

STAIN OR SUSTAIN? EQUITABLE NEIGHBORHOOD REVITALIZATION OF
DISTRESSED COMMUNITIES THROUGH THE LOW INCOME HOUSING TAX
CREDIT PROGRAM, AND THE HOUSING CHOICE VOUCHER PROGRAM

By

HYUNG-CHUL CHUNG

A DISSERTATION PRESENTED TO THE GRADUATE SCHOOL
OF THE UNIVERSITY OF FLORIDA IN PARTIAL FULFILLMENT
OF THE REQUIREMENTS FOR THE DEGREE OF
DOCTOR OF PHILOSOPHY

UNIVERSITY OF FLORIDA

2013

© 2013 Hyung-chul Chung

To my parents, and sister

ACKNOWLEDGMENTS

The best thing about working on this challenging topic is the people I have met along the way who made this work possible. I would like to thank my committee and my family who always encouraged me to finish this dissertation.

My four committee members offered me warm encouragement to continue and finalize this study. I would like to thank Dr. Christopher Silver, my Committee Chair, and the College Dean of Design, Construction and Planning, for all his guidance, financial support, patience and help throughout this long dissertation writing process. I still remember him being my committee chair when I initially lost my first advisor. Ever since I heard his firm and warm voice saying that he would like to join my committee, he has given me so much hope and support as I plodded through this dissertation. Dr. Kristen E. Larsen, my Committee Co-Chair, and the Director of School of Landscape Architecture and Planning, also deserves my thanks for her insightful guidance and advice on the housing issue and neighborhood revitalization. I also would like to thank my committee members, Dr. Paul D. Zwick, and Dr. Timothy Fik, for giving their valuable knowledge and expertise in spatial analysis and econometric models on my dissertation.

Special thanks go to Dr. Andres Blanco, a Senior Specialist in Fiscal and Municipal Management at the Inter-American Development. He acted as my initial advisor for the first three years and provided me with financial support and valuable advice on my research. I enjoyed working with him on research about housing, land use and transportation. His intelligence and humor always invigorated our research in a positive way. I also want to express thanks to recently promoted professor, Dr. Ruth L. Steiner, in the Department of Urban and Regional Planning. She taught me how to

come up with a planning research topic relating to land use and transportation planning. I am grateful for her financial assistance and continued advice on my doctoral research.

None of my academic progress would have been possible without my family. I would like to thank my father, Yeon-dae, and my mother, In-soon, for their strong encouragement and constant moral support during my academic studies. My sister, So-yeon, is the greatest, helping me to overcome emotional hardship when I was depressed after shoulder surgery. Their patience, support and unconditional love enabled me to finish this long journey to a Ph.D. Their encouragement and support were essential for my study. I would like to dedicate this dissertation to my parents and sister.

TABLE OF CONTENTS

	<u>page</u>
ACKNOWLEDGMENTS.....	4
LIST OF TABLES.....	8
LIST OF FIGURES.....	10
ABSTRACT	13
CHAPTER	
1 INTRODUCTION	15
Background and Problem Statement	15
Knowledge Gap	19
Research Objectives and Questions.....	22
Research Structure.....	23
2 NEIGHBORHOOD REVITALIZATION AND SUBSIDIZED HOUSING PROGRAM	26
General Planning Theories	27
Neighborhood Revitalization Theories	29
Brief History of Housing Policy and Neighborhood Revitalization	30
First period: Neighborhood Redevelopment	31
Second period: Neighborhood Regeneration	32
Third period: Neighborhood Revitalization.....	34
Fourth period: Sustainable Revitalization	36
Subsidized Housing Programs and Housing Development.....	38
Revitalization and Neighborhood Change by Subsidized Housing Programs.....	42
3 SUBSIDIZED HOUSING AND PROPERTY VALUES	50
The HCV and the LIHTC.....	50
The HCV program	51
The LIHTC Program	55
Differences Between the LIHTC Program and the HCV Program	62
Impacts of Subsidized Housing on Property Values	71
Implications from the literature review	81
Research Hypothesis.....	85
4 RESEARCH DESIGN	96
Study Area	97
Data	104

Operationalization of Neighborhoods.....	106
Defining Economically Distressed Neighborhoods	106
Classification of Neighborhood Type	109
Econometric model	111
Methodological issues in the econometric model	111
Potential Property Value Impacts of Subsidized Housing.....	116
Econometric Models for Property Value Impacts.....	117
Econometric Models for Displacement Effects of HCV holders	125
Case Studies	126
5 RESULTS AND FINDINGS.....	143
Location, Neighborhoods, and Sale Prices	143
Results from AITS Econometric Models for Price Impacts.....	147
Results of Baseline Models	148
Results from the Models with Income Groups	151
Results from the Models with Poverty Status	153
Results from the Models with Neighborhood Types	155
Results from OLS Econometric Models for Displacement Effects	158
Results from Case Studies	162
Lake Eola Heights and South Eola (Revitalizing neighborhood)	164
Holden-Parramore (Economically distressed neighborhood)	166
6 CONCLUSION.....	207
Justification for Proposed Policy	208
Policies for the Future	214
Limitation and Future Study	223
APPENDIX.....	226
LIST OF REFERENCES	244
BIOGRAPHICAL SKETCH.....	255

LIST OF TABLES

<u>Table</u>	<u>page</u>
3-1 Population growth and the LIHTC units permitted between 1987 and 2008.....	91
4-1 Population of the Orange County and the City of Orlando.....	129
4-2 Assisted housing and population in Orlando MSA and Orange County.....	129
4-3 Economic status of Orange County and the City of Orlando	131
4-4 Data sources of variables	132
4-5 Neighborhood types based on K-means clustering	133
4-6 Description of variables for the property values impacts	135
4-7 Description of variables for the displacement impacts.....	140
5-1 Prices in LIHTC impact area and outside the LIHTC impact area by year.....	183
5-2 Prices in HCV impact area and outside the HCV impact area by year	185
5-3 Prices in HCV of LIHTC impact area and outside the HCV of LIHTC impact area by year.....	187
5-4 Baseline regression results of price impacts of LIHTC projects.....	191
5-5 Baseline regression results of price impacts of HCV holders	192
5-6 Baseline regression results of price impacts of HCV holders in LIHTC	192
5-7 Regression results of price impacts of LIHTC projects by income group.....	192
5-8 Regression results of price impacts of HCV holders by income group	193
5-9 Regression results of price impacts of HCV in LIHTC by income group.....	193
5-10 Regression results of price impacts of LIHTC projects by poverty status	193
5-11 Regression results of price impacts of HCV holders by poverty status.....	194
5-12 Regression results of price impacts of HCV in LIHTC by poverty status	194
5-13 Regression results of price impacts of LIHTC projects by neighborhood type..	195
5-14 Regression Results of Price Impacts of HCV holders by neighborhood type ...	195

5-15	Regression results of price impacts of HCV in LIHTC by neighborhood type ...	196
5-16	Summary of econometric model results	196
5-17	Regression results of displacement of HCV holders between 1990 and 2010 .	199
5-18	Neighborhood characteristics of Lake Eola Heights and South Eola.....	200
5-19	HCV program used in Lake Eola Heights and South Eola.....	200
5-20	Neighborhood characteristics of Holden-Parramore.....	203
5-21	LIHTC projects in Holden-Parramore	203
5-22	HCV program used in Holden-Parramore.....	203
A-1	Baseline regression results of price impacts of LIHTC projects.....	226
A-2	Regression results of price impacts of LIHTC projects by income group.....	227
A-3	Regression results of price impacts of LIHTC projects by poverty status	229
A-4	Regression results of price impacts of LIHTC projects by neighborhood type..	230
B-1	Baseline regression results of price Impacts of HCV holders	232
B-2	Regression results of price impacts of HCV holders by income group	233
B-3	Regression results of price impacts of HCV holders by poverty status.....	234
B-4	Regression results of price impacts of HCV holders by neighborhood type	236
C-1	Baseline regression results of price impacts of HCV holders in LIHTC projects.....	238
C-2	Regression results of price impacts of HCV holders in LIHTC projects by income group.....	239
C-3	Regression results of price impacts of HCV holders in LIHTC projects by poverty status	241
C-4	Regression results of price Impacts of HCV holders in LIHTC projects by neighborhood type	242

LIST OF FIGURES

<u>Figure</u>	<u>page</u>
1-1 Research structure	25
2-1 Conceptual framework for neighborhood change and revitalization by subsidized housing	48
2-2 Conceptual model of different types of revitalization by housing development...	49
3-1 Conceptual Model of property value effects of subsidized housing program.....	95
3-2 Hypothesis Model	95
4-1 Study Area.....	129
4-2 Location of LIHTC projects in 2010	130
4-3 Location of HCV holders in 2010.....	130
4-4 Neighborhood income distribution in 1990 in Orange County.	131
4-5 Neighborhood cluster based on neighborhood income and income change. ...	133
4-6 Illustration of Potential Property Value Impacts of Subsidized Housing.....	134
4-7 welfare changes of households using hedonic price model.....	134
4-8 Location of case study areas.....	142
5-1 Spatial pattern of LIHTC units.....	172
5-2 Spatial pattern of HCV holders. Note. The number of HCV recipients are normalized by a total number of households for each neighborhood in 2007-2011	172
5-3 The number of census block groups based on ratio of percentage of poverty in neighborhood in 1990 to percentage of poverty in county in 1990.....	173
5-4 The number of LIHTC projects based on ratio of percentage of poverty in neighborhood in 1990 to percentage of poverty in county in 1990.	173
5-5 The number of LIHTC units based on ratio of percentage of poverty in neighborhood in 1990 to percentage of poverty in county in 1990.	174
5-6 The number of HCV holders based on ratio of percentage of poverty in neighborhood in 1990 to percentage of poverty in county in 1990.	174

5-7	The number of HCV holders in LIHTC projects based on ratio of percentage of poverty in neighborhood in 1990 to percentage of poverty in county in 1990	175
5-8	The number of census block groups based on neighborhood type.	175
5-9	The number of LIHTC projects based on neighborhood type.	176
5-10	The number of LIHTC units based on neighborhood type	176
5-11	The number of HCV holders based on neighborhood type.....	177
5-12	The number of HCV holders in LIHTC based on neighborhood type.....	177
5-13	The number of census block groups based on neighborhood income group ...	178
5-14	The number of LIHTC projects based on neighborhood income groups	178
5-15	The number of LIHTC units based on neighborhood income groups	179
5-16	The number of HCV holders based on neighborhood income groups	179
5-17	The number of HCV holders in LIHTC based on neighborhood income groups	180
5-18	The number of census block groups based on poverty status.....	180
5-19	The number of LIHTC projects based on poverty status	181
5-20	The number of LIHTC units based on poverty status	181
5-21	The number of HCV holders based on poverty status.....	182
5-22	The number of HCV holders in LIHTC based on poverty status.....	182
5-23	Sale prices in the LIHTC impact area relative to prices outside the LIHTC impact area from 1990 to 2010.....	184
5-24	Sale prices in the HCV impact area relative to prices outside the HCV impact area from 1990 to 2010.	186
5-25	Sale prices in the HCV of LIHTC impact area relative to prices outside the HCV of LIHTC impact area from 1990 to 2010.....	188
5-26	Sale price trends by income groups from 1990 to 2010.	189
5-27	Sale price trends by neighborhood types from 1990 to 2010.	190
5-28	Sale price trends by poverty status from 1990 to 2010.....	191

5-29	Sale price levels and trends of the pre- and post-development in the baseline models.....	197
5-30	Sale price levels and trends of the pre- and post-development in the regression models by income groups.....	197
5-31	Sale price levels and trends of the pre- and post-development in the regression models by poverty status.....	198
5-32	Sale price levels and trends of the pre- and post-development in the regression models by neighborhood type.....	198
5-33	LIHTC projects, voucher holders and Land Use in Lake Eola Heights and South Eola.....	201
5-34	First Baptist Housing in South Eola. Source: Orange County Property Appraiser (2012).....	202
5-35	A trend of average sale prices in Eola and Orange County.....	202
5-36	LIHTC projects, voucher holders and Land Use in Holden-Parramore.....	204
5-37	Public housing building for the elderly in the Carver Park.....	205
5-38	Jackson Court Apartments for elderly.....	205
5-39	City View Apartments.....	206
5-40	A trend of average sale prices in Holden-Parramore and Orange County.....	206

Abstract of Dissertation Presented to the Graduate School
of the University of Florida in Partial Fulfillment of the
Requirements for the Degree of Doctor of Philosophy

STAIN OR SUSTAIN? EQUITABLE NEIGHBORHOOD REVITALIZATION OF
DISTRESSED COMMUNITIES THROUGH THE LOW INCOME HOUSING TAX
CREDIT PROGRAM, AND THE HOUSING CHOICE VOUCHER PROGRAM

By

Hyung-chul Chung

December 2013

Chair: Christopher Silver
Co-Chair: Kristin E. Larsen
Major: Design, Construction and Planning

The Low Income Housing Tax Credit (LIHTC) program and the Housing Choice Voucher (HCV) program are the two major public tools that can provide for the inclusion of low income households in neighborhood revitalization efforts directed at improving the property tax base. The use of voucher in LIHTC-funded developments might benefit those who otherwise cannot afford to live in affordable housing. Although the increasing property values in revitalized communities can displace low-income residents, the LIHTC projects may contribute to absorbing the housing demand.

This study empirically examines the debate over the externalities of subsidized housing programs and their efficacy in community revitalization. This study addresses three research questions. (1) What is the effect of the LIHTC and HCV programs on property values in impoverished neighborhoods? (2) How does the effect vary depending on various neighborhood types? (3) What do these impacts mean for equitable neighborhood revitalization? To answer these questions, this study applies a regression with Adjusted Interrupted Time Series to examine the price impact of the

LIHTC and HCV programs, and uses Ordinary Least Square regression to investigate the displacement effect on HCV holders. This dissertation focuses on Orange County, FL between 1990 and 2010.

The results show that the HCV residents generally have positive impact on sale prices by approximately 4 percent on average, while the LIHTC projects have negative impact on property values by 7 percent. However, the LIHTC funded developments positively affect property values in block groups with 30-60 percent of AMI and 20-40 percent of poverty rate, implying that there is a potential to revitalize economically depressed neighborhoods. In terms of displacement on HCV holders, the higher housing prices decrease the number of voucher holders whereas the assisted rental housing stock absorbs the voucher recipients to some extent. However, LIHTC projects highly promote the usage of vouchers in general. Therefore, I also propose and test future policies based on the analysis outcomes indicating that policy makers should facilitate and incentivize the use of a combination of strategies with the LIHTC and HCV programs by altering local governments' plans gradually.

CHAPTER 1 INTRODUCTION

Background and Problem Statement

The United States' subsidized housing policies were created and developed with the intent to "provide a decent home in a suitable living environment for every American" (Housing Act of 1949). Since the 1930s, when a huge political transformation in housing policies was initiated, many subsidized housing developments were introduced in communities. Regardless of the effectiveness and efficacy of a program, it is an open question if subsidized housing has influenced the creation of a sustainable environment for residents and achieved the revitalization of economically depressed neighborhoods.

Historically, the tenets of housing policy are to enhance living standards and improve the economic health of the community. Improving living standards included addressing fire safety, sanitation, lighting and ventilation (Schwartz, 2010). In the 1930s, public housing policy strived to increase economic opportunity (Katz, Turner, Brown, Cunningham, Sawyer, 2003). When the federal government established a permanent public housing program in 1937, political entities argued that it would improve neighborhoods by boosting property values and raising property tax revenue for governments (Ellen, Schwartz, Voicu, and Schill, 2007; Landis and McClure, 2010).

Similarly, a current justification for federal housing policy concerns revitalizing underserved and economically depressed neighborhoods by increasing property values and promoting mixed income developments. The federal programs that implement these policies include federal neighborhood investment programs such as the Community Development Block Grant program (CDBG), the HOPE VI program, and Choice Neighborhood Program. These programs implement local neighborhood

transformation strategy to achieve mixed-income neighborhoods, better education opportunities and private/public reinvestment to address economic distress characterized by dilapidated and poorly managed public- and assisted housing. These programs are founded on the ideas that neighborhoods can be revitalized based on continuing investment, improving economic development, and achieving better outcomes of families.

Nonetheless, important questions remain. Do revitalization efforts enhance blighted areas? If so, how should planners address problems like the displacement of existing residents and the re-concentration of low income households in surrounding neighborhoods? Indeed, the housing policy direction has significance for community development because poor neighborhoods affect socioeconomic outcomes of individuals by creating a vicious cycle of poverty, decreasing employment opportunities, lowering education levels, and raising crime rates (Jargowsky, 1996). Indeed, circumstances in impoverished neighborhoods have "an independent effect on social and economic outcomes of individuals even after taking account of their personal and family characteristics" (Jargowsky, 1996, p. 4). It becomes more apparent in declining neighborhoods with more continued out-migration of population, decrease in property values, and the incremental decline in the quality of life.

Thus, neighborhood revitalization is a complex challenge requiring multiple strategies to bring about positive effects on community and to create sustained long-term change (Galster, Tatian and Pettit, 2006). Generally, revitalization is intended to achieve physical improvement of neighborhoods, build up a mixed income neighborhood, and improve social equity. Although a revitalization plan enhances

neighborhood conditions, it could displace low-income neighborhoods and lose long-standing social connections, cultural diversity and historical neighborhood context. Therefore, in addition to physical improvement, stable and safe housing opportunities for low-income households are critical in order to revitalize neighborhoods. In this sense, equitable revitalization can be defined as enhancing local economic development throughout neighborhoods, and improving social equity by resolving subsequent displacement of low-income households

Although involving low income households might be challenging, the use of federal subsidies can make it possible to include them in neighborhood revitalization efforts. The Low Income Housing Tax Credit (LIHTC) and Housing Choice Voucher (HCV) programs are the two major public tools that can provide for the inclusion of low income households in neighborhood revitalization efforts directed at improving the property tax base. As described in several sources, LIHTC projects have positive effects on property values in New York, Baltimore and Philadelphia (Lee, Culhane, and Wachter, 1999; Galster, Tatian, Santiago, Pettit, and Smith, 2003; Ellen et al., 2007). HCV similarly has also been proven to have positive effects on property values (Galster, Tatian, and Smith, 1999).

Yet questions arise. How do the programs differ? Are there any negative effects of the LIHTC and HCV programs due to the nature of the subsidies provided? The two programs provide different types of housing assistance for low-income residents. Some argue that vouchers or direct cash assistance to low income households are better than other housing support; others advocate block grant monies for developers to support production of low-income housing projects. Clearly, they differ not only in the forms of

assistance but also in the neighborhoods they target. But, regardless the type of assistance, these subsidized housing programs have prompted concerns in many neighborhoods, provoking extensive debate over the externalities of subsidized housing projects.

Owing to NIMBYism (Not-In-My-Backyard) arising out of subsidized housing projects, some studies focus on the response of neighbors whose prejudicial views of the tenants derives from the negative effects on their property values (Goetz, Lam, and Heitlinger, 1996; Galster et al. 1999; Santiago, Galster and Tatian, 2001). The communities' attitudes are based on the premise that low income households, who are the residents of subsidized housing, negatively affect the quality of the neighborhood by contributing to condition like poverty and crime (Galster et al. 2003).

In contrast, some studies have focused on evaluation of the potential positive effects of federally subsidized housing on property values by redeveloping affordable housing and revitalizing economically distressed communities. The fundamental theory behind the studies is that new subsidized housing can increase property values by minimizing these negative conditions, introducing safer environments, and inviting more affluent income groups (Ding, Simons, and Baku. 2000; Schill, Ellen, Voicu, and Schill, 2002; Galster et al. 2006; Ellen et al. 2007; Schwartz, Ellen, Voicu, and Schill, 2006). However, questions still remain: can subsidized housing programs with limited sources really contribute to a revitalization of distressed, low income urban neighborhoods? If so, what types of a neighbor welcome subsidized housing, and in what manner? Which program is more conducive to community revitalization by attracting private investment, and improving the property tax base for a local government? What strategies are

needed to resolve displacement of low-income residents as a result of neighborhood revitalization? Are the HCV users not affected as much by the increase of property values because of their subsidy? These questions will be addressed in the following chapters.

Knowledge Gap

This dissertation reexamines the ongoing debate over the externalities of subsidized housing programs and their efficacy in equitable community revitalization. It comes out in favor of both the demand-side subsidy program (Housing Choice Voucher Program) and the supply-side subsidy program (Low Income Housing Tax Credit Program). Nonetheless, even though the HCV program might be more preferable to the LIHTC program, supply-oriented subsidies may have more positive external effects on neighborhoods than demand-based subsidies because housing policy still justifies project-based subsidized housing as a good tool for community revitalization. In addition, although the HCV program may be less preferable, in conjunction with the LIHTC program, it may promote social equity in the revitalization process.

Relatively few studies have explored what these major housing programs mean for neighborhood revitalization. Previous studies lack the following significant points. First, from a housing policy perspective, generalizations based on housing subsidy programs might not capture neighborhood effects of assisted housing. Many researchers have analyzed the outcomes of housing subsidy programs on neighborhoods and tenants but have not analyzed the effects of tenants' demographics on property values (Lee et al., 1999; Galster, Tatian, Pettit, 2004; Ellen et al. 2007). A few studies attempt to examine the relationship between income stratification in

subsidized housing and property values, but their results were not significant (Deng, 2011b).

Second, this study provides county-based generalized strategies for equitable neighborhood revitalization using the LIHTC program and the HCV program in order to achieve economic development and social equity. In general, revitalization strategies based on the federal subsidized programs are not fully explored. Although redevelopment of public housing through the HOPE VI program may help improve economic environments and relocate displaced residents, little is known about establishing a local revitalization plan using the two largest subsidized housing programs in the U.S. Based on quantitative and qualitative analyses, the local government's strategies for achieving equitable revitalization will be provided.

Third, it is difficult to practically see the social relations of assisted tenants to their neighbors with regard to a housing market. As Freeman and Botein (2002) point out, neighbors' attitudes toward subsidized housing are key components in determining the effects. Some people in demographically diverse neighborhoods could welcome subsidized housing. Others who are uncomfortable with low-income tenants and diverse races might strongly oppose subsidized housing. Although these attitudes can lead to neighborhood change depending on the community context, the resistance to assisted housing is hard to measure.

Fourth, little is known about neighborhoods where HCV households and LIHTC projects are located. Most HCV recipients and LIHTCs in MSAs live in neighborhoods with a poverty rate of 10-30 percent (Dawkins, 2011). Knowing the extent of poverty rates (high poverty, moderate poverty, and low poverty), the concentration of

substandard housing, and other idiosyncratic characteristics of neighborhoods might help to better understand changing property values due to the location of subsidized housing.

Fifth, prior studies have failed to consider the relative property value impacts of the HCV and LIHTC programs. Several studies take into account the relationship between HCV and LIHTC in terms of cost, benefit, and location outcomes (Shroder and Reiger, 1999; Deng, 2004; Deng, 2007). But these studies do not examine direct relationships between the programs. Given that LIHTC projects are generally located in poverty areas in central cities and low poverty neighborhoods in suburban areas (Freeman, 2004; Dawkins, 2011), LIHTC could be a target of HCV holders that cannot afford market rate housing. Thus, property value impacts may vary depending on different neighborhood contexts associated with locations of HCV households and LIHTC funded developments.

Sixth, methodological shortcomings leave the analysis results in doubt. Many previous studies merely evaluate cross-sectional attributes. Using the Difference-in-Difference (DID) regression model, several studies have overcome this limitation (Galster et al. 1999; Galster et al. 2004; Schill et al. 2006; Ellen et al. 2007; Koschinsky, 2010; Deng, 2011b). The DID regression model – sometimes known as Adjusted Interrupted Time Series (AITS) model – offers a major advantage in this dissertation since it compares conditions in the experimental group with treatment and control groups both intertemporally and cross-sectionally (Galster et al., 2006). The previous studies still fall short in that they do not consider neighborhood characteristics such as stratification of income structure, poverty concentration and the specific housing

submarket. After considering these variables, sophisticated specification of the model could contribute to additional findings that introduce nuances to these earlier studies.

Research Objectives and Questions

The review of key knowledge gaps in the previous section is the motivation for this dissertation. This dissertation argues that income composition and tenant demographics are key components in determining whether impoverished neighborhoods are revitalized through improving social mix and enhancing neighborhood wealth. The goals of this dissertation are to provide empirical evidence of the effects of the HCV and LIHTC programs on equitable community revitalization and to suggest implications for subsidized housing policy. This study primarily identifies the impact of subsidized housing on property value increases within poor neighborhoods. It compares the differential effects on property values of LIHTC developments, HCV households, and LIHTC projects that accept HCV recipients. It also addresses the locational effects of LIHTC and HCV depending on the extent to which poverty concentration is aggravated. In addition, the displacement effects on HCV holders depending on different neighborhood context are examined. To that end, three questions will be addressed:

- What are the effects of the LIHTC and HCV programs on property values in impoverished neighborhoods?
- How do these effects vary depending on various neighborhood types?
- What do these impacts mean for the equitable neighborhood revitalization?

To answer these questions in a comprehensive way, the AITS regression analysis is used for Orange County in Florida between 1990 and 2010. In the econometric analysis, the relevant independent variables, such as property

characteristics and neighborhood characteristics, and dependent variables, such as housing sales price, will be identified and operationalized. To control for the changing property values in different income groups of neighborhoods, this study adopts the methodology developed by Galster and Booza (2007), which defines the number of extremely low income, very low income and low income households in neighborhoods based on the HUD guidelines. It also categorizes the severity of poverty concentration. This study combines various datasets obtained from the Florida Housing Data Clearinghouse's Assisted Housing Inventory (AHI), LIHTC program data from the Department of Housing and Urban Development (HUD), HCV program data from HUD, property tax rolls between 2000 and 2010 obtained from the Florida Department of Revenue (FDOR), Census 2000, and American Community Survey 2007-2011.

Research Structure

The structure of this dissertation is summarized in Figure 1-1. It consists of the following topics. In the first chapter, the problem statement, knowledge gap, research questions and research purposes are explained. The second chapter describes the theoretical background on neighborhood revitalization and a conceptual model about subsidized housing programs and housing developments. The third chapter summarizes the details in the LIHTC program and the HCV program, reviews the existing literature on price impacts of subsidized housing developments, and hypotheses. The fourth chapter explains the methodology, data sources, rationale and operationalization of variables and the econometric models. The fifth chapter provides location of LIHTC projects and HCV holders, the host neighborhoods, and sales price variations. It analyzes the results and presents the related findings. Lastly, the sixth

chapter draws conclusions and policy implications, discusses limitations of this study, and introduces possibilities for future research.

In sum, the purpose of this study is to examine the LIHTC and HCV programs to bring about the positive impacts on property values and to draw out the policy implications of strategies which can achieve equitable revitalization by promoting local economic development and social equity. In the following chapter, studies about subsidized housing programs and neighborhood change are reviewed and the theoretical framework outlining neighborhood revitalization based on the subsidized programs is presented.

<p>Chapter 1. Introduction</p>	<ol style="list-style-type: none"> 1. Problem statement <ul style="list-style-type: none"> ▪ Neighborhood revitalization issues / Low Income Housing Tax Credit (LIHTC) and Housing Choice Voucher (HCV) 2. Knowledge gap <ul style="list-style-type: none"> ▪ Characteristics of assisted residents/ neighborhood characteristics / LIHTC and the HCV / methodology 3. Research questions and research purposes <ul style="list-style-type: none"> ▪ Impacts of the LIHTC and the HCV on property values ▪ Providing policy implications for the LIHTC and the HCV
<p>Chapter 2. Neighborhood Revitalization and Subsidized Program</p>	<ol style="list-style-type: none"> 1. Neighborhood revitalization <ul style="list-style-type: none"> ▪ Planning theories / neighborhood revitalization theories ▪ Economically disadvantaged neighborhoods / housing policy and neighborhood revitalization 2. Subsidized housing programs and housing development <ul style="list-style-type: none"> ▪ Housing development, neighborhood change and subsidized programs
<p>Chapter 3. Subsidized Housing and Property Values</p>	<ol style="list-style-type: none"> 1. The LIHTC and HCV program <ul style="list-style-type: none"> ▪ Differences between LIHTC and HCV 2. Impacts of Subsidized Housing on Property Values 3. Implications from literature review 4. Research Hypothesis
<p>Chapter 4. Research Design</p>	<ol style="list-style-type: none"> 1. Research scope <ul style="list-style-type: none"> ▪ Study area: Orange County / period: 1990 – 2010 2. Data : AHI, HUD voucher, FDOR and FGDL, Census 1990, 2000, and ACS 2007-2011 3. Operationalization: poverty, low-income neighborhoods, and neighborhood type classifications 4. Econometric model: AITS, and OLS 5. Case studies: neighborhood characteristics, and usage of LIHTC and HCV program in Eola and Holden
<p>Chapter 5. Results and Findings</p>	<ol style="list-style-type: none"> 1. Location, neighborhoods, and sale prices 2. Results of econometric model (AITS and OLS) 3. Results of case studies
<p>Chapter 6. Conclusion</p>	<ol style="list-style-type: none"> 1. Justification for proposing policy 2. Policies for the future 3. Limitations and future study

Figure 1-1. Research structure

CHAPTER 2 NEIGHBORHOOD REVITALIZATION AND SUBSIDIZED HOUSING PROGRAM

The issues of revitalization have been discussed extensively throughout the research community, and among policy makers and planners particularly after World War II. Despite the benefits realized through revitalization efforts, neighborhood revitalization has been criticized because of its adverse outcomes including displacement of residents, creation of unaffordable housing, and exacerbation of segregation. In order to address these issues and to promote equitable revitalization, it is important to understand the definition of revitalization and the applicable strategies to achieve sustainable and equitable revitalization from multiple perspectives. More specifically, the relationship between affordable housing and revitalization of distressed neighborhoods is of particular interest in this study. In this regard, this chapter provides a theoretical framework to define equitable revitalization based on economic development and social equity.

Next, using a discussion of planning theory as applied to social problems and economic disadvantage in neighborhoods, this study outlines general planning theories in terms of four different but interrelated planning principles applied to neighborhood revitalization by reviewing historical facts and theoretical perspectives to identify adoption of revitalization strategies and their application to planning practice. Additionally, this study recognizes the importance of economically disadvantaged communities that are affected by various factors such as competing public interest and private market. It is worthwhile to discuss why these communities were historically distressed.

Third, the relationship between subsidized housing programs and neighborhoods is addressed in order to understand the resident's response to the subsidized programs and the effects on neighborhood revitalization. Understanding how the Low Income Housing Tax Credit and the Housing Choice Voucher programs differ from typical assisted rental housing programs in terms of developers, location, size, and funding process allows us to understand how the subsidized programs affect the property values.

General Planning Theories

Ross and Leigh (2000) suggest dividing the three dominant approaches to decision making and the planning process as follows: rational planning, advocacy planning, and equity planning. Despite its contingent controversy over the usage of these approaches, they are developed and designed to tackle inherent problems within neighborhoods and inner city areas.

Rational planning has dominated traditional planning practices, through which planners could solve a problem and prepare a plan by seeking alternatives and potential outcomes based on "an option's effectiveness for achieving the desired objectives" (Ross and Leigh, 2000, p.368). However, this approach is too "simplified" because of the nature of complexity in comprehensive planning. This is also considered incremental planning because policy does not change dramatically; rather, it is just incremental in modifications to current policy. Various alternatives that have distinctive characteristics should not be evaluated since considering all alternatives that have different values is not possible. Instead, only the most relevant alternatives are evaluated. "City, society, and economy are in a state of continual evolution... gradual changes in planning and policy provide the most flexible response to goals and objectives that are always in a

state of flux ” (Ross and Leigh, 2000, p. 368). Apparently, incremental planning uses a pragmatic approach to planning decision making rather than theoretical perspectives.

Due to the exclusionary characteristics of rational planning, advocacy and equity planning were developed. Advocacy planning emphasizes the planner's role in democratization of the planning process (Ross and Leigh, 2000). By providing available resources to use and providing appropriate information to citizens who have been underrepresented, the planners can objectively assist them as “technicians to the central planning agency” (Ross and Leigh, 2000, p. 369). Nonetheless, since the planning process should be viewed from multiple perspectives such as the planning commission, and various organizations in a community, it should involve multiple agents rather than a singular perspective in order to produce more competitive and better outcomes.

Ross and Leigh (2000) cited Krumholz (1997) to describe the concept of equity planning as “a conscious attempt... to devise and implement redistributive policies that move resources, political power, and participation toward low-income groups” (Ross and Leigh, 2000, p.369). Equity planning emphasizes the planner’s social responsibility in representation for raising voices on behalf of the underprivileged low-income populations in order to redistribute unbalanced power and resources. It helps ensure that “every citizen has an equal opportunity to meet his or her basic needs; it also recognizes the fact that minority involvement in politics is increasing, and anticipates service to a shifting set of political priorities” (Ross and Leigh, 2000, p.369). Traditional planning and incremental planning does little incorporate participation of underprivileged populations in comprehensive planning. Equity planning is an upgraded approach from

advocacy planning to overcome the existing social issues for those who need planning changes the most. In fact, “advocacy and equity planning have evolved in reaction to the unintended and negative consequences that planning’s previous approaches have had for those who were excluded from the planning process”. (Ross and Leigh, 2000, p.369). Equity planning also focuses on not only recognition of the exclusion of the minority but also actual contributions to adverse the inequality problem that was not realized in the planning. Ross and Leigh (2000) made an important statement regarding equity planning:

Equity planning goes even further: it argues that having a voice is not enough. Instead, specific efforts must be made to redress the imbalance of resources, opportunities, and power that contribute to the material and social inequities (Ross and Leigh, 2000, p.369).

Neighborhood Revitalization Theories

The three planning theories in the previous section provide fundamental framework for how planners intervene using neighborhood revitalization at the federal and state to local contexts. Although the application of these theories often overlap in planning practice, it is worthwhile to understand a planner's role and applicable theories in neighborhood revitalization. The definition of neighborhood revitalization is the process by which economically distressed or poor neighborhoods become livable and vigorous. Neighborhood revitalization certainly engages in change in economic status of a neighborhood as well as sustained stability of the neighborhood. In general, the neighborhood revitalization process involves complex interactions among the housing market, public policy, and socioeconomic change. For many years, significantly distressed neighborhoods were revitalized through public intervention, and changes in the private market sector during the 1970s, 1980s, and 1990s. Clearly, neighborhoods

have experienced substantial changes during the course of revitalization (Galster et al., 2006). However, investment and reinvestment activities were hindered by lack of information concerning the characteristics of neighborhood change in the revitalization process.

As such, many consider subsidized housing as unwelcome uses in their neighborhoods, which results in Not-In-My-Back-Yard (NIMBY) attitudes and resistance. With the Low Income Housing Tax Credit and the Housing Choice Voucher programs, policy makers and planners still believe that the subsidy program may improve neighborhoods and quality of life for tenants even though impacts on neighborhoods vary depending on regional locations. Thus, it is important to understand why we have still widespread impoverished neighborhoods and how we can improve those neighborhoods with current federal and local resources.

Brief History of Housing Policy and Neighborhood Revitalization

In this historical overview of housing policy and following neighborhood revitalization plan, I divide historical change of federal housing policies into four different periods: neighborhood redevelopment, neighborhood regeneration, neighborhood revitalization, and sustainable revitalization. The terms used for this study are appropriate because they represent unique characteristics of economic, social and political environments with major actors playing significant roles in the policy in order to enhance economically depressed neighborhoods. In each period, this study identifies the generalized approaches toward urban and housing policy issues for revitalization of economically disadvantaged neighborhoods. Although these approaches are sometimes overlapped with other periods in the previous section, the period

classification regarding revitalization by federal policies may help understand policy changes and provide opportunities to learn their lessons.

First period: Neighborhood Redevelopment

In the first period of neighborhood redevelopment era, the federal policy was introduced during the Great Depression to address inner city poverty by replacing the dilapidated and poor quality housing stock with new public housing. The slum clearance plan was first introduced in the Housing Act of 1937; the federal mandate specified by Congress was to provide suitable housing for all poor residents (Schwartz, 2010). The enactment of this law led to the construction of federally funded public housing for low-income households throughout the cities and states. After World War II, political transformation of housing policy as stated in the Housing Act of 1949 stipulated to “providing a decent home in a suitable living environment for every America.” In this policy statement, the federal government officially recognizes the public responsibility for the dwellings of citizens in the United States (Downs, 1981; Keating, 1990; Galster et al., 1999; Ellen et al., 2007). This housing act, introduced the first urban renewal programs, eliminated a number of substandard housing apartments to revitalize city economy and reduce neighborhood segregation (Schwartz, 2010).

The administration of the Urban Renewal programs in the 1949 Housing Act was separated and specialized between the public and private sectors. Clearing and concentrating land sites was managed by the public housing agencies while private developers were responsible for new construction. Indeed, this act was designed to solve two problems: land assembly, and cost of redevelopment (Levy, 2012). It is important to note that the focus of urban renewal was economic revitalization and development and not specifically housing provision. Public housing agencies controlled

the assembly of properties before the development because the entitlement of property was too fragmented to develop. However, the actual building and development was left to the private sector. After World War II, the federal government experienced financial woes. These financial problems led the government to rely on private developers to transform existing urban areas by providing new development and redevelopment of commercial buildings, office and shopping centers. However, few housing developments were constructed and these were designed for higher cost segments of the housing market rather than low-income households who were displaced and relocated due to the redevelopment (Schwartz, 2010).

The planners and politicians were criticized for the negative aspects of the neighborhood clearance act: destruction of healthy communities, neglected actions toward social cost of resident's displacement (Levy, 2012). These developments eventually became centers of crime, poverty and racial segregation (Levy, 2012). In addition, since the housing developments remain for several decades, the vacant houses, unused lots and infrastructure changed the social structure of neighborhoods and caused a great deal of social costs. Urban renewal was completely different than today's subsidized housing programs in terms of its political intentions, administrative process, and social impacts.

Second period: Neighborhood Regeneration

The second period of neighborhood regeneration started in the 1960s when new strategies were implemented based on the criticism of the first neighborhood redevelopment period. Economically distressed communities and poverty were rooted in economic growth, market, and segregation of community (Massey and Denton, 1993). Rather than focusing on public housing itself, policy makers broadened their concern to

the social welfare for citizens themselves. Consequently, they planned to implement comprehensive rehabilitation programs on the existing structures and environments. Moreover, social services and other public services were added to improve quality of life. Indeed, this neighborhood regeneration era can be considered “a shift from physical planning to social issues” (Ross and Leigh, 2000, p.371). With the “Great Society” program acclaimed by president Lyndon Johnson, the War on Poverty program generated many housing and community programs designed to increase social benefits for city residents. However, this effort was discouraged when riots occurred in many large cities. This racial and minority unrest was a result of pandemic and chronic segregation and disinvestment (Massy and Denton, 1993).

When the US Department of Housing and Development (HUD) was created in 1966 to effectively coordinate housing policy and the programs, it created a comprehensive approach to addressing severe poverty. The Model Cities program, was designed to tackle poverty that was deeply rooted throughout large US cities. This program was a federal initiative to improve neighborhoods by channeling federal funding to the most depressed neighborhoods. Funds were derived 80% from federal government and 20% from the local governments. Under HUD supervision, most of the 2.3 billion dollars dedicated were spent on social services like education, health care, job training, public safety, and so on, while only a small portion was spent on housing rehabilitation (Frieden and Kaplan, 1975; Listokin, 1983; Carmon, 1999). In spite of the effort and the large amount of funding spent, this program was discouraged by political unrest and widespread riots in US in the 1960s. This program was considered a failure due to insufficient funding and different local regulatory systems (Banfield, 1974;

Frieden and Kaplan, 1975). Finally, it ended as doubts about its effectiveness resulted in a lack of support by Congress.

Third period: Neighborhood Revitalization

Transforming from neighborhood regeneration to neighborhood revitalization, policy makers realized the shortcomings of the current policies through the trial and error of the previous policies. These programs were too idealistic to be implemented because of disparity between the idealistic plan and unintended consequences. As of 1970s, the government started to shrink the size of large-scale federal programs. During Nixon's administration, the federal government managed to consolidate several reinvestment zone programs into a single small program. In 1974, the first initiative in this process was the community development block grant (CDBG) program by which local governmental entities administered federal grants which include flexible spending provision allowing local discretion in the provision of assistance to low-income households. Furthermore, during the Nixon administration, the federal government attempted to change the supply subsidies to demand subsidies in order to provide direct subsidies to tenants. In addition to these efforts, the Carter administration initiated the Home Mortgage Disclosure Act and Community Reinvestment Act.

However, the fragmentation of governments duties caused by the transition of authority from the federal to the state and local governments occasionally undermined federal policies for the housing and community development in favor of the goals defined by local public/private partnerships (Keating and Smith, 1996). During the 1980s, the Low Income Housing Tax Credit Program was implemented to seek more corporate investment for low-income housing projects. In 1990s, the Empowerment Zone at the federal level and Enterprise Zone (EZ) programs at the state and local

levels were implemented to revitalize communities that experienced significant deterioration and poverty. Even though these EZ programs improve the community environments to some extent, the Affordable Housing Act made more significant contributions to eradicating poverty and revitalizing communities (Keating and Smith, 1996).

Furthermore, the policy focus on the community development for the poor neighborhoods was moved to urban rehabilitation, and the role of non-governmental organizations like community development corporations (CDCs) was expanded in the community development process (Rohe, 2009). More recently, the HOPE VI program to redevelop old existing public housing for creating mixed income, mixed tenure communities with desirable design has been implemented since 1993.

Moreover, housing policy has moved toward a focus on community development and the enhancement of poor neighborhoods. HUD has sought smart ways to revitalize the blighted communities. The HOPE VI program implemented in 1993, for example, was created to accomplish mixed-income communities, and ultimately reduce poverty concentration by rehabilitating or reconstructing severely distressed public housing. The Choice Neighborhood program – based on the success of HOPE VI program – is another big grant program that intends to transform distressed neighborhoods into mixed income neighborhoods in order to improve daily life services like access to jobs, schools, transportation and so on. These efforts to improved economically distressed neighborhoods were made with an eye toward poverty deconcentration by way of providing more opportunities and mobility to low income households. Nonetheless, this program has been criticized for the displacement of low-income residents.

Fourth period: Sustainable Revitalization

Sustainable revitalization is the term that refers to the combination of equitable development for low-income residents and long-term sustained improvement of neighborhoods in terms of socioeconomic status and physical structures. Based on the history of neighborhood revitalization, we know that planners and policy makers believed that their policy and planning practices could save economically disadvantaged neighborhoods, but that fragmented political power and the lack of financial resources to implement those ideas could be a cause the programs to fail. This is because there are always trade-offs between equity issues, healthy housing market and, the efficacy in policy implementation. While ensuring social equity for low-income residents, a community needs to have good and stable housing market. Thus, it is suggested that possible interventions to address recent trends of neighborhood change for equitable revitalization.

The issue of revitalization, gentrification and the subsequent displacement of low-income households has dominated discussions on social equity issues (Ahlbrandt and Brophy, 1978; Palen and London, 1984; Carmon, 1999). Many gentrified neighborhoods have seen increasing property values, rents, and other living expenses. These revitalizing communities create difficult situations for low-income residents who are forced to move out to other apartment in lower income communities. In particular, this displacement problem is severe in central cities in that most revitalization efforts have been made around the central cities where public housing and low-income minorities are concentrated (Palen and London, 1984). Public Housing Authorities occasionally provide vouchers to the displaced residents but the numbers offered are very limited. In 2010, a neighborhood revitalization initiative was released by the Obama

Administration. This initiative mainly focuses on reducing poverty and mitigating unintended outcomes of revitalization. HUD extends and implements several existing programs as part of efforts such as HOPE VI and Choice Neighborhood programs. Also, several housing and community development programs that were created during the 1980s and 1990s have continued to use the CDBG, LIHTC and HCV programs. However, the federal government still does not have comprehensive housing plans that focus on displacement. In this regard, identifying strategies for social equity is a great challenge.

How should planners react to current situation to produce more equitable results? Are there any implications for future policy and plans for sustainable revitalization? Some researchers suggest various possible interventions to address gentrification and neighborhood decline that cause the displacement of low-income residents. Carmon (1999) suggests two strategies for revitalization and three tactical principles. The two strategies include: (1) “preventing or reversing processes of segregation of the lower classes.”, (2) “combining economic development with social equity.” The three tactics proposed for revitalization are: (1) “regeneration through partnerships”, (2) “a gradual approach”, and (3) “differential treatment of different neighborhoods.” Briggs (2005) suggests several strategies for equitable housing choice: strategies for reducing rates of segregation and strategies for reducing costs of segregation (Briggs, 2005).

Indeed, when investing resources for revitalization it is most effective to establish the neighborhood as the basic planning unit for investment actions (Ahlbrandt Jr and Brophy, 1975). However, due to the reality in politics, neighborhood revitalization cannot

be achieved unless an electorate or a politician step in to provide the mandate needed to support public program development. One effective method used to initiate neighborhood revitalization is for citizens in depressed neighborhoods to organize and put political pressure on local government to plan for and invest in change (Ahlbrandt Jr and Brophy, 1975).

Subsidized Housing Programs and Housing Development

As discussed earlier, a LIHTC funded development can be a good resource for low-income households who seek affordable housing units. The Qualified Allocation Plan was changed in 2000 in favor of housing projects serving the lowest income residents for long periods or projects located in Qualified Census Tracts in which new development contributes to the concerted community redevelopment plan. LIHTC funded developments are often supplemented by federal subsidies that allow the lowest-income tenants feasible financial assistance. Indeed, the supply of affordable housing development for low-income households is determined by three different components: rehabilitation, preservation of affordable housing, and new housing development. All of which have the same objective of providing quality environments and stable housing opportunities for low-income households.

