). Due to alleged displacement effects within the most impoverished residential areas throughout South Korea, redevelopment activities have generated controversy. Ha and Kim (2001, p. 65) summarize these policy and planning issues to include the "…lack of residents' participation in [the] planning process, the role of local government, the equity of the housing allocation, and affordability of low-income residents." More importantly, such redevelopment activities can lead to gentrification issues that affect original residents, especially those with low incomes who cannot afford escalating housing prices (Ha 2004, 2007).

Recent studies conducted in Seoul, South Korea (e.g., Ha and Kim 2001; Lee et al. 2013; Seong et al. 2009) concerning the resettlement of former residents in redeveloped areas show a slight difference in each region, with a modest degree (i.e., 20–40 %) occurring throughout. The main reason for this low resettlement of original residents (in particular, tenants) in newly redeveloped areas is likely due to the financial burden many residents experience (Ha and Kim 2001). As might be expected, housing prices and housing maintenance costs in new residences after reconstruction are often subject to dramatic increases (Ha 2004; Ki and Jayantha 2010; Lim et al. 2013; Shin 2009a, b). This low rate of resettlement, according to Ha (2004, p. 387), can lead to unstable "housing security" and weak "sociocultural characteristics of the low-income community."

Both theoretical and empirical approaches to analyzing the determinants of prior dwellers' resettlement and willingness to pay for the resettlement have largely been

ignored in the existing literature. In this study, we investigate lessons learned from recent redevelopment projects which are currently underway in South Korea. Our geographical focus is on the Busan metropolitan area in which we consider: (1) the current effect of urban spatial structure and social differentials, (2) associations between residents' intention to resettle and (3) various socio-demographic, regional economic, redevelopment, housing, and spatial attributes. We also examine the extent to which original residents are willing to pay for resettlement after completion of residences.

2 Frameworks and processes of residential redevelopment in South Korea

Progressive urban redevelopment, in general, intends to ensure that residents of resettled communities can be provided with new livelihoods, a revitalized urban core, and improved quality of life comparable to or better than what existed previously (Kleinhans 2004; Ndezi 2009). As pointed out by Kleinhans (2004) and Zhang and Fang (2003), varied redevelopment planning policies have been employed to enhance a variety of social effects including economic revitalization, social interaction, and improvements in housing quality as well as living environs.

The aim of these projects is associated with improving the quality of housing. Typically, this entails the relocation of original residents in the neighborhoods being renewed. Urban renewal in South Korea follows a fairly standard process. Initially, property owners form an association, which contracts developers (i.e., construction companies) (Ha 2001, p. 386; Act on the Maintenance and Improvement of Urban Areas and Dwelling Conditions for Residents, AMIUDCR 2012). The developers then become part of the redevelopment or reconstruction association and the association serves as the legal body responsible for such redevelopment or reconstruction (AMIUDCR 2012; Ha 2001, p. 386). These so-called 'Joint Redevelopment Projects' have contemporary origins in 1983 when South Korea's central government pursued a strategy of development-oriented policies (Ha and Kim 2001; Shin 2009a, b). In order to allow the original inhabitants to resettle in other residential areas, various compensation (i.e., cost) policies were formulated in accordance with their residential structure, land values, and rental allowance (AMIUDCR 2012). These are analogous to the 'monetarized redevelopment compensation' practices in China (He and Wu 2007; Shin 2007). If original dwellers are willing to resettle in the newly developed areas after the completion of a redevelopment project, "the building constructor arranges loans with which the residents find temporary residence outside the project area" (Cho 2011, p. 1490).

By undertaking housing and residential redevelopment, local units of government attempt to envelop urban-building growth capacities of the territory in accordance with regional social and economic domains (Ball and Maginn 2005). Depending on whether these projects are undertaken in an authoritarian state or a democratic regime, social and economic frameworks such as urban growth machine, territorialization, and state corporatism can be viewed as motivators of redevelopment projects (Shin 2009a, b). Compared with urban redevelopment experiences outside South Korea, in an effort to supervise redevelopment projects and policy delivery in the process of property-led redevelopment projects, market-oriented redevelopment became a dominant approach in the 1990s. Such redevelopment places the private sector as the essential leading collaborator in the renewal process like United Kingdom (He and Wu 2005; Shin 2009a, b). Similarly, urban

redevelopment practice in Hong Kong has relied on private-sector resources under the policy of "the pro-growth government" (Ng 2002, p. 145). China's local government, based on state entrepreneurialism, is arguably in a more powerful position than the private sector (He and Wu 2005; Shin 2009a, b).

In light of public–private partnerships, encouraging community participation in the process of redevelopment is necessary to address issues associated with social exclusion. Active community participation can help overcome diverse obstacles caused by renewal projects and can "… produce people-friendly and community-nurturing spaces with unique local characteristics" (Ng 2002, p. 146). This participatory trend can balance relations among government, market, and societal stakeholders (Lim et al. 2013). As has been shown, stakeholder participation as part of the comprehensive planning process, is a central attribute of effective urban renewal (Zhang and Fang 2004).

3 Resettlement determinants in residential redevelopment

Cities change in response to a variety of economic and social factors. Changes in economic outcomes and housing demand are key determinants of successful urban renewal as Uzun (2005) claims. Together with the provision of public rental apartments for redevelopment programs in South Korea, previous renters are expected and are assumed to return to the same neighborhoods. Recent research, however, suggests that the rate of return of these renters is low. In Seoul's redevelopment projects implemented from 1990 to 2003, Seong et al. (2009) found that 37 % of homeowners determined to resettle after the projects. More recently, results by Lee et al. (2013) on migration patterns of original residents in Seoul's Gireum newtown district suggested that only 25 % of both homeowners and renters re-settled. Ha (2004) found a similar trend as many of the original dwellers had "moved out to other areas where housing costs were lower" (p. 383).

Existing studies (e.g., Ha 2004, 2007; Kim 2010; Shin 2009a, b) have focused on the theoretical justification for housing renewal projects and residential redevelopment in South Korea (which has primarily focused on Seoul) connecting diverse urban issues such as gentrification, substandard settlement and eviction, low-income housing, neighborhood change, and the role of government. Such work has failed to recognize the determinants by which original residents' social and economic status, social involvement, and characteristics of the redevelopment project guide the system of residential redevelopment.

Based on this theoretical background, a number of studies have been conducted in Seoul (with the exception of the work by Choi and Park (2009) that focused on Busan) that employ socio-demographic and household characteristics, social involvement, and redevelopment project attributes to examine determinants of original dwellers' intention to resettle. Socio-demographic and household characteristics have included information on age and family size (Yun and Jung 2011), gender and housing tenure (Choi and Park 2009; Ha and Kim 2001), income (Choi and Park 2009; Yun and Jung 2011), educational attainment (Ha 2007), and job status (Ha 2007; Ha and Kim 2001). Choi and Park (2009) argued that those original residents who have higher incomes are more likely to resettle due to the possibility of economic gains after the project is completed. In addition, those who are older or own their own home are more willing to resettle than younger residents or renters, since their social connections or ties to neighborhood and communities could lead to reduced mobility (Choi and Park 2009; Ha 2007; Ha and Kim 2001; Yun and Jung 2011). In regard to characteristics of the redevelopment project, Choi and Park (2009)

found that the sooner the redevelopment project is completed, the greater the intention of original residents is to resettle. Since higher value change in real estate is often associated with higher profit margins, the degree of housing price change is associated with original residents' willingness to resettlement (Ki and Jayantha 2010).

Spatial attributes of neighborhoods also play a role in resettlement decisions. Social involvement attributes, denoting the extent of relationship between household and neighborhood (Choi and Park 2009; Ha and Kim 2001; Yun and Jung 2011) can be a dominant factor in determining resettlement decisions. The process requires that participants in decision making have common information and that all become informed about each other's interests (Hasselaar 2011, pp. 75–101). In this regard, social involvement characteristics, indicating the degree of residents' participation in the project are likely to play an important role in deciding residential resettlement rates (Ha and Kim 2001; Ndezi 2009; von Hoffman 2009; Yun and Jung 2011).