First, rehabilitation and preservation of affordable housing have long been the concerns of the federal governments. Federally assisted housing, including LIHTC funded developments and privately owned properties, receive federal subsidies for complying with affordability restrictions. These have been a great housing resource for low-income tenants and in their function of both providing housing and improving mobility they contribute to the preservation of neighborhoods and the provision of housing opportunities. For example, 2,250 assisted properties provide approximately

250,000 affordable housing units in Florida. Publicly funded and publicly owned properties, including public housing and rental housing, provide nearly 40,000 housing units in Florida (Ray et al, 2009). However, these assisted housing recipients face expiration of assistance contracts based on prepayment of assisted mortgages or fail-out to maintain physical and financial conditions of the properties. The loss of affordable housing could result in loss of housing inventory for low-income households, creating a challenge to the provision of affordable housing if rents for these projects increase to unaffordable levels. As explained about the provision of income restriction in the LIHTC program, the affordable units can be assigned to the low-income renters if more than 30 percent of eligible household's gross income is spent on rent including utilities, which is the recognized indicator of cost burden. Thus, increase in rent and loss of affordable housing can be a concern for Florida where nearly 53 percent of renters and 38 percent of homeowners spent more than 30 percent of their income in 2011. As economic recession continues, this situation could become even worse.

There are several factors that can play an important role in affecting whether the affordable housing leave the inventory: characteristics of developers, income restriction level applied to properties, property size and neighborhood characteristics. First, type of ownership can determine whether properties remain affordable. Compared with private developers, non-profit developers tend to preserve more affordable housing units over time. This is because non-profit developers are more likely focused on organizational objectives to provide better affordable housing (Finkel, Hanson, Hilton, Lam, and Vandawalker, 2006). In contrast, for-profit developers largely concentrate on financial

status of the rental properties and tend to maximize financial return for their investment from the assisted rental properties (Wallace, 1995; Finkel et al., 2006).

Attempts have been made to identify the determinants of the risk of LIHTC funded developments becoming unaffordable (Melendez et al. 2008). The results imply that the most significant determinant affecting the property owner's decision to opt out of affordability is the ownership structure, indicating that for-profit developers endure higher risk of losing affordability due to the necessity to operate profitably. After all, for-profit developers will naturally avoid additional financial burdens associated with maintaining a property or conversion cost from converting rental property to condominium. This means that, all others being equal, higher renovation cost would hinder affordable properties from becoming unaffordable (Melendez et al., 2008).

Second, income restriction level is an important determinant of conversion of affordable housing. According to a study conducted by Blanco et al. (2011), the most stringent income restriction would convert the properties to unaffordable although the properties remain under affordable rent. This indicates that subsidized housing policy is not as flexible as the housing market, which property owners respond to. (Blanco et al., 2011). That is, the market is generating affordable properties eligible for 60 and 80 percent of AMI rather than providing alternative properties for households below 50 percent of AMI. In LIHTC funded developments, those properties having additional assistance with affordable restrictions are more likely to be in assisted inventory and stay affordable (Melendez et al., 2008). Interestingly, among all units subsidized by Rural Development (RD), Florida Housing Finance Corporation (FHFC), and Department of Housing and Urban Development (HUD), the units assisted by HUD

funding are more likely to serve the lowest segment of demand in the market and have the most stringent income restriction. For example, about 76 percent of these units are occupied by households with below 30 percent of AMI. However, 86 percent of RD units are occupied by households below 50 percent of AMI and 92 percent of Florida Housing units are for households below 60 percent of AMI (Ray et al., 2009)

The third component to address is project size and neighborhood characteristics. A national study conducted with HUD research funds addresses determinants of loss of affordable housing by matching a list of voucher recipients with HUD properties that are already opted out (Finkel et al., 2006). The analysis results show that most housing units were affordable to the voucher holders. This study found that about 60 percent of units were below the FMR and another 31 percent of units were between 100 and 125 of the FMR. For the unassisted households, about 64 percent of units were still affordable for low-income households earning less than 50 percent of AMI. Only 6 percent of units were affordable to low-income households who earn less than 30 percent of AMI. The unassisted housing projects generally had a fewer units, and were located in suburban areas in neighborhoods with low concentrations of poverty and minority households (Finkel et al., 2006). Another study indicates that the probability of becoming unaffordable is dependent on the existence of neighborhood characteristics that may attract higher income groups such as lower poverty rate and higher accessibility to transit system (Blanco et al., 2011). This study suggests that preservation efforts of affordable housing should be directed at the neighborhoods where lower income groups are highly concentrated and concerted revitalization efforts are implemented (Blanco et al., 2011).

Third, new housing construction plays an important role in accommodating more low-income households through the interaction between the supply of new housing development and the demand for the subsidized housing development. The supply side of new construction involves both the private developers, including both for-profit developers and non-profit developers, and the public sectors including both local housing authorities and local planning agencies. The demand side of subsidized housing is eligible households who earn less than standard income.

In the private sector, assisted rental housing and LIHTC funded developments are built by private developers. Market-rate rental housing development is provided by other private developer, taking the form of redevelopment, rehabilitation, new development of multifamily housing, and infill development. These privately invested developments create spatial externalities on surrounding neighborhoods, having impacts on the property values of single family homes. For instance, multifamily housing properties in Boston have positive impacts on single family property values (Schoor, 2005). Multi-mixed income rental housing also positively affect property values of single family homes (Pollaskowski, 2005). Subsidized construction of owner-occupied housing in New York City has positive effects on property values, all other things being equal (Ellen et al. 2001). Next section discusses how the subsidized programs affect neighborhood change and facilitate the revitalization of neighborhoods.

Revitalization and Neighborhood Change by Subsidized Housing Programs

Prior to discussion of neighborhood change, we need to define a neighborhood. The neighborhood itself can be defined by a spatial unit encompassing the social network of a community with interactive political participation and its own unique and distinguishable values (Grigsby et al. 1987). There is no consensus on the size of a

neighborhood, but various spatial boundaries within localities such as five digit zip code areas, census tract, census block group, or census block can be considered the neighborhood if appropriate in a local context. The definition of neighborhood change is also a broad concept to understand. According to Temkin and Rohe (1996), the neighborhood is all types of changes that can be measurable in the physical, social, economic, and demographic environment in a neighborhood caused either by governmental action or by market forces (Temkin and Rohe, 1996).

The clear definition of neighborhood, is necessary in order to better evaluate the neighborhood change created by subsidized programs. An evaluative framework for the evaluation of this change is demonstrated in Figure 2-1. Neighborhood change is measured by change in neighborhood characteristics according to the responses of residents, private developments, and institution. National context, regional market and local neighborhoods are interactively changing. These relationships are not unidirectional but they are systematically related through responses of private market, governmental entities and residents. At the national level, social and economic changes, and urban policies affect neighborhoods through change in regional housing market, change in local government policy implementation, and local resident response to new residential developments. In this context, revitalization is a complex change in the system that has causal relationships with neighborhood change derived from public policy intervention and market change. It involves multiple aspects of community that have different responses to local and national change.

Local neighborhood change is affected by housing development with denser and diverse housing types ranging from market-rate rental housing and renovated housing

to redevelopment of public housing, and federally subsidized housing developments. Above all, neighborhood change is ultimately affected by responses of local residents to the housing projects that result in in-migration and out-migration (Quercia and Galster, 2000; Ellen and O'Regan, 2011). Various income groups may have different impacts on neighborhood change, and change in single family property values.

Neighborhood revitalization can be achieved by achieving social and economic revitalization through change in socioeconomic characteristics in neighborhoods. In this process, advocacy groups in neighborhoods and citizen involvement play an important role. As noted earlier, non-profit developers generally take the form of community development corporations (CDCs). Advocacy groups in neighborhoods occasionally assist the CDCs with housing construction for underserved populations by giving them information about underrepresented populations in neighborhoods.

To explain neighborhood revitalization from practical perspectives, conceptual model of revitalization based on subsidized housing development is described in Figure 2-2. Based on the explanation above, neighborhood revitalization by subsidized housing development focused on increasing property values can be categorized into two groups: (1) economic revitalization and (2) equitable revitalization. First, economic revitalization applies to low-income neighborhoods with old and poorly maintained housing which may experience in-migration of lower income groups. This process can cause a decrease in property values, which facilitate even more in-migration of low-income groups. However, once new subsidized housing and housing redevelopment occur in the economically depressed neighborhoods, economic revitalization can be achieved. By generally improving the neighborhood, this first revitalization may reduce affordable

market rate housing and generate more unaffordable housing units, resulting in immigration of higher income groups. This migration may increase demand in housing development, thus causing increase in property values. Because of the high housing prices, however, low-income groups might be displaced. From a sustainability point of view, this economic revitalization can be considered economically sustainable for local municipalities since increasing property values would generate increased tax revenue. Second, social revitalization can be achieved with the HCV programs for the displaced residents and low-income residents by allowing them to rent more expensive housing than they could without assistance.. This process can be viewed as achievement of social sustainability because it provides better quality housing opportunities for low-income households and displaced residents.

In this sense, neighborhood change and revitalization should be addressed in national, regional and local contexts. Therefore, this study analyzes changes in housing markets and urban housing policy since the 1990s. Based on empirical data and literature review, results of the housing development and the unintended consequences of revitalization such as displacement of low-income resident are identified and analyzed.

In order to conduct a modeling of causal relationships between subsidized housing and property value change through neighborhood change, it is necessary to identify which variables are significant to the model because it is impossible to analyze all possible variables. As for the modeling, we follow the annual variation of property values in order to identify the property value impacts of LIHTC funded developments, HCV units and HCV holders in LIHTC projects throughout the study period. However,

since the Census does not provide annual data, the attributes of neighborhoods are only operationalized at a cross-sectional time point.

For the purpose of modeling, we assume that the neighborhood attributes at the starting point of the analysis are the given conditions of the neighborhood. By complex mechanism of neighborhood change, the end point of the analysis is the final set of neighborhood characteristics defined at the final study year. Accordingly, the neighborhood change is the difference in specific characteristics of neighborhoods between the starting point of the analysis and the ending point of the analysis.

In this dissertation, the major variables of interest are property values, income, poverty and race. Based on the neighborhood change theory, the property values at the beginning point of the analysis is the given condition of neighborhood characteristics in which the variables of interest include income, poverty rate. At the ending point of the analysis, the model includes the finalized property values achieved through the revitalization process and neighborhood change. For the price impact model, census data in 1990 is used as an initial neighborhood condition. For the displacement model, three time points are identified and used.

Another concern for the modeling is a spatial boundary in which a single family home is affected by the subsidized housing developments. Even within the same neighborhood boundary, the property value impacts may vary according to proximity to the subsidized housing developments (Galster et al. 1999). This issue directly relates to differences in residents' responses to the subsidized housing developments. As the response of the residents determines utility for the property itself and the neighborhood, the demand for the house can be changed and ultimately the property values can

decrease. To the extent to which both spatial and temporal differences of neighborhood change are significant, the specific model needs to be considered in the modeling. Therefore, this dissertation examines the differential property value change within a census block group during a study period between 1990 and 2010. In order to include census block group variable properly, the Adjusted Interrupted Time Series specification in the regression model can address the differential impacts of spatial and temporal changes in dependent variables (Wooldrige, 2010; Galster et al., 2004; Ellen et al., 2007). Accordingly, the econometric model can address the property value change and neighborhood change process without considering national, regional and local variables that might be nuanced to the model. Finally, Ordinary Least Square regression model can address the displacement effect of HCV residents between 1990 and 2010 in the modeling.

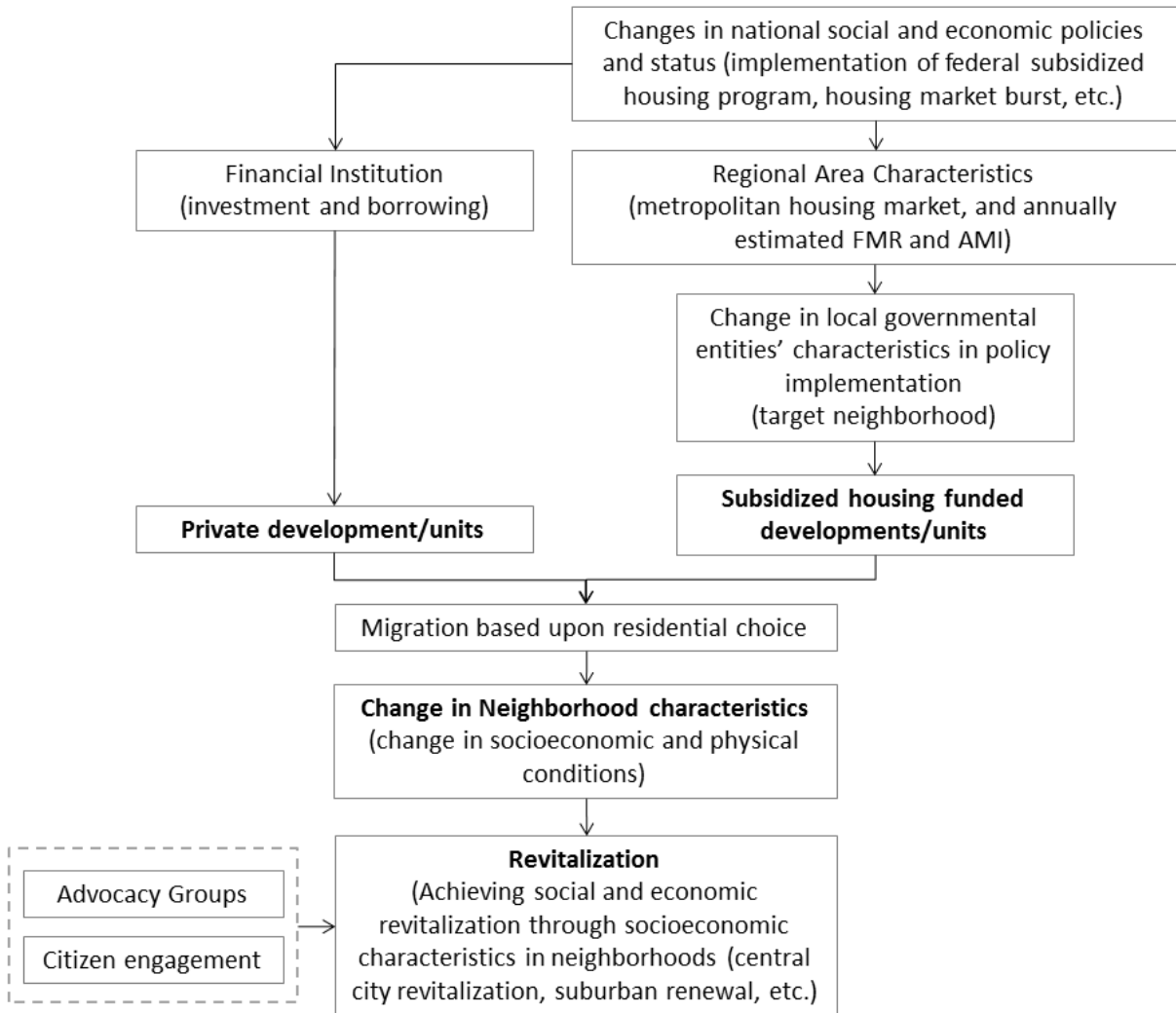


Figure 2-1. Conceptual framework for neighborhood change and revitalization by subsidized housing

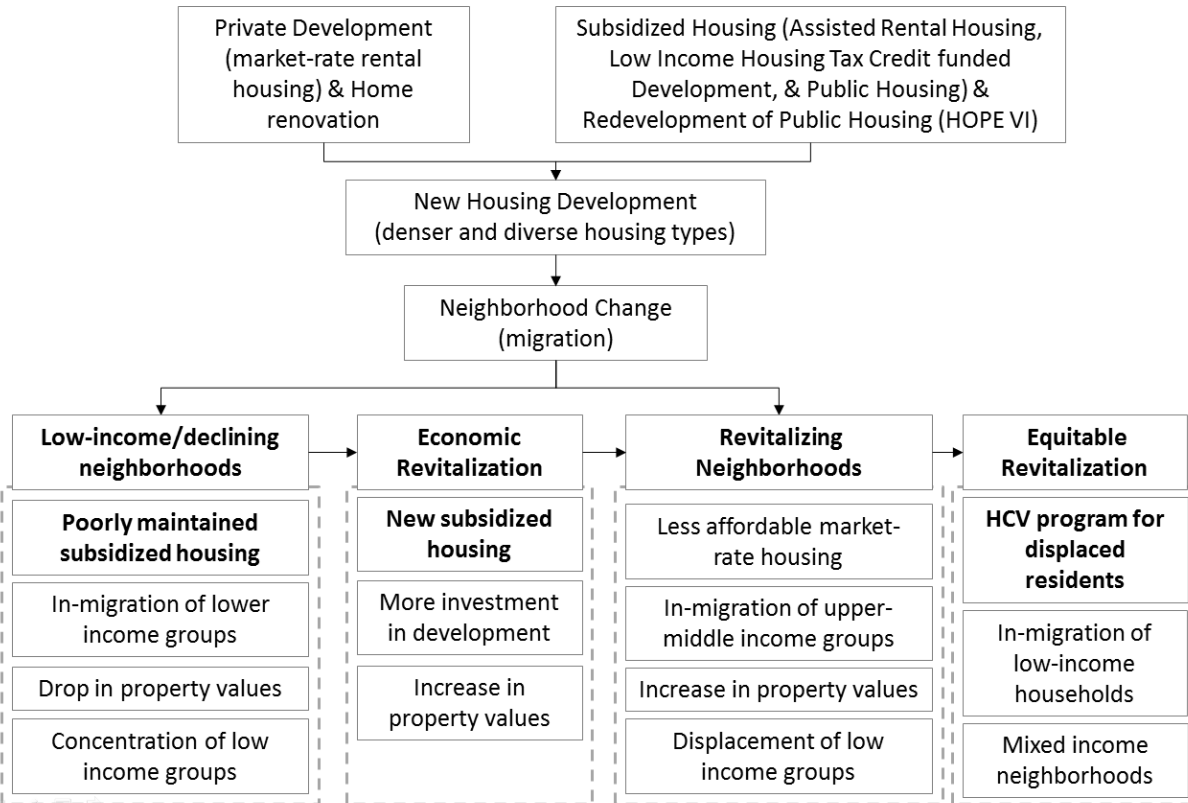


Figure 2-2. Conceptual model of different types of revitalization by housing development

CHAPTER 3 SUBSIDIZED HOUSING AND PROPERTY VALUES

This chapter introduces the theoretical framework and reviews the existing literature on subsidized housing projects and its impacts on neighborhoods. First, this chapter outlines the historical backgrounds, the program objectives, operation and differences of the Housing Choice Voucher Program (HCV) and the Low Income Housing Tax Credit Program (LIHTC). Second, it reviews literature on the property value impacts of subsidized housing in terms of neighborhood contexts, methodology, and analysis results in order to understand how to improve economically distressed neighborhoods and promote neighborhood revitalization.

The HCV and the LIHTC

In the process of shifting from project-based programs to tenant-based programs, federal and state governments have made strenuous efforts to provide shelter for low income household. Among all affordable housing projects with government driven programs, the LIHTC and HCV programs have made the greatest contribution to the production of affordable housing units. Along with low income housing subsidy programs, these programs are currently providing the largest number of affordable housing units in the United States (Schwartz, 2010). In the US, the LIHTC program produced about 1.8 million affordable units for eligible low-income households since its initiation (Schwartz, 2010). With the HCV program, approximately 1.9 million vouchers have been distributed to eligible tenants since 1999. In Florida, LIHTC-funded projects have provided about 100,000 units, and the HCV program has already served about 90,000 low income households (Schwartz, 2010). Florida has subsidized more than

250,000 housing units in project-based programs and more than 90,000 households in tenant-based programs.¹

The assisted housing stock in Florida by the year 2009 consisted of 2,250 properties with 253,826 units. In general, the assisted units are concentrated in large metropolitan areas. Approximately 70 percent are located in the four major Metropolitan Statistical Areas such as Miami, Orlando, Tampa, and Jacksonville. The stock is primarily occupied by tenants with incomes below 60 percent of AMI. Instead of specific populations such as the elderly or persons with disabilities, families constitute the majority of the tenants. The stock is relatively new with more than two thirds built since 1990, and almost 80 percent of units are owned by for-profit corporations (Ray et al, 2009). By 2009, the HUD administered HCV program has provided 94,347 low income households with vouchers (Ray et al, 2009).

The HCV program

The HCV is the most important government housing program since 1998 (Grigsby and Bourassa, 2004) because it provides direct subsidy assistance to tenants (Orlebeke, 2000). In 1974, the Housing and Community Development Act enacted the first subsidized tenant-based program which is Section 8 Housing program. It allowed eligible low-income households to access to housing in the private market as an alternative to public housing. Under the Quality and Work Responsibility Act of 1998, the Section 8 Housing voucher program combined with the Section 8 certificate program to create the Housing Choice Voucher (HCV) program (HUD 2001). This program

¹ Project-based properties include the rental housing subsidized by the state's SAIL and STTIP programs, and the LIHTC other HUD and RD programs, but tenant-based programs mainly are represented by section 8 programs and the voucher program.

provides opportunities for eligible low-income households to choose decent housing and neighborhoods in order to improve residential mobility, promote poverty de-concentration, and thus enhance economically-mixed neighborhoods in the long term (US House 2003).

This demand-side subsidy program includes certain standards. Voucher recipients can find any units in the private market that meet HUD requirements including the quality of the rental unit, the available rent allowance, and the willingness of the owner to accept voucher recipients. Generally, recipients pay about 30% of their income for rent with the remaining difference between that amount and the rent being paid by the local Public Housing Authority (PHA). Landlords are directly paid by the PHA. The proportion of locally assisted voucher recipients should include at least 75 percent of extremely low-income households (30 percent of AMI) and the remaining 25 percent of very low-income households (50 percent of AMI). However, after the revision of HUD voucher requirements, only financially qualified households earning less than 40 percent of AMI can be considered as eligible households. In Florida, other target populations include the homeless, the elderly, and the disabled.

The established maximum rent is based on the Fair Market Rent (FMR) for the area. Any remaining rent that exceeds the FMR is the responsibility of the tenants alone. However, no maximum limit exists that landlords can request for rent as to reasonability based on comparison with unassisted units in the private market. As long as the rent does not exceed the maximum limit, PHA can pay the remaining rent. Furthermore, tenants can choose either to pay the amount that exceeds the FMR or move to more affordable unit.

HCV households are widely distributed throughout regions, composing only small portion of total residents in neighborhoods (Devine, Gray, Rubin, and Tahiti. 2003; Kingsley, Johnson, and Pettit, 2003). The voucher holders live in almost 83 percent of census tracts in 50 different MSAs, constituting average 2 percent of total residents in neighborhoods in 2000 (Devine et al. 2003). However, a large amount of vouchers are still being used in high-poverty neighborhoods. In general, voucher holders live in neighborhoods with 20 percent of poverty rate (Galvez, 2012). A significant share of voucher recipients still lives in high-poverty areas. Approximately 10 percent of voucher holders reside in neighborhoods with poverty rates greater than 40 percent and nearly 22 percent of voucher recipients live in neighborhoods with poverty rates above 30 percent. (Devine et al. 2003). Voucher holders living central cities tend to live in higher poverty neighborhoods than those who are living in suburban neighborhoods. Nearly 30 percent of voucher holder lives in neighborhoods with poverty rate above 30 percent compared to only 5 percent of voucher recipients living in neighborhoods with the similar poverty rates in suburbs (Devine et al. 2003; Galvez, 2012).

However, the outcome of the HCV program presents some negative aspects. Since the program started in 1998, the federal Section 8 HCV program has become one of the largest housing subsidy programs in the United States, providing critical subsidies to over 2 million low-income families (Schwartz, 2010). Despite the good intention of the program and large amount of the sum spent on the program, the quality of the program performance is still on the debate. Previous studies that explore the process and outcomes of the programs show mixed results. Some studies show that the initial residential mobility programs, moving to Opportunity (MTO) and Gautreaux, have

positive impacts in terms of the policy objectives (Johnson, Ladd, and Ludwig, 2002; Goering, Kraft, Feins, McInnis, Holin, and Elhassan, 1999; Rosenbaum and Harris, 2001). Some voucher recipients under HOPE VI program have feelings about safety, and better living quality compared with public housing residents (Briggs, 2005)

However, as opposed to initial policy goal, the existing evidence suggests that HCV has failed to convey its objectives. Some of empirical evidences from other studies present that that voucher holders are still living in poor neighborhoods, especially minority dominated neighborhoods. Additionally, although voucher recipients under the HOPE VI program moved to low-poverty area, they still feel lack of social connection among teens, parents and neighbors. Although the HOPE VI program provides vouchers for relocation to new housing, the voucher recipients do not have enough alternatives to choose housing. This is because the voucher holders are already familiarized with the housing market characteristics of the areas near the redeveloping public housing. Even, they do not have generic access to local resources because of shortage knowledge on neighborhoods (Clampet-Lundquist and Massey, 2008).

There are several reasons for the lack of success. First, voucher holders may be reluctant to move away from their familiar neighborhoods where their friends and families have access to local public services. (Schwarz, 2010) Generally, low income minorities are live together or live in adjacent neighborhoods. Second, new neighborhoods might have discrimination from landlords and neighbors. Third, the current neighborhoods might have better transportation than new neighborhoods (Goetz, 2004). Fourth, voucher holders tend to choose more affordable housing even if subsidy is provided. The affordable housings are generally located in poor and

distressed neighborhoods (census tract) (Pendall, 2000). Fifth, the more metropolitan dominated by White, the fewer minority neighborhoods, the more of voucher holders live in these neighborhoods. Other reasons would be the unwillingness of landlords to accept voucher recipients (Turner and Ross 2005) and better accessibility to transportation and schools in old neighborhoods (Goetz 2004; Popkin and Cove 2007).

In addition, the voucher holders do not have access to all affordable housing properties that are available in MSAs. That is, affordable rental housing units are located in every census tract in fifty MSAs, but these tracts only have less than half of voucher holders that would be expected when the number of used voucher is compared to available affordable housing units (Devine et al. 2003). Indeed, over fifty percent of census tracts housed voucher holders are located in suburbs (Devine et al. 2003).

The LIHTC Program

The LIHTC program has been playing a significant role in providing affordable housing units since its creation in 1986 as part of the Tax Reform Act legislated by Congress. The program is established to "bring the efficiency and discipline of the private market to the building of affordable rental housing" (Cummings and DiPasquale 1999, 252). More specifically, it provides for-profit and non-profit developers with funding based on packaging and selling federal tax credits to private investors on equity of reduction in federal tax credits for private investors in exchange for acquisition of affordable rental projects. Using the tax credits, a state agency allows private sector developers including for-profit developers and non-profit developers to build housing units. Instead of the state agency, the developers decide development size, design of the project, location, operation, and administration of the project.

The LIHTC program defines rent restrictions and requires that at least 20 percent of units are for households at or below 50 percent of AMI, or at least 40 percent of units are for households at or below 60 percent of AMI. More specifically, the LIHTC program provides a tax credit to projects that have housing units that are designated for income-qualified tenants. The credits can be endowed to the projects that have at least 40% of the units that is set aside for households with 60% of area median income or below, or 20% of the units that are allocated for households with 50% of area median income or below. Specific target populations of the LIHTC include low income households with 60% or less AMI, very-low income households with 50% or less of AMI, income qualified elderly, the homeless, and farm workers in Florida. Intrinsically, the LIHTC program set aside households that have diverse income backgrounds, thus providing mixed-income developments to provide improvement for housing opportunities in the low-income neighborhoods. Although the LIHTC program is federally overseen by the Internal Revenue Service in terms of tax revenue aligned with the housing developments, the administration of the LIHTC program is generally based on a statewide oversight. Indeed, at the local level, developers go through the competitive process administered by state agencies. In specific, this supply-side program is primarily administered by State Housing Finance Agencies (i.e. the Florida Housing Finance Corporation), providing block grant funds to private developers with either competitive (9% tax credit) or non-competitive (4% tax credit) programs.

For the projects granted 9% credits, they are eligible for approximately 9% of the qualified basis per year for about 10 to 15 years and can provide a subsidy up to 70% of the qualified basis. This qualified basis is determined by subtraction of land cost, and

construction cost for market-rate units from total project cost. For instance, when the total development cost is approximately 10 million dollars and up to 7 million dollars are assigned to subsidized units set aside for the income-qualified tenants. The rest of 3 million dollars go to cost for land acquisition, demolition and construction for market-rate units with no income restriction. Additionally, the project under the 9% credit have equal qualified basis per year. That is, similar to the 9% credit projects, a tax-credit subsidy is provided to development projects by up to 30% of the qualified basis under the 4% credit. In this case, approximately 3 million dollars out of 10 million dollars are allocated for the subsidized housing units.

This program supports construction activity including rehabilitation, redevelopment and new construction of LIHTC projects. Nonetheless, the tax credit cannot be used to acquire existing properties except rehabilitated projects, projects finances with tax-exempt bonds, and projects receive benefits on financial loans from a federal government. Despite the limited use of tax bonds and tax credits, the use of Housing Choice voucher is permitted at all LIHTC funded developments.

In Florida, the Florida Housing Finance Corporation (FHFC) takes responsibility for several housing subsidy programs to provide development loans, and ensure guarantees for the construction and rehabilitation of housing for specific target populations including the elderly, the homeless and low-income households in Florida. The LIHTC program is administered by the FHFC. The income restriction that is delineated in the LIHTC program can also be applied to other programs such as the State Apartment Incentive Loan (SAIL) and the State Bonds. In addition, other local

housing finance authorities can also provide soft loans with less stringent income restrictions.

The maximum allowable rents for the eligible renters are determined based on the median income in a metropolitan area and non-metropolitan area. The allowable rents are determined at the maximum qualifying income which is 30% of its gross income for rent, which includes utility expenses. For instance, if a developer choose an option to develop a project that has 20% of units for eligible households below 50 % of AMI, the maximum allowable rent is equal to the amount of what households with up to 60% AMI would spend on rent when 30% of their income are spent on rent and utilities. Depending on different cases, these requirements should be observed for at least 15 years up to 50 years.

The LIHTC funded projects are developed by various entities but it can be categorized into two groups: for-profit developers, and non-profit developers. According to the document on the LIHTC database published by the HUD (2009b), about 29 percent of the LIHTC funded projects were built by non-profit developers and the remaining 71 percent of the LHITC developments were built by for-profit developers. These two entities operate differently. Non-profit developers are bound to community benefits and contracts with governments to convey the terms for providing affordable housing. On the contrary, for-profit developers can react to the housing market and build housing in a more efficient way. Because of this difference, non-profit developers tend to take over difficult projects that resources are poorly provided (Bratt, Vidal, Schwartz, Keyes, and Stockard, 1998).

For the non-profit developers, states should allocate at least 10% of their financial resources to projects that are built by non-profit developers. These non-profit developers are generally engaged in local communities to carry benefits from federal to low-income neighborhoods. By using the form of community development corporations (CDCs), they focus on housing production, economic development, production of job training development for community residents, and social services (Nye and Glickman, 2000). These organizations have been located in low- and moderate-income neighborhoods in order to easily access to economically underserved residents (Rohe and Bratt, 2003). Since these neighborhoods are often neglected by private developers, the non-profit developers only organizations that help with housing productions and other social services (Rohe and Bratt, 2003). However, these CDCs are occasionally limited by its own capacity to produce housing developments because of insufficient financial resources, political issues with regard to neighborhood development, and lack of business networking and partnership (Nye and Glickman, 2000). Nonetheless, the LIHTC funded developments provide resources for housing productions to the CDCs and allow them to connect business networking and partnership.

According to the data for the period between 1987 and 2010 provided by HUD, approximately 20% of all LIHTC funded developments are built by non-profit developers, indicating that non-profit developers have played a significant role in LIHTC developments. Indeed, HUD allocate LIHTC funds to state housing finance agencies but the quality of LIHTC funded developments and allocation plan by each state may vary. It is important to understand the mechanisms of developments with unrealized participation of non-profit developers.

In the City of Orlando, applicants seeking LIHTC are encouraged to receive local Affordable Housing Certification. Information regarding the City of Orlando's certification process and available incentives for participation in this program can be found in Chapter 67 of Orlando's City Code. According to the criteria of a developer for affordable housing projects, the applicants should follow the alternative development standards for low and very-low income housing. The codes are intended to "promote innovative design, encourage the production of low and very low income housing, and allow the more efficient use of land as compared with the typical single family development." It also clearly states that the alternative development standards should be consistent with growth management plan. Several elements pursuant to the housing elements of the growth management policy include " 1.3 to promote infill residential development; Policy 1.3.1 to provide residential land uses at varying densities and locations through land development code regulations; Policy 1.6.1 to ensure adequate sites are correctly planned and zoned to accommodate the projected housing growth, including low and very low income housing; Policy 1.6.3 to review the existing land development regulations to consider the necessity of implementing such provisions as higher densities, smaller lots, and innovative designs; and Policy 1.7.1 to encourage developments containing units affordable to a range of income groups" (City of Orlando, 1994).

In addition to requiring the state housing finance agencies to allocate the tax credit, the section 42 of the Internal Revenue Code requires these agencies to create a Qualified Allocation Plan (QAP) that outlines the process of building LIHTC funded developments. This QAP set aside minimum qualification for the LIHTC funded projects

such as financial feasibility standards, site requirements, developer experience, and other tools for measuring project quality. It also establishes set-asides of tax credit for projects that need to be located in high demand areas serving target populations. These plans establish scoring system to identify better quality projects that is in accordance with state housing policy objectives. The QAP delineates several financial incentives for developments that are built in high-poverty areas known as Qualified Census Tracts (QCTs). Also, when built in Difficult to Development Areas (DDA), the LIHTC projects are eligible for additional financial incentive. The State QAPs establishes these incentives to contribute to project locations and other financial characteristics.

It is possible to assume that states may contribute to neighborhood revitalization by proposing central inner-city housing opportunities based on the financial incentives. However, establishing additional financial incentives may increase the project's financial risk and decrease feasibility. Occasionally, successful projects require additional subsidies or incentives. These developers are those with experience and the capital to be able to withstand lengthy application review periods and compliance monitoring requirements.

The location of LIHTC funded developments have various neighborhood environment which is result from state QAPs and local housing market situations (Deng, 2007). Based on the State Allocation Plans, the focus areas of the LIHTC program are generally rural areas and urban infill areas. Nationally, a significant share of LIHTC funded developments are located in low-poverty suburban areas compared to the housing choice voucher program (McClure, 2006). This LIHTC's success attributes to

the program's popularity among the for-profit developers and non-profit developers (Deng, 2011b).

Differences Between the LIHTC Program and the HCV Program

Along with differences in the funding process, and policy goals, differences also exist between the HCV and the LIHTC in terms of tenant income characteristics and location. Both programs assist affordable rental housing in the private market. However, the income targets differ between the two programs. The HCV provides deeper subsidies than the LIHTC because it deals with eligible households that meet income qualifications and pay no more than 30% of their income in housing cost.² The allowable rent of LIHTC programs is determined by a maximum rent amount which is restricted by AMI rather than the gross income of individual households. The LIHTC might not reach as many low income households as the HCV because of its higher income targets (O'Regan and Quigley 2000).

Compared to place-based projects, which tend to concentrate poverty, the HCV offers better opportunity and flexibility in that housing type, community location; accessibility to public transportation, school, and job accessibility can be considered when households choose rental housing in the private market (Turner 2003; Goetz, 2004; Turner and Ross 2005). However, available HCV units can be limited due to tight rental markets, unwillingness of landlords to participate in the program, racial discrimination, criminal record restrictions, and shortage of affordable housing in the market (Turner 2003; Turner and Ross 2005).

² The housing cost include rent, and all utility costs.

In this sense, LIHTC units can be an important source of housing for HCV holders since it is usually affordable units, particularly for households earning less than 40% AMI who otherwise are unable to rent a housing unit. According to a study conducted by HUD (2009), 50 out of every 100 LIHTC projects are occupied by at least one voucher holder. Essentially, they are providing voucher recipients access to units in neighborhoods that might otherwise experience significant shortages of affordable housing units. However, the LIHTCs located in Qualified Census Tracts (QCTs) receive increased tax credit per unit to locate in designated areas³. These projects might prevent HCV policy goals from being realized because QCTs are defined as high poverty neighborhoods. (Grigsby and Bourassa 2004). Nonetheless, voucher holders can still experience improved housing quality despite the LIHTC's location in these areas.

In order to compare locations of HCV and LIHTC units, many studies examine location of tenant based projects and project based projects. But, only handful research efforts have compared the location of the two types of projects. Before comparing locations of HCV and LIHTC, it is necessary to compare locations of HCV and public housing because public housing was the first target of the residential mobility program.

As noted in the description of the HCV program, the HCV was established to deconcentrate poverty, promote economic diversity of lower income households and prevent isolation. Thus, HCV recipients are expected to move to locations with lower poverty since they have the option to select affordable rental housing in the private

³ Qualified Census Tracts (QCTs) are designated by three standards: 1) over 50 percent of households have an income less than 60% of AMI, 2) poverty rate is at least 25 percent, and 3) the QCT is designated by the Secretary of Housing and Urban Development

market. Previous studies found that voucher holders live in lower-poverty area than public housing tenants (Hartung and Henig 1997; Pendall 2000; Devine et al. 2003). For example, according to a study conducted by HUD in 2000(?), about 83 percent of voucher holders live in low-poverty census tracts whereas 8 percent of public housing resident live in these neighborhoods in 2000. Only about 9 percent of voucher holders live in high poverty area compared with public housing residents (Devine et al. 2003).

In terms of neighborhoods poverty rates, LIHTC tenants and voucher recipients have different experience on the neighborhood poverty rates (McClure 2006; Ellen, O'Regan and Voicu 2009). The LIHTC units are located in neighborhood with a 20 percent poverty rate, which is identical to poverty rate that HCV recipients experience in 2004 (Galvez, 2012). About a third of all LIHTC funded units were built in census tracts with poverty rates less than 10 percent while a quarter of HCV households live in low-poverty census tracts (Ellen et al. 2007; Galvez, 2012)

Not surprisingly, LIHTC funded units are less distributed than voucher holders. The LIHTC funded developments are located nearly 22 percent of all census tracts in 50 MSAs while the voucher holders are distributed approximately 86 percent of all census tracts in the same regions. However, the LIHTC is located in lower-poverty areas compared to HCV (McClure 2006; Ellen, O'Regan, and Voicu, 2009). Considering the size and characteristics of the two programs, it seems reasonable. But, although there are better sites with LIHTCs in MSAs than there are places where voucher holders live, several studies show that LIHTC provides better opportunity geographically than HCV program in terms of moving into low-poverty neighborhoods. This becomes more evident in suburban areas (Ellen et al. 2009; McClure 2006). Even though a larger

portion of LIHTC projects are already produced in high-poverty area compared to HCV locations in MSA, they are also developed in low-poverty area in suburbs (McClure 2006). It is suggested that the LIHTC programs popularity leads to new construction of LIHTC funded developments in low-poverty neighborhoods such within low-poverty suburb areas. Evidence show that half of all LIHTC units built in suburbs are located in low-poverty census tracts (McClure, 2006).

In terms of location of usage of the subsidized housing programs, the HCV program and the LIHTC program lend themselves to use in high growth urban areas as found in Florida. The concentration of the HCV program on high growth metropolitan areas can be understood in terms of funding process of notices of funding availability (NOFAs) and management of local administration. The large proportion of LIHTC projects can be explained by Qualified Allocation Plan (QAP) and the specific incentives for siting LIHTC in Difficult Development Areas (DDA) and Qualified Census Tracts (QCT).

For HCV program, the role of HUD and local public housing authorities are distinctively different in the process of implementation and administration of the voucher program. The HUD monitors the implementation and public housing authority actually administers it in specific regions. In terms of process of distributing voucher funds, Public Housing Authorities (PHAs) strictly authorized under the Florida State law recognize the notices of funding availability (NOFAs) which is published in the Federal Register and applies to the HUD. After funding is determined, the HUD provides funds to local selected PHAs, and then PHAs allocate the funds to eligible voucher holders. Voucher participants can choose any private multifamily housing that is made through a

contract with Public Housing Authorities (PHA), not limited to subsidized housing. Since the program starts, every public housing agency which develops and manages the HCV program has responsibility to properly provide subsidies and manages subsidized rental housing for the target population such as low income families, low income seniors, the disabled, and the homeless.

Each year voucher program sponsors voucher recipients including Veteran's Affairs Supported Housing (VASH) voucher holders, Port-In vouchers , and 5-year mainstream vouchers , and other relevant voucher programs. The HCV program is federal administered program. Thus, the number of voucher recipients sponsored is dependent on the availability of funds from the HUD. Currently, many PHAs in Florida do not accept additional voucher applications since HUD does not expand intensity of the funding for HCV program due to cutback in government budgets. Currently, there are several NOFAs published in the Federal Register that include Project-Basing HUD-Veterans Affairs Supportive Housing Vouchers (project-basing HUD-VASH vouchers) , 2012 Housing Choice Voucher Family Self-Sufficiency (HCV FSS) Program and 2010 Family Unification program of HCV.

The NOFA requirements address that HCV funding is provided by identification of "allocation areas, amount of funds available per area, and the selection criteria rating and ranking applications." (HUD, 2012). But these criteria are arbitrary based on the circumstances of jurisdictions that the PHAs administer. According to the HCV program regulations at 24 CFR Part 982, the total number of vouchers that the PHA apply for is decided by the size of the PHA and the local needs for the HCV vouchers. Additionally, the HCV funds are determined based on the various factors like a property owner status,

participant, payment standard, PHA plan (annual plan the 5-year plan as adopted by the PHA), portability, residency preference, special housing needs and so on. Regardless of level of governmental entities, Any PHAs can apply for the HCV. If there is a consortium of housing agencies, the HUD decide whether the consorted governmental entity has a capability to operate the HCV program. Also, any private non-profit or public agencies can apply for the program. This becomes competitive funding process under the NOFA.

Based on the criteria, the funding for HCV can be concentrated on high urban growth areas such as metropolitan areas. Generally, large metropolitan areas or growth urban areas experience growing number of poor population, and low income households along with the increasing number of total population. These potential demands influence the "local needs for the HCV vouchers". Also, the size of PHAs reflects size of a city and population directly. Therefore, the HCV has been increasingly concentrated on the metropolitan areas. Some research consistently finds that HCV recipients are dispersed within Metropolitan Statistical Areas (MSAs) (Devine et al. 2003; Kingsley et al. 2003). A result shows that about 83 percent of census tracts within 50 MSAs accommodate voucher holders who are found to be only 2 percent in total census tracts (Devine et al. 2003).

Regarding the LIHTC concentrated in urban areas, the administrative process of the LIHTC program may facilitate the concentration of LIHTC projects. The process of distributing funding starts with the Internal Revenue Service allocating tax credits to a state allocating agency. The Florida state housing agency develops a Qualified Allocation Plan (QAP) based on certain criteria like housing needs, and set-aside plan. After receiving development proposals from private developers, the Florida state agency

evaluate the applications based on QAP. With final decisions, the Florida state agency gives LIHTC the private developers who already found funds in exchange for tax credits to investors.

There are information about the allocation of tax credit, providing reasons for why LIHTC is concentrated in the large metropolitan areas. It is mandated by Congress and addressed at Section 42(m)(1)(B) of the Internal Revenue Code (IRC). The selection criteria includes appropriate local conditions.

According to Florida's 2008 Universal Application package and 2008 Florida's QAP, the relevant selection criteria are as follows. These criteria also are considered as priorities for selecting projects.

- "Developments which are located in qualified Urban In-Fill areas will be targeted."
- "Developments located in the Florida Keys Area will be targeted."
- "Counties within the state are divided into 3 groups according to population and housing needs. "
- "Specific criteria for the Geographic Set-Aside categories, the Florida Keys Area and the Urban In-Fill area qualifications are addressed in the Universal Application Package which is incorporated by reference in the FHFC rules."
- location in Qualified Census Tracts (QCTs)
- the development that is restricted under community revitalization plan
- Housing Needs Characteristics
- "Developments which meet state, regional and local housing needs will be targeted."
- "Developments which are designed to attract and serve the Elderly will be targeted."
- "Developments which are designed to attract and serve Farm Worker/Commercial Fishing Worker families will be targeted."

- "Developments which are designed to attract and serve the Homeless will be targeted."
- "Developments which are 50 units or less will be targeted."
- "Developments which address revitalization through the use of HOPE VI funding will be targeted."

Qualified Census Tracts (QCTs) are defined in Section 42 of the Internal Revenue Code as areas where 50 percent or more of the households have incomes below 60 percent of the area median income or where the poverty rate is 25 percent or higher. Under a congressional amendment to the LIHTC program in 1989, developers are eligible for a 30 percent bonus if they build LIHTC units in a QCT. The Internal Revenue Service administers the LIHTC program, which keeps it from being subject to the same fair housing laws as other subsidized housing programs administered by the U.S. Department of Housing and Urban Development (HUD). Developers of LIHTC housing select the location of the development and are only required to comply with local residential development laws and the state housing allocation agency. As a result of limited regulation and the QCT-based incentive, many LIHTC units have been located in low-income neighborhoods (Horn and O'Regan, 2011). According to the list of 2008 LIHTC Qualified Census Tract designations, there about 29 counties in Metropolitan area contain the QCTs designated in 2008. Of course, Orange County has the designated QCTs. In fact, the Qualified Census Tracts in central cities have attracted a significant amount of LIHTC development activity; 00% of LIHTC developments are in Orange Area.

Difficult Developed Areas (DDAs) are defined under section 42 of the Internal Revenue Code of 1986 as areas designated by the Secretary of HUD where there are high construction, land, and utility costs associated with the Area Median Gross Income

(AMGI). Similar to QCTs, developers are eligible for a 30 percent bonus if they develop in the DDA. DDA is designated by comparing the average households income (income limits) and housing cost (Fair Market Rent). According to 2008 IRS section 42(d)(5)(c) Metropolitan Difficult Development Areas, there are 14 counties including Broward County, Miami-Dade County, and so on designated as DDAs in Florida. However, the study areas that my dissertation deals with are not included in the list of DDAs.

There is one condition for the number of QCTs and DDAs. The total population of QCTs and DDAs cannot exceed 20 percent of total cumulative population in metropolitan area. For the consistency of section 42 requirements, non-metropolitan areas are considered as one metropolitan area. In this sense, QCT and DDA could bring more LIHTC projects because the limits of designation could possibly make competitive to eligibility for LIHTC projects in metropolitan areas.

Based on the criteria, the funding for the LIHTC can be focused on large metropolitan areas where high population density and housing needs exist because developments meets local housing needs. However, simply the population growth does not determine the number of units by LIHTC program. This is because each housing market and the housing cost calculation methods of state agency can be different. As shown in Table 3-1 which contains top five states in terms of total LIHTC units, Texas is the highest given state but the allocated funds are much less than ones in the State of California. The allocated funds per unit says that there is big discrepancy of housing cost between Texas and California. The methodologies among state are different based on the land and development cost, and housing cost.

As evidence shows, many LIHTC projects are concentrated in high poverty areas known as QCT and DDA. Several empirical studies show that LIHTC units tend to be located in high urban growth areas and poverty increasing areas in the large metropolitan areas even though many LIHTC projects are located in moderate poverty neighborhoods (Abt Associates, 2006). On the other hand, other studies found that many of the recent LIHTC projects are built in suburban areas because of locating benefits. Indeed, the LIHTC projects are more likely to be located in suburban areas despite the locations in the high poverty areas (Freeman, 2004). Also, the LIHTC projects goes out to suburban areas and located in high poverty census tracts, but they census-based poor renters are not relatively located in the high poverty areas (McClure, 2006).

Impacts of Subsidized Housing on Property Values

This section introduces general theories that explain the property value impact of subsidized housing. To conceptualize the neighborhood impact of subsidized housing, this study divides the housing market into three sub-markets: high-income, middle-income, and low-income submarkets. The property value impacts of subsidized housing depend on social and political conditions that alter the meaning of impacts on perceptions and behavior of existing residents. Those who want to evaluate the impact bring their own goals to bear complicating assessment of affordable housing projects. This reaction results in multiple contested reports drawing different conclusions.

Subsidized housing theoretically can increase the number of low income people, and concentrate poverty, increase racial transition, and lower property values (Freeman and Botein, 2002). For instance, subsidized housing lowers property values by incentivizing low income people to move into the neighborhoods, concentrating poverty,

and encouraging whites to leave (Galster and Killen, 1995; Rohe and Freeman, 2001). Other empirical evidences shows that subsidized housing decreases income level because it brings more low income households into neighborhoods (Galster and Killen, 1995; Galster et al, 2003). Also, research indicates that public housing makes neighborhood conditions worse because of its high-rise structure and stigmatizing design characteristics. The resulting diminished neighborhood conditions attract even more low-income households (Newman, 1997; Rohe and Freeman, 2001). Other evidence illustrate that assisted housing is generally located in highly poor and racial minority-dominated neighborhoods where the racial segregation can be made worse than other neighborhoods with the introduction of assisted housing (Rohe and Freeman, 2001).

Indeed, high-income and middle income communities are more likely to oppose to locating subsidized housing within their neighborhoods due to Not-In-My-Backyard (NIMBY) attitudes and the stigmatizing traits of subsidized housing. In particular, the NIMBY attitude is related to the design of the affordable housing, the amount of interaction between affordable housing residents and those in host neighborhoods, and the clustering or concentration of affordable housing, which can feature dilapidated and old rental housing (Nguyen, 2005).

However, as subsidized housing is introduced into low-income markets, impacts of the new assisted housing can improve neighborhood quality by revitalizing the neighborhoods with new construction and an influx of higher income groups. Increasing the supply of newly constructed subsidized housing and the in-migration of high-middle income groups to low-income neighborhoods can improve the overall quality of these

neighborhoods because these properties can be of much higher quality than other properties in these areas (Freeman and Botein, 2002). This situation can have positive effects on property values, and might stimulate additional new construction (Galster et al, 2004; Ellen et al, 2006). Increasing property values generates more property taxes and creates a better neighborhood environment, thus generating investment in these neighborhoods. It will often also remove the negative features of old housing, increase population density, and increase income diversity and racial integration within neighborhoods (Ellen et al., 2001; Schwartz et al., 2006; Ellen et al., 2007).⁴

Despite extensive debate, some researchers found that subsidized housing has no effect on property values because the profile of low income households is indifferent from that in surrounding neighborhoods (Babb, Pol and Guy, 1985; MaRous, 1996). Some studies also find weak evidence of change in property values because the subsidized housing is located in already low-income neighborhoods (Lee et al., 1999; Rohe and Freeman, 2001; Ellen et al., 2007). Surrounding neighbors are also potential consumers of subsidized housing, and so might get public assistance or be on a waiting list for public assistance. This means that low-income people have to compete with each other. This spatial concentration of low income families could cause a decline in property values. However, neighborhood is the flip-side of that coin. Since, although the increment of property value raises property taxes which will be distributed into investment in the public domain, the market forces low-income households to move out of their property.

⁴ Ellen et al. (2007) conceptualize the possible effects of subsidized housing on neighborhood into five dimensions: removal effect, physical structure effect, market effects, population growth effect, and population mix effects.

Some studies evaluating local impacts conclude that these assisted properties tend to decrease property values and also increase poverty rates, aggravate racial and income segregation, raise crime levels and worsen education attainment (Ellen and Turner, 1997; Galster et al. 2003; Freeman and Botein, 2002; Ellen et al., 2007). Since assisted housing hosts only low income tenants, concentration of assisted housing in a locale typically means more low income residents. As such, other studies show the response of neighbors with prejudicial views of the tenants intensifying the negative effects on property values (Galster et al., 2003). The negative response is represented by The Not-In-My-Back-Yard (NYMBY) attitude that leads to community opposition against concentration of less desirable neighbors and concerns about clusters of dilapidated and old rental housing (Nguyen, 2005; Obrinsky and Stein, 2006).

Furthermore, empirical evidence shows that the effects of subsidized housing are different across different neighborhood contexts. In particular, the effects might vary depending on the degree of poverty in each neighborhood. It is hard to generalize the impact of subsidized housing on property values depending on neighborhood types. For instance, some studies present evidence that there is negative effects in impoverished African-American neighborhoods and positive effects in affluent white dominant areas (Galster et al., 1999; Galster et al., 2003). These results are consistent with one that a study find: decreasing property value impacts of public housing in low-income neighborhoods while two high-income neighborhoods experience positive impacts (Baird, 1980).

On the contrary, some find positive effects in low-income areas and negative or no effects in affluent areas. For example, The subsidized housing have more negative

effects on single family homes in suburbs than ones in urban areas (Lyons and Loveridge, 1993). Project-based public housing in Chicago has no impact on surrounding property values in suburban white dominant areas but positive impacts in poor white neighborhoods (Warren, Aduddell, and Tatalovich, 1983). City housing with new construction and rehabilitation subsidies have more positive impacts in economically depressed neighborhoods than high-income affluent areas (Schwartz et al., 2006).

There might be two unintended consequences to this: displacement of low income households, and poverty reconcentration. First, if property values significantly increase, then low income households could be displaced by not only the large development of LIHTC but also by unaffordable market-rated rental housing. These affected households would look for affordable housing, significant amounts of which are located in lower income neighborhoods. Second, if property value is decreased, there are more incentives for low income households to afford rental housing in host neighborhoods than other neighborhoods. As a result, low income households move into the neighborhoods, thus concentrating the poor in that location.

As summarized in Table 3-2, earlier studies used hedonic price model that do not control for idiosyncratic neighborhoods characteristics (Nourse, 1963; Schafer, 1972; Desalvo, 1974; Rabiega, Lin, and Robinson, 1984; Guy et al., 1985; Cummings and Landis, 1993; Lyons and Loveridge; 1993; Goetz et al., 1996; Briggs, Darden, and Aidala, 1999). It needs to be acknowledged that the methodological problem is significantly improved. Thus, the results of the studies utilizing difference-in-difference specification or AITS specification are summarized. Cummings, DiPasquale, and Kahn

(2002) examine the impact of two Nehmia homeownership developments on property values in central inner-city at Philadelphia. They find no effect of the homeownership program on surrounding housing prices. But, the methodological reinterpretation of Galster (2004)'s observation on the results suggest a rather counterintuitive conclusion. Based on the difference-in-difference and AITS approaches, the results can be opposite: the positive effects of subsidized housing on property values.

Santiago, Galster, and Tatian (2001) investigates the impact of dispersed rehabilitated public housing on property values in Denver, Colorado using the difference-in-difference specification. The results show that the publicly subsidized housing have a positive impact on single home values. But, African-American dominated low-income neighborhoods experience detrimental impacts. The authors recognize that the potential property value impacts in the low-income neighborhoods may be offset by the incremental poverty concentration (Santiago, Galster, and Tatian, 2001).

Schill, Ellen, Schwartz, and Voicu (2002) explores the effect of subsidized housing projects implemented as part of New York City's Ten Year Plan. This housing rehabilitation plan provide support to rehabilitate over 180,000 units in impoverished and underserved neighborhoods. The results present that the rehabilitated housing have positive impacts on single family home prices, which increases with project size. But the affected property values are consistent across study periods. The authors

conclude that these positive impacts generally contribute to revitalization of inner-city neighborhoods (Schill, Ellen, Schwartz, and Voicu, 2002)⁵.

Similar to Schill et al. (2002)'s study, Schwartz, Ellen, Voicu, and Schill (2006) examines the effect of New York City's Ten Year Plan, only concentrating on new construction and rehabilitation. They find that the subsidized projects have positive impacts on property values. These positive impacts are somewhat constant over study periods. The positive price impacts increase with project size and decrease with distance to subsidized housing and the portion of unassisted multifamily units. The positive price still remains even after controlling for preexisting price trends. The authors conclude that the positive effects are larger in distressed neighborhoods (typically below 80 percent of AMI community districts), implying that the subsidized housing projects may have regenerating effects of distressed neighborhoods (Schwartz et al., 2006).

The LIHTC and HCV have potentially diverging effects on property value because of the structural design of affordable housing, tenants' characteristics, and neighborhood contexts in which the projects are located. The HCV program has a greater potential for negative effects on property values because the HCV-subsidized households earning generally less than 40% of AMI⁶ are expected to depress nearby properties in communities where the non-poor neighbors are concentrated (Galster et al. 1999). But, the LIHTC tends to have positive effects on property values because of the introduction of new units and the design of these projects (Ellen et al. 2006). Even if low

⁵ The authors find that although the magnitudes of the homeownership program and the rental housing projects are different to some degree, this difference is not statistically significant. Additionally, the impact difference between single family homes and multifamily units are not statistically significant.

⁶ AMI means the area median family income for the Gainesville Metropolitan Statistical Area, as published by the US Bureau of the Census and the US Department of Housing and Urban Development – You need to define this where you first mention AMI.

income households with less than 60% of AMI are housed in LIHTC units, they might not affect values in the adjacent communities because many LIHTC projects are located in high-poverty areas.

As shown in Table 3-2, there are several studies utilizing the DID or the AITS methodology on investigating the housing price effects of the LIHTC funded development and the Section 8 certificates and voucher accepting sites. Although these studies are conducted in various local contexts, it is worthwhile to draw generalizable conclusions for the purpose of this study. The following is a summary of key information regarding the property value effect of LIHTC and HCV. Only one well-designed study examines the property value effects of the section 8 certificate program. Galster et al. (1999) investigated the impacts of the section 8 certificate program on property values in Baltimore County, Maryland. The results show that overall impacts are positive in high-medium income, and African-American low-income census tracts in 1990, while there is a negative impact in depressed neighborhoods. Also, there is a strong negative impact for large size of Section 8 certificate recipients within 500 feet from single family housing in more than 8 sites of section 8 certificate programs⁷. This result implies that sites for section 8 certificate in poorly maintained condition and located in low-income neighborhoods could discourage the demand for single family housing and decrease housing prices. As confirmed in focus group study, the authors suggest that stigmatization effect associated with tenant based-subsidies could create environment where concentration of low-income households may cause stigma by bringing about the

⁷ Examining whether there is a impact of Section 8 households depending on race does not show significant results.

increased activity of crime and drug uses and increased poverty concentration, thus reducing property values in a neighborhood (Galster et al., 1999).

Lee et al. (1999) examines the effects of similar housing programs on nearby property values in Philadelphia. They found that section 8 new construction programs have little positive effects on property values. This implies that homeownership programs and rehabilitation programs have better results than rental housing programs. The voucher program and the LIHTC units were also found to have negative impacts on nearby property values. This might have been due to differential siting decisions for each affordable housing project and different tenant selection criteria in the subsidized housing program. They acknowledge their study's limitations, only including cross-sectional sales data, and focusing on only one locale.

Green, Malpezzi, and Seah (2002) examine the effect of LIHTC funded development on single family home prices in Madison and the Milwaukee Metropolitan in Wisconsin, using repeat sales specification hedonic price model. They find no effects of LIHTC funded development on nearby property values. The authors recognize that there are seemingly positive effects in some relatively high-income areas.

Ellen, Schill, Schwartz, and Voicu (2007) finds that federally subsidized rental housing has positive effects on property values in spite of decreasing the property value in the short term. Admitting existing methodological problems, Ellen et al. (2007) use a more sophisticated econometric model to control spatial and temporal endogeneity. They explore the impact of the Public Housing Program, the Section 8 New and Substantial Rehabilitation program, the Section 202 program for the Elderly and the LIHTC program on sales prices of single family housing in surrounding neighborhoods

in New York. The study utilizes difference-in-difference of hedonic regression analysis with key independent variables such as a quarter-mile ring during pre-construction, AFTER ring, and AFTER time across the programs.

The results show that in general subsidized housing does not reduce property values. However, the impacts are highly sensitive to scale across various subsidized housing programs. In particular, the Section 202 and the LIHTC programs show positive effects on housing values consistently and subsidized housing targeted to the elderly also has positive effects on the property values. Although public housing decreases property values in the short term, the impacts diminish after 3 years of completion of the subsidized housing units. Also, size of the public housing decreases the marginal impacts. They found section 8 programs, which have the lowest income tenants, had the most negative impacts on property values, an effect that can be reduced or aggravated by the size of property.

In terms of neighborhood characteristics, the section 8 program and the rehabilitated public housing have positive impacts in upper middle income neighborhoods but negative impacts in low-income neighborhoods. The New York City's programs such as new construction and substantial rehabilitation programs in distressed neighborhoods have strongly positive impacts.

But, the LIHTC program, which subsidizes the largest and broadest income group, has the most positive effects. The researchers note that the results are too oriented to the idiosyncrasies of New York to generalize to other cities even though New York City has the most well-known and the largest portion of federally subsidized housing. They conclude that the property value impact tend to vary across programs

depending on the size, design of housing, the characteristics of tenants and the host neighborhood characteristics.

Deng (2011b) investigates the property value impacts of the LIHTC funded projects in Santa Clara County, California from 1987 to 2000 using the DID specification based on three different developer types such as for-profit, nonprofit and a county public housing authority. The results show that most of the LIHTC projects have positive impacts on single family property values. In particular, for-profit funded projects carry similarly positive impacts to those of nonprofit projects. Under the context of neighborhoods, the a public housing authority and several large nonprofit developers outperform other developers in terms of generating positive impacts on property values. In terms of neighborhood characteristics, the low-income neighborhoods experience generally positive impacts of the LIHTC funded projects. The author conclude that this positive impacts may have the revitalization effect of low-income and depressed neighborhoods (Deng, 2011b). The key studies of property value impacts of HCV and LIHTC are summarized in Table 3-2.

Implications from the literature review

Property value impacts of the LIHTC and HCV programs vary depending on different subsidized housing program types, size of affordable housing projects, concentration of subsidized housing, proximity to the subsidized housing, assisted tenants' characteristics, neighborhood context and methodology (Galster et al., 1999; Schill et al. 2002; Ellen et al., 2007). Following is the implications from the literature review.

First, while programs type vary, subsidized housing programs generally have positive impacts on property values. Generally, each subsidized housing program may

have differential price impacts. The rental housing programs generally smaller positive impacts than homeownership programs although no statistical difference is found with the magnitude (Schill et al., 2002). Additionally, the New York City's new construction and rehabilitation programs generally have positive impacts in vulnerable neighborhoods with increasing magnitudes as project sizes increase. In terms of concentration of subsidized housing, new construction and substantial rehabilitation programs in distressed neighborhoods generally appear to have greater positive impacts as their project sizes increase (Ellen et al., 2007). However, when negative effects exist, the magnitude of the effects are small (Nguyen 2005) compared with other conditions affecting property values. Furthermore, the negative effects vanished after the first several years of developing the LIHTC funded projects (Ellen et al., 2007).

Second, the larger sized affordable housing projects have, a more significant positive impact on property values. This finding is counterintuitive to the notion that the larger projects can result in greater decline in property values because of poor management and because affordable housing is usually not competitive in the market (Nguyen 2005). However, LIHTC and HCV units catch up with market mainstream to compete with other rental housing. The LIHTC units are newly built, designed, and planned by private developers. The rental housing units for HCV recipients need continued maintenance to meet HUD inspection requirements. The results of continuous management can affect nearby property values in a positive way.

Third, neighborhood composition plays a significant role in changing property values. Conventional wisdom on the effects of affordable housing in different contexts of neighborhoods is that property decline is severe in poor neighborhoods. However, the

literature shows that the LIHTC and HCV projects increase property values within economically distressed neighborhoods. These positive effects can be explained by demolition and removal effects (Ellen et al. 2007) of LIHTC projects that have been rehabilitated, or newly constructed within recent decades. Additionally, HCV units need to meet strong HUD management requirements to comply with stringent guidelines. This will allow adjacent property values to sustain positive effects.

Fourth, methodological variations can generate different outcomes in terms of impacts on property value. Indeed, when Galster and Killen (1998) tested external effects of Section 8 programs using hedonic models with limited controls, the analysis showed negative impacts on property values. Later, Galster et al. (2004) found positive outcomes of supportive housing programs on property values using difference-in-difference specifications, even though the subsidized housing program focuses on a different target population. From a general view point, regional and locational attributes can contribute to different research results. For example, Lee et al. (1999) use Philadelphia data; Galster et al. (2004) concentrate on the Baltimore area; Ellen et al. (2007) use comprehensive data on New York City; Deng (2011b) focuses on Santa Clara County in California. Even though they use the same methodology, the results are different based on differences in interpretation. The methodological problems will be elaborated on more in the next chapter.

But these studies have not strongly tested tenants in subsidized housing receive a very generous and sustained benefit that they can use to reduce the privations of poverty and low social status. Only two studies investigate property value effects of the demographic composition of assisted housing rental projects. Galster et al. (1999) use

the racial composition of assisted housing and its impacts on property values. They find that no significant effects on property values exist. Deng (2011b) tests property value impacts of LIHTC income level restrictions. She also finds there are no significant effects. Additionally, the physical improvement of the buildings and infrastructure, if concentrated enough, may actually increase the attractiveness of the neighborhood to moderate and even middle income households and so meet program the goals envisioned many decades ago (Ellen et al., 2007).

Fifth, none of the studies address the property value effects of LIHTC projects accommodating HCV recipients. Although we have seen the positive effects of the LIHTC and HCV programs, these programs are not only tested in different states from Florida, but also use inconsistent methodologies at different geographical levels. It is important to know the effects of LIHTC and HCV on property values across different neighborhood contexts. More specifically, prior studies have failed to consider the relative property value impacts of the HCV and LIHTC programs. Several studies take into account the relationship between HCV and LIHTC in terms of cost, benefit, and locational outcomes (Shroder and Reiger, 1999; Deng, 2004; Deng, 2007). But, these studies do not examine direct relationships between the programs. Given that LIHTC projects are generally located in poverty areas in central cities and low poverty neighborhoods in suburban areas (Freeman, 2004; Dawkins, 2011), LIHTC could be a target of HCV holders that cannot afford market rated housing. Thus, property value impacts may vary depending on different neighborhood context associated with locations of HCV and LIHTC.

Sixth, this study provides county-based generalized strategies for neighborhood revitalization using the LIHTC program and the HCV program in order to achieve economic development and social equity. In general, revitalization strategies based on the federal subsidized programs are not fully explored. Although redevelopment of public housing through HOPE VI program may help improve economic environments and relocate displaced residents, little is known about concerting local revitalization plan using the two largest subsidized housing programs in US.

Research Hypothesis

In the revitalization, the prevailing theories regarding the effects of subsidized housing on its adjacent neighborhoods are elaborated based on difference between the host neighborhoods that accommodate subsidized housing developments and low-income renters who would reside in the housing projects. Freeman and Botein (2002) provide an effective argument that impacts may occur when a discrepancy exists pervasively socioeconomic characteristics of existing neighborhoods and those associated with subsidized housing, which is mostly occupied by socially and economically vulnerable households. They argue that the physical features of affordable housing and assisted tenants are major factors influencing neighborhoods. This conceptual process will be explained in the following sections.

In general, the poor are concentrated and segregated in certain neighborhood because they lean toward high affordability in housing and increase the crowd-out of low income families in dwelling units. If the poverty concentration is severe enough, the property value and income level of neighborhoods will drop. However, new subsidized housing may have the opposite effect. This study assumes that there are two possibilities: physical amenity effects and demographic effects. With regard to physical

effects, features of the new subsidized housing could upgrade overall housing quality and serve as an incentive for middle- income households to move to neighborhoods. The new design of assisted housing can be attributed to increase in property values. Therefore, the assisted rental housing may decrease the poverty rate in the neighborhoods. The physical amenity effects also include increase in housing density within existing neighborhoods. Of course, increased housing density may result in negative impacts on community's amenity by overwhelming population density, and aggravating congestion (Churchman, 1999). However, compact built environment may provide better options such as job accessibility and proximity to transportation (Galster et al., 2008). In terms of resident effects, the incoming low-income residents seeking LIHTC and HCV units could change the migration behavior of different income groups.⁸ That is, the less stringent income restriction a property complies with, the more the property has positive effect.

In addition, this study adds empirical data regarding neighborhood effects to conceptualized effects of subsidized housing developed in previous studies (Ellen et al., 2007; Galster et al. 1999; Galster et al. 2004). The neighborhood effect could be defined as the effects of current neighborhood status on property values. Generally, property values are determined by changes in demand associated with in-and-out migration of different income groups in a host neighborhood as well as neighborhood status.

⁸ This statement is drawn from preliminary analysis that is conducted by the author. Even though the analysis needs further analysis for sophisticated details, it provides the general idea that there is a threshold of income restriction that could affect neighborhood quality.

Several variables could represent neighborhood status. Among many neighborhood indicators, dispersion of low income households and poverty concentration are the strongest indicators of property value. The influx of a high proportion of low-income residents leads to the flight of high and middle income groups, which attracts more low-income neighbors. In fact, poverty concentration is closely related to income segregation because it occurs not only by due to the influx of low-income populations but also by change in segregation structure of the surrounding neighborhoods (Jargowsky, 1996). Also, homeownership impacts neighborhood stabilization, which is directly related to neighborhood disinvestment, vandalism, and the broken window effect (Galster et al., 1987; Ding, 2008). Homeownership rates relate to the satisfaction of homeowners, local and political activities along with a presence of a supportive social network, and a low tendency to move out (Rohe et al, 2001). The higher homeownership rate, the more stable are property values. Other indicators include accessibility to park and transit, housing density, the number of older housing units, and crime rates (Quercia and Galster, 2000; Galster et al., 2000).

Furthermore, increased property values are determined by the characteristics of the existing host neighborhoods to the extent that the host neighborhoods have sufficient social capital to change (Galster, 2001; Quercia and Galster, 2000; Galster et al, 2000; Ellen, and O'Regan, 2011). Namely, there may be a threshold that triggers property value changes in given neighborhoods.

As discussed above, three types of effects - physical effects, demographic effects, and neighborhood effects - theoretically exist. However, these hypothetical effects operate differently based on the subsidized programs used and socio-economic

characteristics of the neighborhoods in which the subsidized housing programs are located. The diverging effects might be explained as follows.

First, the LIHTC is a project-based program, but the HCV is a tenant-based program. This difference results in LIHTC having physical effects, demographic effects, and neighborhood effects while HCV has demographic effects. and neighborhood effects. That said, LIHTC might be more powerful in overall revitalization impacts than HCV because it incentivizes new investment and attracts more high-middle income households.

Second, the two programs involve different income restrictions that determine which residents can be served. The LIHTC program requires at least 20% of total units have 50% AMI and at least 40% of units have 60% AMI. But, the HCV only accepts households earning less than 50% AMI (sometimes less than 40%). These differing income restrictions in the two programs could create demographic effects in various ways. For instance, when LIHTCs include residents with 60% AMI on average compared to HCV recipients with 40% AMI, it will have a more positive effect on property value than the HCV. This is because the higher income attracts more investment and attracts other higher income residents.

Third, overall LIHTC projects are located in lower-poverty areas than HCV units are. Statistically, LIHTC projects are located in areas with similar poverty rates as neighborhoods where HCVs are located (McClure 2006). Indeed, a large proportion of LIHTC projects are located in higher-poverty areas than are HCV units. But, LIHTCs are also highly distributed in low-poverty areas in suburbs (McClure 2006). These neighborhood characteristics may affect the impacts of subsidized housing on property

value. For example, consider four cases: LIHTC in low-poverty (50% AMI), LIHTC in high-poverty (30% AMI), HCV in low-poverty (50% AMI), and HCV in high-poverty (30% AMI). Borrowing an example from the previous explanation, LIHTC projects have relatively high income residents (60% AMI), but HCV has low income households (40% AMI). By combining the income level of subsidized housing and a neighborhood's poverty level, the interesting facts are complete.

On the one hand, LIHTC in a high-poverty area might present positive effects. Similarly, one in a low-poverty area also might have positive effects because potential income of LIHTC residents is still higher than the overall income level in the neighborhood. On the other hand, HCV introduced into a high-poverty community could show positive effects while the one in the low-poverty neighborhoods can have negative effects. Hence, depending on degree of poverty in neighborhoods, the income restrictions of subsidized housing could play an important role in affecting property values.

Fourth, as discussed in the previous chapter, equitable revitalization can be achieved by the HCV program following economic revitalization. In the process of revitalization, there are two possible scenarios of the unintended consequences from the increasing property values: the displacement of residents, and the poverty re-concentration. The higher housing prices prevent the low-income displaced tenants from obtaining residence in a same neighborhood. Thus, the displacement of residents is more aggravated in neighborhoods experiencing increase in housing prices. For the poverty re-concentration, when property values decrease, rental housing becomes more affordable to the low-income residents. Through the social network or connections of

low-income residents such as relatives and friends, low-income residents tend to bring about poorer residents. This neighborhood change process accentuates poverty concentration. To examine the impacts of housing prices on displacement of residents, this study explores the impacts of housing prices on HCV usages in neighborhoods by using simple OLS regression model. Figure 3-1 and Figure 3-2 outlines the hypothesis model. All things considered, the hypotheses of this dissertation are as follows:

- The LIHTC and the HCV in most economically distressed neighborhoods are more likely to increase property values than those in other neighborhoods.
- The LIHTC outpaces the HCV in terms of positive impacts on property values due to the difference in demographic effects and physical effects.
- HCV holders in LIHTC projects may have less property value effect than those residing in LIHTC funded developments without vouchers because of the HCV's potential income level.
- The high housing prices decrease HCV usage in these neighborhoods, but the LIHTC funded developments attract more HCV holders.

In sum, the hypothesis can be categorized into three different but related groups: the combined effects (physical, demographic, and neighborhood), demographic effect, and subsidized housing program effect.

Table 3-1. Population growth and the LIHTC units permitted between 1987 and 2008

State	Texas	California	Florida	New York	Illinois
Total LIHTC units	196,833	134,267	97,887	86,541	67,355
Total housing Units permitted	2,685,263	3,226,588	3,406,760	958,820	1,073,536
2008 Population	24,304,290	36,580,371	18,423,878	19,467,789	12,842,954
Household growth	2,554,087	2,332,554	2,308,908	550,044	628,692
Allocated funds for LIHTC	653,441,577	1,163,716,964	573,662,437	673,353,468	417,556,683
Allocated funds per unit (\$)	3,320	8,667	5,860	7,781	6,199
LIHTC units per household growth (%)	7.71	5.76	4.24	15.73	10.71
Total units per household growth (%)	105.14	138.33	147.55	174.32	170.76

Source: Census 2000, Census American Community Survey 2005-2009, and national LIHTC database from HUD.

Table 3-2. Summary of research findings examining the effects of subsidized housing programs on the surrounding property values

Author	Year	Sample	Methodology	Area	Program	Results
Nourse	1963	1,916 sales	Treatment vs. Control Area in Hedonic	3 Neighborhoods in St. Louis, MO	8 Public Housing Projects	(x) or (+)
Schafer	1972	196 sales	Treatment vs. Control Area in Hedonic	1 Neighborhoods in LA, CA	1 BMIR Projects	(x)
DeSalvo	1974	Appraised values	Treatment vs. Control Area in Hedonic	50 Neighborhoods in New York City, NY	62 Mitchell-Lama Projects	(+)
Sedway and Associates	1983	14 sales	Treatment vs. Control Area in Hedonic	Marin County, CA	3 Low Income Housing Developments	(x)
Rabiega et al.	1984	581 sales	Pre/Post Hedonic	Multnomah County, Portland, OR	6 Public Housing projects	(+)
Guy et al.	1985	861 sales	Cross-Sectional Hedonic	Fairfax, VA	4 Townhouse Clusters (BMIR)	(-)
Cummings and Landis	1993	3,000 sales	Cross-Sectional Hedonic	3 counties in San Francisco Bay Area	6 Bridge programs developments (BRIDGE program)	(x) or Mixed

Table 3-2. Continued

Author	Year	Sample	Methodology	Area	Program	Results
Lyons and Loveridge	1993	26,503 appraised values	Cross-Sectional Hedonic	Ramsey County, MN	120 subsidized projects (Section 8 New Construction and Rehabilitation, Section 8 Existing Vouchers, Section 202, Section 236, Section 221(d)(3), BMIR and Public Housing)	Section 236 and BMIR (x); Section 221(d)(3) and public housing (+); Section 202(-); Section 8 Existing vouchers and Section 8 New Construction and Rehabilitation (Mixed)
Goetz et al.	1996	X	Cross-Sectional Hedonic	Minneapolis, MN	23 subsidized projects (CDC-Developed Projects, Assisted rental housing, and Public Housing)	CDC projects (+); Other subsidized programs (-)
Briggs et al.	1999	X	Cross-Sectional/Time-Series Hedonic and Survey	Yonkers, NY	7 Scattered-Site public housing	(x)
Lee et al.	1999	18,062 sales	Cross-Sectional Hedonic	Philadelphia, PA	subsidized housing programs (Public Housing, Scattered-Site Public Housing, FHA Housing, Section 8 New Construction and Rehabilitation (NCR), Section 8 Certificates and Vouchers, LIHTC, and Philadelphia Housing Authority (PHA))	FHA Housing, Section 8 NCR, and PHA Homeownership (+); Public Housing, Scattered-Site Public Housing, Section 8 Vouchers, and LIHTC (-)
Galster et al.	1999	43,461 sales	Adjusted Interrupted Time Series and Focus Group	Baltimore County, MD	4,969 Section 8 Certificates and Voucher holder's sites	affluent neighborhoods (+); Low-Income Neighborhoods (-)
Galster et al.	1999	4969 projects	OLS Regression	Baltimore County, Maryland	Section 8 certificate and voucher	Overall: (+) More than 6 sites within 500 feet: (-)

Table 3-2. Continued

Author	Year	Sample	Methodology	Area	Program	Results
Santiago et al.	2001	X	Adjusted Interrupted Time Series and Focus Group	Denver, CO	92 Scattered-Site Public Housing Developments	(+) the impact is sensitive and vary by neighborhood context
Schill et al.	2002	293,756 sales	Difference-in-differences	48 Community Districts in NYC, NY	Subsidized housing programs in NYC's Ten Year Plan	(+) impact increases with project size
Green et al.	2002	6,243 sales	Cross-Sectional/Time-Series Hedonic	4 Counties in Madison and Milwaukee, WI	Low Income Housing Tax Credit Programs	Affluent neighborhoods (x) or (+); high-poverty neighborhoods (-)
Cummings et al.	2002	8,000 households	Cross-Sectional/Time-Series Hedonic and Survey	City of Philadelphia, PA	2 Homeownership Developments (Nehemia)	(x), but possibly (+) based on difference-in-difference framework
Bair and Fitzgerald	2005	157 blocks' median values	Cross-Sectional/Time-Series Hedonic	157 Census blocks in GA, NC, MO, MA, CO, PA	Scattered-Site Public Housing and other public housing programs	Scattered-Site Public housing (+); Other (mixed)
Schwartz et al.	2006	293,786	Difference-in-differences	NYC, NY	Subsidized housing programs in NYC's Ten Year Plan	(+) the impact diminishes with distance and increase with project size; more (+) impact in more impoverished neighborhoods
Ellen and Voicu	2007	-	Difference-in-differences	New York City, New York	660 LIHTC projects	(+)
Ellen et al.	2007	430,000 sales	Difference-in-differences	NYC, NY	77,000 subsidized units (Public Housing, Section 8, Section 202, and LIHTC)	Public Housing and Section 202 (x); LIHTC (+); Section 8 NCR (-) – scale effects and change in effects over time differ by type

Table 3-2. Continued

Author	Year	Sample	Methodology	Area	Program	Results
Koschinsky	2009	52,142 sales	Adjusted Interrupted Time Series	Seattle, Washington	Subsidized housing and unsubsidized housing (market rate multifamily housing)	(+) but sensitive to data structure (X) in low and medium income areas (-) in affluent areas
Deng	2011b	-	Difference-in-Difference	Santa Clara County, California	63 LIHTC projects	Overall: (-) Medium and large size: (+)

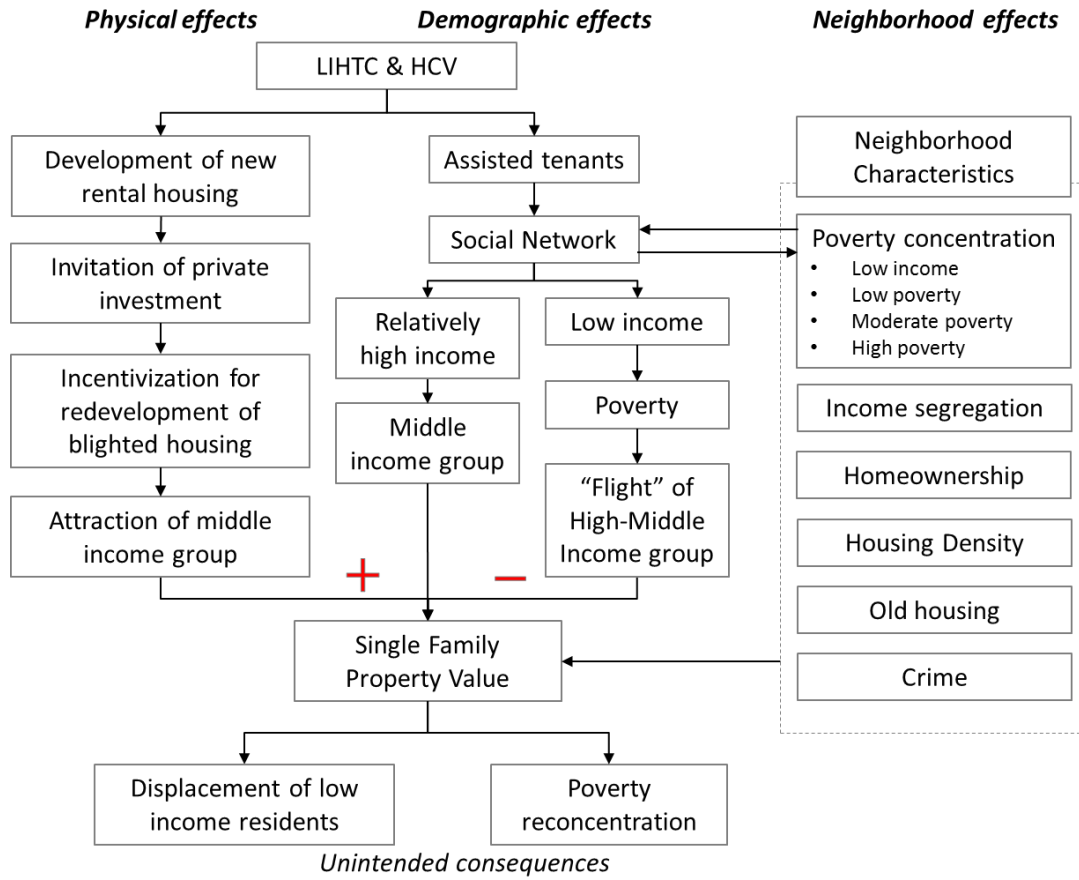


Figure 3-1. Conceptual Model of property value effects of subsidized housing program

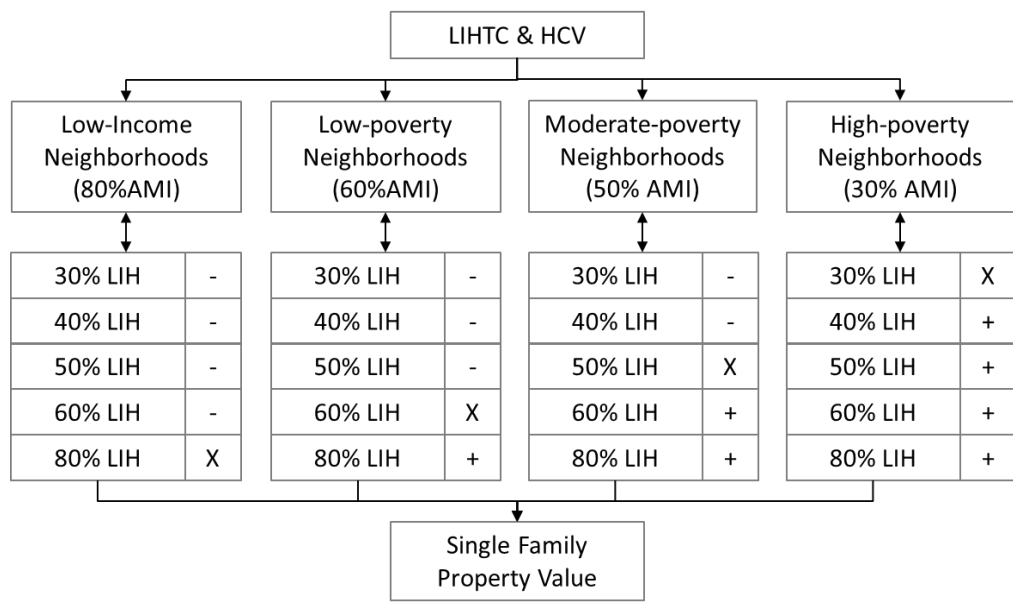


Figure 3-2. Hypothesis Model

CHAPTER 4 RESEARCH DESIGN

This study analyzes the Low Income Housing Tax Credit and Housing Choice Voucher programs from 1990 to 2009 and their impacts on property values in Orange County, Florida. In addition, the displacement effect of HCV holders by housing market change is examined. For analyses, this study uses a mixed research design approach. In order to provide empirical evidence on the relationship between the two subsidized housing programs, and property values and displacement, it uses quantitative analysis, which is Adjusted Interrupted Time Series specification of the regression model (AITS). The Ordinary Least Square regression model (OLS) is used to test the displacement of HCV holders. To understand various cases that have different estimate direction, this study uses a qualitative analysis that focuses on several neighborhood cases.

Before analyzing the data, this study reviews the regional and local context of Orange County. Specifically, it describes socio-economic characteristics of neighborhoods in the Orlando MSA and revitalization plans and comprehensive plans of the City of Orlando and Orange County. Moreover, historical background and city plans of Orange County provide a better understanding of the local context in Orange County.

Regarding the quantitative analysis, this study presents the data obtained from various sources for this study, operationalization and classification of low-income neighborhoods based on cluster analysis, and AITS and OLS regression models. For the qualitative analysis, several case neighborhoods are classified and selected based on the criteria divided based on the revitalization theories. Essential information regarding the selected case neighborhood is summarized. In particular, the case studies are introduced to strengthen the findings from the econometric analyses. Data and

variables combined with other neighborhood data are summarized in the case studies in a descriptive way such as GIS mapping and tabulation of the dataset. Additional data will be acquired through document review such as comprehensive plans of the City of Orlando and Orange County.

Study Area

This study focuses on the Orange County area as shown in Figure 4-1. Orange County is the central region of the Orlando MSA, which is one of the most rapidly growing regions in the US. According to the Census data, the Orlando MSA experience an increase in population by about 0.9 million between 1990 and 2010 (See Table 4-1). The urban growth rate is 74.3%, which is approximately three times the national average. During this period, Orange County experienced increases in population by 69.1 % and population in the City of Orlando increased 44.7%. Despite the dramatic increases in population, a majority of population growth were accumulated in the newly annexed and developing areas near the old city boundary in 1990. Consequently, the population growth within the City of Orlando shows a similar number to the national average for these two decades. Moreover, Orange County in Florida is one of the regions that have the highest share of assisted housing projects, population growth (See Table 4-2).

In terms of the economic status of neighborhoods, the median household income of Orange County and the City of Orlando is \$42,755 and \$49,731 in 2011, respectively. The poverty rate of the City of Orlando is 2.4% higher than that of Orange County in 2011. These indicators suggest that the low-income households are concentrated in a central city rather than outside urban areas. However, Orange County and the City of

Orlando have similar housing price values and median gross rents. The economic status of Orange County and the City of Orlando are summarized in Table 4-3.

According to the LIHTC Allocation Plan, the number of tax credits is allocated annually based on population. High population areas receive more tax credits from the federal government. From 2000 to 2010, Orange County is one of the fastest growing region in Florida. It has 5.85 % of Florida state population and experienced about 118.84 % increase in population during this time. Orange County has 37.7% of low-income neighborhoods. These indicators demonstrate the importance of examining whether subsidized housing programs increases property values in lower income neighborhoods.

The low-income areas including neighborhoods with below 30% of AMI, neighborhoods with 30-50% of AMI, and areas with 80% of AMI are concentrated throughout the city, but largely concentrated in downtown Orlando and near Interstate Highway 4 (I-4). The relatively middle and high-income neighborhoods are distributed outside of the census designated urbanized area. Mostly, the higher income neighborhoods are concentrated in the northeast areas of the City of Orlando. The spatial pattern of median household income and the low-income neighborhoods is shown in Figure 4-4.

The City of Orlando and Orange County have their own housing authorities. The Orlando Housing Authority administers affordable housing programs such as public housing and the LIHTC and HCV programs in the City of Orlando. Orange County has Orange Housing and Community Development Authority. In addition, the Orange County Housing Finance Authority is responsible for funding for the affordable housing

projects. These three primary governmental entities in the boundary of Orange County play important roles in addressing affordable housing issues, rehabilitating substandard housing and supporting new assisted housing development (City of Orlando, 2012; Orange County, 2012). Also, private nonprofit groups including the Orlando Neighborhood Improvement Corporation, Housing and Neighborhood Development Services of Central Florida, Inc., Habitat for Humanity and Florida Community Partners, Inc. are the largest non-profit organizations that are heavily engaged in local housing issues in Orange County.

A total of 97 new LIHTC projects were developed and 12,649 voucher holders were assisted in Orange County and the City of Orlando during the study period. In terms of demographic composition of the voucher holders, the Orange County Housing Authority voucher recipients consist of 52 percent African-American households while White households account for about 46 percent of total voucher recipients. In particular, most of the white voucher holders are Hispanic at 86 percent. Additionally, Orange County has only 2 percent of a total VASH vouchers throughout Florida in 2010. In terms of percentage of households paying actual rent by income, about 90 percent of voucher holders cannot pay more than 40 percent of their income on rents. They need to pay \$50 per month as flat rent. A median household income in block groups is compared with the county's AMI to calculate the comparative percentage of the household income between a neighborhood and a county. Orange County has higher proportion of 10-20% of AMI group, indicating that the county has substantially higher proportion of voucher holders in low-income groups than other income groups.

To ensure revitalizing neighborhoods and providing affordable housing, local governments address revitalization in their housing plans as part of the comprehensive plan. Under the Florida's Growth Management Act, the Growth Management Act mandate local governmental entities to incorporate the comprehensive plan in the growth management plan. Since 1991, the City of Orlando, and Orange County adopted comprehensive plans and growth management plans. These plans set aside the neighborhood revitalization plan as part of policy goals.

This housing plan not only promotes economic status of neighborhoods but also provides decent and affordable housing to low-income households. The City of Orlando acknowledges that the plan has its objectives and its limits described in the Vision Statement as follows:

The City will also provide leadership to stimulate affordable housing demonstrations within new and existing neighborhoods throughout the City. The City will institute strong and directed housing policies and work with the Orlando Housing Authority, non-profit development corporations and the private housing sector to meet the very real and growing affordable housing needs of the community...But simply preserving the housing that already exists and providing affordable new housing in and near the City's activity centers are not enough to solve the problems facing Orlando. The City also is aware of the fact that low-income housing will become more and more difficult to provide, and that the homeless and economically disadvantaged in our society must be re-incorporated into an economic system that has, by and large, passed them by (City of Orlando, 2012, p. V-5, and V-6).

In particular, the housing development strategy combining with supply of affordable housing, preservation of existing housing stock, and relocation plan of residents is implemented through housing supply strategy as stipulated in the Housing Element in the Growth Management Plan which targets extremely low income, very low income, low, or moderate income. While the City of Orlando encourages the supply of affordable housing using discretionary funds, tax credits, and state or local bonds, the

city must also avoid the concentration of affordable housing, by promoting mixed-use development (City of Orlando, 2012, H-6 and H-7). Moreover, the City monitors loss of housing units by expiring Section 8 contracts and conversion of affordable housing into condominium (City of Orlando, 2012, H-5).