4 Data and methods

4.1 Model specifications

In an effort to examine the determinants of original residents' resettlement in the study area, a binary logit model was employed with the dependent variable, willingness to resettle (*WTR*). Together with various social and spatial characteristics and intentions of residents i in a planned redeveloped district area j to resettle in the same district area, the empirical model can be addressed by the following equation:

$$\begin{aligned} WTR_{ij} = {} & \beta_0 + \beta_1 Gender_{ij} + \beta_2 Age_{ij} + \beta_3 Family_{ij} + \beta_4 Income_{ij} + \beta_5 Tenure_{ij} \\ & + \beta_6 Dwell_{ij} + \beta_7 Bond_{ij} + \beta_8 Participation_{ij} + \beta_9 Price_{ij} \\ & + \beta_{10} Estate_{ij} + \beta_{11} Completion_{ij} + \beta_{12} Core_{ij} \\ & + \beta_{13} Suburban_{ij} + \varepsilon_{ij} \end{aligned} \tag{1}$$

In Eq. (1), explanatory variables related to socio-demographic characteristics include gender (*Gender*), age (*Age*), family size (*Family*), and household income level (*Income*). These are included to explore the effects of social and economic status of original inhabitants on willingness to resettle (*WTR*) in residential redevelopment districts. Individual characteristics encompass housing tenure (*Tenure*) and the degree of housing price change (*Price*). Social involvement and redevelopment project characteristics such as the length of residence (*Dwell*), former residents' perception of neighborhood bonds (*Bond*), the extent of residents' participation in the process of a redevelopment project (*Participation*), the degree of real estate's variation (*Estate*), and the period of redevelopment completion (*Completion*) are involved. In an effort to address the effect of urban structure on the original residents' intention to resettlement, core and high-density urban (*Core*) and mature and emerging suburban (*Suburban*) variables are selected in consideration of the geographical location of each residential redevelopment districts, and the effect is useful to estimate the relationship between resettlement determinants of former residents and social differentials.

In order to take into consideration variability concerned with each level of nesting, multilevel analysis can be employed (Snijders and Bosker 1999). This analysis is appropriate to adjust for the lack of independence within the clusters (in this study, original

residents in each redevelopment district clustered within neighborhood) (Raudenbush and Bryk 2002). In particular, since the dependent variable, *WTR*, is dichotomous, a multilevel logistic regression model can be employed to estimate the cross-level effects (Snijders and Bosker 1999). Given an original dweller *i*'s willingness to resettle within a neighborhood *j* ($WTR_{ij} = 1$), the model is described below:

$$\begin{aligned} WTR_{ij} = {} & \alpha_{0j} + \alpha_{1j}Gender_{ij} + \alpha_{2j}Age_{ij} + \alpha_{3j}Family_{ij} + \alpha_{4j}Income_{ij} + \alpha_{5j}Tenure_{ij} \\ & + \alpha_{6j}Dwell_{ij} + \alpha_{7j}Bond_{ij} + \alpha_{8j}Participation_{ij} + \alpha_{9j}Price_{ij} \\ & + \alpha_{10j}Estate_{ij} + \alpha_{11j}Completion_{ij} + \alpha_{12j}Core_{ij} \\ & + \alpha_{13j}Suburban_{ij} + \gamma_{ij} \end{aligned} \tag{2}$$

$$\begin{aligned} \alpha_{0j} = {} & \delta_{00} + \delta_{01}School_{1j} + \delta_{02}Subway_{2j} + \delta_{03}Bus_{3j} + \delta_{04}Publicservice_{4j} \\ & + \delta_{05}Park_{5j} + \delta_{06}Inequality_{6j} + \delta_{07}Cluster_{7j} + \mu_{0j} \end{aligned} \tag{3}$$

Whereas WTR_{ij} is represented as a function of the level-one model (2) (i.e., individual-level characteristics) explanatory variables, the random intercept and random slope are presented as functions of one or more contextual variables in the level-two model (3) (i.e., neighborhood-level characteristics). This method allows estimates of the overall relationship between individual-level (original residents) characteristics collected from the survey conducted in 2010 and neighborhood-level characteristics collected from census-based data by using spatial autocorrelation tools such as GeoDa and ArcGIS (Getis 2010). Spatial analysis was employed to address spatial cluster (income) within redevelopment districts and the variation between physical and social neighborhood-level characteristics that cannot be accounted for by social individual-level characteristics. Spatial clustering estimated by local spatial statistics (local Moran's *I* approach), indicating positive or negative autocorrelation values is useful in examining the extent of regional homogeneity (Anselin et al. 2010).

In terms of selected variables in the Eq. (3), access to neighborhood public services within a 500 m radius from each designated redevelopment district, such as average distance to public transportation services (*Bus* and *Subway*), average distance to elementary school (*School*), average distance to municipal public administrative office (*Public service*), and whether or not a park exists within a 500 m radius from a redevelopment district (*Park*) are included to take into consideration the influences of neighborhood-level built and natural amenity status on original residents' willingness to resettle. Although there is no strictly defined spatial boundary of neighborhoods (He and Wu 2007), a 500 m radius from each household center was used on this study to match the findings of Hwang and Kim (2008) in South Korea. Based on the income distribution of each respondent, inequality (*Inequality*) and spatial cluster attributes (*Cluster*), particularly focused on individual income level, were selected to address the effects of neighborhood economic characteristics on the residents' willingness to resettle. Corresponding to the influence of spatial clustering on resettlement of original residents, the cluster variable was dummy coded (i.e., 0 = negative Moran's *I* coefficient value, 1 = positive value).

In addition, as a natural extension of the binary logit model, a sequential logit model (i.e., sequential-response, hierarchical-response, or hierarchical logit model) was employed to address some levels in the sequence as a kind of multinomial-response model (Agresti 2002). Among the original residents who were willing to resettle, decisions about resettlement are made according to prior residents' willingness to pay (*WTP*) for resettlement after the redevelopment projects. Due to the gap between compensation cost for relocation

before redevelopment and the price of housing relocated after redevelopment, original inhabitants typically are under a financial burden (Ha and Kim 2001). In this context, the *WTP* is divided into three levels corresponding to the extent of the current housing sale price: 150, 180, and 200 %. Based on the work of Choi and Park (2009), original residents were generally not willing to pay more than 200 % of the current housing sale price. In knowing this, such a range of three levels is regarded as the appropriate financial burden of original residents. Whereas some original residents are willing to resettle if the resettlement fee was identified at 150 % ($WTP_{150} = 1$) of the current housing sale price of a new house constructed in the redevelopment area, others will not ($WTP_{150} = 0$). The range of percentage also reflects the residents' perception about current housing sales price evaluated in this study area or other areas.

With regard to the sequential process ($P_1 = WTP_{150}$, $P_2 = WTP_{180}$, and $P_3 = WTP_{200}$), the logistic probabilities can be elaborated as follows:

$$P_1 = F\left(\sum_{K1} \beta_{k1}\chi_{k1}\right)$$

$$P_2 = F\left(\sum_{k1}^{K1} \beta_{k1}\chi_{k1}\right) F\left(\sum_{k2}^{K2} \beta_{k2}\chi_{k2}\right)$$

$$P3 = F\left(\sum_{k1}^{K1} \beta_{k1}\chi_{k1}\right) F\left(\sum_{k2}^{K2} \beta_{k2}\chi_{k2}\right) F\left(\sum_{k3}^{K3} \beta_{k3}\chi_{k3}\right) \quad (4)$$

where $K1$, $K2$, and $K3$ indicate the sets of X variables included in levels I, II, and III, respectively. The parameters β_{K1} can be estimated by dividing the entire sample into two groups—these are identified as 150 % of a current housing sales price and the additional cost to determine whether or not the original inhabitants want to resettle. Coupled with the binary logit model, it is necessary to estimate $J - 1$ number of sets of parameters, with J being the total number of categories in the response. At this point, it is worthwhile to consider that in sequential models, the probability of choice among each level should be independent (Maddala 1983). That is, $K1$, $K2$, and $K3$ in Eq. (4) should be conceptually distinct and statistically independent from each other.

Similar to the model elaborated in Eq. (1), we can establish a new equation in accordance with the degree of *WTP* and original dweller *i*'s intention to pay for resettlement in a new redevelopment area *j*. The empirical model can be addressed by the following equation:

$$\begin{aligned} WTP_{ij} = f(&Gender_{ij}, Age_{ij}, Family_{ij}, Income_{ij}, Tenure_{ij}, Dwell_{ij}, Bond_{ij}, \\ &Participation_{ij}, Price_{ij}, Estate_{ij}, Completion_{ij}, Core_{ij}, Suburban_{ij}) \end{aligned} \quad (5)$$

In this Eq. (5), the WTP_{ij} represents that some original residents will resettle if the resettlement fee was determined in the three levels: 150 % ($WTP_{ij} = 1$) or not ($WTP_{ij} = 0$), 180 % ($WTP_{ij} = 1$) or not ($WTP_{ij} = 0$), and 200 % ($WTP_{ij} = 1$) or not ($WTP_{ij} = 0$).