As part of “Local Displacement Strategy and Residential Anti-displacement and Relocation Assistance Plan”, the City is mandated to relocate residents when federal funds are available for “acquisition, demolition, rehabilitation, or conversion”, complying with the “Uniform Relocation Assistance Real Property Acquisition Policies Act and with Section 104(d) of the Housing and Community Development Act of 1974” (City of Orlando, 2012, H-3). When funds are available, the city needs to consider providing housing opportunities for displaced residents (City of Orlando, 2012, H-5).

In Orlando metropolitan area, the LIHTC program administered by the FHFC has been successful in providing affordable housing to eligible low-income tenants. Approximately 80 percent of affordable housing in the Orlando MSA is newly constructed multi-family apartments. These affordable housing communities have various assisted programs for low-income households such as day-care programs, and tutoring programs for after-school homework projects.

However, although the City of Orlando has a planned housing development strategy to address affordable housing need, the plans associated with the revitalization plan is only limited and not effectively supported. As part of revitalization efforts, the City of Orlando established the Parramore Heritage Renovation Projects in order to revitalize the Callahan, Holden, and Parramore community through empowering business and residents (City of Orlando, 2012, H-17). The major concern for this project is to focus on

addressing the affordable housing issues. Also, the city targets neighborhood revitalization, and affordable housing within the Parramore Heritage Renovation Area by supporting and implementing various public programs (City of Orlando, 2012, H-17). Through these public programs, the City of Orlando intends to revitalize neighborhoods by providing multifamily housing, mixed-use development and commercial development. However, these programs merely concentrate on the several communities so the area is too small to revitalize.

Most of the affordable housing communities in the Orlando area are operated through public/private partnerships, but these are not supported as revitalization plans. In particular, the City of Orlando stipulates in Comprehensive Plan that the city needs to participate in various programs such as federal and state housing programs as well as mortgage revenue bond program, and tax exempt financing program of the Orange County Housing Finance Authority. It also supports Community Housing Development Organizations to provide financial and technical assistance to the city and the county as well as families and individuals that seek affordable housing. The city needs to correspond with for-profit and non-profit developers to efficiently determine the size, location, and number of affordable housing developments through the Affordable Housing Advisory Committee (City of Orlando, 2012, H-7 and H-8). The city also prioritizes high density, mixed-income and mixed-use developments located in proximity to major employment centers and near public or mass transit centers (The City of Orlando, 2012, H-9). However, these components are explicitly not elaborated in the neighborhood revitalization plan.

Unlike to the City of Orlando, Orange County does not strongly support neighborhood revitalization through its Housing Element even though the county has several policy components to promote neighborhood revitalization. As neighborhood revitalization plan, Orange County applies several urban design components through various programs such as neighborhood signage program, Residential Tree Planting Program, and a representative to the Urban Design Commission (Orange County, 2011, N-2). Also, Orange County encourages commercial businesses to get involved in the revitalization of neighborhoods (Orange County, 2011, N-5 and PW-17). In terms of affordable housing developments, Orange County focuses on affordable housing supply through several major plans such as the SHIP Local Housing Assistance Plan, and workforce housing through several programs such as Employer Assisted Housing (EAP) and the Down Payment Assistance Program (Orange County, 2011, H-2 – H-6). Furthermore, Orange County has compensation plan for displaced residents in accordance with the Relocation and Displacement Plan as part of the Uniform Relocation Act. However, the details of this act are not specified. Although Orange County intends to provide affordable housing based on the comprehensive plan, the housing development combined with revitalization plan is not supported.

In sum, despite increasing urban poverty and low-income households, local housing authorities in Orange County and the City of Orlando have made efforts to support affordable housing projects through federal, state and locally-initiated programs. However, within the context of different neighborhoods and housing markets, the evaluation of the outcomes of placement of affordable housing and the location of voucher holders still remain to be addressed. This evaluation can provide valuable

implications for equitable neighborhood revitalization for residents, tenants and policymakers.

Data

The primary data for the analysis is extracted data from the Housing Choice Voucher (HCV) holder dataset obtained from HUD under the confidentiality agreement with HUD.¹ The data of the LIHTC program and other privately owned assisted rental housing are obtained from the Florida Housing Data Clearinghouse's Assisted Housing Inventory² that is housed at the Shimberg Center for Housing Studies at the University of Florida.

To conduct appropriate econometric analyses, other data are collected at both a parcel level and a neighborhood level³. Using parcel data, neighborhood characteristics are operationalized or aggregated at this level to construct a complete dataset for

¹ The Shimberg Center received an extract from HUD's longitudinal Multifamily Tenant Characteristics System (MTCS) dataset in order to create a household-level data of all Housing Choice Voucher (HCV) holders in Orange County in Florida in 2000, 2005 and 2010. The information of HCV dataset that the author acquires include unit addresses, date of admission to the program, number of family members, age of head of household, household income, race and ethnicity, the number of bedrooms in unit, whether a household is homeless at admission, and whether they are elderly or disabled. Additional information includes zip code before admission.

² This Assisted Housing Inventory is the web-based dataset that provides information on the privately owned assisted rental housing developments that have been constructed using federal, state, and local housing programs in Florida.

³ In this study, a neighborhood is identified as a separate residential area that can be distinguished from other residential areas and delineated within a boundary of walking distance. The closest operational area is the census block group based on the following explanations. Considering size of neighborhoods, the census tract is the geographical unit that has been most frequently used in other studies. However, the size of census tract is too large to use as a neighborhood. Thus, a census block group is reasonably scaled to represent a neighborhood specifically in the urbanized area. Traditionally, the size of a neighborhood is defined by a walking distance, which is generally 0.25-0.5 mile radius boundary. The size of a neighborhood having a half mile radius is about 0.785 square mile. The median size of census block groups within the census designated urbanized area (census block groups of which 75% of land is located within the urbanized area: 529 of total 695 census block groups) is 0.60 square mile and the mean value is 0.96 square mile. Of course, the size of some census block groups outside of the urbanized area is much larger than that of the traditional neighborhood, but the census block group is the smallest spatial unit for which the Census Bureau provides specific neighborhood information.

econometric analysis. In terms of a parcel level, the major data source is the property tax rolls from the Florida Department of Revenue (FDOR) and the collected tax roll data obtained from the Shimberg Center for Housing Studies at the University of Florida. At the neighborhood level, Census 1990 and 2000, and the American Community Survey (ACS) 2007-2011⁴ are collected. The information at a census block group level is obtained from the National Historical Geographic Information System (NHGIS).⁵

In order to identify single family parcels that have a history of sales transactions between 1990 and 2010, the land use code,⁶ and the original built year of parcels of the property tax rolls are used. To calculate housing density, water bodies which are considered undevelopable lands, need to be identified. The U.S. Geological Survey has a scale of 1:24,000 in National Hydrography Dataset (NHD), which can be obtained from Florida Geographic Data Library (FGDL). The parcel data's information is used to construct property characteristics for the econometric models. The Census and ACS data are utilized to construct neighborhood characteristics. Due to the inconsistency of

⁴ The National Census conducts the American Community Survey (ACS) and update the ACS every year since 2005. It provides data at both census tract level and census block group level based on an 1-year estimate, a 3-year estimate, and a 5-year estimate. For this study, we use a 5-year estimate in order to provide better results for the analyses. The information of neighborhoods from ACS 2007-2011 is not exact attributes of neighborhoods in 2011 but rather the average of the estimated attributes between 2007 and 2011. The sample size of the ACS is approximately 1.5% of total households in a county every year. The ACS 2007-2011 use the Census 2010 boundary.

⁵ Minnesota Population Center. *National Historical Geographic Information System: Version 2.0*. Minneapolis, MN: University of Minnesota 2011.

⁶ The DOR land use code is the three digits code to represent different land use. For example, the land use code is '001', the parcel is single family home, '002' indicates mobile homes. In this study, the code that contains 001 is only included in the sample properties. Among these data, single family homes that have smaller sale price than \$10,000 are excluded because parcels with less than \$10,000 are not actual sale properties. Possible assumption is that those properties may be inherited, given as a gift, and so on. Other residential, commercial, industrial, institutional, and government properties for which land use codes range from 002 to 099 are excluded.

Census boundaries between 1990, 2000, and 2010, the boundaries of Census block groups are adjusted based on Census 2000 boundaries.⁷

Data for the two selected case studies in the City of Orlando are obtained through documents review and internet search. These case study communities are selected based on historical backgrounds in downtown Orlando. Through review of Comprehensive Plans, growth management plans, and the websites of the Orlando Housing Authority, and the Orange County Property Appraiser, information about the case study areas are collected. Descriptions of data sources are summarized in Table 4-4.

Operationalization of Neighborhoods

Defining Economically Distressed Neighborhoods

Generally, the term, "economically distressed neighborhoods" is arbitrary depending on a set of rules defining the threshold of lower income populations in certain areas. The size of the boundary is also arbitrary depending on the different research so it is necessary to initially understand how to define the neighborhoods. The economically distressed neighborhoods can be defined with Census definition and HUD guidelines. On the one hand, many refer to neighborhoods (generally defined by census tracts) with incomes above 40 percent of the poverty rate as high-poverty neighborhoods. Neighborhoods with poverty rates of 20 - 40 percent are considered as moderate poverty areas. When poverty rates in neighborhoods are less than 20 percent,

⁷ The adjustment of the boundaries between 1990 and 2000 is conducted using density concept based on the following procedures: (1) identifying divided census block group in 1990 due to the change of census boundary; (2) calculating housing density of the census block group in 1990 – total number of housing units divided by developable land acre; (3) calculating the land acres of the divided areas; (4) calculating the number of housing units of each divided area by multiplying the area's land acres with the housing density in 1990; (5) summing up the calculated number of housing units based on the 2000 census block group boundaries. The same process is applied to adjust the boundary of 2010 Census block groups.

they are regarded as low-poverty areas (Census, 2000). The poverty rates are calculated by dividing total number of population living under Census poverty line by total population in the areas. The poverty rates can be standardized based on the county poverty rate. The following is the definition of poor neighborhoods using Census data:

- High poverty neighborhoods = $\frac{\text{above 40 percent of poverty rate}}{\text{poverty rate in Orange County}}$
- Moderate poverty neighborhoods = $\frac{\text{20-40 percent of poverty rate}}{\text{poverty rate in Orange County}}$
- Low poverty neighborhoods = $\frac{\text{below 20 percent of poverty rate}}{\text{poverty rate in Orange County}}$

On the other hand, income level in neighborhoods can also be used to define economically distressed neighborhoods. For operationalization, this study adopts a method that is used by Galster and Booza (2007). The income level can be classified by HUD guidelines (U.S. Department of Housing and Urban Development, 1996) that define income thresholds based on specific income groups. It is categorized by six groups based on the area median income (AMI). But, they do not include standard criteria that define extremely low income groups which usually earn less than 30 percent of AMI. This criterion of 30 percent of AMI is used when setting income limitations in the HUD income limitation documentation system. Thus, this study follows this rule and adds the extremely low income groups, defining each neighborhood as follows:

- Extremely low income neighborhoods (less than 30% AMI);
- Very low income neighborhoods (30-50% AMI);
- Low income neighborhoods (50-80% AMI).

To identify the low-income neighborhoods, a median household income of a block group is divided by a median household income of Orange County⁸. When the

⁸ Since the typical AMI is based on family income and the block group information is based on household income, the median household income of the county is used.

calculated ratio is less than 30 percent, then the block group is considered as extremely low-income neighborhoods. If the ratio of a median household income of a block group to a median household income of Orange County is between 30 and 50 percent, then the block group is regarded as very low-income neighborhoods. If that ratio is between 50 and 80 percent, the block group is considered as a low-income neighborhood.

Most multifamily projects funded by the LIHTC and HCV programs are located in economically distressed areas. Still, the location pattern will be examined to identify the spatial distribution of subsidized units. Understanding subsidized units' location will provide insight on better siting assisted housing.

As noted earlier, a neighborhood is identified as a separate residential area that can be distinguished from other residential areas and delineated within a boundary of walking distance. In the defined neighborhoods, we can measure and quantify the neighborhood quality using different indicators. Understanding neighborhood quality requires considering multiple measurable factors – socio-economic, political, and institutional forces – that affect the changes in neighborhoods (Temkin and Rohe, 1996). The indicators of neighborhood quality have been used in studies examining neighborhood change. In the theoretical models of neighborhood change which have been established by a growing number of studies, no consensus was reached on good indicators of neighborhood quality because the built environment, physical change, demographic change, social development, and change in economic status are associated with each other and varied depending on neighborhood contexts. Very common indicators are generally income, race, crime, housing price, poverty level, education and female headship (Carter, William, Michael, Schill and Wachter, 1998;

Cotterman, 2001; Coulson and Bond, 1990; Galster et al, 2007; Galster and Mincy, 1993; Galster et al., 1997; Guest, 1974; Krivo, Peterson, Rizzo, and Reynolds, 1998; Lauria, 1998; Vandell, 1981). These indicators are used by policy makers to identify ways to reduce neighborhood decline and revitalize economically depressed communities.

The indicators from the Census and other relevant datasets include median household income, poverty rate, median housing prices standardized by metropolitan housing prices, median gross rent standardized by metropolitan gross rent, unemployment rate, crime rate, foreclosure rate, the number of old housing units built before 1990, the number of issuance of new building permits less than ten years, and single-family mortgage approval rate. These indicators are used in many studies in order to evaluate economic characteristics of neighborhood change since they represent quality of life and people's economic well-being (Zielenbach, 2003a; Ellen and O'reagan, 2011; Immergluck and Smith, 2005). In this study, the income level represents economic status in neighborhoods because income is related to the severity of poverty, education, housing prices, employment and other economic related variables.

Classification of Neighborhood Type

Unlike the classification of the impoverished neighborhoods based on the income status in 1990, we need to classify the neighborhoods based on both income in 1990 and change of income between 1990 and 2010 in order to understand how this temporal change affect the impact of subsidized housing. As summarized in the conceptual model, the effect of the LIHTC funded developments and voucher recipients on surrounding property values may vary depending upon the economic status of neighborhoods. Since the subsidized housing funded sites are affected by

neighborhood conditions, the potential tenants' characteristics, property age and other attributes of the subsidized housing could differ according to the neighborhood types. These different traits of subsidized housing development may lead to various outcomes within each neighborhood type. Thus, this study classifies the types of neighborhoods in order to provide better understanding of various conditions of economic status in neighborhoods.

In particular, the neighborhood types are categorized into four neighborhoods using cluster analysis. This cluster analysis is conducted based on different variables such as median household income in 1990, and change of median household income from 1990 to 2007-2011. The median household income in each census block group is normalized by the median household income of Orange County in order to compare two different time points. The method of cluster analysis applies a K-means clustering method because it gives options to a researcher to classify observations into K groups based on the mean (or median) distances between calculated points of variables (McQueen, 1966). The total number of K groups are determined if the sum of distance between observations and center of cluster is minimized. This K-means clustering method categorizes up to ten groups with more than five observations in each group. The cluster analysis is summarized in Figure 4-5, and Table 4-5.

This K-mean cluster analysis identifies four different neighborhoods: Revitalizing Neighborhoods, Declining Neighborhoods, Low-Income Neighborhoods, and Middle and Higher-Income Neighborhoods. Revitalizing Neighborhoods and Low-Income Neighborhoods are generally mixed and concentrated in central inner city areas, and downtown Orlando. But, Declining Neighborhoods are distributed throughout the county.

Accordingly, the location pattern of the LIHTC projects and HCV holders will be presented based on different neighborhood types in the next chapter.

Econometric model

Methodological issues in the econometric model

Previous studies provided empirical evidence regarding the impact of subsidized housing programs on surrounding property values; however, they have not demonstrated consistent results because of methodological variations. These various results are primarily attributed to methodological challenges: uncontrolled idiosyncratic neighborhood characteristics, unobserved variables, and the selection bias problem. First, the weakness of methodology is primarily due to the fact that the models do not control for the idiosyncratic neighborhood characteristics that are not associated with property values (Galster, 2004; Ellen et al. 2007), making it difficult to examine the property value impacts across different neighborhoods. Second, the control variables are not rigorous enough to rule out the influence of neighborhoods adjacent to assisted housing, reflecting a failure to control for all variables that might affect property values. The unobserved characteristics that may affect property values may not be completely excluded in the econometric model. Third, the previous methodologies cannot determine the causal relationship between trends of property value change in neighborhoods and assisted housing developments. It is hard to distinguish whether declines of property values are related to the siting of assisted housing or to general neighborhood decline (Galster, 2004). The preexisting conditions of neighborhoods may attract such low-income housing development. For instance, assisted housing developments are highly concentrated in high-poverty areas due to incentives for developers and to local governments' siting decisions. Specifically, the studies that use

cross-sectional hedonic regression models with treatment/control area and pre-development/post-development variables do not overcome this fundamental challenge (Galster, 1999; Galster, 2004; Santiago et al. 2001; Ellen et al. 2007; Deng, 2011b). While it is not possible to completely eliminate the methodological concerns, previous studies generally attempt to reduce those problems.

In particular, previous studies have shown methodological flaws in the multivariate regression model and improvement of statistical models. Galster (2004) briefly explains about the various methodological challenges and improvements in terms of six different major approaches: Treatment vs. Control Area, Pre/Post, Cross-Sectional, Cross-Sectional/Time-Series, Difference-in-Differences (DID), and Adjusted Interrupted Times Series (AITS).

First, the Treatment vs. Control Area approach essentially compares treatment neighborhoods having subsidized housing developments with control neighborhoods that do not have subsidized housing projects. The other characteristics of control neighborhoods are identical to the treatment neighborhoods except for the presence of the subsidized housing. However, the major challenge of this method is to find exactly identical control neighborhoods to the treatment neighborhoods. Because neighborhoods have many attributes, it is hard to find the same neighborhoods except for the presence of subsidized housing. Also, the neighborhoods with the introduction of subsidized housing are selected by developers or potential tenants because of the neighborhoods' characteristics (Galster, 2004).

Second, similar to the Treatment vs. Control Area approach, the Pre/Post approach compares the treatment property values after the introduction of the

subsidized housing with the property values prior to the development of the subsidized housing of interest. The challenge of this method is to completely rule out the local housing market trends, regional housing market pressures, and national economic factors when the subsidized housing is introduced (Galster, 2004).

Third, the Cross-Sectional approach uses regression models to examine the relationship between the proximity to the subsidized housing developments and single family property values, controlling the neighborhood attributes, various property unit characteristics, and characteristics of census tracts or zip code areas at one period. The major challenge of this approach is to establish the direction of the relationship by incorporating the Pre/Post approach.

Fourth, the Cross-Sectional/Time-Series approach consummates the Cross-Sectional approach by considering the Pre/Post variable. However, the Cross-Sectional approach and the Cross-Sectional/Time-Series approach generally do not control for the idiosyncratic neighborhood characteristics that possibly affect the property values after subsidized housing development, and that is unrelated to the subsidized housing projects (Galster, 2004). If the characteristics of neighborhoods are highly correlated with the location of a subsidized housing development, the estimated property value impacts of subsidized housing developments can be biased or incorrect. This bias can be created by the neighborhood attributes rather than the subsidized housing development of interest (Galster, 2004).

Fifth, as many studies have been limited by methodological challenges, the fundamental and primary questions for this research effort involve how to establish different sets of equations for testing causality between affordable housing projects and

property values. On this note, several studies made significant contributions to the methodological improvements. As with a general methodological design, Galster et al. (2004) provide a summary of the discontinuity design that is beneficial for the evaluation of targeted placed-based interventions. Deng and Freeman (2011) summarize his major steps in a concise way: 1) "postintervention absolute change approach", 2) "postintervention relative change approach", 3) "the pre- and postintervention absolute change approach", and 4) "the pre- and postintervention relative change approach" (Deng and Freeman, 2011, p. 309). These approaches fundamentally address the absolute value of increasing/declining effects and relative number of changing effects within different impact areas, but within the same neighborhoods before and after placed-based intervention is implemented.

The strongest advantage of the discontinuity design is to compare conditions in experimental groups with treatment and control groups both intertemporally and cross-sectionally. Galster et al. (2004) develop a model that can estimate not only the slope of measurement but also the slope of changing trends of measurements. Using this method, a researcher will be able to test outcome indicators of policy interventions by identifying differences between pre-treatment and post-treatment.

Based on the concept of the discontinuity design, the Difference-in-Difference and the AITS approaches generally overcome the methodological challenges discussed in previous methods. The terminology can be confusing because they look very similar. Essentially, the DID model measures differences in coefficients in regards to price level but the AITS compares price trends of pre-development period and post-development period.

The DID model was first developed and utilized by Galster et al. (1999). This method controls for the idiosyncratic neighborhood characteristics typically within 2,000 feet. The difference-in-difference approach operates in two steps. First, it quantifies the difference in property values between neighborhoods that have subsidized housing development with those that do not have but are located in the same census tract before the introduction of the subsidized housing development and the difference in property values after the construction of subsidized housing developments. Second, the approach quantifies the difference in property values between the post-development and the pre-development within the same census tract.

Similarly, the AITS approach measures the differences in property values and property value trends within the pre/post development neighborhood framework. This AITS approach is more accurate and stronger than the DID approach because it measures and controls for both immediate price levels and price change trends before and after the introduction of subsidized housing development. This method helps control all of the idiosyncratic neighborhood characteristics by addressing preexisting status of neighborhoods and property and historical trends of changing prices in neighborhoods. Additionally, this approach controls and limits the geographical boundary of the impacts by associating the post-development property value levels in the small impact areas with larger areas like census tracts. It also has the strong advantage of controlling for self-selection bias of neighborhoods and mitigates causality problems (Galster et al. 1999; Galster 2004; Schwartz et al. 2006; Koschinsky 2009). Even though the DID regression model and the AITS model are seemingly confusing, the terms are used interchangeably due to their similar data structure.

In sum, the literature review of the methodology suggests that the DID or the AITS approach employing hedonic regression is the most appropriate model to examine the price impacts of the subsidized programs. In terms of major variables to use, the findings of the DID and AITS studies suggest that the property value impact of subsidized housing developments depends on the type of subsidized housing programs, concentration of subsidized housing, proximity to subsidized housing, characteristics of subsidized housing tenants, and neighborhood characteristics (Galster et al., 1999; Schill et al. 2002; Ellen et al., 2007).

Potential Property Value Impacts of Subsidized Housing

The hypothetical model is shown in Figure 4-6. This model can demonstrate the property price relationship pattern before and after occupancy of subsidized housing, all other things being equal. Galster et al. (1999) establish the six alternatives of price change patterns. The upper three graphs present positive value impacts, which could be discouraged through subsidized housing. These patterns can be defined as “(1) a diminution of the rate of price appreciation (pattern A-A'-A”), (2) a discontinuous shift down in the price gradient but a reestablishment of the prior rate of appreciation (pattern A-A'-B-B'), or (3) both of the above (pattern A-A'-B'-B'”)” (Galster et al. 1999, 899). On the other hand, the negative appreciation can be found in the down side of the graph with patterns of A-C-C', A-D-D', and A-D-D". These patterns are assumed in a sense that subsidized housing is located in overall neighborhoods.

In low-income neighborhoods, however, different price patterns may exist after siting subsidized housing than the above hypothetical patterns. Considering that some subsidized housing sites may have positive impacts on surrounding neighborhoods, the price can be increased after subsidized housing is introduced. These patterns are

portrayed through several processes such as (1) a proliferation of the rate of price appreciation (pattern A-C-C’), (2) a diminution of increasing rate of price appreciation (pattern A-C-C’’) (3) a discontinuous shift up in the price gradient but incremental change in prior appreciation rate (pattern A-E-E’), and (4) application of both the (1) and (3) (pattern A-E-E’).

Econometric Models for Property Value Impacts

This study establishes AITS model by using OLS model with robust standard errors for imbalanced panel data. The AITS model compares the differences in property values in the same impact area before and after a subsidized rental site is built with those in comparable surrounding neighborhoods that are distant from the subsidized rental sites. In order to develop the AITS model, data required for the analysis are adjusted. The parcel data having miscoding and outliers are cleaned and we finally use 88,143 single family parcels that have at least two transactions during pre-development and post-development of the subsidized housing programs.⁹ The total number of LIHTC projects used in this analysis is 97, and the total number of voucher units are 12,649 between 1990 and 2010.

As explained in Figure 4-7, the AITS approaches typically employ hedonic price regression models, which are based on the utility theory. The hedonic price reflects a consumer’s preference for the bundled attributes of housing, location and neighborhoods within a budget constraint. Regarding the utility function, the subsidized housing can have a positive impact on property values. Conventional wisdom is that if the subsidized housing is built, the nearby property values decrease. Generally,

⁹ In this process, we deleted the single family parcels that have one or no transactions. The sales parcels traded below \$10,000 are also deleted.

regardless of the location of the assisted rental housing developments, utility of high-income households decrease to own a home due to the low-income household profile and old housing characteristics because low-income households tend to maximize their utility by moving in low income neighborhoods because of lower housing prices. Figure 4-7 shows that $p(z^e)$ is smaller than $L(z)'$.¹⁰ Depending on the market and location, the effects of subsidized housing can differ because we do not know the exact utility function. Conversely, under the assumption that market utility will satisfy and increase utility by locating new assisted rental housing, $L(z)'$ will be negative to distance so tangent of $P(z)'$ at z^e is changed, all other things being equal. Thus, subsidized housing could increase property values.

The Equation (4-1) represents a general hedonic price model, where a value of a property P is a function of C , N , and L . C represents property characteristics including structure of the property, N means neighborhood characteristics, and L indicates location characteristics.

$$P = f(C, N, L) \tag{4-1}$$

The primary interest of the AITS hedonic regression model is neighborhood characteristics related to each single family property. Whether the subsidized housing units are placed or not, the neighborhoods have a preexisting price level and affect the property values of single family homes. Considering the neighborhood characteristics,

¹⁰ Lyon and Loveridge (1993) illustrate the housing price change by location of subsidized housing. Where Z is a bundle of determinants to housing price, $p(z)$ is the hedonic price function, and $L(z)$ is linear approximation which is tangent at z^e , and point b is actual price at z^a , $P(z^e)$ is the property value where a home is located z^e away from subsidized housing. Where price at z^e is observed value at market clearing which is the point where the supplied quantity equals demanded quantity. We cannot observe b price at z^a by simply subtracting $L(z^e)$ from $L(z^a)$ because market has unobserved $p(z)$. The authors acknowledge that the $p(z)$ could be changed in every single market. It could be convex, or concave depending on the market situation. By making partial derivative from $L(z^a)$, we can approximate b price. The authors note

the base regression model is established in the equation (4-2). It specifies the factors of the property characteristics, neighborhood characteristics, and locational characteristics for repeated panel structure.

$$\ln(P)_{int} = \alpha + \beta C_i + \gamma N_n + \delta Li + \zeta T_{it} + \eta H_{it} D_i + \varepsilon_{int} \quad (4-2)$$

where $\ln(P)_{int}$ is the natural log of sales value of the property i in neighborhood n and at time t . For each single family home, the property characteristics, C_i includes several variables such as property age, unit size, and lot size. N_n represents neighborhood characteristics which control for neighborhood fixed effects of single family property, and time-invariant and unobservable attributes of neighborhoods. In this research, attributes of census block groups in 1990 – when study period begins – specifies the neighborhood characteristics. The Li indicates locational characteristics that controls for spatial heterogeneity. This locational variable includes the geographic coordinates of each property to normalize the location and capture any other locational attributes. T_{it} is the time variable that contains indicators like sales trends, the year of sale, and seasonal change for each quarter. The $H_{it} D_i$ indicates whether the subsidized housing projects have impacts on nearby property values after the introduction of the units. D_i is a set of matrix of variables indicating whether the single family homes are located within impact area or not. The impact area is defined as the area within 2,000 feet of the subsidized units. ε_{int} represents the error term of the regression model. It is assumed to be independently and identically distributed. The coefficients are estimated with ordinary least squares regression model with robust standard errors to mitigate heteroskedasticity that may affect the normal variance assumption.

that there is significant unreality for the hedonic model because housing market is not always cleared. Thus, one percent of vacancy rate could be an equilibrium in a growing city.

More specifically, the AITS model is estimated for all of areas where LIHTC funded developments and HCV units are provided. The standard errors and the coefficients of this model are estimated using the entire dataset, which leads to more accurate results. Similar to the basic functional form (4-2), the model includes neighborhood environment, locational characteristics, and property characteristics such as property structure, property age, and unit size. The AITS model is expanded to explain how the LIHTC projects and HCV units affect single family property values in different models. Table 4-6 explains each variable in the model. In order to test differential impacts of LIHTC and HCV, the AITS model specification can be divided into several alternative models for evaluating price impacts of subsidized housing projects: LIHTC site model, HCV site/unit model, and HCV unit in LIHTC project model. The following equations (4-3) and (4-4) are the detailed descriptions of the model.

- LIHTC site model (where testing proximate impacts of LIHTC site)

$$\begin{aligned}
 \text{LnSP} = & \alpha + \beta_0 * \text{STRUCTURE}_i + \delta_0 * \text{CEN_TRACT}_i + \zeta_0 * \text{TIME}_i + \zeta_1 * \text{TREND}_i + + \\
 & \eta_0 * \text{AFTER_Inner_TREND_LIHTC}_i + \eta_1 * \text{INNER_LIHTC}_i + + \\
 & \eta_2 * \text{AFTER_Inner_LIHTC}_i + \eta_3 * \text{AFTER_Distance_LIHTC}_i + \\
 & \gamma_0 * \text{AFTER_Inner_Medium_LIHTC}_i + \gamma_1 * \text{AFTER_Inner_Small_LIHTC}_i \\
 & \gamma_2 * \text{AFTER_Inner_GRAV_T_LIHTC}_i + \gamma_3 * \text{AFTER_Inner_AHden_new_LIHTC}_i + \\
 & \gamma_4 * \text{AFTER_Inner_AHden_pre90_LIHTC}_i + \gamma_5 * \text{AFTER_Inner_MHden_new_LIHTC}_i \\
 & + \gamma_6 * \text{AFTER_Inner_MHden_pre90_LIHTC}_i + \gamma_7 * \text{AFTER_Inner_30DEN_LIHTC}_i + \\
 & \gamma_8 * \text{AFTER_Inner_50DEN_LIHTC}_i + \gamma_9 * \text{AFTER_Inner_AH_tot_LIHTC}_i + \\
 & \gamma_{10} * \text{AFTER_Inner_MH_tot_LIHTC}_i + \gamma_{11} * \text{BEFORE_Inner_MidPOOR_LIHTC}_i + \\
 & \gamma_{12} * \text{BEFORE_Inner_HighPOOR_LIHTC}_i + \gamma_{13} * \text{BEFORE_Inner_30LIN_LIHTC}_i + \\
 & \gamma_{14} * \text{BEFORE_Inner_50LIN_LIHTC}_i + \gamma_{15} * \text{BEFORE_Inner_80LIN_LIHTC}_i + \gamma_{16} * \\
 & \text{BEFORE_Inner_EconomicallyDepressed_LIHTC}_i + \gamma_{17} * \\
 & \text{BEFORE_Inner_Revtalizing_LIHTC}_i + \gamma_{18} * \text{BEFORE_Inner_Middle-} \\
 & \text{Declining_LIHTC}_i + \gamma_{19} * \text{AFTER_Inner_MidPOOR_LIHTC}_i + \\
 & \gamma_{20} * \text{AFTER_Inner_HighPOOR_LIHTC}_i + \gamma_{21} * \text{AFTER_Inner_30LIN_LIHTC}_i + \\
 & \gamma_{22} * \text{AFTER_Inner_50LIN_LIHTC}_i + \gamma_{23} * \text{AFTER_Inner_80LIN_LIHTC}_i + \\
 & \gamma_{24} * \text{AFTER_Inner_EconomicallyDepressed_LIHTC}_i + \\
 & \gamma_{25} * \text{AFTER_Inner_Revtalizing_LIHTC}_i + \gamma_{26} * \text{AFTER_Inner_Middle-} \\
 & \text{Declining_LIHTC}_i + \gamma_{27} * \text{HousingDensity90}_i + \gamma_{28} * \text{PovertyRate90}_i + \delta_1 * X_i + \delta_2 * Y_i + \epsilon_i
 \end{aligned}$$

(4-3)

- HCV site/unit model (where testing proximate impacts of HCV site/unit)

$$\begin{aligned}
\text{LnSP} = & \alpha + \beta_0 * \text{STRUCTURE}_i + \delta_0 * \text{CEN_TRACT}_i + \zeta_0 * \text{TIME}_i + \zeta_1 * \text{TREND}_i + + \\
& \eta_0 * \text{AFTER_Inner_TREND_HCV}_i + \eta_1 * \text{INNER_HCV}_i + + \eta_2 * \text{AFTER_Inner_HCV}_i + \\
& \eta_3 * \text{AFTER_Distance_HCV}_i + \gamma_0 * \text{AFTER_Inner_Medium_HCV}_i + \\
& \gamma_1 * \text{AFTER_Inner_Small_HCV}_i \gamma_2 * \text{AFTER_Inner_GRAV_T_HCV}_i + \\
& \gamma_3 * \text{AFTER_Inner_AHden_new_HCV}_i + \gamma_4 * \text{AFTER_Inner_AHden_pre90_HCV}_i + \\
& \gamma_5 * \text{AFTER_Inner_MHden_new_HCV}_i + \gamma_6 * \text{AFTER_Inner_MHden_pre90_HCV}_i + \\
& \gamma_7 * \text{AFTER_Inner_30DEN_HCV}_i + \gamma_8 * \text{AFTER_Inner_50DEN_HCV}_i + \\
& \gamma_9 * \text{AFTER_Inner_AH_tot_HCV}_i + \gamma_{10} * \text{AFTER_Inner_MH_tot_HCV}_i + \\
& \gamma_{11} * \text{BEFORE_Inner_MidPOOR_HCV}_i + \gamma_{12} * \text{BEFORE_Inner_HighPOOR_HCV}_i + \\
& \gamma_{13} * \text{BEFORE_Inner_30LIN_HCV}_i + \gamma_{14} * \text{BEFORE_Inner_50LIN_HCV}_i + \gamma_{15} * \\
& \text{BEFORE_Inner_80LIN_HCV}_i + \gamma_{16} * \\
& \text{BEFORE_Inner_EconomicallyDepressed_HCV}_i + \gamma_{17} * \\
& \text{BEFORE_Inner_Revtalizing_HCV}_i + \gamma_{18} * \text{BEFORE_Inner_Middle-Declining_HCV}_i \\
& + \gamma_{19} * \text{AFTER_Inner_MidPOOR_HCV}_i + \gamma_{20} * \text{AFTER_Inner_HighPOOR_HCV}_i + \\
& \gamma_{21} * \text{AFTER_Inner_30LIN_HCV}_i + \gamma_{22} * \text{AFTER_Inner_50LIN_HCV}_i + \\
& \gamma_{23} * \text{AFTER_Inner_80LIN_HCV}_i + \\
& \gamma_{24} * \text{AFTER_Inner_EconomicallyDepressed_HCV}_i + \\
& \gamma_{25} * \text{AFTER_Inner_Revtalizing_HCV}_i + \gamma_{26} * \text{AFTER_Inner_Middle-Declining_HCV}_i + \\
& \gamma_{27} * \text{HousingDensity90}_i + \gamma_{28} * \text{PovertyRate90}_i + \delta_1 * X_i + \delta_2 * Y_i + \varepsilon_i \quad (4-4)
\end{aligned}$$

The dependent variable LnSP is the natural log of sales housing price.

Independent variables such as *STRUCTURE*, and *TIME* are variables that demonstrate single family housing structure, and seasonal and yearly dummy variable at time of sale.

CEN_TRACT represents the census tracts in which the single family home is located.

Other variables are major variables that examine the impact of pre-development of subsidized housing programs. *TREND* and *INNER* measure the preexisting housing price and price trend within the impact areas of the subsidized housing developments before the introduction of the subsidized units. These variables are inserted into the model in order to avoid possible self-selection problems, which indicate that the micro-neighborhoods may be different from the other census tracts (Santiago et al., 2001).

After defining the pre-development variables, the post-development variables are generated and included in the model to examine how the subsidized housing developments affect property values. *AFTER_Inner_TREND* is a vector of a dummy

variable explaining housing price trends in the impact area after the introduction of the subsidized housing programs. *AFTER_Inner* is a dummy variable showing whether a property is sold after development. *AFTER_Distance* measures whether the property value impacts decline as distance to the subsidized housing program increases. In order to measure the differentiated impacts by project size, three variables are included. *AFTER_Inner_GRAV_T* is gravity model variable considering project size and distance between assisted housing and single family housing. *AFTER_Inner_Medium* and *AFTER_Inner_Small* are the variables that measure the impacts of medium-size and small-size projects, respectively. The reference of these two size variables is a vector of a dummy variable measuring the projects that have more than 100 units. Moreover, in order to measure the impacts of assisted housing and multifamily developments, several variables are added to the variable lists. *AFTER_Inner_AHden_new* and *AFTER_Inner_AHden_pre90* are separate variables that explain the annually constructed assisted units from 1990 to 2010, and existing assisted housing developments until 1990. *AFTER_Inner_MHden_new* and *AFTER_Inner_MHden_pre90* are vectors of variables measuring the number of multifamily housing units from 1990 through 2010 and before 1990. *AFTER_Inner_30DEN* is density of assisted units with 30% AMI in an impact area and a neighborhood after development. *AFTER_Inner_50DEN* is density of assisted housing with 50% AMI in an impact area and a neighborhood after development. *AFTER_Inner_AH_tot* is the annual assisted units that are built in the the impact area after the introduction of the subsidized programs. *AFTER_Inner_MH_tot* is a dummy variable measuring the total number of new construction of multifamily units in the impact area after development.

In addition, other variables are included to capture the pre- and post-impacts of the subsidized housing programs in different types of neighborhoods. The preexisting status of neighborhoods explains the impacts of different types of neighborhoods on property values prior to the introduction of subsidized housing programs. The post-impact variables explain the price variation after the introduction of subsidized housing programs depending on the neighborhood types. As defined in the previous section, the neighborhoods are grouped in three different ways: poverty status, income level groups, and neighborhood types based on a cluster analysis.

For the poverty status, BEFORE_Inner_MidPOOR and BEFORE_Inner_HighPOOR prior to the introduction of the subsidized housing programs are inserted in the model. To examine the post-impacts of the subsidized housing programs, AFTER_Inner_MidPOOR and AFTER_Inner_HighPOOR are included in the regression model. As for the income level groups, BEFORE_Inner_30LIN, BEFORE_Inner_50LIN, and BEFORE_Inner_80LIN are included in the regression model. With the after-impacts of subsidized housing programs, AFTER_Inner_30LIN, AFTER_Inner_50LIN, and AFTER_Inner_80LIN are inserted into the model.

In the previous section, neighborhoods are classified into five different types. In this study, only three neighborhood types are included in the model such as BEFORE_Inner_EconomicallyDepressed, BEFORE_Inner_Revitalizing, and BEFORE_Inner_Middle-Declining. For the post-impacts variables, AFTER_Inner_EconomicallyDepressed, AFTER_Inner_Revitalizing, and AFTER_Inner_Middle-Declining are included. Additionally, the neighborhood variables

such as housing density in 1990 and poverty rate in 1990 are used to control for the preexisting status of the neighborhoods. These variables are used to examine the four different models separately in different neighborhood types. They include the baseline model, the model with income group, the model with poverty status, and the model with the neighborhood types that are classified using cluster analysis.

Finally, in order to examine impacts of LIHTC projects having HCV holders, the variable, *AFTER_inTC*, is included. Separate from the HCV site model, the third model, *LIHTC projects having HCV holders*, is created by including *AFTER_inTC* in the second model.

The *X*, *Y*, are included in the model to control spatial heterogeneity known as spatial autocorrelation. Variables *X* and *Y* represent the geographic coordinates of each single family home, which are normalized by the distance to the center of Orange County.¹¹ For the location of parcels, Galster et al. (2004) recognize the problem of spatially autocorrelated housing prices in the literature of subsidized housing impacts, pointing out the importance of spatial fixed effects and trend surface effects that are addressed in the previous literature (Can, 1992; Anselin, 1988; Casetti, 1972). In order to mitigate the spatial fixed effects, census tracts are included in the model.

Furthermore, these *X* and *Y* coordinates control for the trend surface effect. In fact, *CEN_TRACT* captures the idiosyncratic and unobservable attributes of neighborhoods that are not measured in the microneighborhoods within the impact area (Galster et al. 2004). The incorporation of *X* and *Y* coordinates into a model describes the relative

¹¹ By conducting a Moran's I test of the regression residuals, we found that there is the spatial autocorrelation. It is reasonable to include these variables. However, three variables such as X^*X , Y^*Y , and X^*Y did not pass the multicollinearity test. Therefore, *X* and *Y* coordinate variables are only used in the model.

location of sale property to other locations – the center of Orange County in this case. Fik, Ling and Mulligan (2003) show that discrete location dummies and absolute location [X,Y] leads to the most accurate results, but models with sole [X,Y] coordinates also improve well enough to explain housing prices. Inclusion of these variables is motivated by an assumption that we treat spatial interactions of properties as statistical errors, not major independent variables. The details about operationalization of each variable are demonstrated in Table 4-6.

Econometric Models for Displacement Effects of HCV holders

In order to address the displacement effects of housing prices on HCV holders depending on income groups of neighborhoods, poverty status, and neighborhood types, this study conducts an econometric analysis. The equation (4-5) shows a general econometric model, where the number of HCV in 2010, V , is a function of A , P , and N ., A indicates assisted rental housing including the LIHTC projects, P represents housing prices, and N reflects neighborhood characteristics.

- $V = f(A, P, N)$ (4-5)

For the analysis, the regression model uses the Ordinary Least Square (OLS) method. The primary interest of the regression model is to identify (1) whether LIHTC projects attract more voucher holders, and (2) whether there are displacement effects of housing prices on the number of voucher holders in neighborhoods. Considering all the variables in the model, the equation (4-6) specifies the independent variables.

- $V_{n10} = \alpha + \beta V_{n90} + \gamma_1 A_{n90} + \gamma_2 A_{n90-10} + \delta_1 P_{n90} + \delta_2 P_{n90-10} + \zeta_1 N_{n90} + \varepsilon_n$ (4-6)

Where, V_{n10} is the total number of voucher holders in 2010 in neighborhoods n . V_{n90} is the vector of the number of voucher holders in 1990 in neighborhoods n . A_{n90} is the variable of the number of assisted rental housing and the number of LIHTC units in

1990, A_{n90-10} is the vector of the number of assisted units and LIHTC units between 1990 and 2010. P_{n90} is the housing price in 1990 and P_{n90-10} is the housing price in 2010. N_{n90} is the classified neighborhood dummy. ε_i is the error term. To conduct a baseline model, the percentage of the population under the poverty line in 1990 and the change in the percentage of the poor population between 1990 and 2010 are included in the model instead of the neighborhood variables. The explanation of the variables used in the regression model is described in detail in Table 4-7.

Case Studies

In order to provide a better understanding of the results of the econometric models and the relationship between the subsidized housing programs and community revitalization, this study conducts case studies focusing on two selected areas.

The two neighborhood types in a central city are selected as representative for Economically Distressed Neighborhoods and Revitalizing Neighborhoods where multifamily housing developments are located and various subsidized housing programs, such as Housing Choice Voucher holders, LIHTC funded developments, public housing, and HOPE VI projects, are implemented. The selected neighborhoods are located in downtown Orlando. The major challenge of these case studies is that the two selected neighborhood boundaries are not exactly consistent with census block group boundaries. Since, all information of neighborhood attributes are available based on census block group boundaries, case studies are conducted based on the boundaries of the census block groups. All information of neighborhood characteristics such as demographic, socio-economic, and housing data of the census block groups are summarized based on census block groups within the boundary of the City of Orlando.

The basic information and the location of the selected neighborhoods for the case study are shown in Figure 4-8.

The historical background and relevant local government policies in the case neighborhoods are summarized and reviewed. The locations of HCV recipients and LIHTC funded developments as well as other subsidized housing developments are mapped using ArcGIS software. Change in property values and neighborhood attributes, such as median household income, poverty rates, housing values, rents, and race are summarized in order to better understand the relationship between proximity to subsidized housing and single family property values. As noted earlier, the main focus of this research is to examine the property value impact of the LIHTC program and the HCV program. The characteristics of the two federal housing programs are identically applied across the U.S. It is not expected to see variations of the programs' utilization throughout Orlando city area. Instead, it is important to see utilization of the housing programs such as locations, and tenants characteristics in association with neighborhood revitalization of inner city areas.

As discussed in previous sections, the DID hedonic model provides the result of the property value impacts of the HCV and the LIHTC programs in different types of neighborhoods. The analysis results may inform general policy implications regarding property value impacts of the subsidized programs and subsequent neighborhood revitalization. However, these results do not reflect specific information about neighborhoods where the subsidized housing truly affects property values. Thus, it is difficult to connect the results of the hedonic model to neighborhoods and see whether property values change in certain neighborhoods according to the hypothesis. The

selected case neighborhoods contain detailed information regarding the research hypothesis. The case studies reinforce and strengthen the results of the hedonic model by providing provide a better explanation. Of course, mapping the location, and examining detailed explanations of voucher program and LIHTC program use narrows gaps between analysis results and real world examples and provides better explanation regarding the relationship between the subsidized housing programs and property values.

In sum, the case studies provide detailed evidence regarding the utilization of the subsidized housing programs, and the impacts on the private housing market, as well as how local land and housing policies coincide with the results of the DID regression model in order to better understand policy implications of neighborhood revitalization. The results of the spatial pattern of the LIHTC projects and HCV holders, the DID regression model, and selected case neighborhood studies are summarized in the next chapter.

Table 4-1. Population of the Orange County and the City of Orlando

Area	1990	2000	2010	Population growth	growth rate
Orlando MSA	1,224,844	1,644,558	2,134,411	909,567	74.3%
Orange County	677,491	896,354	1,145,956	468,465	69.1%
City of Orlando	164,693	185,951	238,300	73,607	44.7%

Source: Census 1990, 2000, 2010

Table 4-2. Assisted housing and population in Orlando MSA and Orange County

Location	Assisted Housing Units in 2008	Share of Units in 2008
Orlando MSA	49,198	19.39%
Orange County	31,923	12.58%
Total in Florida	253,826	100%

Sources: Ray et al (2009)¹. The State of Florida's Assisted Rental Housing, Shimberg Center for Housing Studies.

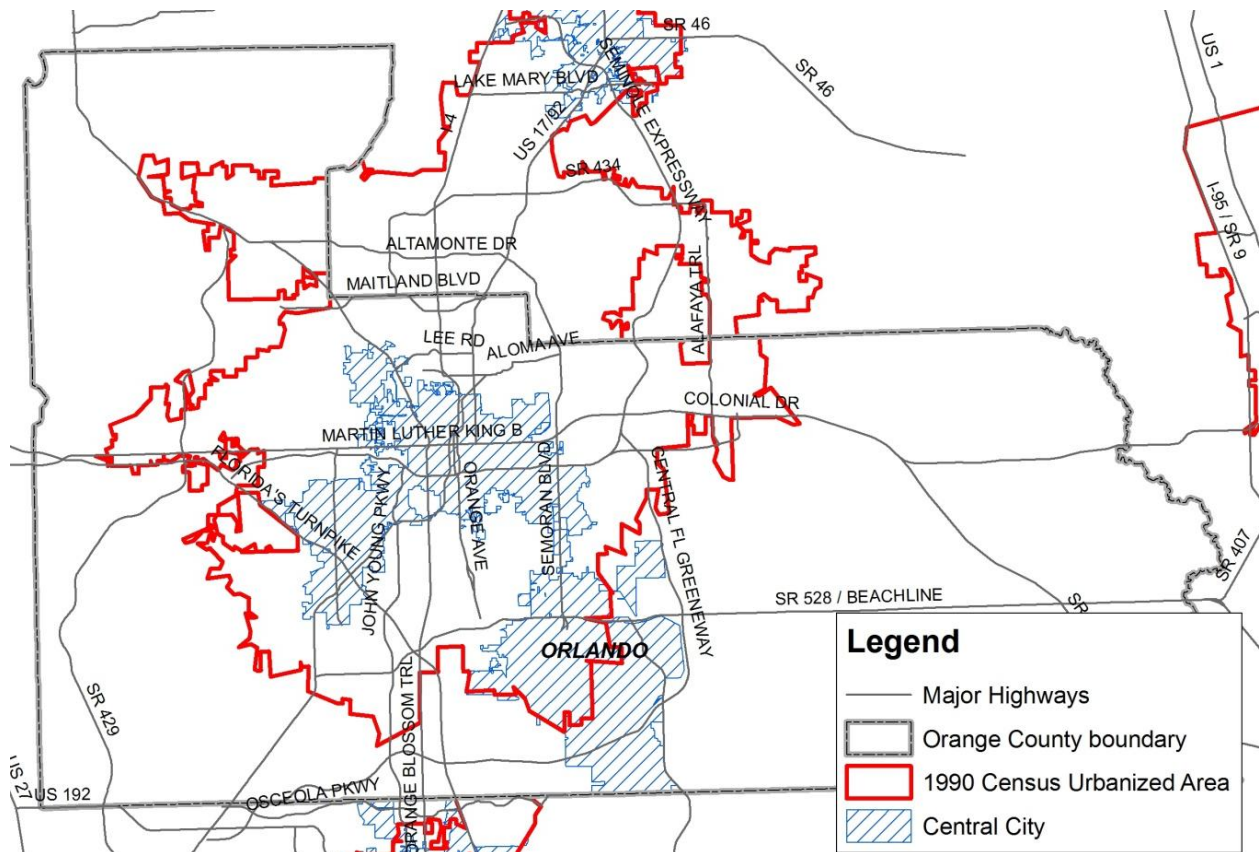


Figure 4-1. Study Area. Source: Florida Geographic Data Library (FGDL) and Census

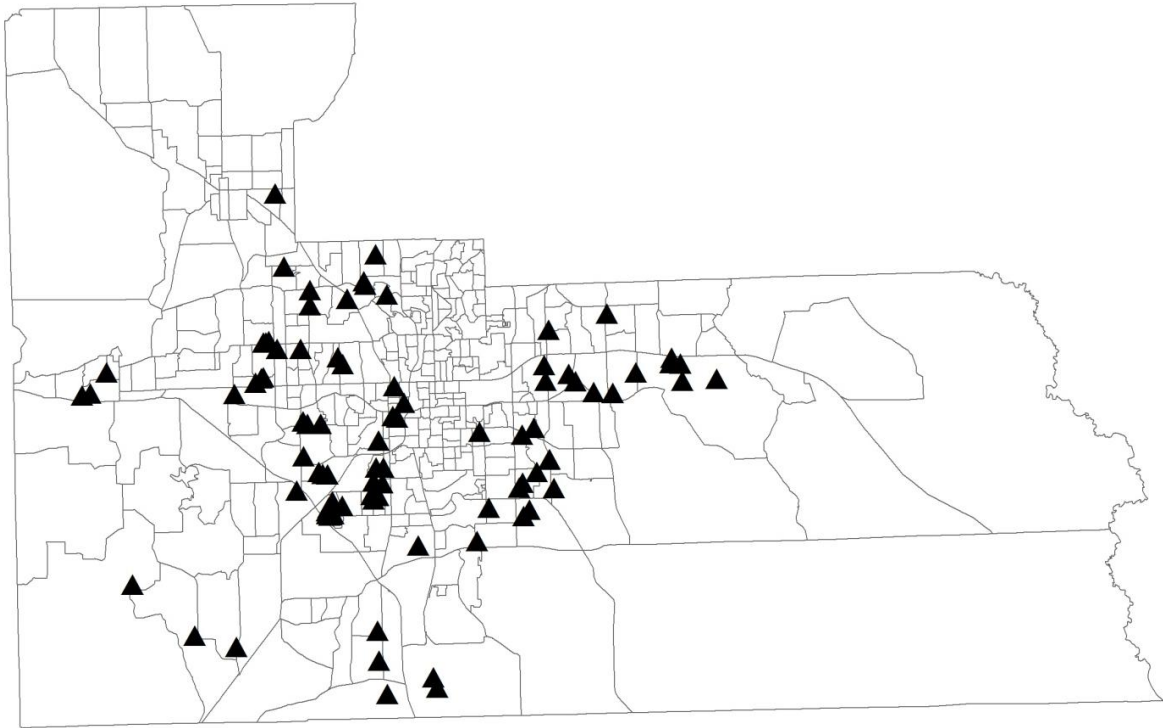


Figure 4-2. Location of LIHTC projects in 2010

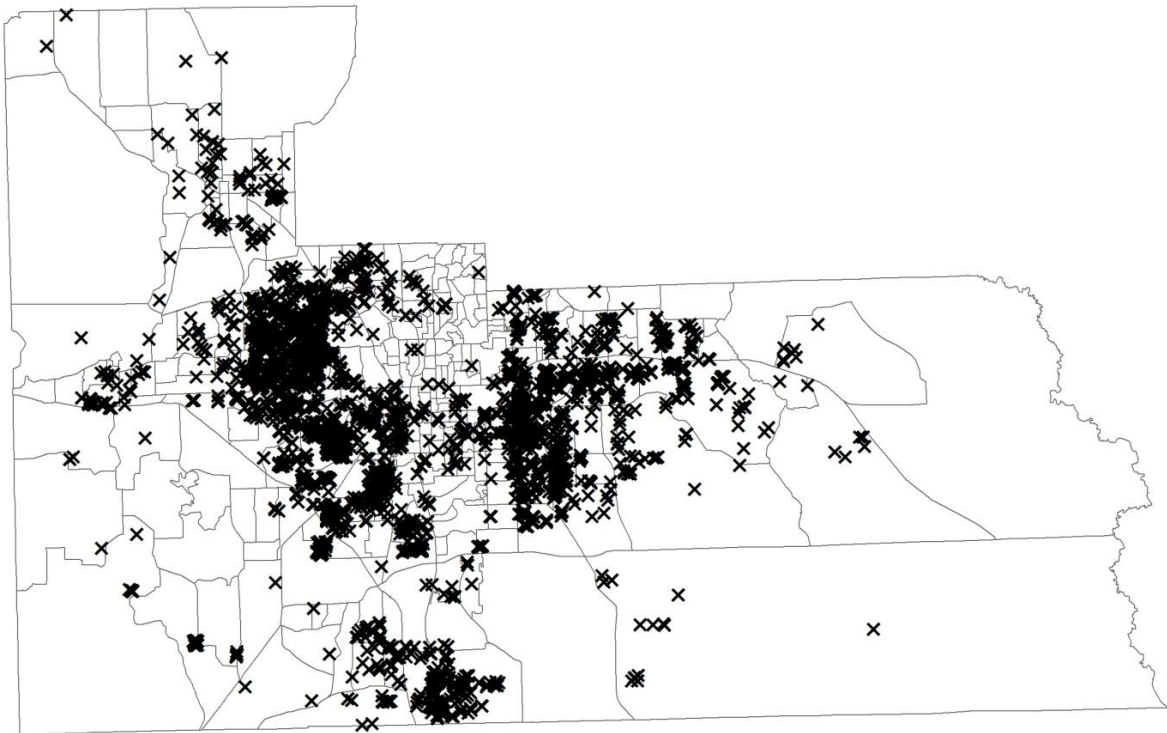


Figure 4-3. Location of HCV holders in 2010

Table 4-3. Economic status of Orange County and the City of Orlando

	City of Orlando			Orange County		
	1990	2000	2011	1990	2000	2011
Population	164,693	185,951	236,532	677,491	896,344	1133,087
White (%)	68.8	61.1	58.4	79.6	68.6	65.0
African American (%)	26.9	26.9	27.8	15.2	18.2	20.3
Households	65,703	80,883	98,067	254,852	336,286	408,605
Housing units	73,425	88,486	119,343	282,686	361,349	482,616
Owner occupied unit (%)	36.8	37.3	33.4	53.4	56.5	50.4
Renter occupied unit (%)	52.7	54.1	48.8	36.7	36.6	34.2
Vacant unit (%)	10.5	8.6	17.8	9.8	6.9	15.3
Median housing value (\$)	74,300	103,200	199,600	81,400	107,500	211,100
Median contract rent (\$)	428	606	816	441	605	850
Median gross rent (\$)	506	700	975	517	699	1016
Median household income (\$)	26,119	35,732	42,755	30,252	41,311	49,731
Median family income (\$)	30,570	40,648	48,057	34,670	47,159	57,518
Poverty rate (%)	20.6	15.9	17.3	21.1	12.1	14.9

Note: The median gross rent includes monthly rent and utility cost. However, the median contract rent does not include utility cost. Source: Census 1990, 2000, ACS 2007-2011, NHGIS.

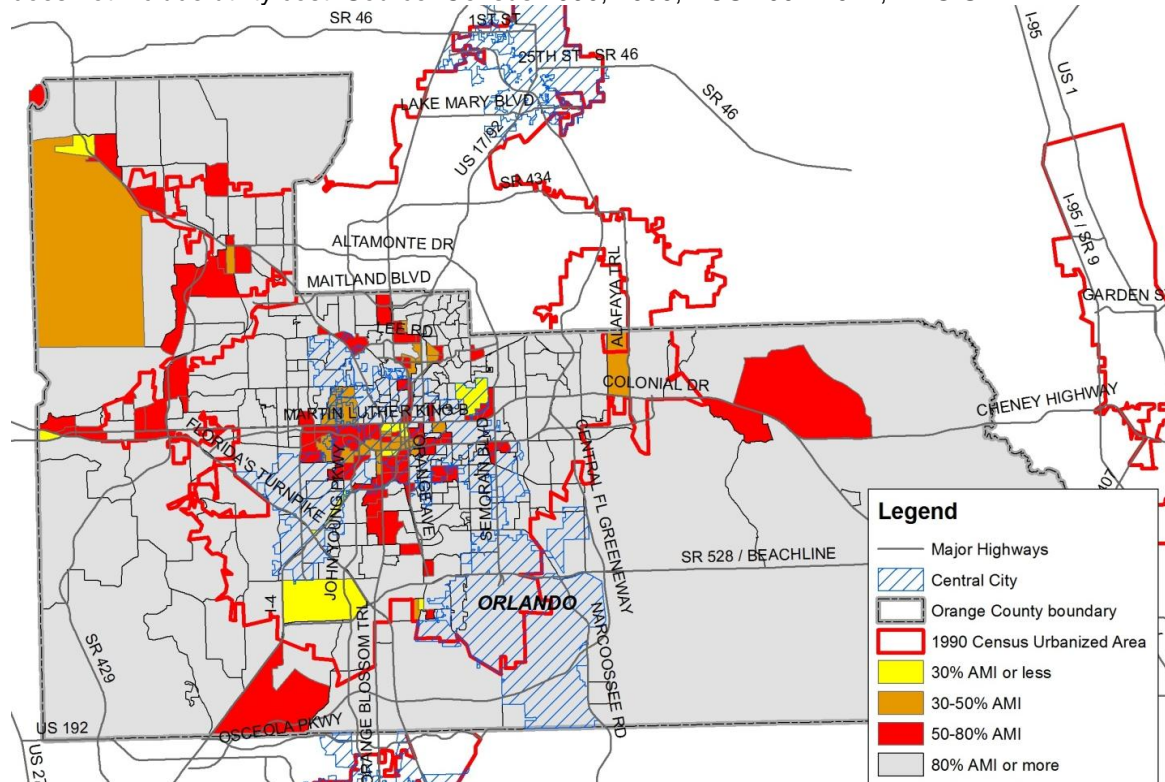


Figure 4-4. Neighborhood income distribution in 1990 in Orange County. Note: the Area Median Income Distribution of Orange County is calculated based on median household income in Orange County in 1990.

Table 4-4. Data sources of variables

Variables	Description	Unit	Period	Data Source
HCV	Housing Choice Voucher Program	Rental Unit / Project	2000-2010	Shimberg Center
LIHTC	Low Income Housing Tax Credit Program	Project	1990-2010	Assisted Housing Inventory (AHI) Florida
Housing sale price	Base year : 2000 Base interval : 4 quarter	Parcel	1990~2010	Department of Revenue (FDOR)
Property characteristics	Total living area, land area, lot size, and age of the property at sale	Parcel	1990~2010	FDOR
Housing programs	Average income restriction (e.g. less than 30%, 30 % ~ 80%, and more than 80%)	Parcel	1990~2010	FDOR and AHI
Neighborhood characteristics	Poverty level and household median income	Census block group	1990~2010	Census 1990, Census 2000, and ACS 2007-2011
Regional characteristics	Area Median Income (AMI) and Population	County	1990-2010	Census 1990, Census 2000, and ACS 2007-2011

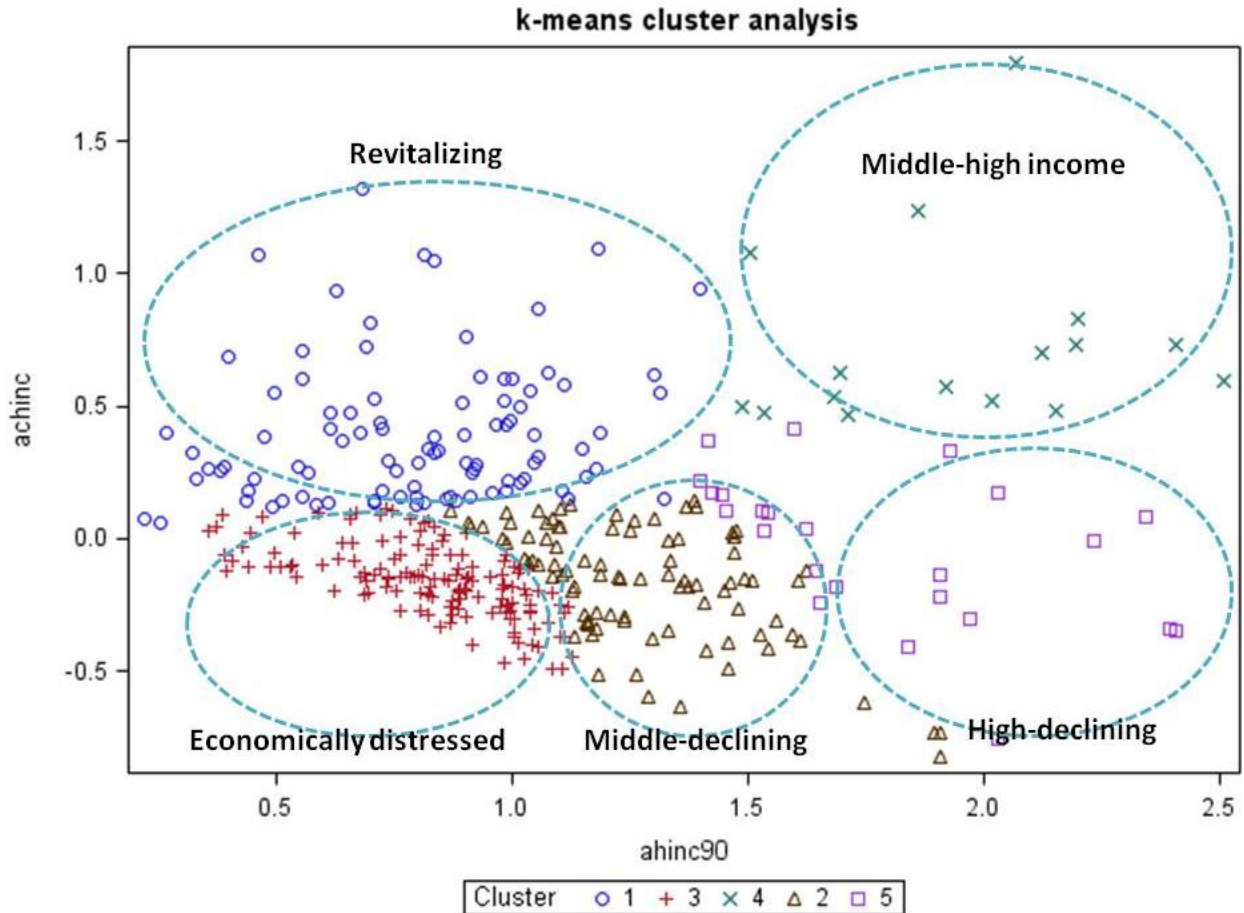


Figure 4-5. Neighborhood cluster based on neighborhood income and income change. Note: Ahinc90 indicates the median household income of a census block group standardized by the median household income of Orange County in 1990. Achinc is the difference between median household income a census block group in 1990 and 2007-2011. Median household income of census block groups are normalized by the median household income of Orange County in each period.

Table 4-5. Neighborhood types based on K-means clustering

Neighborhood type	N	Neighborhood income 1990		Change in income from 1990 to 2011	
		Mean	Std.Dev	Mean	Std.Dev
Economically distressed	142	0.83	0.19	-0.16	0.14
Revitalizing	95	0.80	0.27	0.40	0.27
Middle-declining	92	1.28	0.22	-0.17	0.22
High-declining	24	1.79	0.32	-0.03	0.28
Middle-high income	16	1.94	0.32	0.74	0.36

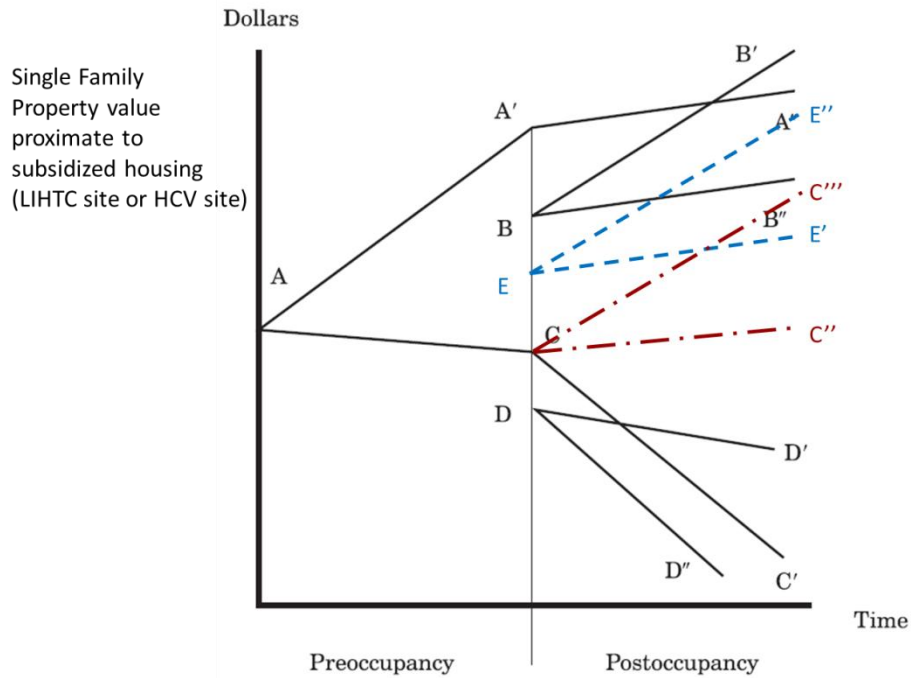


Figure 4-6. Illustration of Potential Property Value Impacts of Subsidized Housing edited by the author (source: Galster et al., 1999)

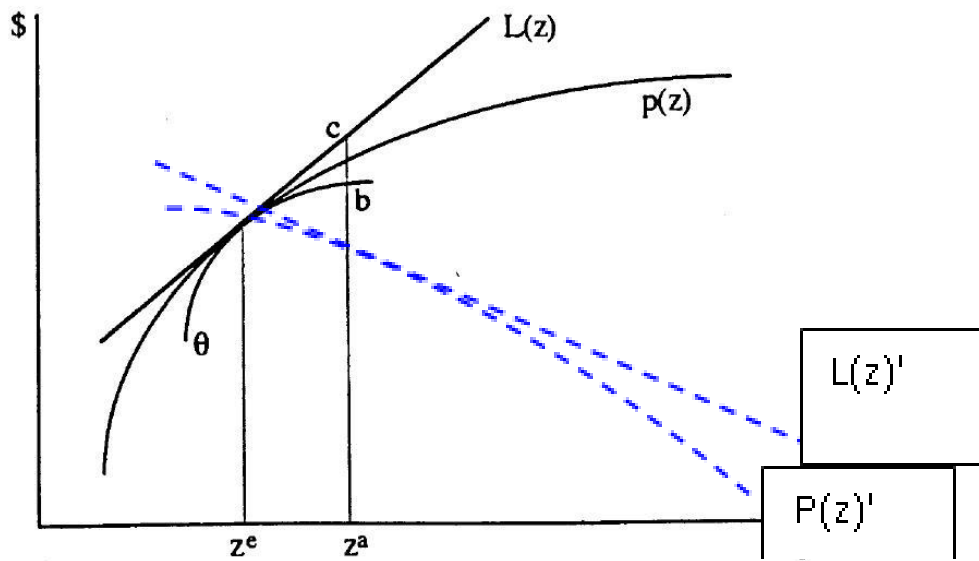


Figure 4-7. Welfare changes of households using hedonic price model by Lyon and Loveridge (1993)

Table 4-6. Description of variables for the property values impacts

Variable	Description
LnSP	Log of sales price of single family housing. It is counted as percent affected by independent variables.
α	Intercept or constant
STRUCTURE	A set of vector of variables represent size of property and age of property. It includes total living area, lot size, and age of the property at sale
TIME	A set of dummy variables that controls seasonal transition and yearly change. It includes three seasonal dummies that are first quarter, second quarter, and third quarter. Time variables also include 20 yearly dummy variables.
CEN_TRACT	This variable shows whether the single family housing is previously sold within a census tract. It controls preexisting status of the census tracts. There are 190 census tract dummy variables. This variable is used to control for neighborhood fixed effects of single family property and neighborhood time invariant effects. It allows the treatment variable to be independent from any other variation of neighborhood characteristics across space and time.
TREND	A vector of variable controls reflecting the annual trend of housing price appreciation in the impact area. It is operationalized by the difference between the sales transaction year and the year 1990.
AFTER_ Inner_TREND	This variable controls the annual trend of housing price appreciation in the impact area after the introduction of subsidized housing developments. A vector of this variable equals the number of years between the sales year and the completion year of the LIHTC projects; otherwise it is 0.
INNER	The dummy variables demonstrate whether single family housing is located in the impact area of subsidized housing before it is sold. This variable represents preexisting level of neighborhood status in terms of housing price. If single family housing is previously sold in census block group, then the value is 1; otherwise it is 0.

Table 4-6. Continued

Variable	Description
AFTER_Inner	The dummy variable controls the time difference between before and after development of subsidized housing. This variable shows whether the single family housing is sold within an impact area after development of subsidized housing. If single family housing is located in the impact area and is sold after the development, then the variable is 1; otherwise it is 0.
AFTER_Distance	The vector of continuous variable that demonstrates Euclidean distance between sale property and the subsidized housing project. This variable indicates whether the impact of subsidized housing varies according to distance from the subsidized site. The distance is measured based on meters.
AFTER_Inner_Medium AFTER_Inner_Small	This vector of dummy variables exhibits effects of differentiated property size, considering that size of property is critical in determining property value. These variables are divided into three different types: small (less than 50 units), medium (50-100 units), and large (more than 100 units). If the size of the subsidized site falls into one of the categories, then the variable is 1; otherwise it is 0.
AFTER_Inner_GRAV_T AFTER_Inner_GRAV_A AFTER_Inner_GRAV30	These variables control impact of differentiated property size depending on Euclidean distance. To control both size and distance, this study adopts a gravity equation to identify the interaction between subsidized housing and single family housing. It is operationalized as follows: $\alpha * (P_1 * P_2) / D^2$. Where α is a constant coefficient (α is 1 in this case), P_1 is the number of subsidized units, P_2 is the number of single family units (which is 1), and d is distance between subsidized project and single family housing. GRAV_T stands for gravity in total units of property; GRAV_A represents gravity of total subsidized units; GRAV30 is gravity of total subsidized units with 30% AMI.

Table 4-6. Continued

Variable	Description
AFTER_Inner_AHden_new	The dummy variable describes the impacts of assisted housing density on single family property values. The new assisted housing is built between 1990 and 2010. The second variable measures the existing density of assisted rental housing. If single family housing is located in the impact area and a property transaction occurred after the new construction, then the variable is 1; otherwise it is 0.
AFTER_Inner_AHden_pre90	
AFTER_Inner_MHden_new	The dummy variable reflects property value impacts from new multifamily construction and existing multifamily properties. The new multifamily housing is built between 1990 and 2010. The variable with pre90 describes whether the preexisting density of multifamily housing before 1990 affect the sale value depending on time within the impact area. If single family housing is located in the impact area of new multifamily housing and a property transaction is occurred after the new construction, then the variable is 1; otherwise it is 0.
AFTER_Inner_MHden_pre90	
AFTER_Inner_30DEN	This variable demonstrates the density effect of assisted rental housing on the sales price of single family housing by income restrictions. Two variables are operationalized by the following equations: total number of assisted units with 30% of AMI in Census block group / area of census block group (square miles), and total number of assisted units with 50% of AMI in Census block group / area of census block group (square miles).
AFTER_Inner_50DEN	
AFTER_Inner_AH_tot	These variables measure property value impacts of the total number of assisted rental housing units and the total number of multifamily housing units, respectively. From 1990 to 2010, a total number of assisted units and multifamily units are calculated to examine the accumulative effect of rental housing.
AFTER_Inner_MH_tot	

Table 4-6. Continued

Variable	Description
Inner_POORN Inner_30LIN Inner_50LIN Inner_80LIN	Different sets of dummy variables show whether single family housing is located in 30% of AMI neighborhoods, 50% of AMI neighborhoods, 80% of AMI neighborhoods, and impact area of subsidized housing development. If the single family housing is located in these low income neighborhoods and in an impact area of subsidized housing then the variable is 1; otherwise it is 0.
AFTER_Inner_Mid_PO OR	This dummy variable identifies whether the single family housing is located in both the impact area and lower income neighborhoods in 1990 (lower income neighborhoods are defined in previous section). It describes the preexisting price level of poor neighborhoods. If the single family property is located in both the impact area and lower income neighborhoods and is sold after the subsidized housing are introduced, then the variable is 1; otherwise it is 0.
AFTER_Inner_HighPO OR	
AFTER_Inner_30LIN	This dummy variable tells whether the single family home is located in both the impact area and an <i>extremely low income neighborhood</i> where area median income (AMI) is cut off at 30%. If the single family property is located in both the impact area and a 30% of AMI neighborhood and is sold after the subsidized housing, then the variable is 1; otherwise it is 0.
AFTER_Inner_50LIN	This dummy variable shows whether the single family home is located in both the impact area and a <i>very low income neighborhood</i> where area median income (AMI) is cut off at 50%. If the single family property is located in both the impact area and a 50% of AMI neighborhood and is sold after the subsidized housing, then the variable is 1; otherwise it is 0.
AFTER_Inner_80LIN	This dummy variable shows whether the single family home is located in both the impact area and a <i>low-medium income neighborhood</i> where area median income (AMI) is cut off at 80%. If the single family property is located in both the impact area and an 80% AMI neighborhood and is sold after the subsidized housing, then the variable is 1; otherwise it is 0.

Table 4-6. Continued

Variable	Description
AFTER_HCVinLIHTC	A vector of interaction variables that show distance of impact area at the time of sale. This interaction variable represents whether the HCV holders live in the LIHTC projects. AFTER_HCVinLIHTC includes all HCV recipients in LIHTC projects after eligible households are admitted in the HCV program. AFTER_HCVin30LIHTC and AFTER_HCVin50LIHTC indicate HCV holders living in LIHTC projects with 30% AMI and LIHTC developments with 50% AMI, respectively.
AFTER_HCVin30LIHTC	
AFTER_HCVin50LIHTC	
AFTER_Economically distressed Neighborhood	This variable is based on the cluster analysis that categorizes neighborhoods. This variable indicates whether a neighborhood that experiences a constant income levels near the poverty line between 1990 and 2010. If the census block group constantly has a low-income level, then the variable is 1; otherwise it is 0.
AFTER_Revitalizing Neighborhood	This variable is based on the cluster analysis that categorizes neighborhoods. The variable indicates whether the neighborhood experiences an increase in income between 1990 and 2010. If the census block group experiences an increase of average household income level, then the variable is 1; otherwise it is 0.
AFTER_Middle-Declining Neighborhood	This variable is based on the cluster analysis that categorizes neighborhoods. This variable represents the neighborhoods that experience a decrease in average income level.
Housing Density 1990	The variable reflects the housing units per square miles in 1990.
Poverty Rate 1990	This set of vector variables indicates poverty rates in 1990.
X	X coordinate of single family housing standardized by the center of Orange County.
Y	Y coordinate of single family housing standardized by the center of Orange County.
ϵ	Error term

Table 4-7. Description of variables for the displacement impacts

Variable	Description
HCV 2010	The number of Housing Choice Voucher recipients in 2010
α	Intercept or constant
HCV 1990	The number of Housing Choice Voucher recipients in 1990
LIHTC units 1990	The number of LIHTC units in 1990.
Increase of LIHTC units 1990-2010	The change in the number of LIHTC units between 1990 and 2010.
Assisted housing units 1990	The total number of assisted housing units in 1990 that exclude the total number of LIHTC units.
Increase of assisted housing units 1990-2010	The change in the number of assisted rental housing units between 1990 and 2010. This variable is a result of subtracting the LIHTC units from assisted housing units between 1990 and 2010.
Housing price 1990	Median housing price in 1990.
Poverty rate 1990	The percentage of population under poverty line relative to the total of base population in 1990.
Change of housing price 1990-2010	Change in the median housing price between 1990 and 2010.
Change of poverty rate 1990-2010	Change in the median poverty rate between 1990 and 2010.
Neighborhoods with 30% AMI	If the median household income in the neighborhood is lower than 30% of the median household income in Orange County, then the variable is 1; otherwise it is 0.
Neighborhoods with 30-50% AMI	If the median household income in the neighborhood is lower than 50% and greater than 30% of the median household income in Orange County, then the variable is 1; otherwise it is 0.

Table 4-7. Continued.

Variable	Description
Neighborhoods with 50-80% AMI	If the median household income in the neighborhood is lower than 80% and greater than 50% of the median household income in Orange County, then the variable is 1; otherwise it is 0.
High poverty neighborhoods	If the poverty rate in 1990 is higher than 40% then the variable is 1; otherwise it is 0.
Middle poverty neighborhoods	If the poverty rate in 1990 is between 20% and 40% then the variable is 1; otherwise it is 0.
Revitalizing neighborhoods	If the cluster analysis defines a neighborhood as a revitalizing neighborhood, then the variable is 1; otherwise it is 0.
Middle declining neighborhoods	If the cluster analysis defines a neighborhood as a middle-declining neighborhood, then the variable is 1; otherwise it is 0.
Economically distressed neighborhoods	If the cluster analysis defines a neighborhood as a economically distressed neighborhood, then the variable is 1; otherwise it is 0.
ε	Error term

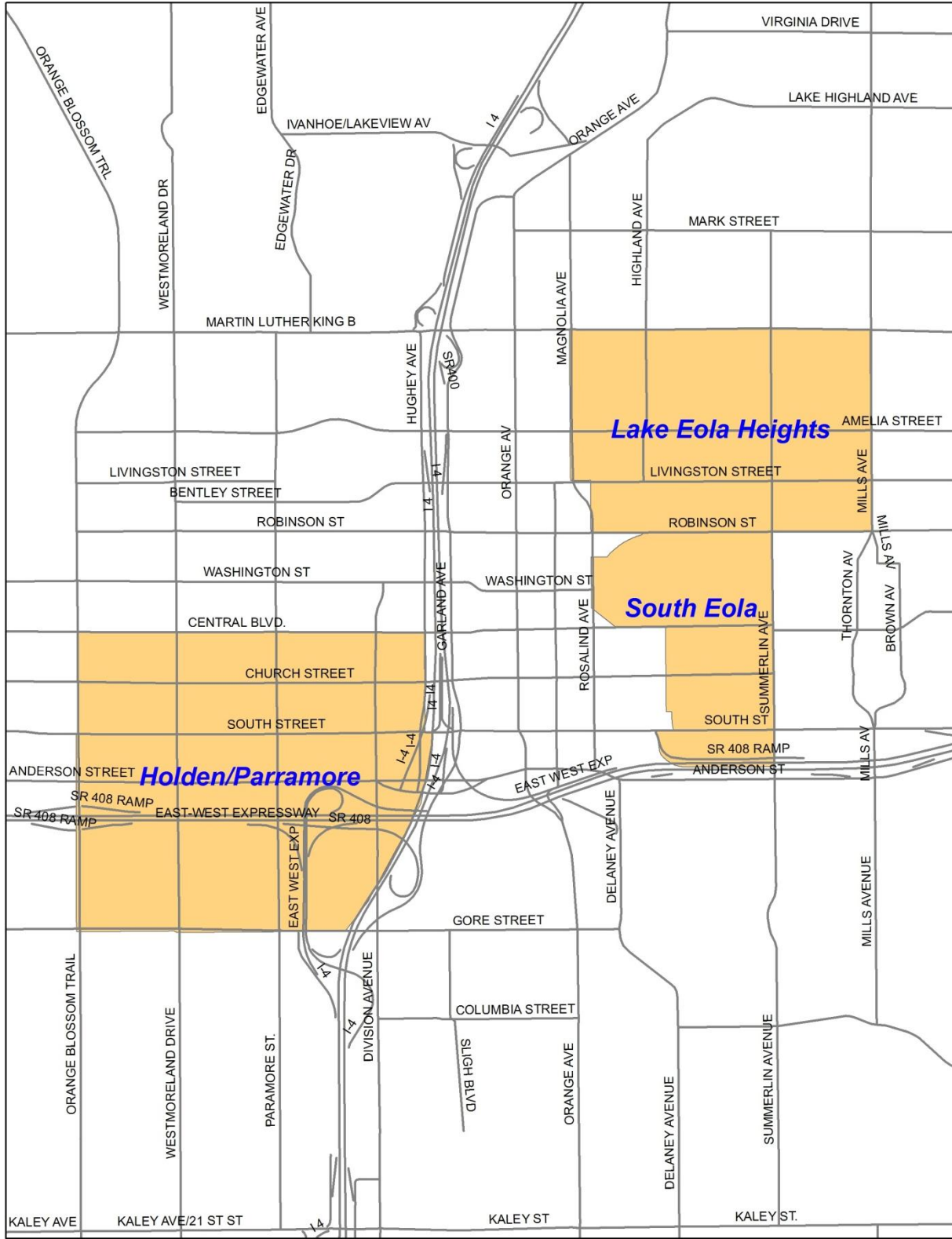


Figure 4-8. Location of case study areas.

CHAPTER 5 RESULTS AND FINDINGS

Location, Neighborhoods, and Sale Prices

As discussed in the literature review, the impacts of subsidized housing developments may vary significantly depending on different types of neighborhoods (Freeman and Botein, 2002). It is therefore important to understand the spatial pattern in Orange County of the LIHTC projects and the HCV units examined in this study. Among the 97 LIHTC projects built through 2010, 26 developments are located in the City of Orlando. The remaining 71 developments are located throughout Orange County. Through the same period, 3,850 HCV holders are located in the central city of Orange County whereas the remaining 8,799 voucher recipients live outside the City of Orlando. As discussed in the previous section, the City of Orlando made a significant efforts to produce affordable housing and accommodate more low-income households. The city promotes this goal through its comprehensive plan, housing plan and land use plan. Indeed, a study shows that the Orlando Housing Authority has provided 1,496 public housing units whereas Orange County Housing Authority has not completed any developments (Shimberg Center for Housing Studies, 2013). During this time, the Housing Authority of the City of Winter Park contributed to 171 assisted units with merely one assisted housing development.

As Figures 5-1 and 5-2 present, most LIHTC funded projects are located near the city fringe and suburbs. The HCV holders are widely distributed throughout the county except for the neighborhoods in the central city. More specifically, the location of LIHTC projects and HCV holders vary depending on the neighborhood. As shown in Figure 5-3, the number of census block groups is calculated in each neighborhood type based on

ratio of percentage of poverty in a neighborhood in 1990 to percentage of poverty in Orange County in 1990. This indicator implies the severity of poverty for neighborhoods compared with poverty in the county. In Figures 5-4 and 5-5, the neighborhood groups with 0.6-0.9 and 0.9-1.2 have the largest share of block groups in total. These areas show higher shares of LIHTC projects and units than other neighborhood groups. Similarly, HCV holders are largely concentrated in neighborhoods with 0.6-0.9 and 0.9-1.2.

Based on neighborhood type categorized by cluster analysis, the spatial pattern of LIHTC projects and HCV holders vary depending on neighborhoods. The number of distressed block groups is 142, whereas 31.5 percent of block groups account for high declining and middle declining neighborhoods. About 25.7 percent of total block groups are categorized as revitalizing neighborhoods. Only 4.3 percent of neighborhoods are middle and high income neighborhoods. As shown in Figures 5-9, 5-10, 5-11 and 5-12, the largest share of LIHTC projects and HCV recipients are concentrated in distressed neighborhoods. The remaining shares of LIHTC developments and HCV holders are distributed in middle-declining and revitalizing neighborhoods.

As Figure 5-13 shows, a large number of block groups are predominantly 50-80 percent of AMI, 80-100 percent of AMI and 100-120 percent AMI. These three income group neighborhoods account for approximately 66.5 percent of total census block groups. Among these, 40 LIHTC projects with 8,978 units are concentrated in income group neighborhoods with 80-100% of AMI as shown in Figures 5-14 and 5-15. Similarly, the largest share of HCV holders can be found in the neighborhoods with 80-100 percent of AMI. The share of HCV holders by income groups is demonstrated in Figure

5-16 and 5-17. Finally, based on poverty status, most of the LIHTC projects and HCV holders can be found in low- and middle-poverty areas (See Figures 5-18 – 5-22).

On the other hand, a big difference exists between inside the price impact areas and outside the price impact areas of LIHTC projects and HCV holders. The sale prices in the impact area of the LIHTC funded projects and the HCV households are relatively lower than the ones outside the impact areas. In Orange County, the LIHTC projects are located in areas that experienced comparatively lower housing prices. The LIHTC impact areas are about 31 percent lower than the prices of single-family homes located outside the 2,000 foot impact area. Furthermore, these patterns become more apparent over the study period. Table 5-1 shows that differences exist in annual sale prices for single family homes located within a 2,000 foot area with sale prices outside the LIHTC impact area between 1990 and 2010. The table presents that not only the average of the differences of sale prices are detrimental but also the annual differentiated trends also decline. After 2007, the percentage of the differentiated prices is much lower than the one in previous years. Figure 5-23 reinforces these explanations. Considering the fact that the LIHTC projects started being funded in 1987 when Congress passed Tax Reform Act, it is not surprising that the depressed prices may be a result of the LIHTC developments. However, new construction of LIHTC projects occurred in low-income neighborhoods where housing prices were lower than average neighborhoods in 1990. The location of the LIHTC projects may have no effects on property values.

Table 5-2 shows differences between properties located within 2,000 foot circle area close to the HCV holders, and ones outside the HCV impact area. Similar to the differences in impact areas of the LIHTC projects, the price impact areas of HCV

households have lower price levels than outside HCV impact area but the degree of the depressed prices is much lower than the LIHTC impact area. Sale prices for single-family homes located within the 2,000-foot area from HCV holders are 49.3 percent lower than the prices located outside the 2,000 foot area of HCV holders on average. Similar to the LIHTC projects, the sale prices declined over time. In 2010, properties sold within 2,000 feet of an LIHTC project are, on average, about 62 percent lower than sale prices outside the impact areas. The prices in the HCV impact area relative to prices outside the HCV impact area during two decades are shown in Figure 5-24. These patterns are similar to the calculated differences between sale prices in the price impact area of HCV households in LIHTC projects and sale prices outside the impact area of HCV holders in LIHTC projects. As Table 5-3 presents, the sale prices in the impact area close to the HCV recipients in LIHTC projects are, on average, 31 percent lower than sale prices outside the impact area. Based on these results, it is not certain that the HCV holders live in neighborhoods with lower prices than HCV users in the LIHTC projects do. This uncertainty of price difference is due to the fact that the average sale prices of HCV impact area are still higher than ones in the impact area of HCV holders living in the LIHTC projects.

From 1990 to 2010, sale prices for single family homes varied depending on neighborhoods. Figure 5-26 demonstrates the sale price trends by income groups during the study period. Overall, the sale price variations show a similar shape with the average sale prices in Orange County: the constant increase of housing prices between 1990 and 2003, the skyrocketing sale prices from 2004 to 2007, and plummeting housing values after 2008 until 2010. The average sale prices in neighborhoods with 30

percent or less AMI has the lowest values while the sale prices in neighborhoods with 150 percent of AMI or more has the highest sale prices. The sale prices, on average, are similar in the two low-income neighborhoods with income groups such as 30-50 percent AMI, and 50-80 percent AMI. However, the sale prices in neighborhoods with 30-50 percent AMI are, on average, higher than neighborhoods with 50-80 percent AMI. This result may indicate that sales prices within these neighborhoods depend not only on the average income groups but also other neighborhood characteristics that determine housing sale activities.

The sale prices also vary depending on neighborhood types. As shown in Figure 5-27, the sale prices in distressed neighborhoods are lower than other neighborhoods whereas high-declining and middle-high neighborhoods have the highest sale price values. However, middle-declining neighborhoods have, on average, lower sale prices than revitalizing neighborhoods. This result implies that these two neighborhoods may have other inherited characteristics that affect sale prices. Nonetheless, per unit sale prices of single-family homes depending on poverty status show similar patterns. As shown in Figure 5-28, although sales prices in high-poverty neighborhoods fluctuate over time, the sales prices in other neighborhoods show similar average sales prices during the study period.

Results from AITS Econometric Models for Price Impacts

In this chapter, all the regression models are estimated using ordinary least squares (OLS) with robust standard errors. Also, the estimates of the models are transformed into the percentage of housing price by increase of one unit of each variable. As noted in the methodology chapter, econometric analyses are separately conducted for different subsidized housing programs: (1) LIHTC projects, (2) HCV

recipients, and (3) HCV units in LIHTC projects. For each model, the estimates of the price impacts are tested without or with a consideration of neighborhoods. The final four models are baseline, income groups, poverty status, and neighborhood types for the price impacts of each subsidized program. For all regression models, autocorrelation and heteroscedasticity may not exist. All of the models are significant, and the adjusted R^2 is high enough to explain sale prices. The independent variables explain the price change between 82 and 84 percent. Also, the Variance Inflation Factor (VIF) is less than 10, indicating that multicollinearity among the independent variables is not strong in the econometric analyses. All control variables such as housing density and poverty rate are included in the model simultaneously. In particular, dummy variables that describe the year of transaction show high and positive significance, indicating that the housing prices increase during the housing market boom period. In order to interpret the results of the regression models, the estimates of AFTER variables are only focused. To interpret the coefficients of the AFTER variables, we use the standard formula $100*(e^{\beta}-1)$, where the β is the coefficient to explain the logged sale prices (Ellen and Voicu, 2006; Galster, Tatian, and Accordino, 2006). The full results of the regression models are presented in Appendix A, B, and C. The coefficients of the major variables only are selected to show the regression results from Table 5-4 to Table 5-15.