4.2 Data collection and study area

As illustrated in Fig. 1, the study area of Busan is one of six major metropolitan areas within South Korea. In 2011, its population was roughly 3.5 million individuals.

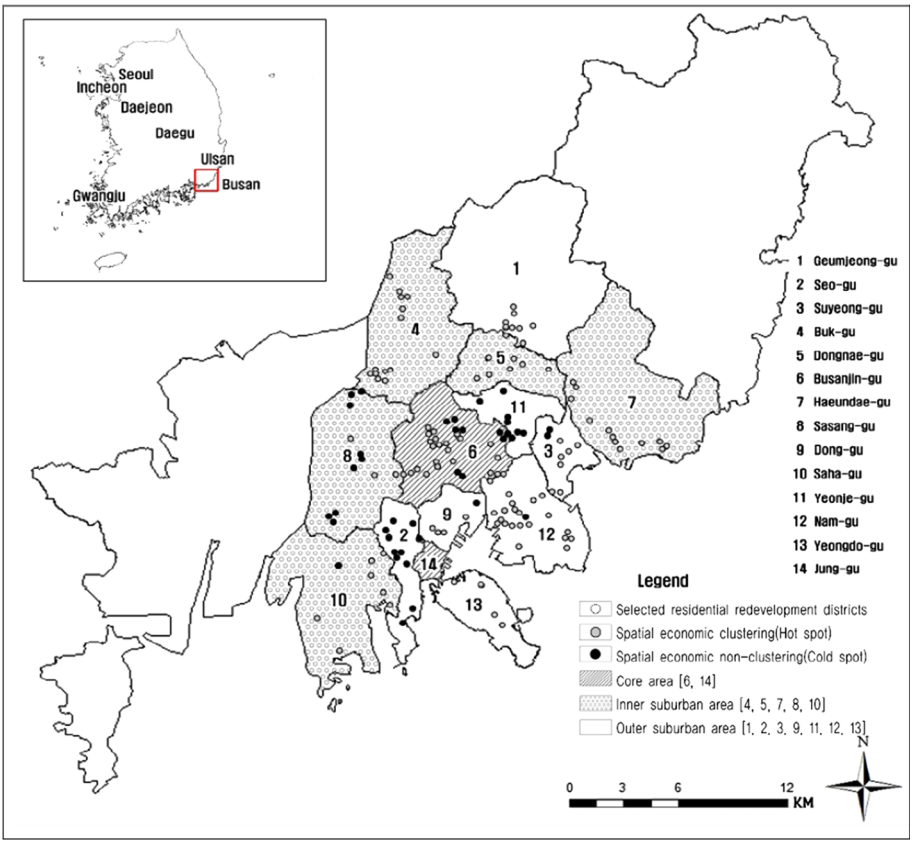

Fig. 1 Residential redevelopment districts and urban spatial configuration in the study area

According to the 2030 master plan for Busan (Busan Metropolitan City 2011b), the city is comprised of 16 administrative jurisdictions, otherwise referred to as 'gu.' In conjunction with the geographical hierarchical system, the 'gu' can be thought of as a county equivalent in the USA.

Embedded in the quasi-monocentric spatial structure and ethnically homogeneous social structure, Busan consists of an urban core, inner suburban area, and outer suburban area. Among the 16 'gu,' Jung-gu and Busanjin-gu are included in the core, containing an economic, political, intellectual, and cultural focus. The inner suburban area is made up of Haeundea-gu, Sasang-gu, Saha-gu, Dongnae-gu, and Buk-gu, which serve to support the urban core and enhance economic activities through tourism and manufacturing. The outer suburban area comprised of Geumjeong-gu and Nam-gu is primarily as residential.

Since 2001, the local government within Busan has designated 15 of the 16 gu (except Jung-gu) as redevelopment districts in an effort to improve deteriorated housing and residential areas. The designated areas comprise 152 redevelopment sub-districts. Since 14 redevelopment districts were under redevelopment and one district redevelopment project was canceled during this study period, 137 of 152 planned sub-districts (roughly 90 %) were selected as the study area (see Fig. 1). Based on the selected 137 redevelopment districts, a survey was conducted to examine original dwellers' willingness to resettle and

willingness to pay for resettlement. Questions and terminology were refined following small pilot surveys each with 10 residents in the 137 redevelopment districts.

Employing point-in-time survey methods, primary data were collected with an emphasis on the association between various characteristics of original dwellers' intention to reside in designated redevelopment areas. In 2011, 67,128 original residents existed within the designated redevelopment districts. The most accurate sampling frame of these original residents was compiled through the Korean Statistical Information Service (KSIS), for which 20,138 dwellers (30 % of total residents in the redevelopment districts) were randomly selected to represent the survey population. While urban residential redevelopment projects take place in South Korea, there is a difference between homeowners and eligible (or ineligible) tenants, in particular with respect to compensation derived from the projects (Shin 2008). In addition, neighborhoods under residential redevelopment projects accommodate a number of ineligible tenants who may not be eligible to receive the compensation. Such differences between eligible (or ineligible) tenants and homeowners in the process of redevelopment can have an influence on willingness to resettle or willingness to pay for resettlement. In this context, residential redevelopment projects give rise to different impacts on eligible (or ineligible) tenants and poor homeowners and then this can result in various modes of urban contestation and politics (e.g., "poor owner-occupiers and unaffordable redevelopment cost," "tenants' permanent displacement and their frustration," "redevelopment compensation for tenants") (Shin 2008, p. 414; 2009a, p. 914).

In line with the Ha (2004, p. 383; 2007, p. 123) and Ha and Kim (2001), this study has a limitation that it failed to specifically describe tenure type (both owners and tenants) in relation to 'whether they (original residents) lived in the area before renewal project or not' and 'they moved out from the newly developed area' before the survey was conducted. Instead, without such differentiated household tenure type or tenants group, we surveyed eligible tenants who have lived in the redevelopment projects. As a result, the tenants were divided into homeowners and renters (see Table 1).

In order to secure more accurate estimates in different parts of the study areas and reduce sampling error, a stratified random sample was employed in proportion to the population density stratum within each study area. A total of 1854 inhabitants were included in the final sample, resulting in an effective response rate of approximately 31 % (i.e., 1854 of 6041 respondents). Given that it would take extensive effort, 6041 residents were selected in accordance with each of the roughly 30 % levels of the redevelopment project districts. Following the tailored design method put forth by Dillman et al. (2009), questionnaires were mailed to individual residences using multiple contacts.

The questionnaire was comprised of three sections. The first section included Likert-type questions pertaining to social involvement with the neighborhood, residents' perceptions of housing prices, and residents' participation in the redevelopment project. The second section, primarily dealing with Likert-type questions, encompassed resettlement choices, whereby only respondents who determined to resettle were asked to indicate their willingness to pay for resettlement designated by three levels. The last section of the questionnaire contained items regarding socio-demographic and household characteristics such as income, age, gender, duration of dwelling, and tenure (e.g., homeowner or renter). The initial mailing of the questionnaire began in April 2011 and was followed by postcard reminders and telephone calls to increase response rates. Such reminders occurred until June 2011.

In addition, to address the characteristics of urban spatial structure and clustering within this study area, secondary data were collected from the KSIS. With an emphasis on the cross-level effects between original residents and neighborhood environments, various

Table 1 Concept measurement

Variable name	Obs			Mean	SD	Range	Definition/measurement
Dependent variables							
WTR[a]	1854	0 = 866 1 = 988		0.533	0.499	0–1	Willingness to resettle in residential redevelopment districts: 0 = not resettle, 1 = resettle
WTP[b]	988[c]	150 %	0 = 226 1 = 762	0.775	0.417	0–1	Willingness to pay for resettlement: 0 = not willing to pay, 1 = willing to pay
	762[d]	180 %	0 = 433 1 = 329	0.432	0.495	0–1	
	329[e]	200 %	0 = 176 1 = 153	0.466	0.499	0–1	
Independent variables: Individual characteristics (Level I)							
Socio-demographic and household attributes							
Gender	1854		1 = 952 0 = 902	0.513	0.500	0–1	Gender: 1 = male, 0 = female
Age	1854		1 = 74 2 = 230 3 = 555 4 = 688 5 = 307	3.498	1.034	1–5	Age: 1 = less than the twenties, 2 = the thirties, 3 = the forties, 4 = the fifties, 5 = more than the sixties
Family	1854		1 = 84 2 = 420 3 = 547 4 = 650 5 = 153	3.198	1.025	1–5	Family size: 1 = one person, 2 = two persons, 3 = three persons, 4 = four persons, 5 = five persons
Income	1854		1 = 270 2 = 579 3 = 533 4 = 393 5 = 79	2.694	1.088	1–5	Household income level: 1 = <1,499,000 won,* 2 = 1,500,000 to 2,499,000, 3 = 2,500,000 to 3,499,000, 4 = 3,500,000 to 4,499,000, 5 = more than 4,500,000
Tenure	1854		1 = 1203 0 = 651	1.351	0.477	0–1	Housing tenure: 1 = owner, 0 = renter

Table 1 continued

Variable name	Obs		Mean	SD	Range	Definition/measurement
Social involvement attributes						
Dwell	1854	1 = 251 2 = 616 3 = 394 4 = 296 5 = 297	2.877	1.288	1–5	Length of residence: 1 = <5 years, 2 = 5 to <10 years, 3 = 10 to <15 years, 4 = 15 to <20 years, 5 = more than 20 years
Bond	1854	1 = 40 2 = 324 3 = 1035 4 = 423 5 = 32	3.045	0.746	1–5	Residents' perception of neighborhood bond: 1 = very dissatisfied, 2 = dissatisfied, 3 = neither dissatisfied nor satisfied, 4 = satisfied, 5 = very satisfied
Participation	1854	1 = 50 2 = 364 3 = 763 4 = 624 5 = 53	3.143	0.857	1–5	The degree of residents' participation in the process of redevelopment project: 1 = very dissatisfied, 2 = dissatisfied, 3 = neither dissatisfied nor satisfied, 4 = satisfied, 5 = very satisfied
Price	1854	1 = 32 2 = 213 3 = 685 4 = 871 5 = 53	3.378	0.791	1–5	The degree of housing price change: 1 = big falling, 2 = falling, 3 = neither big falling nor falling, 4 = rising, 5 = big rising
Redevelopment project attributes						
Estate	1854	1 = 66 2 = 351 3 = 596 4 = 739 5 = 102	3.248	0.943	1–5	The degree of real estate variation: 1 = very dissatisfied, 2 = dissatisfied, 3 = neither dissatisfied nor satisfied, 4 = satisfied, 5 = very satisfied

Table 1 continued

Variable name	Obs		Mean	SD	Range	Definition/measurement
Completion	1854	1 = 370 2 = 597 3 = 420 4 = 467	2.531	1.074	1–4	The period of redevelopment project completion: 1 = <3 years, 2 = 3 to 5 years, 3 = 6 to 8 years, 4 = more than 9 years
Urban structure effect attributes[f]						
Core	1854	0 = 1512 1 = 342	0.184	0.388	0–1	Core and high-density urban area: 0 = otherwise, 1 = urban core area (inner)
Suburban	1854	0 = 926 1 = 928	0.501	0.500	0–1	Mature and emerging suburban area: 0 = otherwise, 1 = suburban area (inner)
Independent variables: Neighborhood characteristics (Level II)**						
Accessibility to social service and amenity attributes[g]						
School	137		272.5	94.01	70.38–474.46	Average distance to elementary school within an area in a 500 m radius from a redevelopment district (m)
Subway	137		253.2	120.4	75.56–491.48	Average distance to subway station within an area in a 500 m radius from a redevelopment district (m)
Bus	137		274.5	62.85	154.91–466.00	Average distance to bus station within an area in a 500 m radius from a redevelopment district (m)
Public service	137		240.8	94.25	61.59–443.89	Average distance to municipal public administrative office within an area in a 500 m radius from a redevelopment district (m)
Park	137	0 = 132 1 = 5	0.036	0.187	0–1	Whether or not there is a park within an area in a 500 m radius from a redevelopment district: 1 = yes, 0 = no)

Table 1 continued

Variable name	Obs		Mean	SD	Range	Definition/measurement
Economic inequality and spatial clustering attribute						
Inequality	137		0.195	0.057	0–0.381	Gini coefficients based on income distribution of each respondent in survey
Cluster[h]	137	0 = 54 1 = 83	0.605	0.488	0–1	0 = less than 0 (negative Moran's *I* coefficient value), 1 = more than 0 (positive Moran's *I* coefficient value)

[a] dependent variable in binary logit model and multilevel analysis, [b] dependent variable in sequential logit model, [c] total number of willingness to resettle, [d] total number of willingness to pay for 150 % of current housing sale price, [e] total number of willingness to pay for 180 % of current housing sale price, [f] census-based estimates, [g] geographical information system-based estimates, [h] recoded value

* about 1100 won is 1US$, ** each 137 redevelopment districts

neighborhood facility characteristics including proximity to elementary schools, municipal administrative offices, and public transportation systems from each redevelopment district (within a 500-m radius of the redevelopment district center) were analyzed. Supported by the hypothesis that income level of original dwellers is closely associated with the willingness to resettle, economic inequality and spatial clustering attributes were measured using Gini coefficients and spatial statistics, respectively. In particular, Moran scatterplots and local Moran's *I* statistics can be used to assess spatial pattern and clustering (Anselin et al. 2010) among original residents or redevelopment districts.

4.3 Descriptive statistics

Based on multilevel characteristics, descriptive statistics of the socio-demographic and household, social involvement, redevelopment project, urban structure effect attributes, accessibility to social services attributes, economic inequality, and spatial cluster attribute across the study area are presented in Table 1. More than half of all respondents who reside in the redevelopment project areas preferred to move to another residential area through cash liquidation rather than resettlement.

The left side in Fig. 2 depicts the willingness to resettle according to tenure types across five different income levels. Among renters, willingness to resettle gradually increased as income level increased up to an increase of approximately 50 % at the highest income level. Every renter surveyed with income of at least 4.5 million won (one US dollar is the equivalent of 1100 won) per month was willing to resettle. Comparing the two tenure types, homeowners with an income level below 3.5 million won were more willing to resettle than renters at the same income level. The opposite was true for the two tenure types at an income level of at least 3.5 million won per month, with renters indicating they were more likely to resettle.

To assess residents' willingness to pay, individuals were asked to consider resettlement at three levels, 150, 180, and 200 %, of the current housing sale prices (see Table 1). Roughly 77 % of the total respondents ($n = 762$) claimed they "would pay 150 % of the previous assets," whereas the remaining participants ($n = 226$) indicated they "would not pay." This result suggests that a higher financial burden for original residents may explain a lower willingness to pay for resettlement. More specifically, about 80 % of the

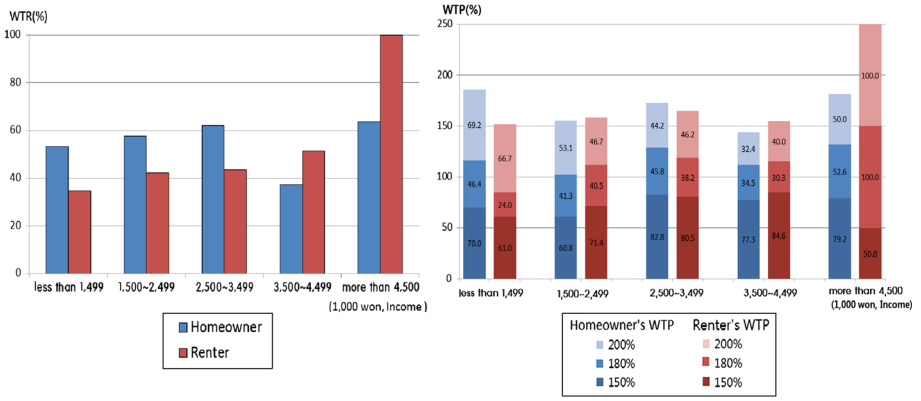

Fig. 2 Relationship between income level by tenure and willingness to resettle (*left*) and willingness to pay for resettlement (*right*) in the study area. *Source* Author's calculation based on survey

respondents had between two and four members in their household and made as much as 3.5 million won per month. More than half of the respondents who lived with their children or married children were long-term residents (i.e., more than 10 years) and also owned their house. This finding indicates that most of the residents who lived in the study area were content with the neighborhood in which they reside.