Results of Baseline Models

The baseline regression models are initially conducted, without a consideration of characteristics of low-income neighborhoods. The main result generated with the AITS models for Orange County is that negative price variations of the HCV households in the pre-impact areas are reduced afterward, but the positive price trends of the LIHTC projects are declined after the LIHTC developments. The sale price differences between

the pre-impact areas and the post-impact areas often disappear or reduce after the construction of new LIHTC funded apartments or the introduction of new HCV households. Specifically, the LIHTC projects begin with relatively higher prices in the pre-development levels, so they are related to the large decrease in price levels after the LIHTC developments. For instance, the property values decline from 5.4 to -0.3 percent for the LIHTC impact areas. These results, however, are inconsistent with the findings for New York City (e.g. Shwartz et al., 2006). Nonetheless, the housing prices in the HCV impact area increase from -1.19 to 0.01 percent. Also, the property values in the impact areas of HCV households in LIHTC developments increase from -2.1 to -0.3 percent. For all baseline models, the price change trends are not significant since the average differences between \ln_TRENDR and $AFTER_ln_TRENDR$ fall between -1 and 1 percent. Figure 5-29 illustrates these housing price variations in the pre- and post-development.¹

More specifically, in the baseline model of the LIHTC model, the two important variables are demonstrated to explain, as a whole, the price impacts of LIHTC projects as shown in Table 5-4. The coefficient for \ln_TRENDR is negative but not significant, indicating that the parameter is not different from zero. The estimate for the $INNER$, however, is positive and significant. This positive parameter implies that the impact areas have higher prices than the other neighborhoods before constructing the LIHTC

¹ The percentage of housing price change from the $INNER$ represents the initial price levels. The percentage of housing price change for the \ln_TRENDR means the level of changed housing prices prior to the introduction of the LIHTC projects or the HCV households. Therefore, the transformed coefficients are summed to create the final housing price levels in the impact areas before the introduction of the subsidized housing. The transformed percentage of housing price level from the $AFTER_INNER$ is the percentage of initial price level after the subsidized developments. The transformed coefficient for the $AFTER_ln_TRENDR$ is the changed housing price levels after the introduction of the subsidized developments. These two after-variables are summed to generate the final price levels in the end. Figure 5-29 is the aggregated results of the four variables from the regression results in Table 5-4, 5-5, and 5-6.

funded developments. However, the significance and direction of the coefficients are changed after controlling for the pre-existing status of neighborhoods. The estimated parameter for the AFTER_IN_TREND variable is statistically significant but having a negative value, implying that a price trend decline over time after the introduction of the LIHTC projects. The estimated coefficient for the AFTER_INNER does not show statistical significance, implying that the LIHTC projects do not contribute to variations of the property values. Even though both small-sized and medium-sized LIHTC projects do not have effects on the property values, the gravity model is negatively associated with the property values. The property values increase if the distance to the LIHTC projects decay, and if the number of LIHTC units increase. This results are consistent with other studies (Elle et al., 2007; Deng, 2011b). The gravity variables to price in the models show the highest coefficient. This highest positive effect might occur because of overestimated numbers from gravity models. Therefore, the coefficients for the gravity model are not transformed into the percentage change of housing prices.

For the HCV price impact model, the estimated parameter for the In_TREND is negative, indicating that the preexisting appreciations of the single-family homes are lower than other neighborhoods. The estimate for the variable, INNER, is also negative and significant. This negative parameter indicates that the pre-existing price level is lower than other microneighborhoods. The coefficient for the AFTER_In_TREND is significant and positive, but its magnitude is close to zero. The parameter for the AFTER_INNER is significant and positive. In addition, the AFTER_In_Small is negative and significant, implying that the small-sized assisted housing projects tend to decrease nearby property values in the impact areas of HCV households compared to the large-

size assisted developments. Table 5-5 shows the result of the regression model. For the price impacts of HCV households in the LIHTC projects, the statistical significance and direction of the estimated parameter are the same with the HCV price impact model. The only difference is the magnitude of each coefficient. Table 5-6 presents coefficients in the regression model of price impacts of HCV households in the LIHTC projects. Following interprets the results of the regression models that consider the location of the LIHTC projects in various types of neighborhoods.

Finally, in order to examine the discrepancy between assisted tenants and neighborhoods, the information of targeted income levels of the LIHTC projects is included in the regression model. In Table 5-4, the results show that the LIHTC projects have positive effects on property values. For example, AFTER_Inner_GRAV_A and AFTER_Inner_GRAV30 have positive impacts on sale prices. These results show that the LIHTC funded units with close distance could increase property values even though the property contains high proportion of assisted units with 30 percent AMI. These results are consistent with Ellen et al. (2006), Galster et al. (2004), and Deng(2011b) providing evidence that large development has some positive effects in the end.

Results from the Models with Income Groups

The two programs, the LIHTC program and the HCV program, have different effects on property values depending on income groups. Overall, the prices of the LIHTC projects decline but that of the HCV households finally increases. For example, the property values of the LIHTC impact area decrease from 3.15 to -0.26 percent (3.41 percent drop in total). On contrary, the housing price levels of HCV households increase from -3.1 to 0.0 percent. The property values in the impact areas of HCV holders in LIHTC developments also increase from -3.8 to -1.2 percent after the introduction of the

HCV households. Similar to the baseline model, there is only a minor change of the housing price trends in-between -1 and 1 percent. Figure 5-30 demonstrates these price changes after the introduction of the LIHTC projects, the HCV households, and the HCV households in the LIHTC projects.² This may be attributed to the location of the assisted units rather than tenant's characteristics. Because the LIHTC projects are located in relatively lower income neighborhoods, it may be unlikely that the LIHTC projects itself can bring more capital investments and cause increase in property values.

However, the results of price impacts for the low-income areas show different results. As hypothesized, the LIHTC projects have more positive impacts on property values in low-income neighborhoods than the HCV households because of higher income levels of assisted tenants, and the features of newly developed buildings. In order to test the price impacts in the low-income neighborhoods, before- and after-dummies for each low-income neighborhood are included. As shown in Table 5-7, Table 5-8, and Table 5-9, BEFORE_Inner_30LIN, BEFORE_Inner_50LIN, BEFORE_Inner_80LIN, AFTER_Inner_30LIN, AFTER_Inner_50LIN, and AFTER_Inner_80LIN are included. The difference between before and after variable provides the final results of the price impacts for each neighborhood.

Even if LIHTC funded developments are located in the poor neighborhoods, there is an improvement effect that Ellen et al. (2006) suggested. However, when the LIHTC projects are located in neighborhoods where the income level reaches at a certain level, the property value impacts can reverse. Indeed, the results become more perplexing. The LIHTC projects in the neighborhoods with 30 percent of AMI generate

² Figure 5-30 is the calculated results of the four variables, In_TREND, AFTER_In_TREND, INNER, and AFTER_INNER, from the regression results in Table 5-7, 5-8, and 5-9.

the highest increase in property values by 17.7 percent. Even in neighborhoods with 50 or 60 percent of AMI, a small amount of property values increase by 1.7 percent. However, neighborhoods with 80 percent of AMI experience a decrease in property values by 13 percent. Since the LIHTC program accepts applicants who earn only below 60 percent of AMI, the LIHTC projects in neighborhoods with 80 percent of AMI may have negative impacts on property values.

On the contrary, the price impact model for the HCV households presents the opposite results. The HCV household model is described in Table 5-8. All of the coefficients of the models show negative price impacts of the HCV recipients. The property values in neighborhoods with 30 percent of AMI decrease by 19.3 percent, neighborhoods with 50 or 60 percent of AMI by 12.5 percent, and neighborhoods with 80 percent of AMI by 8.3 percent. This negative price impact is similarly occurred in the HCV of LIHTC project model as shown in Table 5-9. The negative effects of HCV holder models are reasonable. Because the income restriction of the HCV program is 40 percent of AMI, it is likely that the average income of HCV holders is less than 40 percent of AMI. This average income may further decrease the property values based on the established hypothesis.

Results from the Models with Poverty Status

The LIHTC projects and the HCV holders have different price impacts depending on poverty status of neighborhoods. Considering the poverty status in the model, the LIHTC projects have negative impacts on property values, whereas the HCV households have positive effects on the property values. For instance, the price levels start off at 5.8 percent prior to the LIHTC developments, but the percentage point of the property values drop to -1.7 percent after the construction of the LIHTC projects. In total,

the property values decrease by 7.5 percent. However, the price levels affected by the HCV households are increased from -1.8 to 0.9 percent. The total increase is 2.7 percent of the property values. Additionally, the HCV households in the LIHTC projects raise the property values from -2.7 to 1.7 percent. This is 4.4 percent of growth rate in total. Figure 5-31 shows the sale price levels and trends of the pre- and post-introduction of the LIHTC projects and the HCV holders by poverty status.³

In terms of the price impacts of different types of the poor neighborhoods, the results are diverging in two different poverty areas. To examine the price impacts in the poor neighborhoods, before- and after-dummies for each poor neighborhood are included. As shown in Table 5-7, Table 5-8, and Table 5-9, BEFORE_MiddlePOOR, BEFORE_HighPOOR, AFTER_MiddlePOOR, and AFTER_HighPOOR are included in each regression model. Compared to the low-poverty areas, the middle poverty neighborhoods in the LIHTC price impact models have positive impacts on property values (3.4 percent) whereas the high poverty neighborhoods negatively affect property values (-20.5 percent). This result is understandable, since the high concentration of the poverty does not necessarily mean the large shares of low-income populations. After all, the systematic price changes in the high poverty areas result in decrease of the property values, in part, due to stigmatization of the high concentration of the poverty.

However, the results show that the price impacts of HCV households in different types of the poor neighborhoods are negative. The HCV recipients have negative impacts in both middle-poverty and high-poverty neighborhoods at -4.1 percent and -6.8 percent, respectively. Also, the HCV households in the LIHTC projects have negative

³ Figure 5-31 is the calculated results of the four variables, In_TREND, AFTER_In_TREND, INNER, and AFTER_INNER, from the regression results in Table 5-10, 5-11, and 5-12.

price impacts at -4.1 percent and -5.8 percent in the middle- and high-poverty neighborhoods, respectively. This depressed housing prices are partly due to the residents' concerns in terms of change of neighborhood conditions, and changes of socio-demographic residents in the poor neighborhoods (Galster et al., 1999). According to the group survey conducted by Galster et al. (1999), the voucher tenants are perceived as a source of the concentration of the poverty, the decline in physical features, and the increased crime. These concerns are likely to be manifested in declining property values. Following is the interpretation for the results of the regression models that consider the location of the HCV holders in various types of neighborhoods.

Results from the Models with Neighborhood Types

Depending on the neighborhood types that are classified by a cluster analysis, the LIHTC projects and the HCV holders have different price impacts. With the variables of the neighborhood types, both the LIHTC projects and the HCV households have positive impacts on property values. These results counteract with the results from other regression models. For example, as shown in Figure 5-32⁴, the price levels are initiated at -3.9 percent and increased to -3.6 percent before the construction of the LIHTC projects, but the price level turns to the positive level at 5.7 percent after the LIHTC funded developments. Similarly, the percentage of property values in the impact areas of HCV households start with -1.7 percent before the HCV households are occupied, and increase to 3.1 percent after the introduction of the HCV households. The price effects of HCV households in the LIHTC projects are smaller than all the HCV

⁴ Figure 5-32 is the calculated results of the four variables, In_TREND, AFTER_In_TREND, INNER, and AFTER_INNER, from the regression results in Table 5-10, 5-11, and 5-12.

households, starting off at -2.7 percent and finalizing at 1.7 percent. A total price growth rate is 4.4%

Regarding the price impacts of the neighborhood types, the results present that there are constant appreciations of the properties incurred by the LIHTC projects and the HCV households in most of the neighborhood types. These positive effects are largely attributed to the physical effect and demographic effect. As Freeman and Botein (2002) point out, newly developed assisted housing have revitalization effects in neighborhoods. However, In terms of the price impacts of the various neighborhood types, the LIHTC projects and the HCV households have negative impacts on property values. This is largely due to the fact that the revitalization effects of the LIHTC projects are localized, indicating that the LIHTC projects selectively improve the lower-income neighborhoods. In order to investigate the price impacts in the neighborhood types, pre- and post-development dummies for each neighborhood type. As shown in Table 5-13, 5-14, and 5-15, BEFORE_Revitalizing, BEFORE_Economically-Distress, BEFORE_Middle-Declining, AFTER_Revitalizing, AFTER_Economically-Distress, and AFTER_Middle-Declining are inserted into each regression model. For the price impacts of the LIHTC projects, the Economically Distressed neighborhoods have negative impacts on property values at -1.7 percent compared with middle- and high-income neighborhoods. Middle-declining neighborhoods also negatively affect the property values at -3.5 percent. Revitalizing neighborhoods have the highest and negative impacts at -6.8 percent.

Moreover, the results show that there are negative price impacts of HCV households in different types of the poor neighborhoods. All of the neighborhood types

in the HCV price impact model show negative values. Regarding the model of HCV households in LIHTC projects, the Economically Distressed neighborhoods and the Revitalizing neighborhoods have negative impacts except for the middle-declining neighborhoods which present no price impacts. The negative impacts in all models may be attributed to the cluster analysis that is different from the other group classifications. It is possible that the revitalizing neighborhoods may include other neighborhood types that do not belong to the revitalizing neighborhoods.

In sum, the results of regression models provide evidence, in part, about the effectiveness of subsidized housing program in revitalizing low-income neighborhoods. Inconsistent with the hypothesis, the LIHTC funded projects have negative property value impacts, but the HCV units can increase property values during the study periods. the LIHTC projects in middle-poverty neighborhoods, low-income neighborhoods with 30 percent of AMI and 50-60 percent of AMI positively affect property values. However, the results are surprisingly opposite once the neighborhood types from a cluster analysis are considered in the model. Nonetheless, the HCV models in most neighborhoods have constantly negative effects on property values. The effects of the neighborhood types are summarized in Table 5-16.

Conventional wisdom says that it is likely that economically distressed neighborhoods and middle-declining neighborhoods experience the depreciations of single-family homes because of the preexisting traits of the neighborhoods. However, the negative price impacts of revitalizing neighborhoods still remain. This indicates two important discussion points. First, the revitalizing neighborhoods may have complex mechanisms that are not easily comprehended. As the locations of the LIHTC projects

and the HCV residents are irregular, the unique context of individual neighborhood associated with the LIHTC projects and the HCV households may not be presented in the model. Second, the revitalizing neighborhoods are still in the process of transitioning. The transition process may create mixed neighborhood types that include the already revitalized communities, revitalized community by a big public investment, newly revitalizing communities based housing developments, etc. Therefore, the association of the LIHTC projects and the HCV tenants with the property values more explored in the selected neighborhoods in order to provide detailed descriptions of the property variations. Following section is the results of displacement effects of HCV households in association with the LIHTC projects.

Results from OLS Econometric Models for Displacement Effects

This section describes the regression results of displacement of HCV holders between 1990 and 2010 as summarized in Table 5-17. The baseline model does not consider the different types of neighborhoods based on income and poverty. Rather, it includes control variables such as poverty rate 1990 and change of poverty rate 1990-2010 to control for neighborhood characteristics. Similar to the price impact models, the final models include the baseline, and the HCV holders in income groups, poverty status and neighborhood types. When these four econometric model specifications provide common results, it is highly considered that the variables are the strong evidence for the model. All of these models are significant, the power of explaining the independent variables is high enough (65 to 66 percent). Additionally, the Variance Inflation Factor (VIF) is less than 10, indicating that a multicollinearity problem is not an issue in the regression models.

The primary concern of these models is whether the increasing housing prices displace the voucher users during the study period. Also, whether the LIHTC units assist increase HCV recipients in neighborhoods is of second interest. In general, the housing prices in 1990 have negative impacts on the number of HCV holders in 2010, but the degree is close to zero in all the models. But, the change of housing prices between 1990 and 2010 significantly decreases the number of HCV holders in 2010. In 1990, the ratio of a median housing price to a median household income in Orange County was 2.69 but it increased to 4.24 in 2010. This increased ratio means increasing burdens of housing cost for homebuyers as well as low-income households who otherwise cannot afford to buy homes. During the 2000s, the skyrocketed housing prices decreased housing affordability, so the voucher users may move to places at more affordable rent prices.

The LIHTC units may attract more future HCV holders. Specifically, the number of LIHTC units in 1990 significantly increases the HCV usages in 2010. Also, change of LIHTC units between 1990 and 2010 increase the HCV users in 2010. However, this increase does not necessarily mean that all HCV holders are attracted by the LIHTC projects, which provide quality housing units to HCV holders, but the LIHTC funded developments have potential to bring more HCV recipients in neighborhoods.

On contrary, the assisted housing including other subsidy programs does not attract the HCV holders. For instance, the existing stock of assisted housing in 1990 does not affect the number of HCV in 2010. The increase of the assisted housing stocks between 1990 and 2010 actually decrease the number of HCV holders in 2010. The difference in the estimated coefficients between the LIHTC units and the assisted

housing stocks may be attributed to the location of the assisted housing projects, target population of the assisted projects, the status of property maintenance, and affordable housing design. The HCV holders may prefer the LIHTC units than the assisted housing developments because of property age, building design, and location with good accessibility. But, this speculation is not confirmed, and requires further examination in the future study.

The poverty rate in 1990 and the change of poverty rate between 1990 and 2010 are not statistically significant, indicating that the HCV usage does not depend on the poverty status of neighborhoods. The HCV program is originally designed to mitigate the poverty concentration and enhance quality of life of low-income residents who otherwise have access to poor neighborhood resources. The HCV program may affect the poverty de-concentration, but the concerns of re-concentrating poverty still remain due to the lack of social network and connection in the moved neighborhoods. However, the estimated results show that the poverty status may not be a source of concentration of HCV holders. Instead, the HCV users tend to be affected by other neighborhood characteristics such as housing prices, and quality of affordable housing stocks. However, the further analyses are required to examine what determinants to affect the location of HCV holders.

The regression models with variables of income group, poverty status, and neighborhood type examine the effects of the quantity of LIHTC units and housing prices on the quantity of HCV usages depending on different type of neighborhoods. Indeed, most of the estimated parameters of neighborhood types in the regression models are insignificant except for the neighborhoods with 50-80 percent of AMI

variable in the second regression model. All other things being equal, the direction and degree of variables such as the number of LIHTC units in 1990, change of LIHTC units between 1990 and 2010, housing prices in 1990, and change of housing prices between 1990 and 2010 are almost similar. These results indicate that the HCV holders are influenced by factors like the local housing market change, and affordable housing stocks whether the neighborhoods characteristics are changed significantly. However, the neighborhoods with 50-80 percent of AMI in 1990 have a significant effect on HCV usages in 2010. To some extent, the voucher usage decreased in the neighborhood. As explained in the first section, the large shares of LIHTC units are concentrated in neighborhoods with 80-100 percent of AMI, which may be associated with the large shares of HCV users in the same neighborhoods.

The results of the regression model with poverty status show that the high poverty and middle poverty neighborhoods decrease the number of HCV in 2010. This result implies that the HCV are de-concentrated from the poor neighborhood to some extent although the variables are not significant. Similarly, the estimated results for the effects of LIHTC projects on HCV usages in revitalizing, middle-declining and economically distressed neighborhoods are statistically not significant. Also, the directions of the estimated results are unexpected in all models. In particular, the HCV program may not have potential to resolve displacement issue in the revitalizing neighborhoods. However, the positive direction of the middle declining and economically distressed neighborhoods indicate that these neighborhoods may attract more HCV holders despite the weak relationship. The insignificance of the variables

may be attributed to the sudden housing market change during the 2000s. The effects of housing market change on voucher usages should be addressed in the future study.

In sum, the results of regression models provide the evidence that the LIHTC developments incentivize more HCV usage in neighborhoods, and that the increased housing prices can displace the HCV holders. On the contrary, the neighborhoods with 50-80 percent of AMI decrease the number of HCV holders but other neighborhood types do not affect the usages of the HCV program. These insignificant estimates of neighborhood type variables may be attributed to the different types of neighborhoods which have their own values and different attributes. Since each neighborhood has unique and sophisticated systems that affect neighborhood change and property values, it is not easy to understand the complex relationship between neighborhood type and the HCV usage. Another explanation can be difficulty in the classification of neighborhood types. As explained, each neighborhood has its own characteristics. The classification of the neighborhoods may remove the unique values of the diverse attributes of neighborhoods.

Thus, the displacement effect on the HCV holders can be explored in the case studies. The location of LIHTC projects and HCV holders in case studies can reinforce the explanation of possible displacement of HCV holders. The socio-economic characteristics of neighborhoods and other neighborhood characteristics are addressed in the case studies.

Results from Case Studies

In order to conduct case studies, two neighborhoods including Parramore and Eola are selected. For each case, the planning documents and historical data such as Census are used to identify historical characteristics of the neighborhoods. The current

location of Low Income Housing Tax Credit funded development and Housing Choice Voucher recipients are mapped using ArcGIS program. Additionally, if applicable, information on subsidized housing projects including public housing, HOPE VI developments, LIHTC projects and other assisted rental housing funded developments are summarized. As the project-based developments are presented, the voucher holders' characteristics are presented and analyzed to have better understanding of the results. Lastly, the findings from both case studies and results of the econometric models are connected to understand the local housing market, revitalization and social equity issues.

The planning department of the City of Orlando focused on neighborhood revitalization Parramore and Eola. These two communities have experienced typical neighborhood decline in early days due to the geographical location near downtown (Larsen, 2005). Historically, the downtown Orlando has the most prosperous period during 1990s even though it experienced disinvestment during the post-war era. In order to address this issue, the Downtown Orlando Redevelopment Plan was established and adopted by multiple entities such as the City of Orlando, the Orlando Downtown Development Board, and Community Redevelopment Board to promote redevelopment of the downtown area (Downtown Orlando Community Redevelopment Agency, 1990). After the Growth Management passed in 1985, the principles of the redevelopment were incorporated into the growth management plan. Downtown neighborhoods such as Lake Eola, Thornton Park, and Lake Cherokee experienced astonishing neighborhood revitalization. Similar initiatives were paid attention to communities such as Parramore Heritage. The end of 1990s brought more new

construction of multifamily housing, mixed-use, commercial, hotels and retail centers. However, despite the impressive neighborhood revitalization efforts, these downtown neighborhoods still have difficulty in supply of affordable housing and problems in displacement of low-income neighborhoods. Therefore, it is important to understand how subsidized housing projects are located and how the voucher are utilized to support the neighborhood revitalization.

Lake Eola Heights and South Eola (Revitalizing neighborhood)

Lake Eola Heights and South Eola (Eola hereafter) are the representative revitalizing neighborhoods in downtown Orlando. The neighborhood is located at the intersection of I-4 and SR 408 in downtown Orlando. Eola is the central part of the Traditional City⁵, which has mixed-used and great neighborhood interconnectedness. The Downtown Orlando CRA intervened during 1980s to promote neighborhood characteristics, preserve architectural styles and mixture of housing type, and improve physical feature of buildings. These actions indeed catalyzed private and public investment. The Lake Eola Heights is recognized as unique amenities which trigger more pressure for development of multifamily housing. In fact, Lake Eola Heights were designated as a local historic preservation district in 1989. When a modification to the exteriors of the historic buildings is needed to make in the area, a Certificate of Appropriateness is required from Historic Preservation Board. For the maintenance purposes, a tax incentive is available. The Federal Investment Tax Credit allows for

⁵ The City of Orlando has three distinctive development phases: the Traditional City, the Post-World War II, and newly developing areas. The Traditional City is the oldest area that has mixed-use neighborhoods, mixed income, various architectural style and densities, various building setbacks, large lots, and separated land uses (Larsen, 2005). The annexed developing areas to the City of Orlando after Second World War are expanded.

rehabilitated buildings up to 20% of necessary expenditure on the rehabilitation of the historic properties.

Eola has a median household income of 71 percent of area household median income of Orange County in 1990 and it has a median household income of 82 percent of Orlando City's AMI. However, the proportion of a median income increases to 112 percent of Orlando County AMI and 130 percent of Orlando City's AMI in 2007-2011. A median housing price increases from 119 percent to 144 percent of a median housing price in Orange County. Also, Eola has 131 percent of a median housing price of the Orlando city in 1990, but increases to 152 percent of a median housing price in 2007-2011. While these indicators are a result from economic growth and housing market change in the last two decades, they may indicate excessive housing cost burden and cause unintended movement of lower-income due to high housing prices and high rents. In contrast, the poverty rate decreases from 14.9 percent to 12.8 percent during the same period. More details are demonstrated in Table 5-18.

From 1990 to 2011, First Baptist Terrace Housing development, as presented in Figure 5-34, is only a single project that provides assisted housing units specifically for low-income elderly families in Eola. Under the Section 202 Direct Loan from HUD, this project was built in 1968 to provide 197 assisted units. No single voucher user is identified in this project. Historically, Eola has had neither LIHTC projects nor other assisted rental housing developments. This failure of providing LIHTC projects in Eola may be related to difficult acquisition of land due to a high land price and low feasibility for the developers in Eola area. As shown in Figure 5-35, sale prices in Eola in 2010 had retreated to the 2005 level while Orange County has retreated to the 2001 level.

These comparatively high prices might affect the occurrence of assisted property placement in Eola. Also, the other component may include expensive acquisition and demolition cost of existing properties for the redevelopment. In fact, to meet local housing demands for low-income families, state agencies allocate tax credits by collaborating with local housing agencies. But, when the policy goals conflict with developers' interest, housing supply of public sector can be discouraged. The map of LIHTC projects, voucher holders and Land Use in Lake Eola Heights and South Eola is demonstrated in Figure 5-33.

From 1980s to 1990s, six HCV holders were occupied in this revitalizing area. However, the number of HCV recipients decreased from 6 to 1. This is largely due to influx of higher income and subsequent increase in housing prices. Figure 5-35 shows the a trend of the average sale prices in Eola and Orange County. In general, the low-income residents are sensitive to housing market change because the housing affordability significantly decreases when housing prices followed by increase of rents. Therefore, this change of economic status and housing market might provoke displacement of HCV users to other neighborhoods. For instance, the average income of voucher holders is 41 percent of a median household income of Eola in 1990, but that of voucher recipient is only 23 percent of a median household income of Eola in 2010.

Holden-Parramore (Economically distressed neighborhood)

Holden-Parramore is one of the most economically distressed neighborhoods in the City of Orlando. This Holden-Parramore is historically an African-American community located at the west of the intersection between I-4 and SR 408 in downtown Orlando. Poverty rate of this community is about fifty percent in the study period. From 1990 to 2007-2011, population significantly decreases from 5,520 to 3,660 and the

number of households decreases from 1,879 to 1,186. This is largely attributed to typical sprawl-like development pattern in suburbs in 1970s and outmigration of higher income induced by new housing developments (Larsen, 2005). Since then, Holden-Parramore was left with vacant homes.

Unlike to Lake Eola Heights and South Eola, Holden-Parramore is traditionally black community. The percentage of African American in 1990 is 92.2 percent and decrease to 79 percent in 2007-2011. Among the total housing units, most of occupied units are renter-occupied units although the percentage decreases from 88.1 percent to 73.4 percent. Compared to the central city, the ratio of a median household income of Holden-Parramore decrease from 15.4 percent in 1990 and 10.0 percent in 2007-2011. The ratio of a median household income of Holden-Parramore to that of Orange County also decreases from 14.1 percent in 1990 to 9.4 percent in 2007-2011. Neighborhood characteristics of Holden-Parramore is presented in Table 5-20.

As part of revitalization efforts, the City of Orlando clearly establishes the goals to provide quality housing in downtown Orlando such as Parramore community as described in the growth management plan of the City of Orlando:

The City will participate in the Parramore Heritage Renovation Project to rebuild Orlando's Callahan/Holden/Parramore community... This initiative will work to build a partnership between the public and the private sectors in order to revitalize the area. Among other issues such as crime and economic development, the community will focus on issues such as affordable housing... The City shall encourage neighborhood revitalization, affordable housing and homeownership throughout the Parramore Heritage Renovation Area by implementing programs and regulations that promote a wide variety of housing types, including single-family dwelling units, accessory cottage dwellings, townhouses, condominiums and rental apartments (City of Orlando, H-17).

Collaborating with nonprofit organization, the City of Orlando is dedicated to revitalization of Holden-Parramore community throughout several housing and

community development, but these efforts were not successful. Afterwards, as catalyst for neighborhood revitalization for housing and community, the City of Orlando is committed to several initiatives and programs such as preservation and enhancement of Parramore Heritage Community through Pathways for Parramore initiative and Orlando Main Street program to empower street businesses in downtown area and to revitalize community (City of Orlando, LU-8.3). These initiatives are intended to enhance not only housing and community but also businesses, and public safety as well as children and education.

Applied to the LIHTC rehabilitation/reconstruction program, several projects were successfully built in Holden-Parramore. These developments include City View Apartments and Carver Park HOPE VI project. In order to meet the policy goals such as providing affordable housing and addressing displacement issues, these projects not only provide mixed income units such as low-income housing a market rate units. The City View development adopted multiple subsidy programs such as Low Income Housing Credits 4 percent from Bank of America, Local Bonds and State HOME programs. Also, the City of Orlando provides funds for this project through tax increment financing. The income restriction of this project set aside 4 percent of units at 50 percent AMI and 36 percent of units at 60 percent of AMI. This redevelopment project which is built in 2003 provides a total of 266 housing units. Only 40 percent of units are provided at an assisted rent price. The remaining 60 percent of units are market rate housing (Orlando Neighborhood Improvement Corporation, 2005).

Carver Park is a project that redevelops existing the old Carver Court Public Housing building. The public housing development was originally built in 1945 and had

212 housing units. With HOPE VI grant and tax credits awarded from the Florida Housing Finance Corporation (FHFC), the project has built a total of 121 units (HUD, 2010; Orlando Housing Authority, n.d.a). Villas at Carver Park is targeted for elderly low-income households by providing 64 units whereas Landings at Carver Park is targeted for low-income families with 30 units. Villas is funded from Housing Credits 4% and State Bonds and Landings receives funds from Housing Credits 4% and Local Bonds. Both projects are provided for low-income households who earn less than 60% AMI at affordable rent. The number of LIHTC projects developed during the study period is summarized in Table 5-21. The pictures of Carver Park, Jackson Court Apartments and City View Apartments are presented in Figure 5-37, 5-38, and 5-39, respectively.

In Holden-Parramore, the HCV is quite actively used, implying that displaced residents may not have difficulty in finding affordable housing and that rental price is relatively low due to a weak housing market. From 1980s to 1990s, nineteen voucher holders originally occupied in Holden-Parramore area but twenty nine voucher holders live in 2010 as shown Table 5-22. This increase may be results from the demolition of public housing units through the Carver Park HOPE VI project. Additionally, unlike Eola, a median housing price becomes relatively affordable. The ratio of a median housing price of Holden to that of Orange County dropped from 48% in 1990 to 25% in 2007-2011. As shown in Figure 5-40, a trend of average sale prices in Holden-Parramore was not fluctuated during the housing crisis period as much as the ones in Orange County. Also, the sale prices in Holden-Parramore in 2010 had retreated to the 2001 level. This pattern is similar to the variation of housing prices in Orange County. It is important to recognize that the comparatively stable housing market in Eola created a better

environment for affordable housing developments. Since the rent and housing prices in Holden-Parramore are relatively lower than other neighborhoods, the housing became more affordable to low-income residents. Only small number of voucher users moved out during the study periods, but most voucher recipients stay in LIHTC projects or other multifamily housing developments. As confirmed in the Eola case, the displacement of low-income households is related to economic status of neighborhoods and local housing market. Since the HCV program subsidizes tenants' rents, the slight change in housing price may not result in displacement. However, if the revitalization process increases housing prices, neighborhood characteristics may significantly affect the displacement of tenants. The location of LIHTC projects, HCV holders and Land Use in Holden-Parramore is demonstrated in Figure 5-36.

In sum, the case studies show several supporting points of the estimated results from the regression models. First, housing programs implemented in each neighborhood produce the affordable housing units available to eligible low-income households differently. For example, only one assisted housing project for the elderly has been constructed in Eola while assisted housing projects, and city-driven mixed income developments as well as LIHTC projects and HOPE VI developments in Holden-Parramore. Although these projects may improve economic status of neighborhoods, they may intensify the concentration of low-income households.

Second, housing sale prices may alter the response from the voucher holders: stay, move-in, or move-out. The housing market in Holden-Parramore has been relatively stable, implying that the relatively weak housing market generated more affordable housing units than the Eola. This stable housing market allows low-income

households to stay or move into the host neighborhood. The increasing housing prices during the 2000s may displace the remaining voucher users who entered in the 1990s.

Third, it is not surprising that Holden-Parramore has much more resources to achieve equitable revitalization. The City of Orlando, Orlando Housing Authority and other agencies are making strenuous efforts to economically revitalize the neighborhood. Relatively good share of affordable housing units and better neighborhood environments make more attractive to low-income households and increase the property values to a point where the neighborhood is stabilized.

In this chapter, the analyses for locations and sale price variations, AITS and OLS econometric models, and case studies for the two representative neighborhoods are carried out to provide better explanation of the relationship between the LIHTC and HCV programs and neighborhood revitalization. The results show that the HCV residents generally have positive impacts on sale prices, while the LIHTC projects have negative impact on property values. However, the LIHTC funded developments positively affect property values in block groups with 30-60 percent of AMI and 20-40 percent of poverty rate, implying that there is a potential to revitalize economically depressed neighborhoods. In terms of displacement of HCV holders, the higher housing prices decrease the number of voucher holders whereas the assisted rental housing stock absorb the voucher recipients to some extent. However, LIHTC projects highly promote the usage of vouchers in general. Therefore, I also propose and test a future policy based on the analysis outcomes, urging that policy makers should facilitate and incentivize the use of a combination of strategies with the LIHTC and HCV programs by altering local governments' plans in a gradual phase in the conclusion.

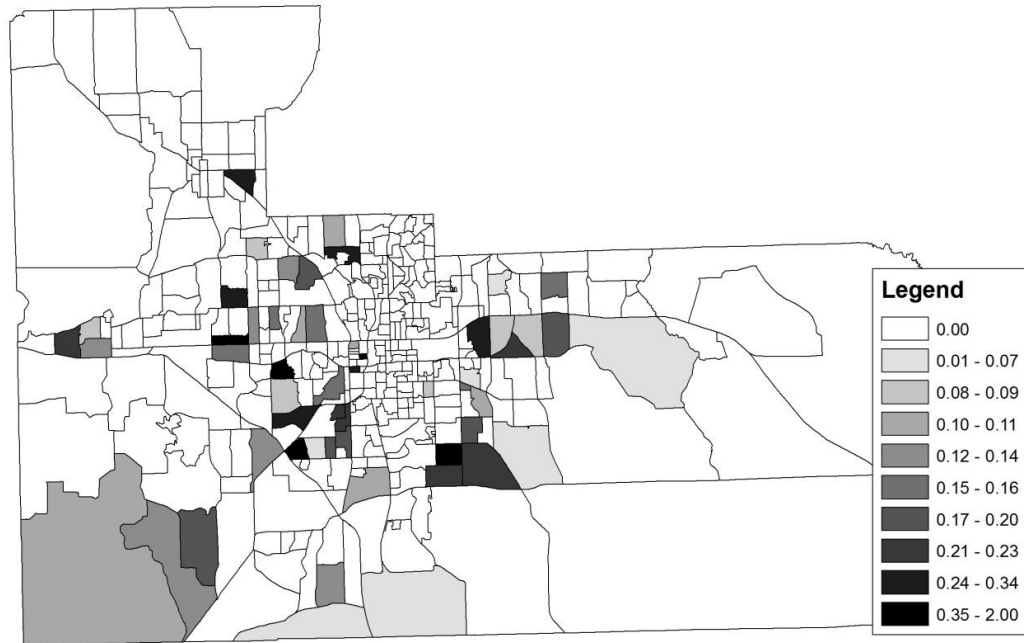


Figure 5-1. Spatial pattern of LIHTC units. Note. The number of LIHTC funded units are normalized by a total number of housing units for each neighborhood in 2007-2011

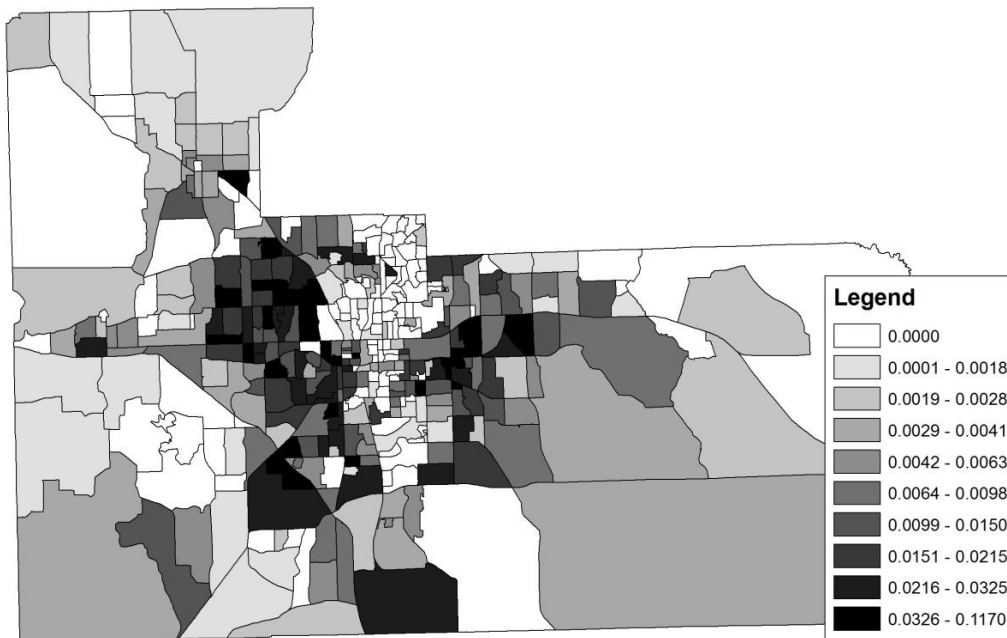


Figure 5-2. Spatial pattern of HCV holders. Note. The number of HCV recipients are normalized by a total number of households for each neighborhood in 2007-2011

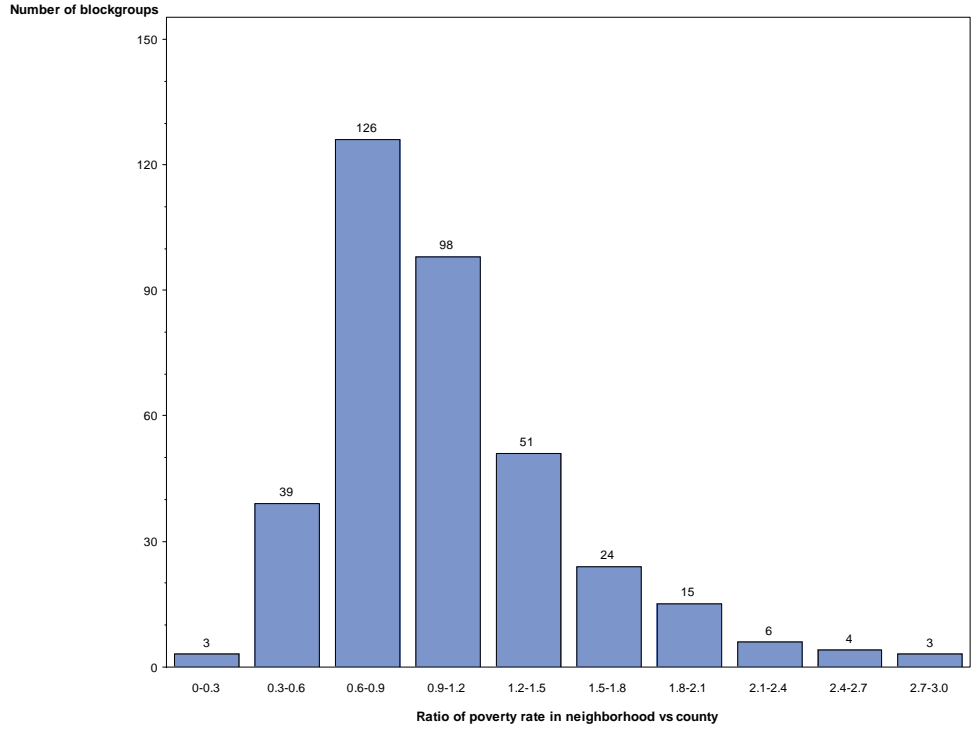


Figure 5-3. The number of census block groups based on ratio of percentage of poverty in neighborhood in 1990 to percentage of poverty in county in 1990.

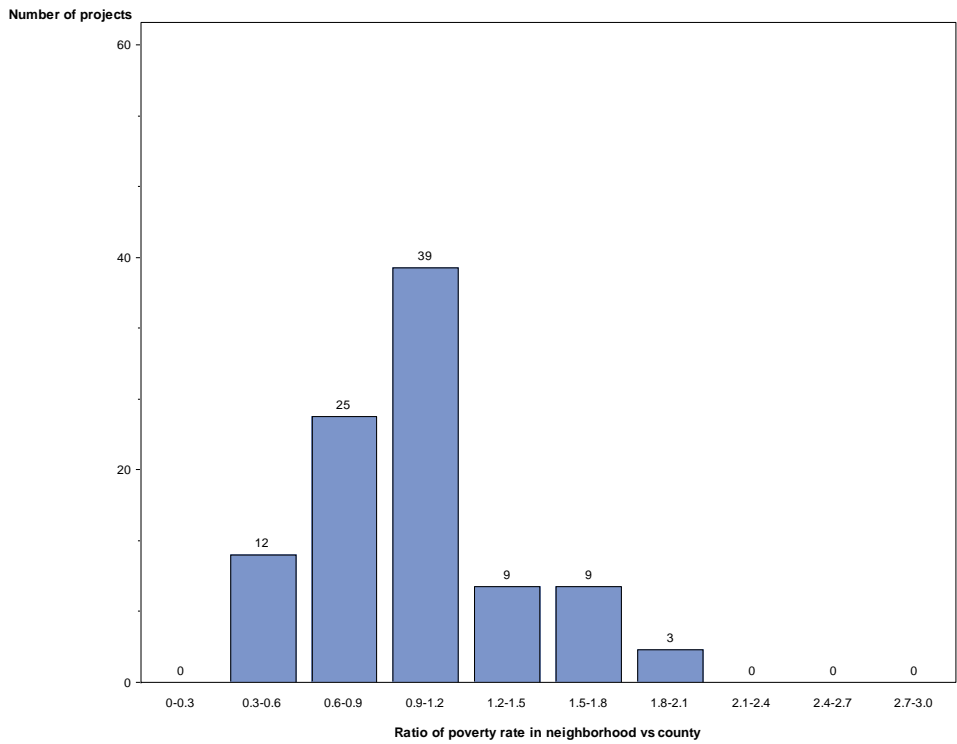


Figure 5-4. The number of LIHTC projects based on ratio of percentage of poverty in neighborhood in 1990 to percentage of poverty in county in 1990.

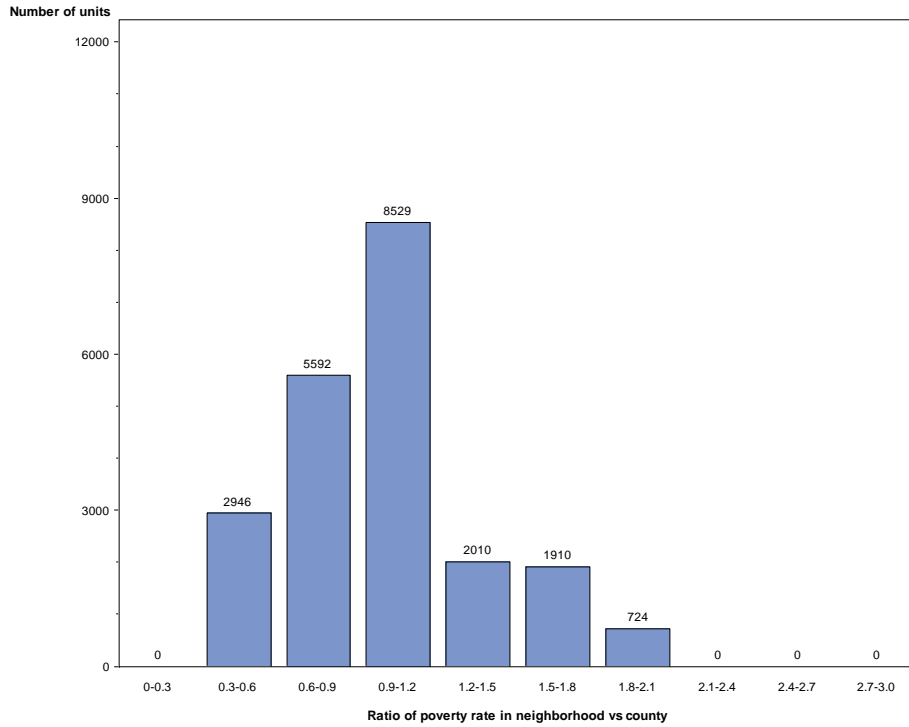


Figure 5-5. The number of LIHTC units based on ratio of percentage of poverty in neighborhood in 1990 to percentage of poverty in county in 1990.

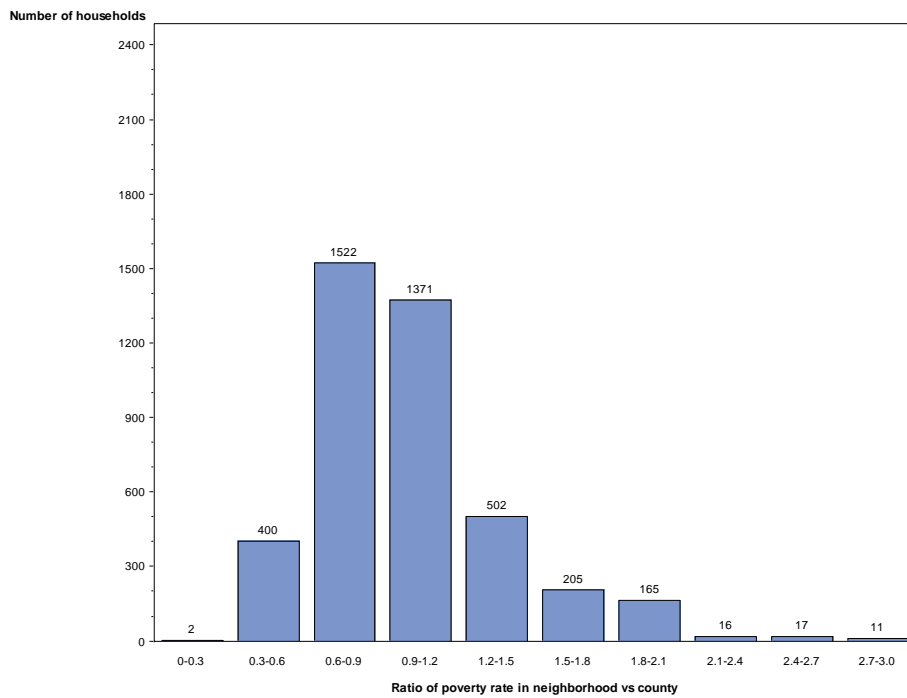


Figure 5-6. The number of HCV holders based on ratio of percentage of poverty in neighborhood in 1990 to percentage of poverty in county in 1990.