In response to the question concerning housing price variation following the completion of the redevelopment project, roughly 20 % of the respondents predicted that the price would rise. With respect to the association between willingness to pay for resettlement and income level by tenure, the right side in Fig. 2 shows that willingness to pay for resettlement by original residents is fairly consistent in the range of approximately 145–180 %, regardless of income level. One exception to this is for the income level of 4.5 million won or more for renters. There is a dramatic increase of approximately 100 % at the highest income level for renters.

Following descriptive analyses, nonparametric statistical relationships were then considered. While most explanatory variables were significantly correlated (in a positive direction) with *WTR* and *WTP* at the 0.01 and 0.05 alpha levels (Kendall's tau-b with a range of 0.097 to 0.161), *Tenure* and *Completion* were significantly correlated (in a negative direction) with the two dependent variables at the 0.05 alpha level (Kendall's tau-b $= -0.158$ and -0.137, respectively). This finding suggests that as a rule, greater social involvement and the status of the redevelopment project status tend to contribute to a higher likelihood of original residents' resettlement.

Accessibility to social service amenities (e.g., elementary schools, subway and bus stations, municipal facilities) ranged from 70 to 490 m away from redevelopment sites within the study area. Proximity to natural amenities was somewhat lower as indicated by the fact that only five of the 137 redevelopment districts had a neighborhood park within 500 m. Based on the income distribution among respondents (i.e., original residents in 137 redevelopment districts), economic inequality measured by Gini index was very low, ranging from 0 to 0.38. The residents' income Moran's *I* coefficients ranged between -0.685 and 0.474, with significant at the 0.1 % level. In accordance with whether these local Moran coefficients were negative or positive, the average recoded spatial autocorrelation (clustering) value was 0.605.

5 Empirical results

5.1 Original residents' willingness to resettle and socio-spatial differentials

A binary logistic regression was used to determine the likelihood that a factor was related to the dwellers' intentions to resettle in the study area, together with the coefficients odds ratio of the explanatory variables (see Table 2). Regarding socio-demographic and household characteristics (in the case of *Model 1* (1) and *Model 3* (1) of Table 2), *Gender* and *Tenure* were likely to be contributing predictors affecting the decision for residential resettlement at the 0.05 alpha level or better. In many societies, women tend to be more realistic than men in terms of their financial forecast taking into consideration various household needs. Inconsistent with this general proposition on gender disparity in resettlement, this study revealed that men (*Gender*) are more willing to resettle in redevelopment districts than women. This finding potentially suggests that men might be more apt to adjust to new environments given the circumstances of relocating. Based on an odds ratio of 1.870 for *Tenure*, original

Table 2 Willingness to resettle and socio-spatial differentials

	Model 1			*Model 2*			*Model 3*		
	(1)	(2)	(3)	(1)	(2)	(3)	(1)	(2)	(3)
Intercept	−0.513	−0.799**	−0.186	−1.622**	−2.145**	−0.750	−1.932**	−2.403**	−0.895
Socio-demographic and household attributes									
Gender	0.228* [1.257]	0.350** [1.420]	−0.045 [0.956]				0.243* [1.275]	0.385** [1.470]	−0.091 [0.913]
Age	−0.058 [0.943]	−0.012* [0.883]	0.010 [1.010]				−0.064 [0.937]	−0.165** [0.848]	0.018 [1.019]
Family	0.113* [1.121]	0.189** [1.209]	0.064 [1.066]				0.095 [1.100]	0.156* [1.169]	0.064 [1.066]
Income	0.063 [1.065]						0.059 [1.062]		
Tenure	0.626** [1.870]	0.705** [2.023]	0.517** [1.677]				0.518** [1.679]		
Social involvement attributes									
Dwell				0.047 [1.049]	0.039 [1.040]	0.059 [1.061]	0.008 [1.009]	0.641** [1.899]	0.391* [1.479]
Bond				0.252* [1.287]	0.329** [1.389]	0.153 [1.165]	0.230* [1.259]	0.011 [1.011]	0.015 [1.015]
Participation				0.114 [1.121]	0.150* [1.162]	0.060 [1.062]	0.099 [1.105]	0.305** [1.356]	0.139 [1.150]
Price				0.162* [1.176]	0.240** [1.271]	−0.029 [0.971]	0.154* [1.167]	0.142 [1.153]	0.058 [1.060]
Redevelopment project attributes									
Estate				0.219** [1.246]	0.214** [1.239]	0.210* [1.234]	0.188* [1.208]	0.174* [1.191]	0.183* [1.201]
Completion				−0.256** [0.774]	−0.354** [0.702]	−0.119 [0.888]	−0.255** [0.775]	−0.368** [0.692]	−0.112 [0.894]

Table 2 continued

	Model 1			*Model 2*			*Model 3*		
	(1)	(2)	(3)	(1)	(2)	(3)	(1)	(2)	(3)
Urban structure effect attributes									
Core	−0.438* [0.645]			−0.318* [0.728]			−0.350 [0.704]		
Suburban	−0.248* [0.780]			−0.105 [0.900]			−0.182 [0.833]		
Spatial Clustering	No	Yes (positive spatial autocorrelation)[a]	Yes (negative spatial autocorrelation)[b]	No	Yes (positive spatial autocorrelation)	Yes (negative spatial autocorrelation)	No	Yes (positive spatial autocorrelation)	Yes (negative spatial autocorrelation)
Number of obs	1854	1255	599	1854	1255	599	1854	1255	599
Likelihood Ratio	75.03**	63.44**	10.55*	117.73**	110.61**	15.17*	163.91**	162.32**	21.02*
Score	74.03**	62.22**	10.59*	113.93**	105.13**	14.99*	157.15**	152.20**	20.78*
Wald	71.61**	59.78**	10.49*	107.04**	96.14**	14.61*	145.10**	135.26**	20.13*

Dependent variable: *WTR*, Odds ratios in bracket

* $P < 0.05$, ** $P < 0.01$

[a] Moran's *I* coefficient value is more than 0, [b] Moran's *I* coefficient value is less than 0

residents who own their house were roughly 0.53 times as likely to resettle in the study area as respondents who did not own a home. Such a finding is in keeping with the work of Choi and Park (2009), which examined the role of household characteristics in determining willingness to resettle in the new residential redevelopment area.

With an emphasis on the relationship between socio-spatial differentials and resettlement as depicted in (2) and (3) of *Models 1* and *3* in Table 2, differences in the degree of resettlement preferences exist. In particular, the *Tenure* variable, representing an economically significant component in original residents' intention to resettle, definitely shows the social and spatial differentials in accordance with the spatial economic cluster (see *Model 1* (2) and (3)). Original residents who own their home are about 0.49 times as likely to resettle as respondents who have their home in areas with a similar economic level (in particular, income). This result suggests that as a whole, original residents living in areas with similar economic level have a higher tendency to resettle than their counterparts.

In terms of social involvement and redevelopment project attributes, as described in *Models 2* and *3* of Table 2, most variables tended to be significant drivers influencing the original residents' preference for resettlement in the study area (at the 0.05 alpha level or better). This finding suggests that the residents who need to determine whether they resettle or move to other residential areas are likely to estimate that when the redevelopment project begins, housing price or land value will rise in the short term and then the project will provide them potential economic benefits (Ha and Kim 2001). As depicted in Fig. 3, this trend also existed in the area surrounding this study area before and after redevelopment projects. Economic outcome for a household can be regarded as the most important factor for resettlement.

Consistent with the basic assumption and the findings of the work of Choi and Park (2009) and Yun and Jung (2011), that a dweller interested in the redevelopment project with direct or indirect participation and a resident who has a strong relationship with neighbors is related to a higher intention to resettle, both *Participation* and *Bond* variables

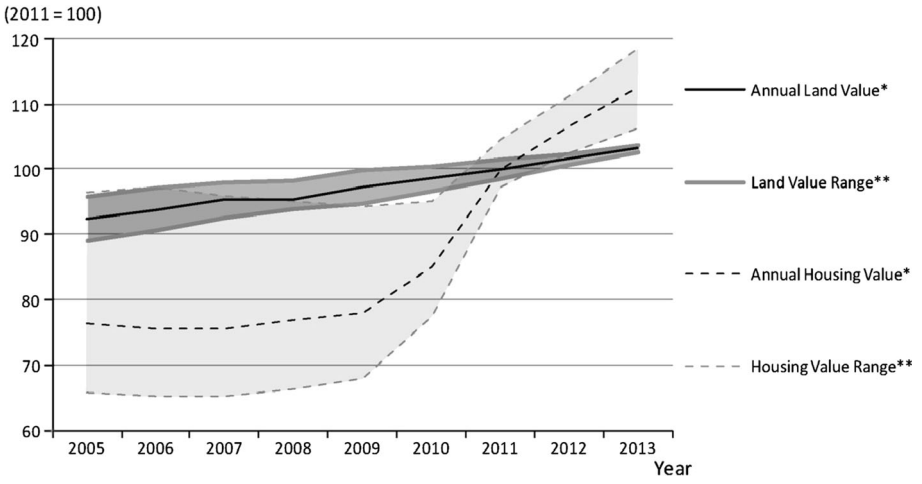

Fig. 3 Changing land value and housing value before and after redevelopment project (2011) in the area surrounding the study area. *Source*: Korea's official statistical web site: http://www.onnara.go.kr/index and http://kosis.kr/. *Note*: *Busan (as area surrounding this study area)'s land value and housing value change, **Gu's (as area surrounding this study area) land value and housing value change, *dark gray* indicates land value range, *light gray* indicates housing value range

are likely to be a significant factor determining the resettlement intention of original dwellers. This finding suggests that the better a residents' social networking conditions, such as relationships with neighbors and the participation for social activities, the higher the probability of resettling.

As noted in (2) and (3) of *Models 2* and *3* in Table 2, regarding the correlation between socio-spatial differentials (i.e., spatial economic clustering) and original habitants' willingness to resettle, *Price* and *Completion* variables are more likely to be significant factors in areas with similar economic level. Among them, the *Completion* variable, indicating that former residents' perception of the redevelopment project, shows social and spatial differences. Original residents in a similar economic level-based area who are satisfied with the short completion period of the redevelopment project are unlikely to resettle.

As depicted in Table 3, multilevel modeling was employed in an attempt to examine residential resettlement corresponding to the effect of individual characteristics and neighborhood characteristics. Similar to the result of Table 2, overall individual characteristic variables, *Gender*, *Income*, *Tenure*, *Bond*, *Price*, and *Estate*, are estimated as drivers affecting resettlement at the 0.05 alpha level or better. Neighborhood characteristics influencing residents' willingness to resettle include *Subway*, *Park*, and *Cluster* variables. Spatial clustering attributes associated with income level had a positive influence on resettlement. Given residents and their neighbors have a somewhat similar income level, the residents were more likely to resettle. Such findings indicate that transportation facilities, amenity attributes, and economic similarity have some effect on residents' decision to resettle in the new residential development area.

5.2 Original residents' willingness to pay for resettlement and socio-spatial differentials

As depicted in Table 4, the first level was employed to find out the determinants of resettlement of the original inhabitants, provided that current home values are estimated at 150 % of the sale price of a newly constructed home in the redevelopment area. With respect to the socio-demographic and household characteristics, only the *Age* variable tended to be a significant predictor affecting the decision for residential resettlement at the 0.05 alpha level (see *Model 7* (1) of Table 4). Contrary to the general assumption that older individuals have tighter bonds with the community than younger people and are not willing to move(Choi and Park 2009), results suggest that older residents in the current study were about 1.33 times as unlikely to resettle as younger respondents. In terms of socio-spatial differentials, older residents were about 1.38 times as unlikely to resettle in the residential redevelopment districts as younger respondents in the areas with a similar economic level. Provided that younger people play a more important role in economic growth than older residents in areas with similar economic level, this result suggests that the younger residents are more willing to resettle the redevelopment districts to maintain their economic activities rather than move to other residential areas. In addition, we can assume that due to financial constraints elderly residents may face and their intention to give more financial opportunities to their children, the older dwellers are more likely to leave the neighborhood than younger ones.

In the context of social involvement and redevelopment project characteristics, *Price* and *Completion* were statistically significant factors at the 0.05 alpha level. Consistent with the results of Table 2, the results suggest that the higher the degree of value change after the redevelopment project contributes to a higher resettlement rate, while a faster redevelopment project completion will have a positive influence on the resettlement of the

Table 3 Multilevel model estimating residential resettlement[†]

	Model 4	*Model 5*	*Model 6*
Intercept	−2.25* (1.21)	−1.68 (1.06)	−2.05 (1.26)
Fixed effects			
Individual characteristic variables (level one)			
Socio-demographic and household attributes			
Gender	0.32* (0.18)	0.32* (0.18)	0.31* (0.18)
Age	−0.12 (0.09)	−0.15 (0.09)	−0.13 (0.09)
Family	0.10 (0.09)	0.18* (0.09)	0.10* (0.09)
Income	0.18* (0.10)		
Tenure	0.68* (0.28)	0.75* (0.30)	0.67 (0.07)
Social involvement attributes			
Dwell	−0.04 (0.07)	−0.04 (0.07)	−0.04 (0.07)
Bond	0.43* (0.18)	0.42* (0.18)	0.42* (0.18)
Participation	0.10 (0.10)	0.09 (0.10)	0.11 (0.10)
Price	0.35* (0.16)	0.38* (0.16)	0.35* (0.16)
Redevelopment project attributes			
Estate	0.21* (0.11)	0.21* (0.11)	0.22* (0.11)
Completion	−0.28* (0.12)	−0.28** (0.12)	−0.27* (0.12)
Neighborhood characteristic variables (level two)			
Accessibility to social service and amenity attributes			
School	−0.001 (0.001)		−0.001 (0.001)
Subway	0.005* (0.0009)		0.005* (0.0009)
Bus	0.0006 (0.002)		0.0005 (0.002)
Public service	0.0007 (0.001)		0.004 (0.001)
Park	1.15* (1.00)		1.28* (1.01)
Economic inequality and spatial clustering attributes			
Inequality		0.38 (2.36)	0.27 (2.44)
Cluster		0.21* (0.28)	0.35* (0.30)
Random effects			
Neighborhood characteristic level	0.92* (0.66)	0.84* (0.63)	0.86* (0.63)
Number of obs/groups	1854/137		
Log likelihood	−117.19	−117.18	−116.33
Wald Chi^2	8.69*	8.21*	8.44*

[†] dependent variable: *WTR*, standard errors in parentheses

* $P < 0.05$, ** $P < 0.01$

original dwellers. However, in considering the connection of *Price* with social and economic components, no definitive relationships between the two determinants and spatial economic clustering were found.

Given that the current home price was 180 % of the sales price of newly constructed homes, a second level (see *Model 8* of Table 4) was used to connect resettlement determinants with socio-spatial differentials. Statistically significant factors included *Gender*, *Income*, *Participation*, *Price*, and *Completion* at the 0.05 alpha level or better. Similar to Model 1 of Table 2, *Price* in *Model 8* was also negatively associated with *WTP*. In terms of

Table 4 Willingness to pay and socio-spatial differentials[†]