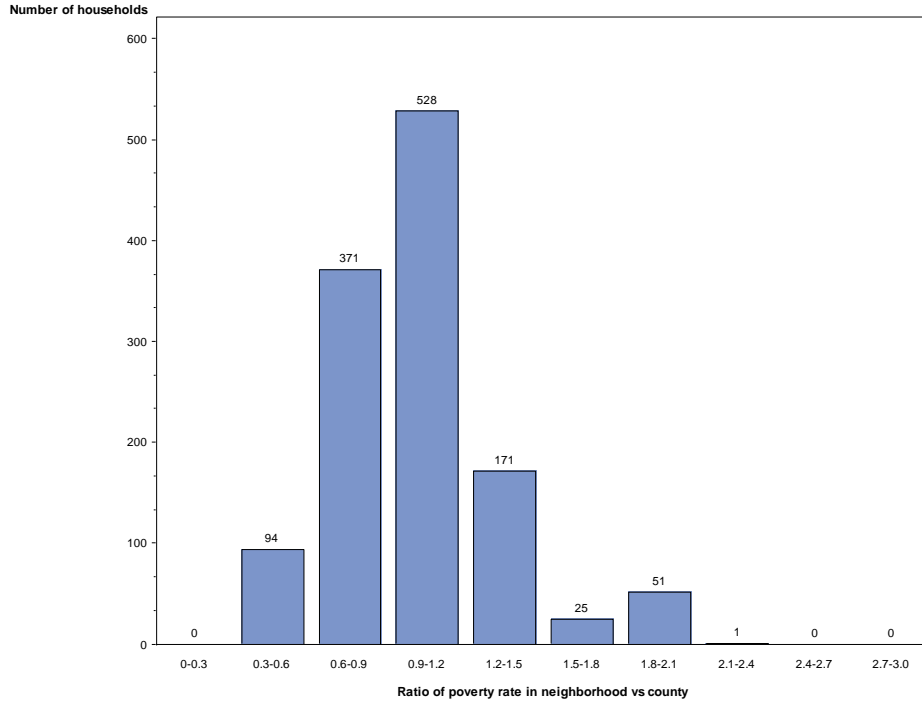


Figure 5-7. The number of HCV holders in LIHTC projects based on ratio of percentage of poverty in neighborhood in 1990 to percentage of poverty in county in 1990

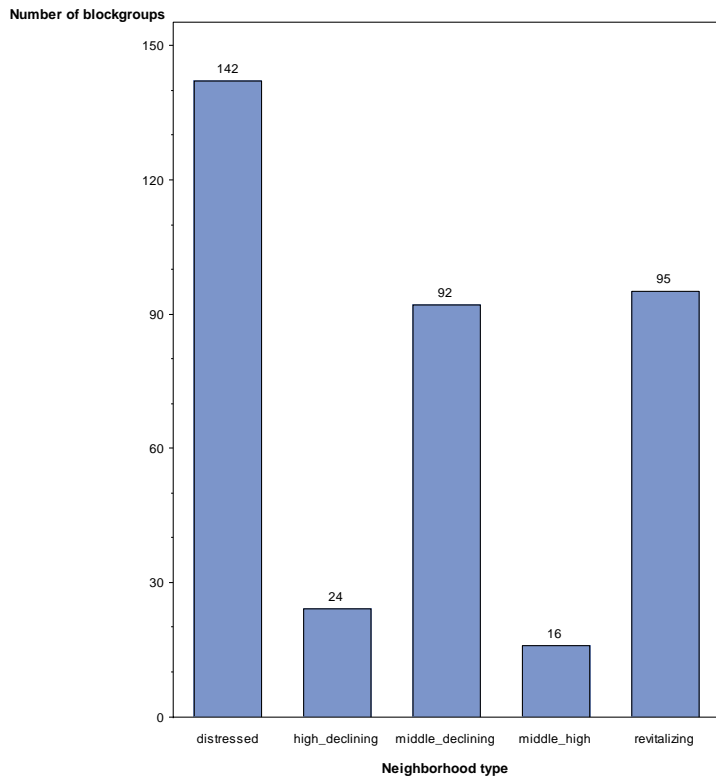


Figure 5-8. The number of census block groups based on neighborhood type.

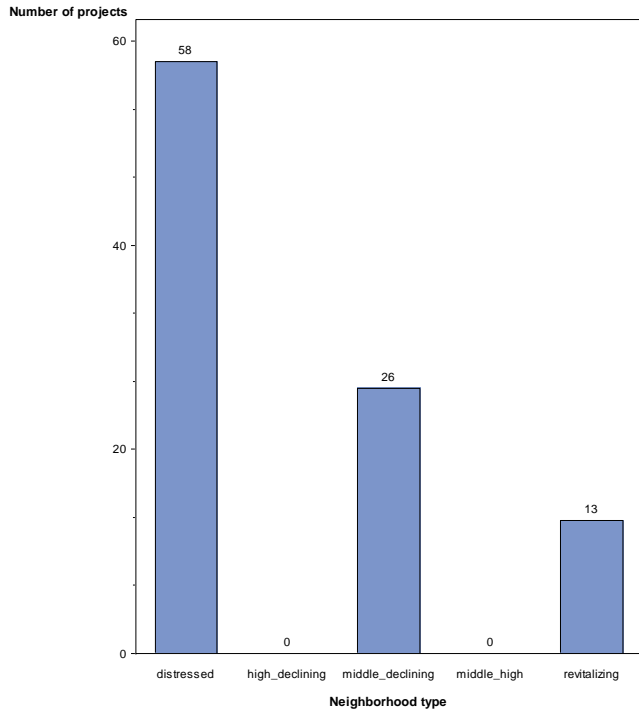


Figure 5-9. The number of LIHTC projects based on neighborhood type.

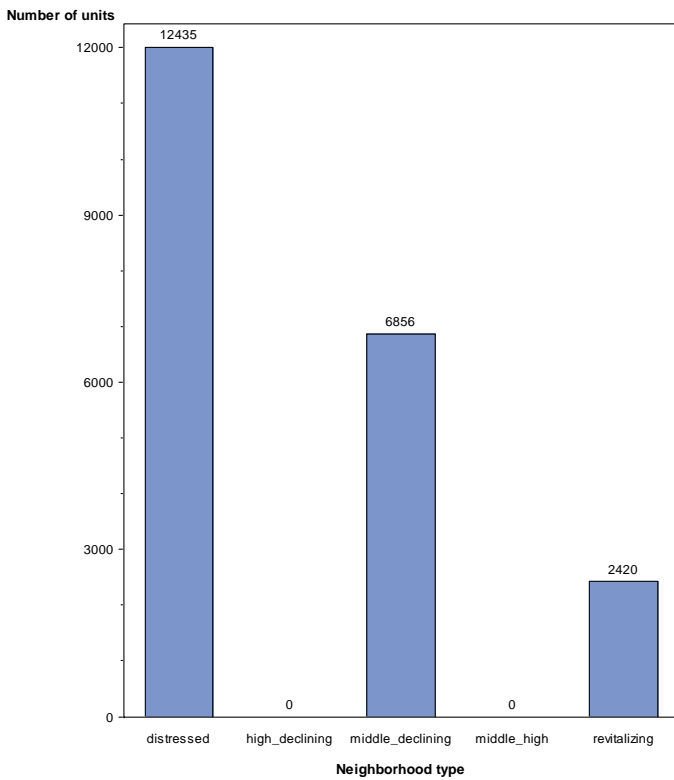


Figure 5-10. The number of LIHTC units based on neighborhood type

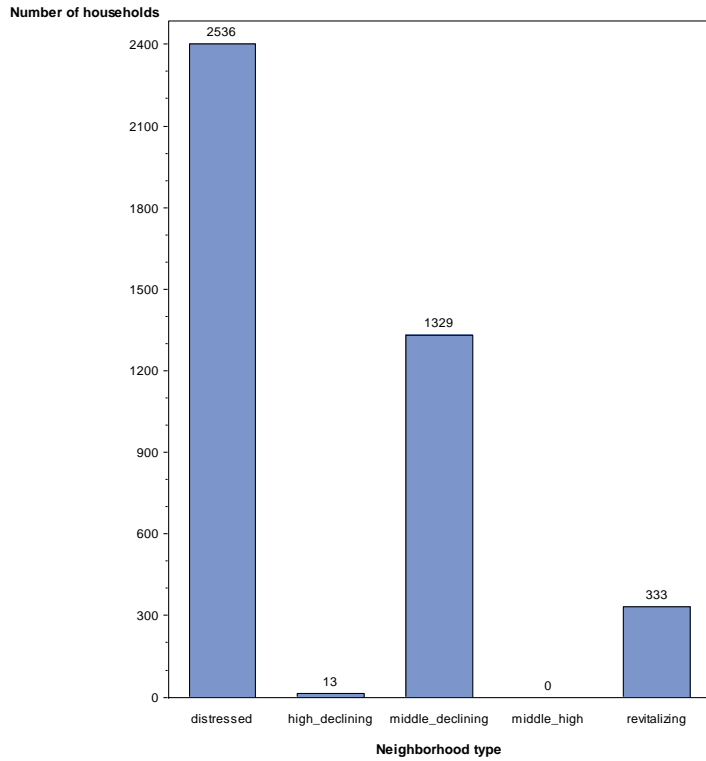


Figure 5-11. The number of HCV holders based on neighborhood type

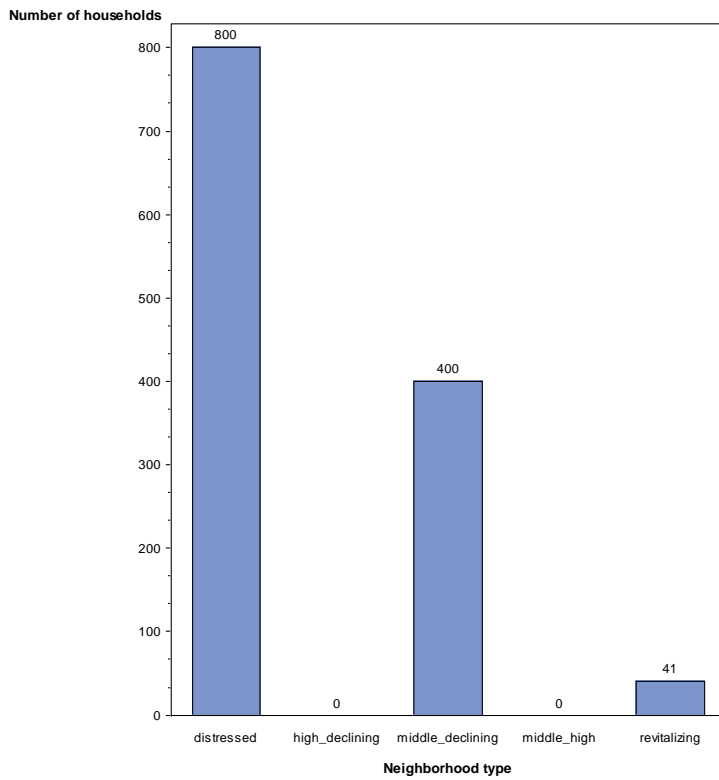


Figure 5-12. The number of HCV holders in LIHTC based on neighborhood type

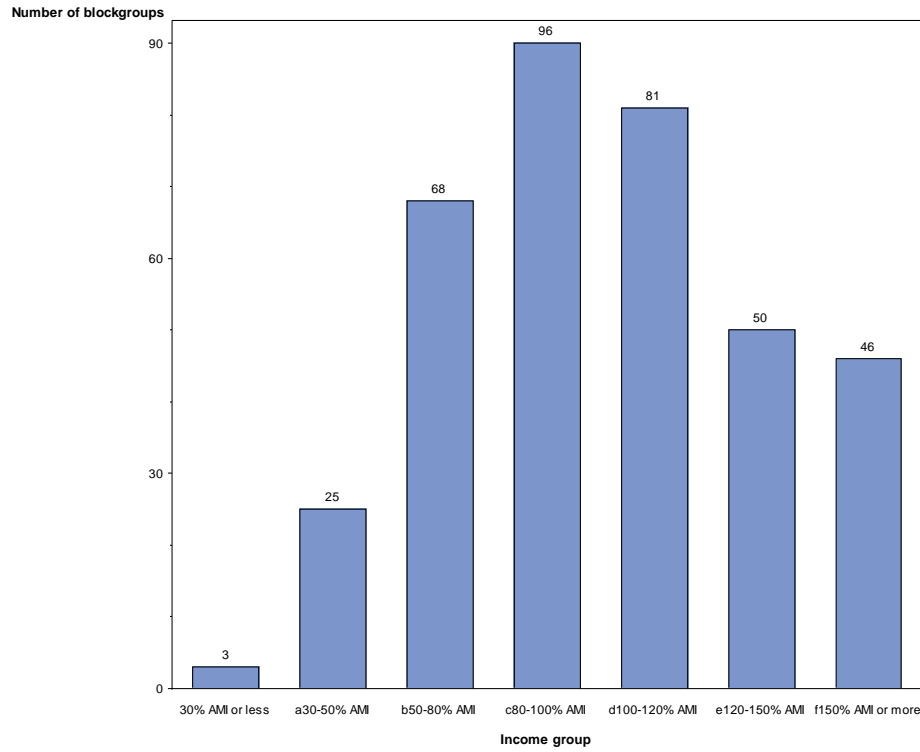


Figure 5-13. The number of census block groups based on neighborhood income group

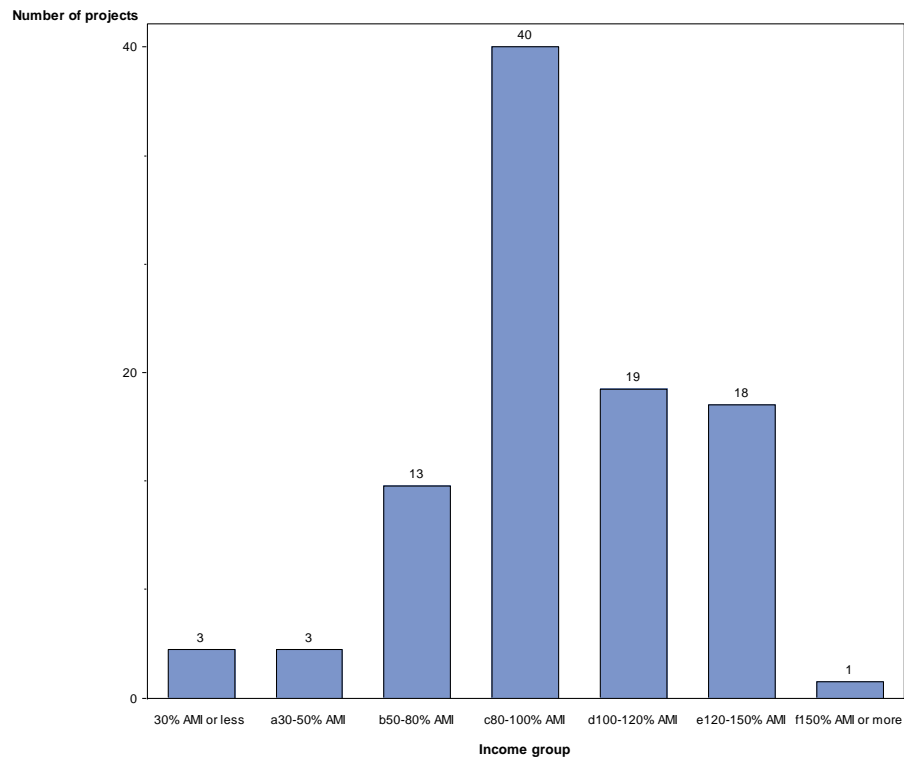


Figure 5-14. The number of LIHTC projects based on neighborhood income groups

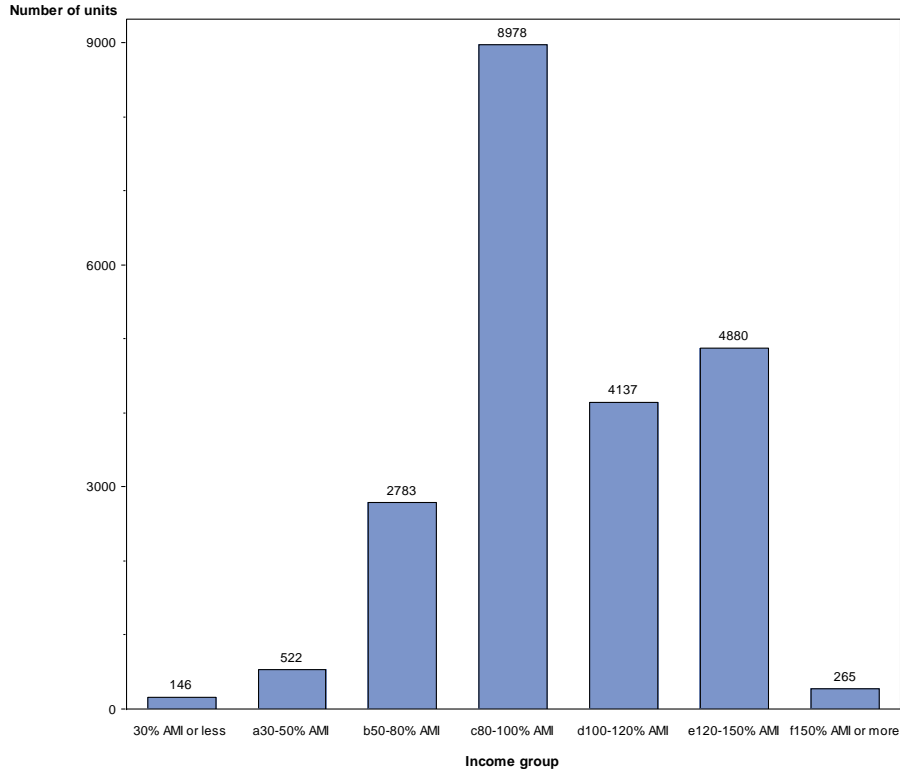


Figure 5-15. The number of LIHTC units based on neighborhood income groups

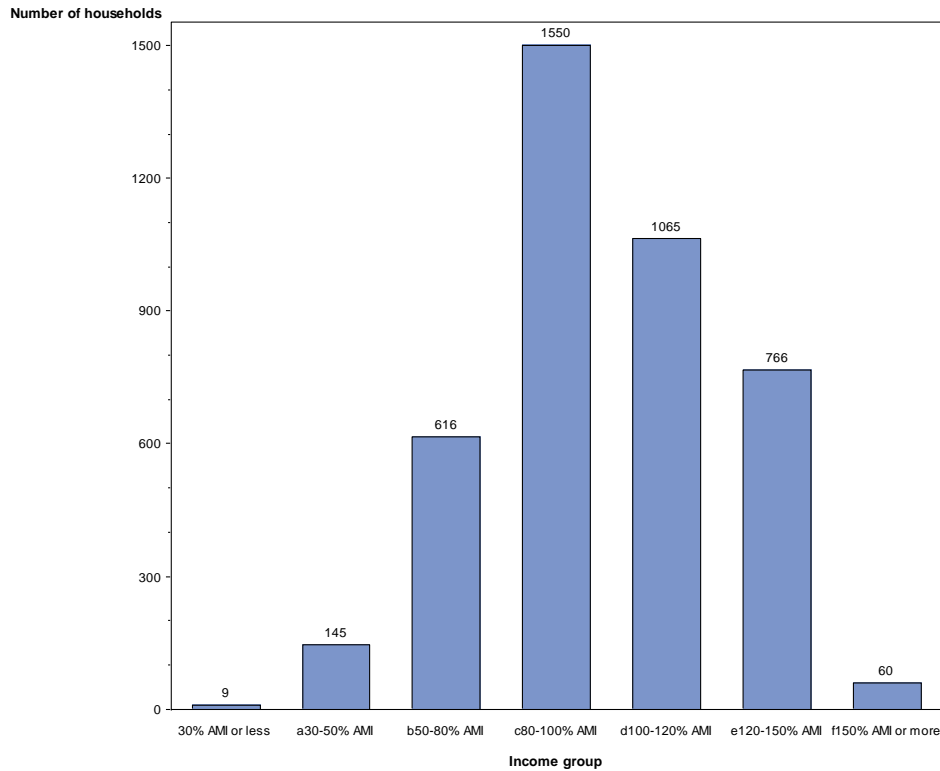


Figure 5-16. The number of HCV holders based on neighborhood income groups

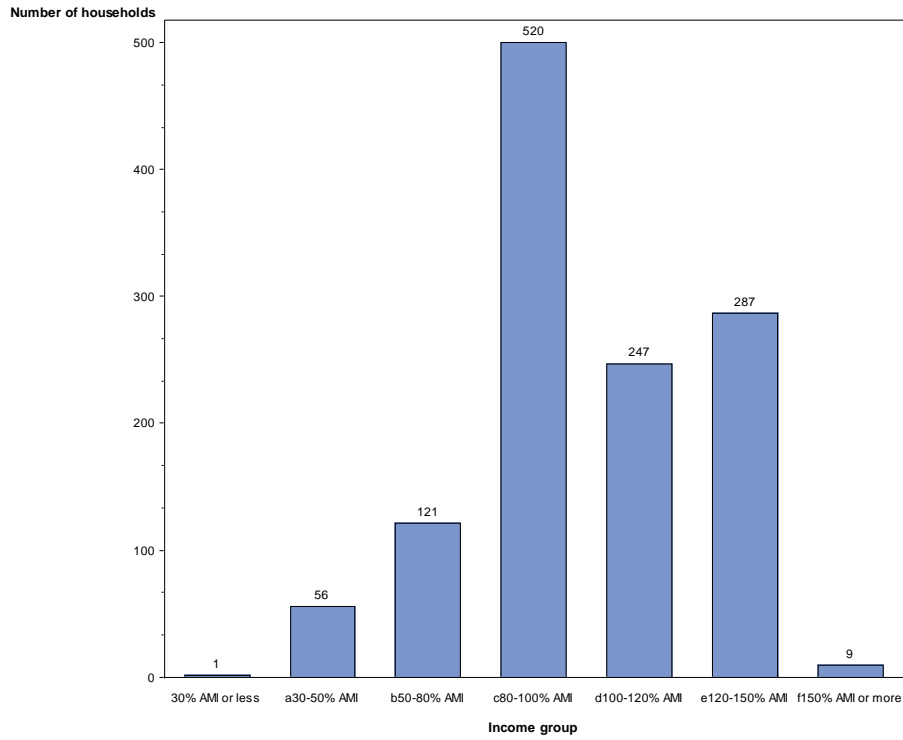


Figure 5-17. The number of HCV holders in LIHTC based on neighborhood income groups

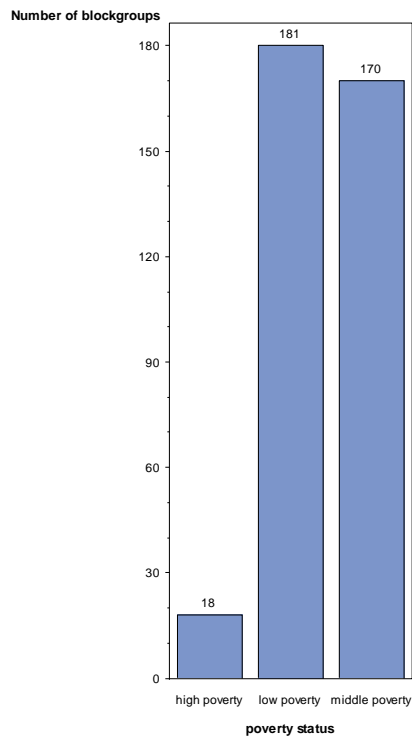


Figure 5-18. The number of census block groups based on poverty status

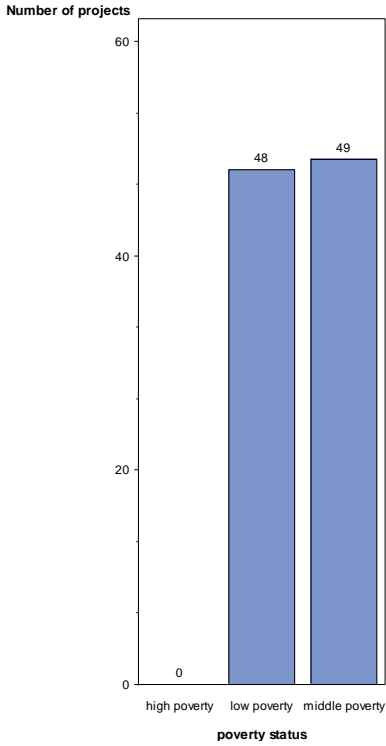


Figure 5-19. The number of LIHTC projects based on poverty status

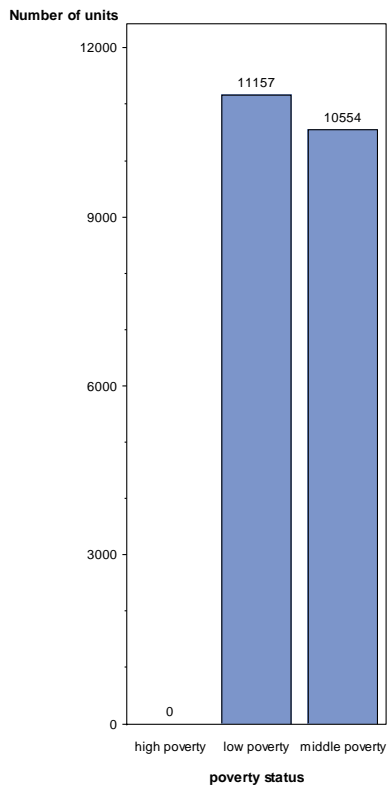


Figure 5-20. The number of LIHTC units based on poverty status

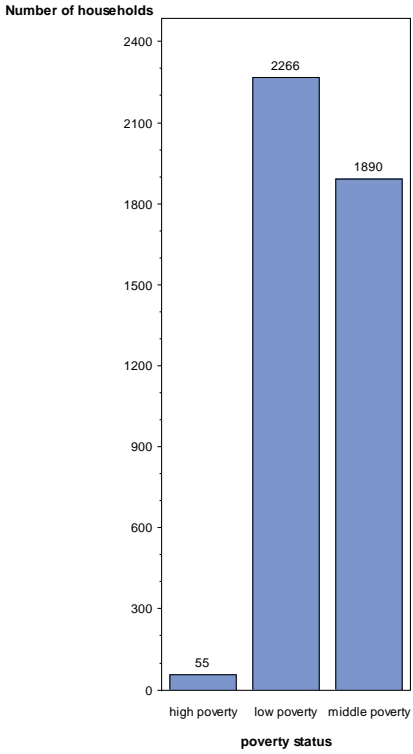


Figure 5-21. The number of HCV holders based on poverty status

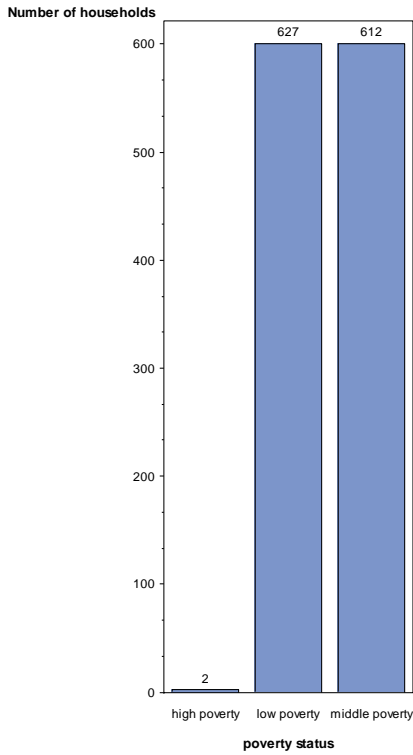


Figure 5-22. The number of HCV holders in LIHTC based on poverty status

Table 5-1. Prices in LIHTC impact area and outside the LIHTC impact area by year

Year	Inside 2,000 foot impact area		Outside 2,000 foot impact area		Prices in the impact area relative to prices outside the impact area
	Number of sales	Average sale price(\$)	Number of sales	Average sale price(\$)	
1990	849	77,311	8,718	105,819	-26.9%
1991	590	77,142	7,655	106,718	-27.7%
1992	588	77,231	8,442	108,497	-28.8%
1993	754	79,169	9,991	111,359	-28.9%
1994	755	82,237	10,713	117,375	-29.9%
1995	893	79,649	10,062	120,714	-34.0%
1996	1,064	85,158	11,580	126,151	-32.5%
1997	1,255	90,472	12,912	131,607	-31.3%
1998	1,355	94,830	14,829	137,664	-31.1%
1999	1,730	103,101	17,219	144,176	-28.5%
2000	1,675	109,078	17,035	157,754	-30.9%
2001	1,158	109,280	12,797	160,033	-31.7%
2002	1,064	118,285	12,817	170,876	-30.8%
2003	1,175	129,304	14,166	186,526	-30.7%
2004	1,360	141,120	15,359	210,537	-33.0%
2005	1,470	180,541	15,963	265,792	-32.1%
2006	1,124	210,363	11,391	300,089	-29.9%
2007	535	208,802	6,172	298,014	-29.9%
2008	449	139,322	5,641	229,382	-39.3%
2009	636	103,583	6,473	172,371	-39.9%
2010	518	90,656	5,657	159,321	-43.1%
Total	20,997	115,654	235,592	167,820	-31.1%

Note. The sale transaction is recorded every year in the FDOR system. The number of sales and average sale price is calculated based on the transacted sales by each year.

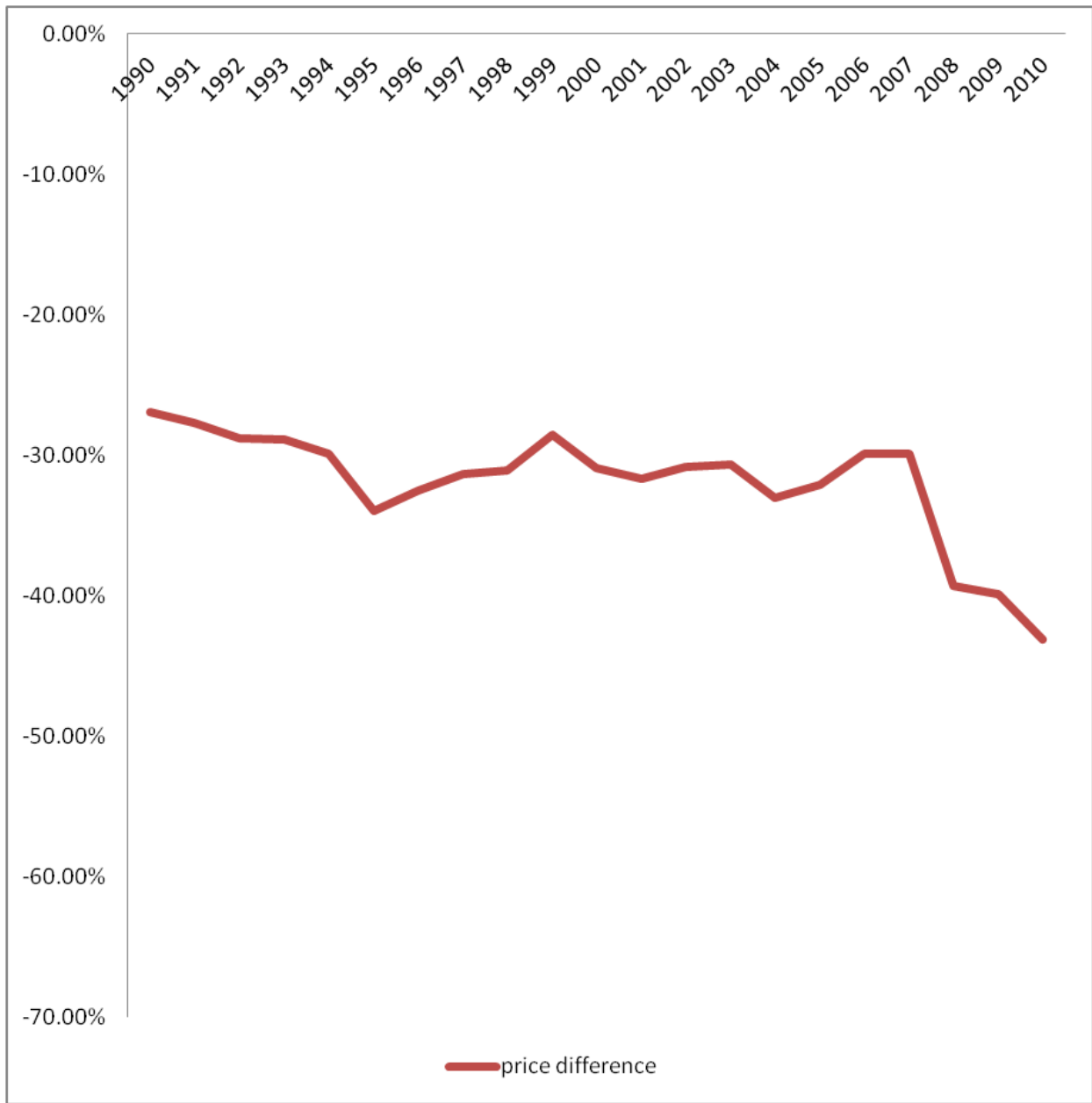


Figure 5-23. Sale prices in the LIHTC impact area relative to prices outside the LIHTC impact area from 1990 to 2010.

Table 5-2. Prices in HCV impact area and outside the HCV impact area by year

Year	Inside 2,000 foot impact area		Outside 2,000 foot impact area		Prices in the impact area relative to prices outside the impact area
	Number of sales	Average sale price(\$)	Number of sales	Average sale price(\$)	
1990	7,553	88,298	2,014	159,511	-44.6%
1991	6,422	90,036	1,823	155,910	-42.3%
1992	7,043	91,511	1,987	159,453	-42.6%
1993	8,253	92,745	2,492	163,265	-43.2%
1994	8,561	95,679	2,907	172,142	-44.4%
1995	8,184	95,884	2,771	180,813	-47.0%
1996	9,303	99,093	3,341	188,440	-47.4%
1997	10,254	102,391	3,913	194,975	-47.5%
1998	11,522	107,159	4,662	200,607	-46.6%
1999	13,981	111,959	4,968	220,538	-49.2%
2000	13,738	120,589	4,972	244,045	-50.6%
2001	10,385	123,713	3,570	249,224	-50.4%
2002	10,380	133,637	3,501	265,303	-49.6%
2003	11,317	146,533	4,024	282,293	-48.1%
2004	12,515	161,167	4,204	335,052	-51.9%
2005	13,435	208,807	3,998	425,942	-51.0%
2006	9,901	237,568	2,614	498,319	-52.3%
2007	5,067	235,356	1,640	462,500	-49.1%
2008	4,470	168,614	1,620	372,096	-54.7%
2009	5,521	122,639	1,588	317,724	-61.4%
2010	4,759	111,391	1,416	295,286	-62.3%
Total	192,564	131,621	64,025	259,585	-49.3%

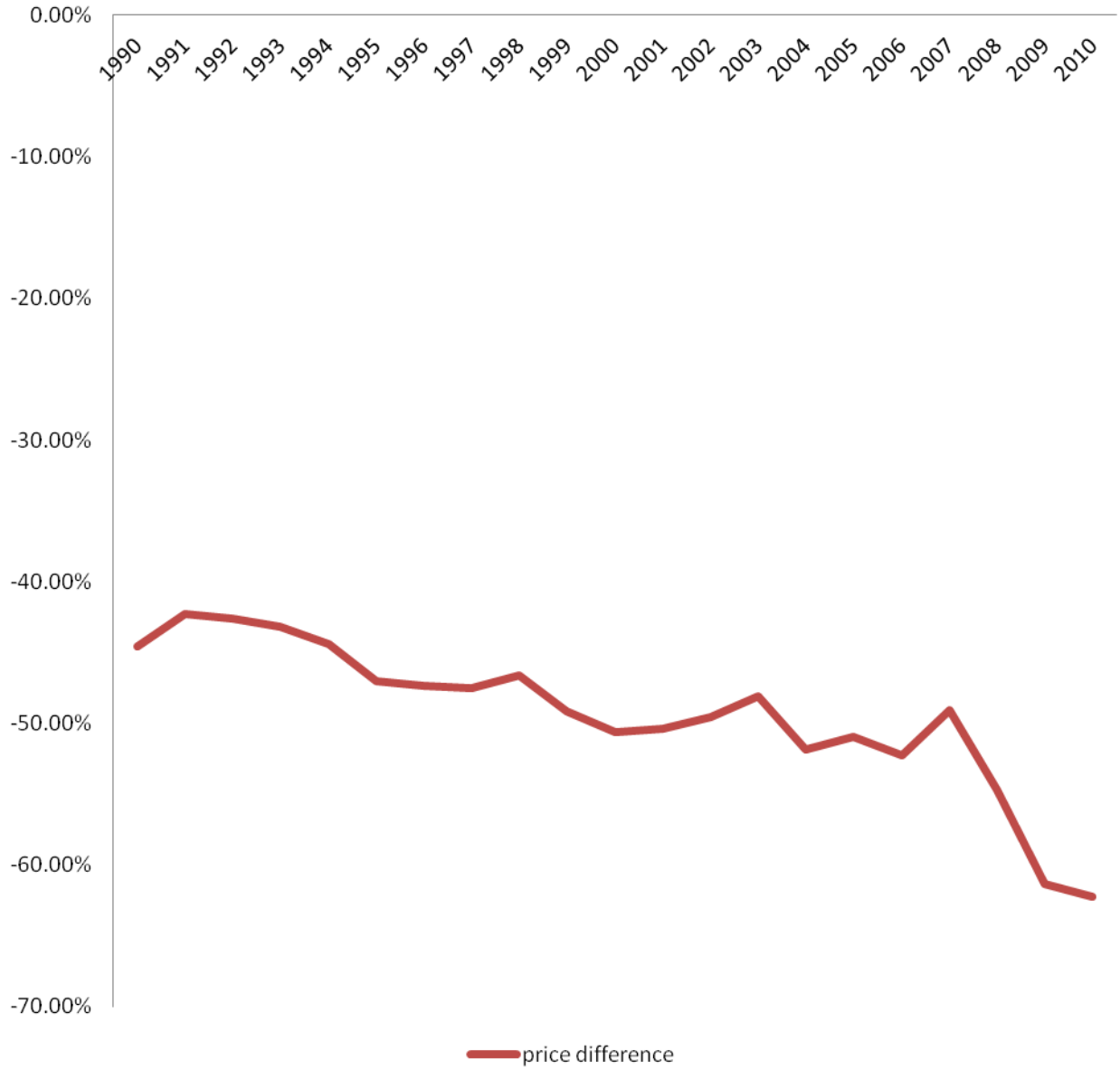


Figure 5-24. Sale prices in the HCV impact area relative to prices outside the HCV impact area from 1990 to 2010.

Table 5-3. Prices in HCV of LIHTC impact area and outside the HCV of LIHTC impact area by year

Year	Inside 2,000 foot impact area		Outside 2,000 foot impact area		Prices in the impact area relative to prices outside the impact area
	Number of sales	Average sale price(\$)	Number of sales	Average sale price(\$)	
1990	1,133	76,697	8,434	106,862	-28.2%
1991	789	77,033	7,456	107,518	-28.4%
1992	849	76,499	8,181	109,571	-30.2%
1993	966	78,573	9,779	112,116	-29.9%
1994	1,043	81,615	10,425	118,408	-31.1%
1995	1,129	82,775	9,826	121,341	-31.8%
1996	1,403	86,164	11,241	127,262	-32.3%
1997	1,651	88,883	12,516	133,118	-33.2%
1998	1,684	95,193	14,500	138,594	-31.3%
1999	2,130	102,283	16,819	145,257	-29.6%
2000	2,183	108,709	16,527	159,298	-31.8%
2001	1,495	108,760	12,460	161,468	-32.6%
2002	1,430	116,852	12,451	172,587	-32.3%
2003	1,639	128,422	13,702	188,570	-31.9%
2004	1,769	141,781	14,950	212,358	-33.2%
2005	1,943	181,572	15,490	268,266	-32.3%
2006	1,456	211,990	11,059	302,569	-29.9%
2007	738	209,343	5,969	300,981	-30.4%
2008	627	140,794	5,463	232,148	-39.4%
2009	827	109,924	6,282	173,627	-36.7%
2010	706	92,427	5,469	161,452	-42.8%
Total	27,590	116,042	228,999	169,275	-31.4%

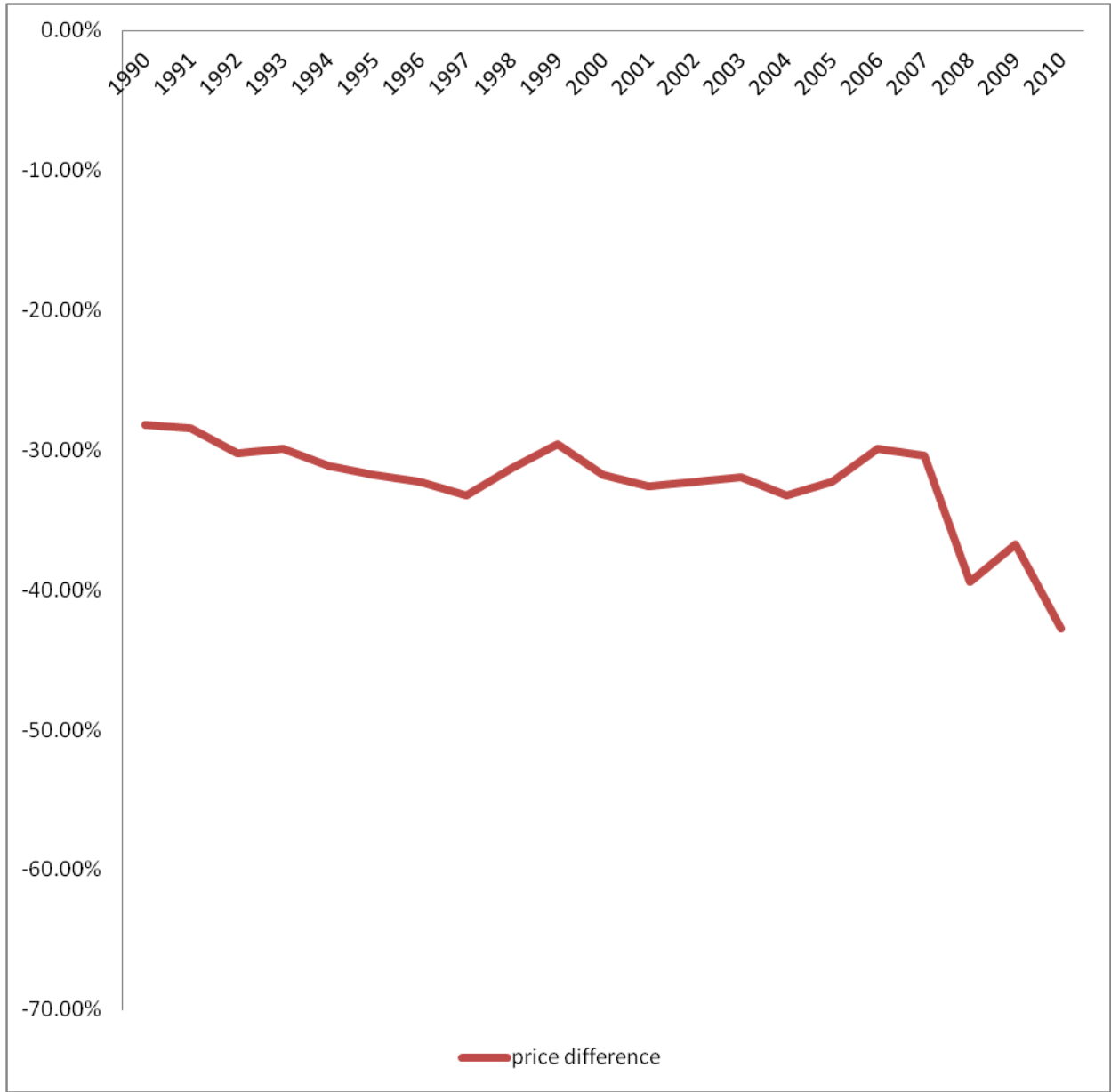


Figure 5-25. Sale prices in the HCV of LIHTC impact area relative to prices outside the HCV of LIHTC impact area from 1990 to 2010.