	Model 7			*Model 8*			*Model 9*		
	(1)	(2)	(3)	(1)	(2)	(3)	(1)	(2)	(3)
Intercept	3.114**	3.404**	2.842*	0.045	0.837	−0.496	0.166	−1.725	3.405
Socio-demographic and household attributes									
Gender	0.231 [1.260]	0.368* [1.445]	−0.014 [0.986]	0.381* [1.464]	0.287 [1.333]	0.379 [1.461]	0.079 [1.082]	0.092 [1.096]	0.134 [1.144]
Age	−0.283* [0.754]	−0.324** [0.723]	−0.209 [0.812]	0.036 [1.037]	−0.075 [0.928]	−0.012 [0.989]	0.214 [1.240]	0.083 [1.087]	0.072 [1.075]
Family	−0.028 [0.972]	−0.401 [0.960]	0.251 [1.286]	0.091 [1.096]	0.236* [1.267]	0.079 [1.083]	0.094 [1.099]	0.168 [1.182]	−0.161 [0.852]
Income	0.099 [1.104]			0.186* [1.205]			−0.127 [0.880]		
Tenure	0.354 [1.425]	0.387 [1.472]	0.538 [1.712]	0.202 [1.225]	0.571* [1.770]	−0.222 [0.801]	−0.464 [0.629]	−0.272 [0.762]	−0.574 [0.563]
Social involvement attributes									
Dwell	0.111 [1.118]	0.162 [1.176]	−0.006 [0.994]	0.098 [1.103]	0.022 [1.022]	0.322** [1.380]	0.199 [1.221]	0.444** [1.559]	0.092 [1.097]
Bond	−0.112 [0.893]	−0.168 [0.845]	−0.039 [0.962]	−0.076 [0.926]	−0.059 [0.942]	0.007 [1.007]	−0.107 [0.899]	0.075 [1.078]	−0.334 [0.716]
Participation	−0.095 [0.909]	−0.136 [0.873]	−0.067 [1.069]	0.180 [1.198]	0.098 [1.103]	0.270 [1.311]	0.169 [1.185]	0.179 [1.196]	0.287 [1.333]
Price	0.249* [0.779]	−0.282* [0.754]	−0.246 [0.782]	−0.485** [0.615]	−0.209 [0.811]	−0.946** [0.388]	−0.301 [0.740]	−0.114 [0.892]	−0.872** [0.418]
Redevelopment project attributes									
Estate	−0.030 [0.970]	0.143 [1.154]	−0.204 [0.815]	0.004 [1.004]	−0.148 [0.862]	0.325* [1.384]	0.075 [1.079]	0.047 [1.048]	0.184 [1.202]
Completion	−0.174* [0.840]	−0.152 [0.859]	−0.170 [0.844]	−0.286* [0.751]	−0.497** [0.608]	0.082 [1.085]	−0.327* [0.721]	−0.611** [0.543]	−0.192 [0.825]

Table 4 continued

	Model 7			*Model 8*			*Model 9*		
	(1)	(2)	(3)	(1)	(2)	(3)	(1)	(2)	(3)
Urban structure effect attributes									
Core	1.055* [2.872]			0.142 [1.153]			0.080 [1.084]		
Suburban	0.389* [1.477]			0.020 [1.021]			−0.183 [0.832]		
Spatial clustering	No	Yes (positive spatial autocorrelation)[a]	Yes (negative spatial autocorrelation)[b]	No	Yes (positive spatial autocorrelation)	Yes (negative spatial autocorrelation)	No	Yes (positive spatial autocorrelation)	Yes (negative spatial autocorrelation)
Number of obs	982	631	351	760	484	276	328	213	115
Likelihood ratio	54.31**	30.57**	15.66*	60.95*	40.77**	52.87**	33.19*	28.17**	14.48
Score	52.65**	29.47**	15.69*	58.59*	39.19**	48.55**	31.77*	26.65**	13.13
Wald	49.52**	27.95**	14.90	54.14*	36.34**	40.45**	29.03*	23.69**	11.81

† dependent variable: *WTP*, odds ratios in bracket

* $P < 0.05$, ** $P < 0.01$

[a] Moran's *I* value is more than 0, [b]Moran's *I* value is less than 0

urban spatial structure, there remains a different odds ratio for *Price* in *Model 8*. This finding indicates that the higher the degree of value change after a redevelopment project will contribute to a higher resettlement.

Additionally, as a statistically significant driver, *Completion* was negatively correlated with *WTP* at the 180 % level. This result suggests that shorter redevelopment project completion can lead to a higher willingness to pay among original residents. In other words, if the period of redevelopment project completion is shortened, more original residents may be willing to resettle rather than move to other residential areas. This similar association also was obviously taken into account under the 200 % level (see *Model 9* of Table 4). Consequently, findings indicate that the inhabitants in the residential districts appear not to have adequate recognition of the compensation policies. Original residents do not seem to be satisfied with the compensation policies offered in the process of housing redevelopment projects. It is important to note that to promote residential redevelopment projects smoothly, it appears necessary to establish an easily accessible institution which provides original residents with accurate information about compensation costs.

6 Conclusions and discussion

Over time, numerous endeavors have been employed to alleviate the decline of urban infrastructure, including diverse redevelopment projects in residential areas. Through the improvement in residential environments, the goals associated with redevelopment and expansion of urban infrastructure can be achieved. As one of numerous urban concerns, housing redevelopment projects focused on the resettlement of original dwellers should be a priority for sustainable community development (Ha 2007).

Based on a survey of original residents of 137 residential redevelopment districts within a major South Korean metropolitan area, resettlement determinants and willingness to pay for resettlement were explored. Among various factors derived from the previous studies, gender, housing types, housing price variation, neighborhood bonds, and completion period for the redevelopment project were selected as resettlement determinants. Due to a higher likelihood of housing value increase after redevelopment (Ha and Kim 2001), residents were more likely to be willing to resettle. In addition to housing value and similar to findings of previous research, original residents by and large were not satisfied with their current income status and felt the need to relocate to redeveloped districts for economic gain.

As suggested by Choi and Park (2009) and Ndezi (2009), the better a residents' social networking conditions (e.g., relationships with neighbors and the participation in the redevelopment project), the higher the probability for resettlement. When it comes to original dwellers' willingness to pay for resettlement (based on the current home values), cost was associated with the economic status of households and willingness of younger residents to pay. Combined with the role of redevelopment in raising housing prices, original residents were more likely to absorb the higher cost (i.e., a greater willingness to pay). Furthermore, a higher willingness to pay was also correlated with a shorter completion period for the redevelopment project.

Even though many residential redevelopment projects have been halted primarily due to the lack of business value since the financial crisis in 2007–2008 (Lim et al. 2013), the aim of many recent residential redevelopment projects in South Korea has been profit focused. Most of the original inhabitants, however, cannot afford to resettle even though they would

like the opportunity. Thus, affordable housing policies and the expansion of the supply of rental housing can enhance resettlement in the original residential area. The social and economic statuses of former residents should be taken into account in the process of redevelopment. For instance, when the original residents have financial trouble resettling, appropriate housing sale prices can be arranged based on public–private partnerships among original residents, redevelopment corporations, and local or national government agencies. More importantly, the role of the public sector (in particular the central government) is essential in financial support, rather than relying primarily on the private sector in the current redevelopment projects in South Korea (Lim et al. 2013).

Human interaction (e.g., relationships between original residents, redevelopment corporations, and government agencies) and "stable community and strong neighborhood relations" (Ha 2007, p. 126) can be a pivotal component, in particular in the context of dynamic and complex redevelopment projects. For this reason, it is imperative to underline that original residents' intentions as well as specific preferences for resettling should be fully reflected in order to encourage such individuals to resettle in these redeveloped residential areas. Furthermore, this social consideration and support, in particular for those who cannot afford rising home prices in residential redevelopment, will be helpful to enhance the degree of resettlement of former residents and "transform dilapidated neighborhoods into a more profitable space" (Shin 2007, p. 164).

In contrast to prior research that assumes a homogeneous correlation across the entire study area, this study employed empirical models (including spatial clustering analysis) based on a survey of residents' responses after the redevelopment projects had begun. Despite the novelty of this study focusing on willingness to resettle in redeveloped areas and willingness to pay for such resettlement, limitations exist for the work. Given the limited study area based exclusively on metropolitan Busan, South Korea, some would assert that generalizing the empirical findings to other locations is problematic. For this reason, future research should embrace additional study areas, including other cities within South Korea as well as those in China, the United States, and throughout Europe. These broad viewpoints can help contribute to cross-national comparisons concerning resettlement and residential redevelopment.

Primarily focused on cross-sectional survey data, this study is limited in its ability to estimate how original residents' intention to resettle and pay for resettlement will change based on related regulations or policy changes (Shin 2009a, b). Future studies should consider additional variables such as those put forth by Ha (2004), Ha and Kim (2001), and He and Wu (2007) in an effort to compare the effect of housing and redevelopment characteristics (e.g., residents' perceptions on wealth increase, change in housing price, comparison of actual resettlement and willingness to resettlement, change in housing type, housing ownership, and income) before and after the redevelopment project. Future studies should include longitudinal data or panel data based on a follow-up survey conducted to see whether residents' perceptions on resettlement changed over a period of time. Since questionnaires used in this study primarily contained closed-ended questions, various qualitative perceptions and opinions concerning resettlement of residential redevelopment may not be easiest to ascertain. In an effort to examine the degree to which residential resettlement has had a positive influence on the lives of those involved, future work should assess residents' job status (i.e., type of job, employment throughout the resettlement process, and perceptions about the effects of job selection on resettlement) with respect to household and individual status. For this reason, survey instruments used in future studies should incorporate more open-ended questions, in particular about willingness to pay for

the resettlement. Such resulting qualitative data will serve to complement existing quantitative data in providing a more robust understanding of resettlement.

As mentioned, when urban residential redevelopment projects take place in South Korea, there is a difference between homeowners and eligible (or ineligible) tenants, in particular in terms of compensation derived from the projects (Shin 2008). In addition, neighborhoods under residential redevelopment projects accommodate those who may not be eligible to receive the compensation. Such difference between (or ineligible) tenants and homeowners in the process of redevelopment can have an influence on willingness to resettle or to pay for resettlement. Future work should incorporate such distinctions to determine the role such compensation plays in resettlement.

References

Act on the Maintenance and Improvement of Urban Areas and Dwelling Conditions for Residents (AMIUDCR, 2012). Korea Ministry of Government Legislation. Available at: http://www.law.go.kr/eng;.sSc.do?menuld=0&subMenu=5&query=#1:Bgcolor34. Accessed Feb 2015

Agresti, A. (2002). *Categorical data analysis* (2nd ed.). Hoboken, NJ: Wiley-Interscience.

Anselin, L., Syabri, I., & Kho, Y. (2010). GeoDa: An introduction to spatial data analysis. In M. M. Fischer & A. Getis (Eds.), *Handbook of applied spatial analysis: Software tools, methods and applications* (pp. 73–89). London and New York: Springer.

Ball, M., & Maginn, P. J. (2005). Urban change and conflict: Evaluating the role of partnerships in urban regeneration in the UK. *Housing Studies, 20*(1), 9–28.

Busan Metropolitan City. (2011a). *The 2020 masterplan for urban and housing or living environment renewal*. Available at: http://renewal.busan.go.kr/information/data2.asp?Menusinformation9. Accessed Jan 2015

Busan Metropolitan City. (2011b). *The 2030 Masterplan for Busan*. Available at: www.busan.go.kr/04ocean/0404future/07_08.jsp. Accessed April 2013

Cho, C. (2011). An analysis of the housing redevelopment process in Korea through the lens of the transaction cost framework. *Urban Studies, 48*(7), 1477–1501.

Choi, Y., & Park, S. H. (2009). Analyzing the determinants and estimate cost against resettlement on new town project using ordinal logit model. *Journal of Korea Planners Association, 29*(2), 287–293.

Dillman, D. A., Smyth, J., & Christian, L. (2009). *Internet, mail, and mixed-mode surveys: The tailored design method* (3rd ed.). Hoboken, New Jersey: Wiley.

Getis, A. (2010). Spatial autocorrelation. In M. M. Fischer & A. Getis (Eds.), *Handbook of applied spatial analysis: Software tools, methods and applications* (pp. 255–278). London and New York: Springer.

Ha, S.-K. (2001). Substandard settlements and joint redevelopment projects in Seoul. *Habitat International, 25*, 385–397.

Ha, S.-K. (2004). Housing renewal and neighborhood change as a gentrification process in Seoul. *Cities, 21*(5), 381–389.

Ha, S.-K. (2007). Housing regeneration and building sustainable low-income communities in Korea. *Habitat International, 31*, 116–129.

Ha, S.-K., & Kim, T. (2001). Socioeconomic characteristics of reoccupied-residents in housing renewal estate in Seoul. *Journal of the Korean Regional Development Association, 13*(3), 65–82.

Hasselaar, E. (2011). Market dominance and participatory planning in new housing development. In L. Qu (Ed.), *Making room for people: Choice, voice and liveability in residential area* (pp. 75–101). Amsterdam: Techne Press.

He, S., & Wu, F. (2005). Property-led redevelopment in post-reform China: A case study of Xintiandi redevelopment project in Shanghai. *Journal of Urban Affairs, 27*(1), 1–23.

He, S., & Wu, F. (2007). Socio-spatial impacts of property-led redevelopment on China's urban neighborhoods. *Cities, 24*(3), 194–208.

Hwang, H., & Kim, C. (2008). A study on the standards for planning neighborhood unit in Korean new towns. *Journal of Korea Planners Association, 43*(4), 49–64.

Jacobs, J. (1961). *The death and life of Great American Cities*. New York: Random House.

Ki, C. O., & Jayantha, W. M. (2010). The effects of urban redevelopment on neighbourhood housing prices. *International Journal of Urban Sciences, 14*(3), 276–294.

Kim, S. (2010). Issues of squatters and eviction in Seoul: From the perspectives of the dual roles of the state. *City, Culture and Society, 1*, 135–143. doi:10.1016/j.ccs.2010.10.002.
Kleinhans, R. (2004). Social implications of housing diversification in urban renewal: A review of recent literature. *Journal of Housing and the Built Environment, 19*, 367–390.
Lee, C. M., Kim, M. K., & Won, H. J. (2013). Migration pattern of the original residents in the Gireum newtown area. *Housing Studies Review, 21*(3), 123–141.
Lim, J.-M., Lee, Y.-H., Kim, J.-S., & Kim, S.-Y. (2013). Analyzing the current situation and issues of urban renewal projects in Korea: Focused on housing redevelopment projects and housing reconstruction projects. *LHI Journal, 4*(4), 333–348.
Maddala, G. S. (1983). *Limited dependent and qualitative variables in econometrics*. Cambridge: Cambridge University Press.
Ndezi, T. (2009). The limit of community initiative in addressing resettlement in Kurasini Ward, Tanzania. *Environment and Urbanization, 21*(1), 77–88.
Ng, M. K. (2002). Property-led urban renewal in Hong Kong: Any place for the community? *Sustainable Development, 10*, 140–146.
Pritchett, W. E. (2008). Which urban crisis? Regionalism, race, and urban policy, 1960–1974. *Journal of Urban History, 34*(2), 266–286.
Raudenbush, S. W., & Bryk, A. S. (2002). Hierarchical linear models: application and data anaysis methods. Thousand Oaks: SAGE Publications.
Schwartz, A. F. (2010). *Housing policy in the United States* (2nd ed.). New York & London: Routledge.
Seong, S. J., Nam, Y. W., & Kim, S. W. (2009). A study on the enhancement of resettlement ratio for aborigine in housing redevelopment districts. *Korea Real Estate Academy, 38*, 320–337.
Shin, H. B. (2007). Residential redevelopment and social impacts in Beijing. In W. Fulong (Ed.), *China's emerging cities: The making of new urbanism* (pp. 163–184). London and New York: Routledge.
Shin, H. B. (2008). Living on the edge: Financing post-displacement housing in urban redevelopment projects in Seoul. *Environment & Urbanization, 20*(2), 411–426.
Shin, H. B. (2009a). Property-based redevelopment and gentrification: The case of Seoul, South Korea. *Geoforum, 40*, 906–917.
Shin, H. B. (2009b). Residential redevelopment and the entrepreneurial local state: The implications of Beijing's shifting emphasis on urban redevelopment policies. *Urban Studies, 46*(13), 2815–2839.
Smith, N. (2011). Gentrification, the frontier, and the restructuring of urban space. In F. S. Susan & C. Scott (Eds.), *Readings in urban theory* (3rd ed., pp. 229–246). Hoboken, New Jersey: Wiley-Blackwell.
Snijders, T., & Bosker, R. (1999). *Multilevel analysis: An introduction to basic and advanced multilevel modeling*. Thousand Oaks: SAGE Publications.
Squires, G. D. (2011). Partnership and the pursuit of the private city. In F. S. Susan & C. Scott (Eds.), *Readings in urban theory* (3rd ed., pp. 207–228). Hoboken, New Jersey: Wiley-Blackwell.
Uzun, C. N. (2005). Residential transformation of squatter settlement: Urban redevelopment projects in Ankara. *Journal of Housing and the Built Environment, 20*(2), 183–199.
von Hoffman, A. (2009). Housing and planning: A century of social reform and local power. *Journal of the American Planning Association, 75*(2), 231–244.
Yun, J., & Jung, D. (2011). Study on the determinants of original residents' resettlement in combination with their characteristics in a land development project. *Journal of Korea Planners Association, 46*(2), 43–55.
Zhang, Y., & Fang, K. (2003). Politics of housing redevelopment in China: The rise and fall of the Ju'er Hutong project in inner-city Beijing. *Journal of Housing and the Built Environment, 18*(1), 75–87.
Zhang, Y., & Fang, K. (2004). Is history repeating itself? From urban renewal in the United States to inner-city redevelopment in China. *Journal of Planning Education and Research, 23*, 286–298.