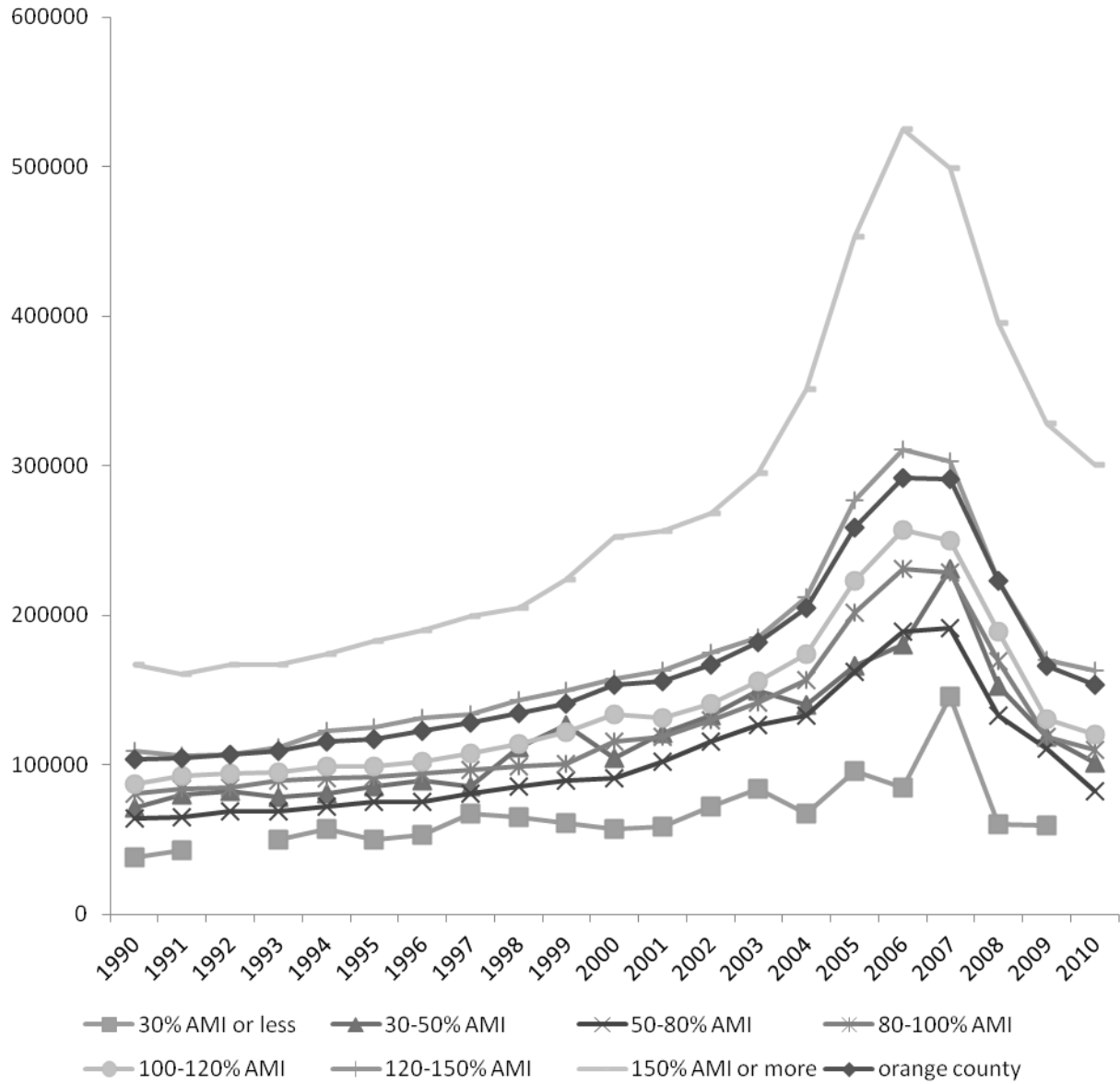


Figure 5-26. Sale price trends by income groups from 1990 to 2010.

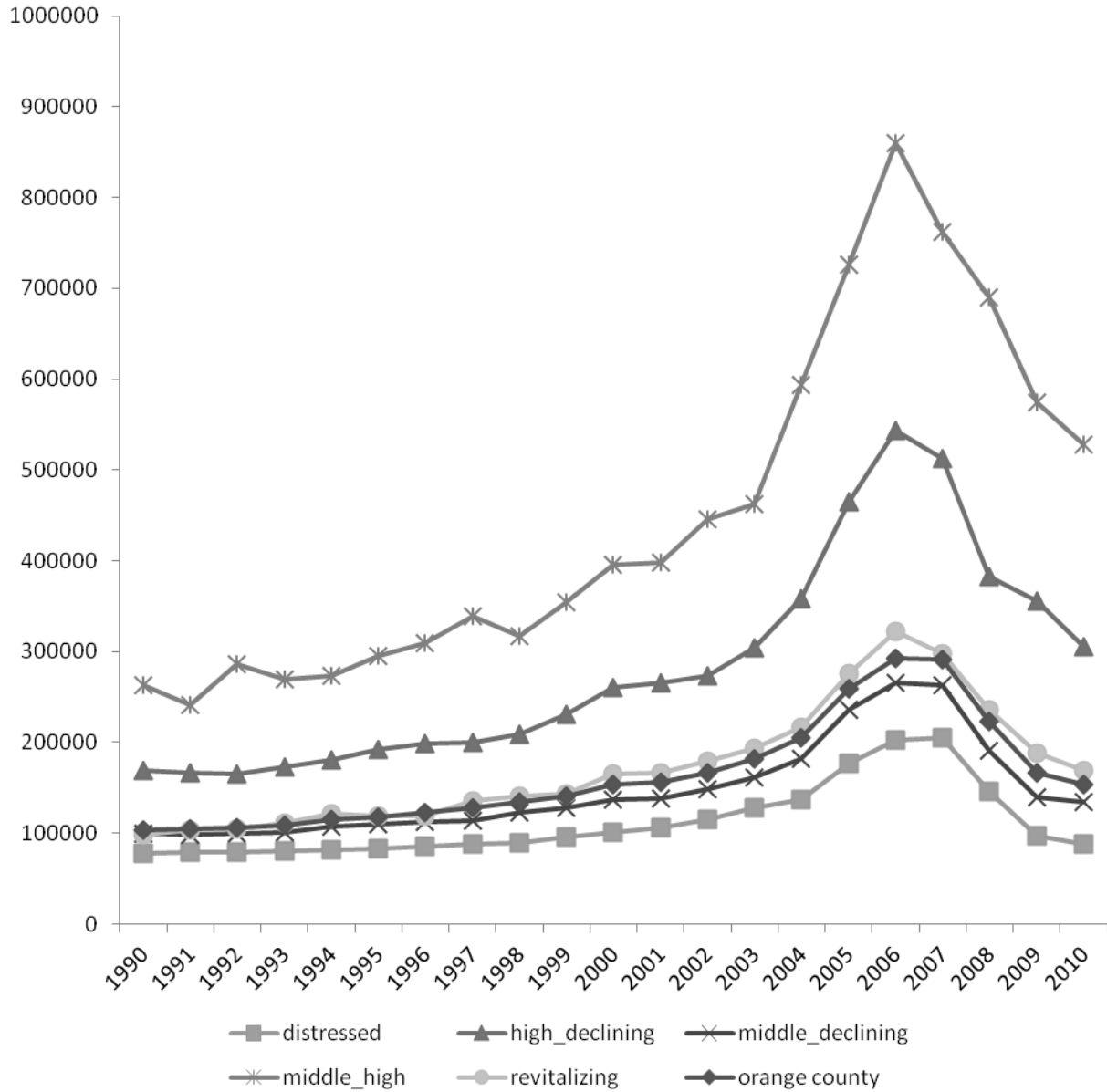


Figure 5-27. Sale price trends by neighborhood types from 1990 to 2010.

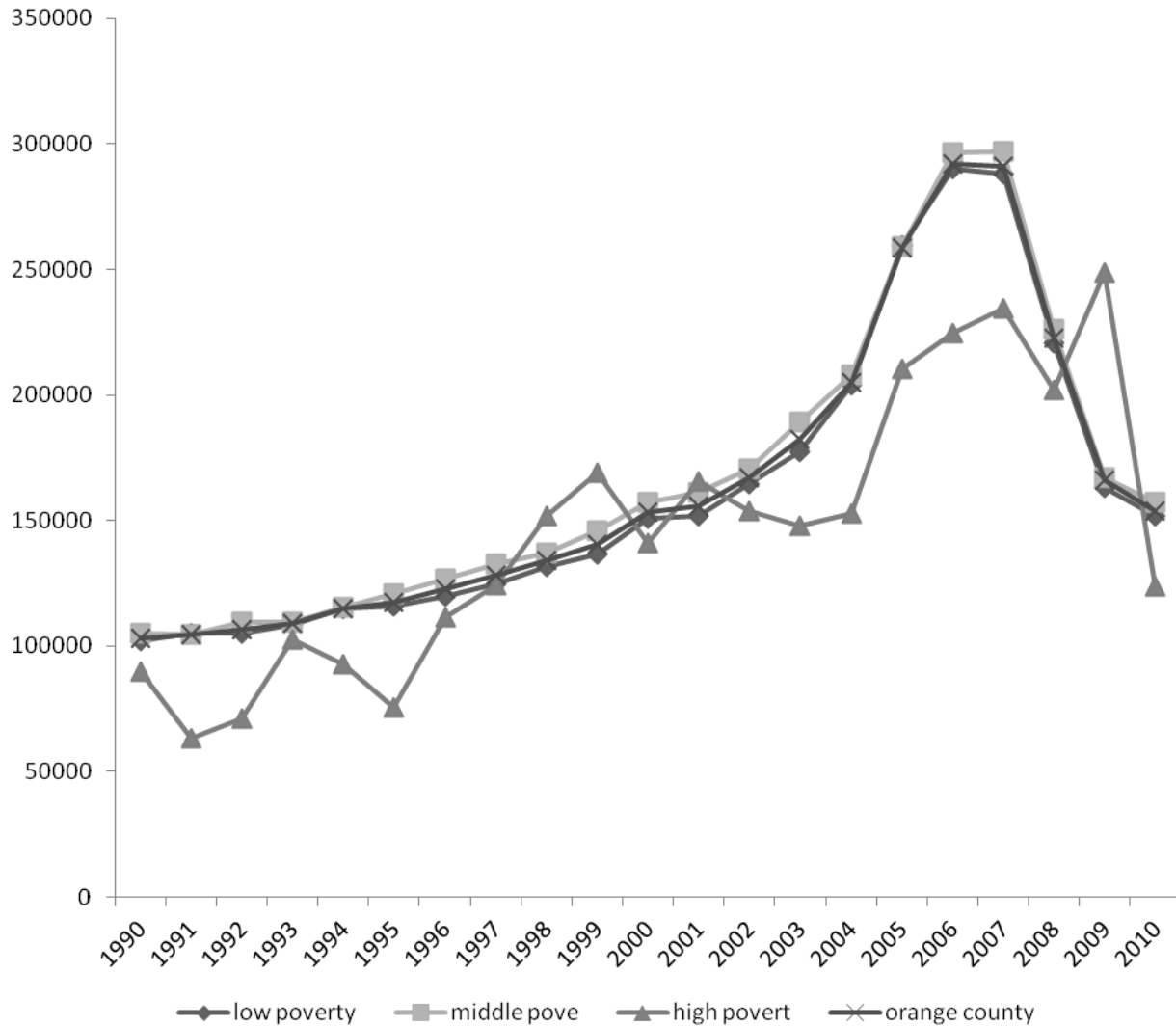


Figure 5-28. Sale price trends by poverty status from 1990 to 2010.

Table 5-4. Baseline regression results of price impacts of LIHTC projects

Variable	Estimates	Robust Standard Error	% change of housing price by one unit increase
In_TREND	-0.0001	0.0006	
AFTER_In_TREND	-0.0026***	0.0003	-0.26%
INNER	0.0522***	0.0084	5.36%
AFTER_INNER	0.0000	0.0000	
AFTER_In_Small	0.0111	0.0135	
AFTER_In_Medium	-0.0142*	0.0082	-1.41%
AFTER_Inner_GRAV_T	-36.6765***	11.6173	(-) no unit

Note. *** significance level at 1%, ** significance level at 5%, and *significance level at 10%. No asterisks were added when the estimated parameters were not statistically significant.

Table 5-5. Baseline regression results of price impacts of HCV holders

Variable	Estimates	Robust Standard Error	% change of housing price by one unit increase
In_TREND	-0.0014***	0.0002	-0.14%
AFTER_In_TREND	0.0000***	0.0000	0.00%
INNER	-0.0120***	0.0029	-1.19%
AFTER_INNER	0.0001***	0.0000	0.01%
AFTER_In_Small	-0.1032***	0.0029	-9.81%
AFTER_In_Medium	-0.0037	0.0062	
AFTER_Inner_GRAV_T	-2.2339	1.4866	

Note. *** significance level at 1%, ** significance level at 5%, and *significance level at 10%. No asterisks were added when the estimated parameters were not statistically significant.

Table 5-6. Baseline regression results of price impacts of HCV holders in LIHTC

Variable	Estimates	Robust Standard Error	% change of housing price by one unit increase
In_TREND	-0.0013***	0.0002	-0.13%
AFTER_In_TREND	0.0000***	0.0000	0.00%
INNER	-0.0210***	0.0029	-2.08%
AFTER_INNER	0.0001***	0.0000	0.01%
AFTER_In_Small	-0.0928***	0.0029	-8.86%
AFTER_In_Medium	-0.0017	0.0061	
AFTER_Inner_GRAV_T	-2.0147	1.4833	

Note. *** significance level at 1%, ** significance level at 5%, and *significance level at 10%. No asterisks were added when the estimated parameters were not statistically significant.

Table 5-7. Regression results of price impacts of LIHTC projects by income group

Variable	Estimates	Robust Standard Error	% change of housing price by one unit increase
In_TREND	0.0003	0.0006	
AFTER_In_TREND	-0.0026***	0.0003	-0.26%
INNER	0.0310***	0.0085	3.15%
AFTER_INNER	-0.0005	0.0057	
AFTER_In_Small	0.0174	0.0135	
AFTER_In_Medium	-0.0118	0.0082	
AFTER_Inner_GRAV_T	-34.3029***	11.6076	(-) no unit
BEFORE_Inner_30LIN	-0.0047	0.0679	
BEFORE_Inner_50LIN	-0.1786***	0.0314	-16.36%
BEFORE_Inner_80LIN	0.0416***	0.0154	4.25%
AFTER_Inner_30LIN	0.1628***	0.0389	17.68%
AFTER_Inner_50LIN	-0.1590***	0.0111	-14.70%
AFTER_Inner_80LIN	-0.0918***	0.0058	-8.77%

Note. *** significance level at 1%, ** significance level at 5%, and *significance level at 10%. No asterisks were added when the estimated parameters were not statistically significant.

Table 5-8. Regression results of price impacts of HCV holders by income group

Variable	Estimates	Robust Standard Error	% change of housing price by one unit increase
In_TREND	-0.0015***	0.0003	-0.15%
AFTER_In_TREND	0.0000***	0.0000	0.00%
INNER	-0.0314***	0.0030	-3.09%
AFTER_INNER	-0.0008	0.0028	
AFTER_In_Small	-0.0750***	0.0030	-7.23%
AFTER_In_Medium	0.0134**	0.0062	1.35%
AFTER_Inner_GRAV_T	-2.4198	1.4769	
BEFORE_Inner_30LIN	0.1768***	0.0611	19.34%
BEFORE_Inner_50LIN	-0.1501***	0.0141	-13.94%
BEFORE_Inner_80LIN	-0.0815***	0.0064	-7.83%
AFTER_Inner_30LIN	-0.0006	0.0681	
AFTER_Inner_50LIN	-0.3073***	0.0096	-26.46%
AFTER_Inner_80LIN	-0.1753***	0.0044	-16.08%

Note. *** significance level at 1%, ** significance level at 5%, and *significance level at 10%. No asterisks were added when the estimated parameters were not statistically significant.

Table 5-9. Regression results of price impacts of HCV in LIHTC by income group

Variable	Estimates	Robust Standard Error	% change of housing price by one unit increase
In_TREND	-0.0015***	0.0003	-0.15%
AFTER_In_TREND	0.0000***	0.0000	0.00%
INNER	-0.0391***	0.0030	-3.83%
AFTER_INNER	-0.0118***	0.0028	-1.17%
AFTER_In_Small	-0.0670***	0.0030	-6.48%
AFTER_In_Medium	0.0192***	0.0062	1.94%
AFTER_Inner_GRAV_T	-2.2543	1.4787	
BEFORE_Inner_30LIN	0.2273***	0.0611	25.52%
BEFORE_Inner_50LIN	-0.1574***	0.0141	-14.56%
BEFORE_Inner_80LIN	-0.0864***	0.0064	-8.28%
AFTER_Inner_30LIN	-0.0137	0.0681	
AFTER_Inner_50LIN	-0.3084***	0.0096	-26.54%
AFTER_Inner_80LIN	-0.1716***	0.0044	-15.77%

Note. *** significance level at 1%, ** significance level at 5%, and *significance level at 10%. No asterisks were added when the estimated parameters were not statistically significant.

Table 5-10. Regression results of price impacts of LIHTC projects by poverty status

Variable	Estimates	Robust Standard Error	% change of housing price by one unit increase
In_TREND	0.0005	0.0006	
AFTER_In_TREND	-0.0027***	0.0003	-0.27%

Table 5-10. Continued.

Variable	Estimates	Robust Standard Error	% change of housing price by one unit increase
INNER	0.0563***	0.0086	5.79%
AFTER_INNER	-0.0140**	0.0059	-1.39%
AFTER_In_Small	0.0129	0.0135	
AFTER_In_Medium	-0.0162**	0.0082	-1.61%
AFTER_Inner_GRAV_T	-38.9875***	11.6602	(-) no unit
BEFORE_MiddlePOOR	-0.0236***	0.0066	-2.33%
BEFORE_HighPOOR	-0.2112	0.1714	
AFTER_MiddlePOOR	0.0105***	0.0038	1.06%
AFTER_HighPOOR	-0.2289***	0.0199	-20.46%

Note. *** significance level at 1%, ** significance level at 5%, and *significance level at 10%. No asterisks were added when the estimated parameters were not statistically significant.

Table 5-11. Regression results of price impacts of HCV holders by poverty status

Variable	Estimates	Robust Standard Error	% change of housing price by one unit increase
In_TREND	-0.0019***	0.0003	-0.19%
AFTER_In_TREND	0.0000***	0.0000	0.00%
INNER	-0.0180***	0.0031	-1.78%
AFTER_INNER	0.0089***	0.0030	0.89%
AFTER_In_Small	-0.1020***	0.0029	-9.70%
AFTER_In_Medium	-0.0040	0.0062	
AFTER_Inner_GRAV_T	-2.4357*	1.4804	
BEFORE_MiddlePOOR	0.0072**	0.0033	0.72%
BEFORE_HighPOOR	-0.2215***	0.0203	-19.87%
AFTER_MiddlePOOR	-0.0346***	0.0029	-3.40%
AFTER_HighPOOR	-0.3106***	0.0129	-26.70%

Note. *** significance level at 1%, ** significance level at 5%, and *significance level at 10%. No asterisks were added when the estimated parameters were not statistically significant.

Table 5-12. Regression results of price impacts of HCV in LIHTC by poverty status

Variable	Estimates	Robust Standard Error	% change of housing price by one unit increase
In_TREND	-0.0019***	0.0003	-0.19%
AFTER_In_TREND	0.0000***	0.0000	0.00%
INNER	-0.0265***	0.0031	-2.62%
AFTER_INNER	-0.0030	0.0030	
AFTER_In_Small	-0.0934***	0.0029	-8.92%
AFTER_In_Medium	0.0018	0.0062	
AFTER_Inner_GRAV_T	-2.2492	1.4822	
BEFORE_MiddlePOOR	0.0078**	0.0033	0.78%

Table 5-12. Continued

Variable	Estimates	Robust Standard Error	% change of housing price by one unit increase
BEFORE_HighPOOR	-0.2274***	0.0203	-20.34%
AFTER_MiddlePOOR	-0.0333***	0.0029	-3.28%
AFTER_HighPOOR	-0.3035***	0.0129	-26.18%

Note. *** significance level at 1%, ** significance level at 5%, and *significance level at 10%. No asterisks were added when the estimated parameter were not statistically significant.

Table 5-13. Regression results of price impacts of LIHTC projects by neighborhood type

Variable	Estimates	Robust Standard Error	% change of housing price by one unit increase
In_TREND	0.0023***	0.0006	0.23%
AFTER_In_TREND	-0.0011***	0.0003	-0.11%
INNER	-0.0395***	0.0098	-3.87%
AFTER_INNER	0.0564***	0.0070	5.80%
AFTER_In_Small	0.0065	0.0136	
AFTER_In_Medium	0.0060	0.0083	
AFTER_Inner_GRAV_T	5.9231	11.7347	
BEFORE_Revitalizing	-0.1041***	0.0230	-9.89%
BEFORE_Economically-Distress	-0.0524***	0.0073	-5.11%
BEFORE_Mddle-Declining	-0.0831***	0.0074	-7.97%
AFTER_Revitalizing	-0.1230***	0.0067	-11.57%
AFTER_Economically-Distress	-0.1272***	0.0059	-11.94%
AFTER_Mddle-Declining	-0.1223***	0.0059	-11.51%

Note. *** significance level at 1%, ** significance level at 5%, and *significance level at 10%. No asterisks were added when the estimated parameters were not statistically significant.

Table 5-14. Regression Results of Price Impacts of HCV holders by neighborhood type

Variable	Estimates	Robust Standard Error	% change of housing price by one unit increase
In_TREND	-0.0011***	0.0003	-0.11%
AFTER_In_TREND	0.0000***	0.0000	0.00%
INNER	-0.0167***	0.0042	-1.66%
AFTER_INNER	0.0302***	0.0074	3.07%
AFTER_In_Small	-0.1008***	0.0030	-9.59%
AFTER_In_Medium	0.0154**	0.0063	1.55%
AFTER_Inner_GRAV_T	-2.3260	1.4798	
BEFORE_Revitalizing	-0.0245***	0.0052	-2.42%
BEFORE_Economically-Distress	-0.0094*	0.0048	
BEFORE_Mddle-Declining	-0.0031	0.0042	
AFTER_Revitalizing	-0.0350***	0.0077	-3.44%
AFTER_Economically-Distress	-0.1061***	0.0076	-10.07%
AFTER_Mddle-Declining	-0.0160**	0.0073	-1.59%

Note. *** significance level at 1%, ** significance level at 5%, and *significance level at 10%. No asterisks were added when the estimated parameters were not statistically significant.

Table 5-15. Regression results of price impacts of HCV in LIHTC by neighborhood type

Variable	Estimates	Robust Standard Error	% change of housing price by one unit increase
In_TREND	-0.0012***	0.0003	-0.12%
AFTER_In_TREND	0.0000***	0.0000	0.00%
INNER	-0.0276***	0.0042	-2.72%
AFTER_INNER	0.0166**	0.0075	1.67%
AFTER_In_Small	-0.0918***	0.0030	-8.77%
AFTER_In_Medium	0.0223***	0.0063	2.26%
AFTER_Inner_GRAV_T	-2.1249	1.4814	
BEFORE_Revitalizing	-0.0242***	0.0052	-2.39%
BEFORE_Economically-Distress	-0.0081*	0.0048	
BEFORE_Mddle-Declining	0.0010	0.0042	
AFTER_Revitalizing	-0.0286***	0.0077	-2.82%
AFTER_Economically-Distress	-0.1065***	0.0076	-10.10%
AFTER_Mddle-Declining	-0.0133*	0.0073	

Note. *** significance level at 1%, ** significance level at 5%, and *significance level at 10%. No asterisks were added when the estimated parameters were not statistically significant.

Table 5-16. Summary of econometric model results

Neighborhood type	LIHTC			HCV			HCV in LIHTC		
	Before	After	Sum	Before	After	Sum	Before	After	Sum
30% AMI neighborhood	0.0%	17.7%	17.7%	19.3%	0.0%	-19.3%	25.5%		-25.5%
50% or 60% AMI neighborhood	-16.4%	-14.7%	1.7%	-13.9%	-26.5%	-12.5%	-14.6%	-26.5%	-12.0%
80% AMI neighborhood	4.3%	-8.8%	-13.0%	-7.8%	-16.1%	-8.3%	-8.3%	-15.8%	-7.5%
Middle poverty neighborhood	-2.3%	1.1%	3.4%	0.7%	-3.4%	-4.1%	0.8%	-3.3%	-4.1%
High poverty neighborhood	0.0%	-20.5%	-20.5%	-19.9%	-26.7%	-6.8%	-20.3%	-26.2%	-5.8%
Economically distressed neighborhood	-9.9%	-11.6%	-1.7%	-2.4%	-3.4%	-1.0%	-2.4%	-2.8%	-0.4%
Revitalizing neighborhood	-5.1%	-11.9%	-6.8%	0.0%	-10.1%	-10.1%	0.0%	-10.1%	-10.1%
Middle declining neighborhood	-8.0%	-11.5%	-3.5%	0.0%	-1.6%	-1.6%	0.0%	0.0%	0.0%

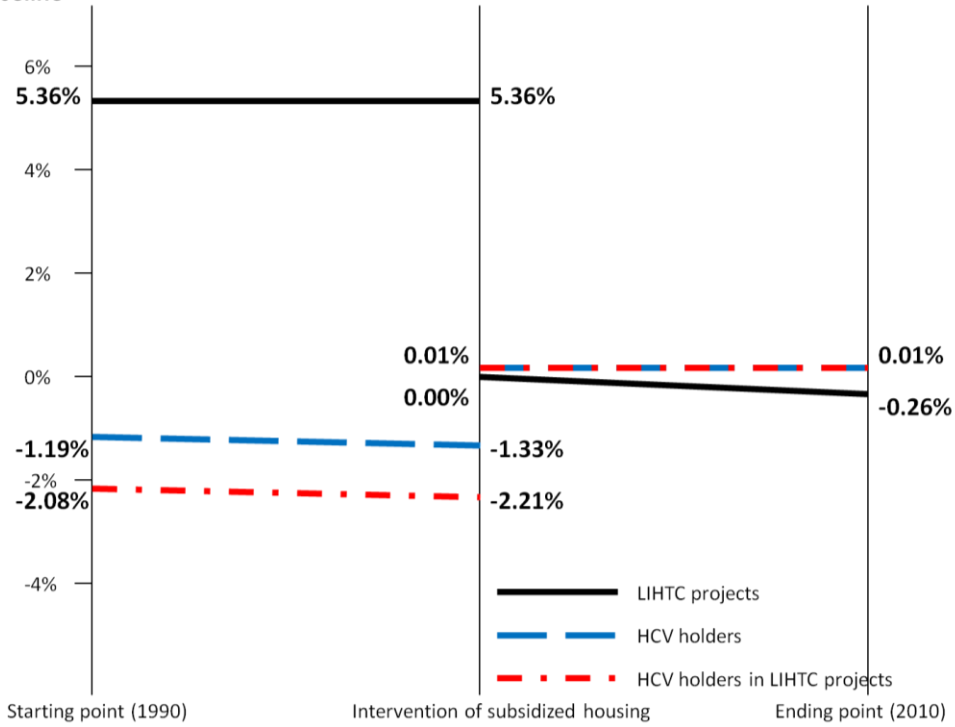


Figure 5-29. Sale price levels and trends of the pre- and post-development in the baseline models

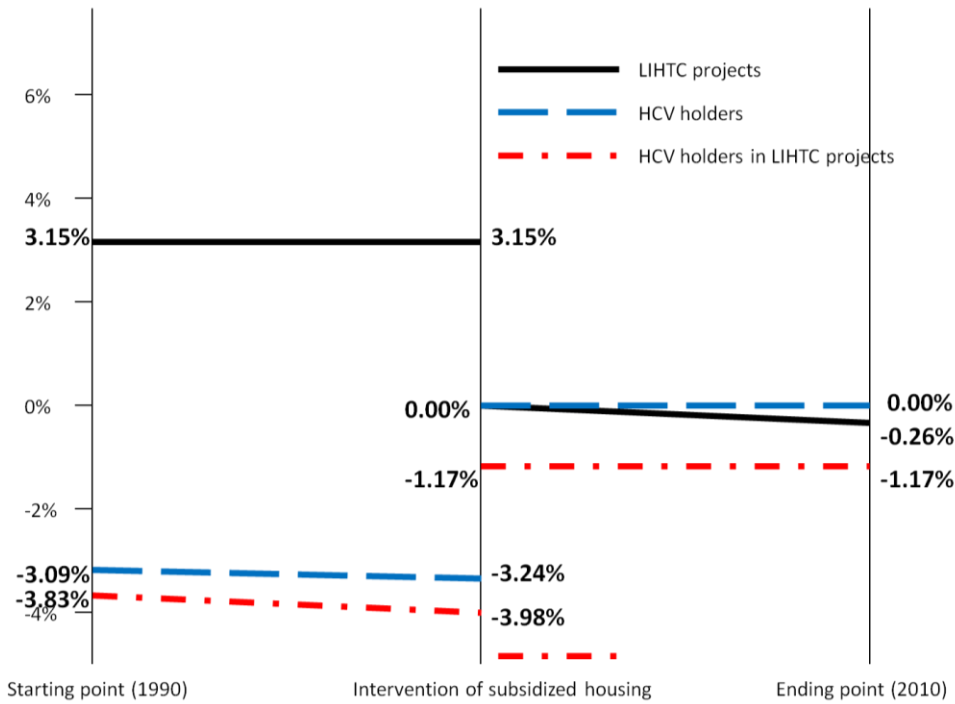


Figure 5-30. Sale price levels and trends of the pre- and post-development in the regression models by income groups

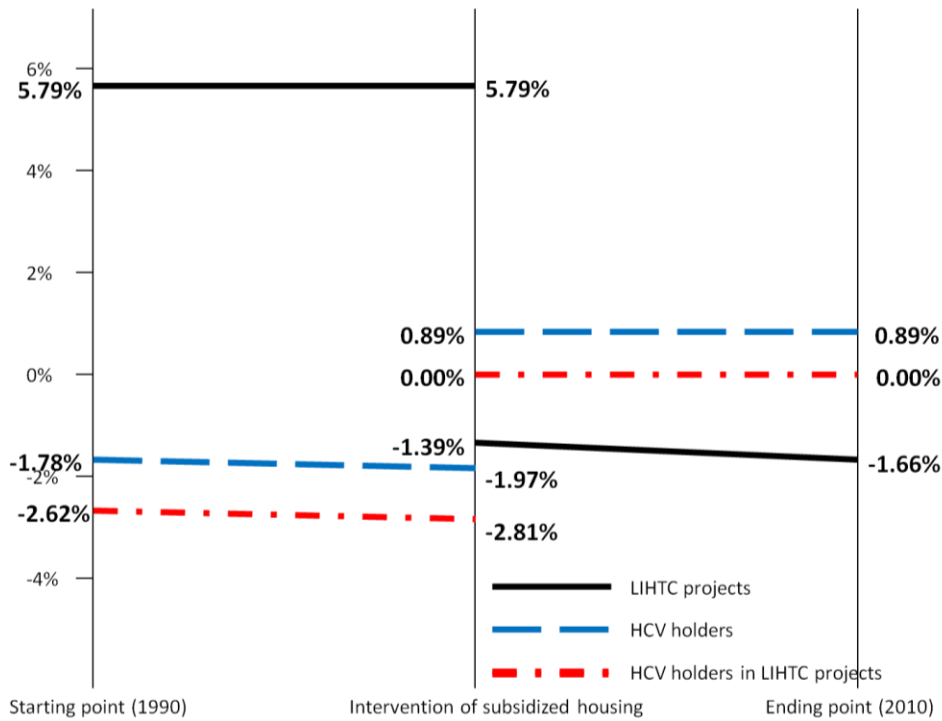


Figure 5-31. Sale price levels and trends of the pre- and post-development in the regression models by poverty status

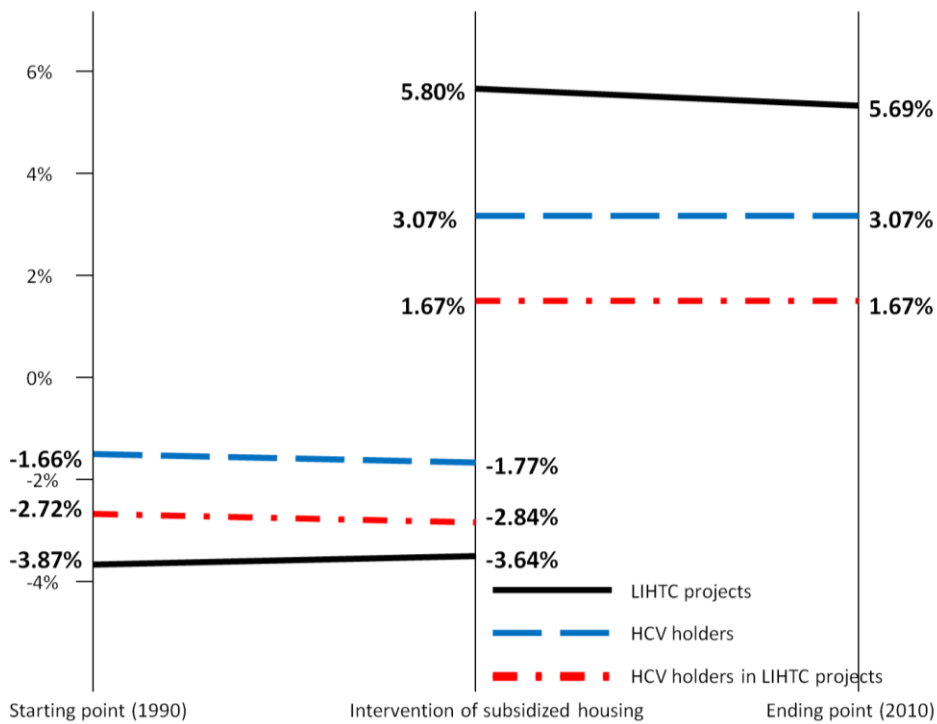


Figure 5-32. Sale price levels and trends of the pre- and post-development in the regression models by neighborhood type

Table 5-17. Regression results of displacement of HCV holders between 1990 and 2010

Variable	Dependent: the number of Housing Choice Vouchers in 2010							
	Base		Income group		Poverty status		Neighborhood type	
	Estimates	Standard Error	Estimates	Standard Error	Estimates	Standard Error	Estimates	Standard Error
Intercept	17.841***	4.303	16.444***	2.921	16.030***	2.982	9.300*	4.806
Housing Choice Voucher 1990	1.976***	0.275	1.993***	0.274	1.965***	0.274	1.872***	0.277
LIHTC units 1990	0.113***	0.035	0.113***	0.034	0.115***	0.035	0.115***	0.034
Increase of LIHTC units 1990-2010	0.090***	0.005	0.089***	0.005	0.090***	0.005	0.089***	0.005
Assisted housing units 1990	0.002	0.009	0.006	0.009	0.002	0.009	0.004	0.009
Increase of Assisted housing units 1990-2010	-0.087***	0.018	-0.085***	0.018	-0.087***	0.018	-0.084***	0.017
Housing price 1990	-0.000**	0.000	-0.000***	0.000	-0.000**	0.000	-0.000	0.000
Poverty rate 1990	-12.780	8.233	-	-	-	-	-	-
Change of housing price 1990-2010	-2.656***	0.859	-2.519***	0.832	-2.665***	0.838	-1.552*	0.897
Change of poverty rate 1990-2010	-0.011	1.249	-	-	-	-	-	-
Neighborhoods with 30% AMI	-	-	-9.097	8.120	-	-	-	-
Neighborhoods with 30-50% AMI	-	-	-3.985	3.061	-	-	-	-
Neighborhoods with 50-80% AMI	-	-	-4.501**	1.953	-	-	-	-
High poverty neighborhoods	-	-	-	-	-4.183	3.502	-	-
Middle poverty neighborhoods	-	-	-	-	-2.108	1.499	-	-
Revitalizing neighborhoods	-	-	-	-	-	-	-1.737	3.028
Middle declining neighborhoods	-	-	-	-	-	-	4.687	2.973
Economically distressed neighborhoods	-	-	-	-	-	-	3.772	3.150
Observations	369		369		369		369	
Adjusted R square	0.6549		0.6580		0.6550		0.6619	

Note. *** significance level at 1%, ** significance level at 5%, and *significance level at 10%. No asterisks were added when the estimated parameter were not statistically significant. The variables of "Urbanized Area" and "Central City" were included in the model, but both estimates were insignificant in the four models. Thus, they are not included in the model.

Table 5-18. Neighborhood characteristics of Lake Eola Heights and South Eola

Neighborhood attributes	1990	2000	2007-11
Population	3,192	2,847	3,595
Number of households	1,802	1,797	2,183
Number of housing units	2,083	1,947	2,917
Percentage of White	89.6%	91.0%	91.3%
Percentage of African American	6.0%	3.8%	3.7%
Percentage of renter-occupied housing	62.7%	63.8%	52.6%
Vacancy rate	8.5%	7.7%	25.1%
Median household income	\$21,355	\$37,081	\$55,695
Poverty rate	14.9%	8.1%	12.8%
Median housing price	\$97,100	\$176,825	\$304,320
Median rent	\$356	\$567	\$1033

Source: Census 1990, 2000, Census ACS 2007-2011. Information is tabulated based on four census block groups (Federal Information Processing Standard (FIPS) census block group code in Census 2000: 120950102001, 120950102003, 120950102004, and 120950102005).

Table 5-19. HCV program used in Lake Eola Heights and South Eola

Years	1980s and 1990s	2000 - 2005	2005-2010	Total
HCV in LIHTC	0	0	0	0
HCV in other	6	2	1	9
Total	6	2	1	9
Average of income	\$14,634	\$12,734	\$12,912	
Median income	\$18,240	\$12,734	\$12,912	

Note: parenthesis indicates the percentage of voucher holder income to median household income in Lake Eola Heights and South Eola. The average of income and median income are adjusted dollars for inflation in 2010. Therefore, the dollars in 1990 and dollars in 2000 are adjusted for 2010 dollars. The inflation is calculated using the Consumer Price Index (CPI). The final adjusted dollars are calculated by multiplying original dollars with the CPI ratio which is calculated by dividing two CPIs at two time points.

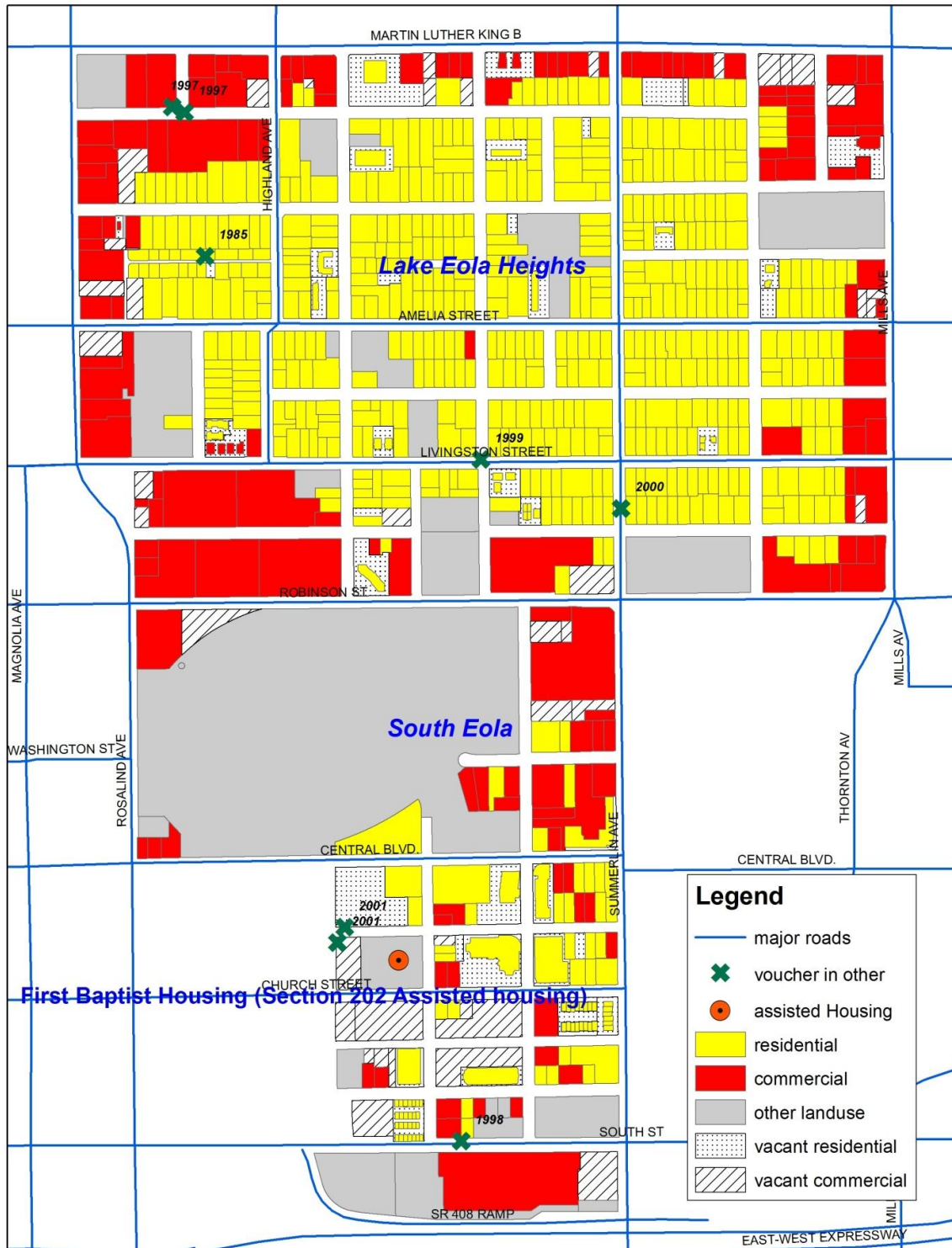


Figure 5-33. LIHTC projects, voucher holders and Land Use in Lake Eola Heights and South Eola. Note. The number shown above "voucher in other" refers to admission year of each voucher recipient. Land use categories such as residential, commercial, and other land use do not reflect actual land use or zoning but rather are based on the FDOR property records



Figure 5-34. First Baptist Housing in South Eola. Source: Orange County Property Appraiser (2012).

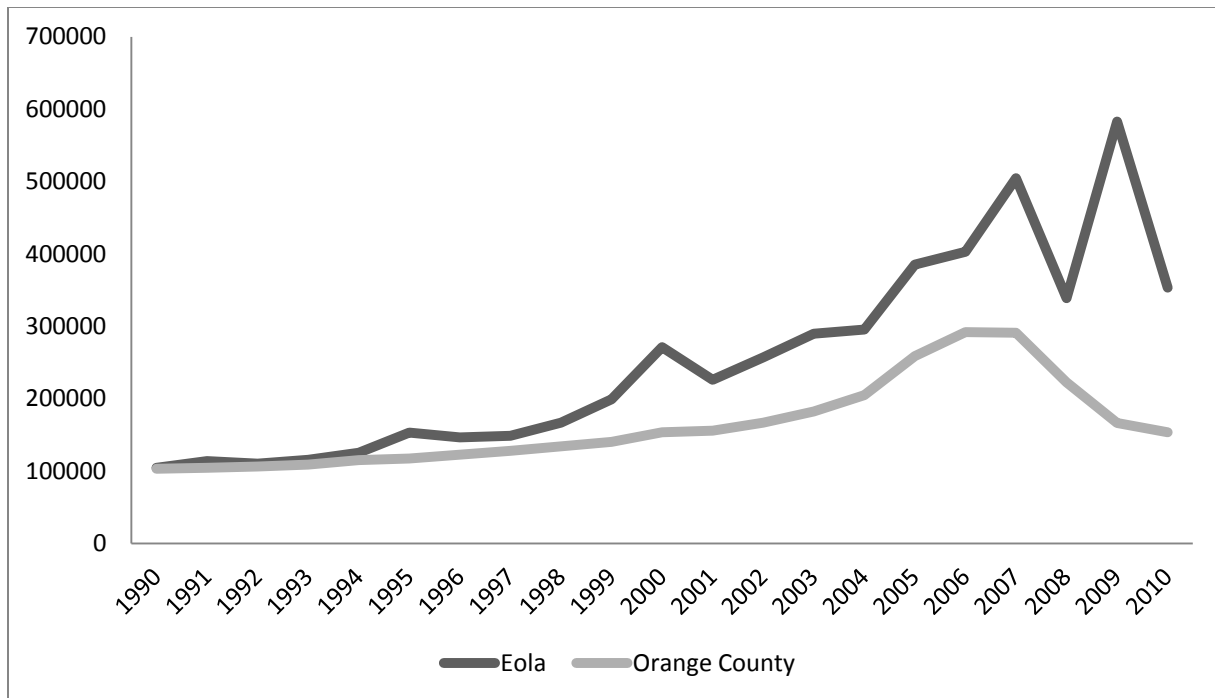


Figure 5-35. A trend of average sale prices in Eola and Orange County.

Table 5-20. Neighborhood characteristics of Holden-Parramore

Neighborhood attributes	1990	2000	2007-11
Population	5,520	4,876	3,660
Number of households	1,879	1,696	1,186
Number of housing units	2,100	1,853	1,465
Percentage of African American	92.2%	86.8%	79.0%
Percentage of renter-occupied housing	88.1%	87.8%	73.4%
Vacancy rate	10.5%	8.5%	19.0%
Median household income	\$11,477	\$15,586	\$19,941
Poverty rate	51.5%	55.4%	47.1%
Median housing price	\$38,817	\$60,950	\$52,075
Median rent	\$233	\$291	\$509

Source: Census 1990, 2000, Census ACS 2007-2011. Information is tabulated based on six census block groups (Federal Information Processing Standard (FIPS) census block group code: 120950104002, 120950104001, 120950105002, 120950105001, 120950106002, 120950106003).

Table 5-21. LIHTC projects in Holden-Parramore

Years	1980s and 1990s	2000 - 2005	2005-2010	Total
New construction	1	0	0	1
Renovation	0	1	2	3
Total	1	1	4	4

Source: Shimberg Center for Housing Studies

Table 5-22. HCV program used in Holden-Parramore

Years	1980s and 1990s	2000 - 2005	2005-2010	Total
HCV in LIHTC	7	9	13	29
HCV in other	12	7	16	35
Total	19	16	29	64
Average of income	\$14,755	\$12,516	\$9,377	
Median income	\$17,587	\$13,894	\$12,582	

Note: parenthesis indicates the percentage of voucher holder income to median household income in Holden-Parramore. The average of income and median income are adjusted dollars for inflation in 2010. Therefore, the dollars in 1990 and dollars in 2000 are adjusted for 2010 dollars. The inflation is calculated using the Consumer Price Index (CPI). The final adjusted dollars are calculated by multiplying original dollars with the CPI ratio which is calculated by dividing two CPIs at two time points.



Figure 5-37. Public housing building for the elderly in the Carver Park, source: Google map (2013)



Figure 5-38. Jackson Court Apartments for elderly, Source: Orange County Property Appraiser (2013).



Figure 5-39. City View Apartments, Source: Orange County Property Appraiser (2013).

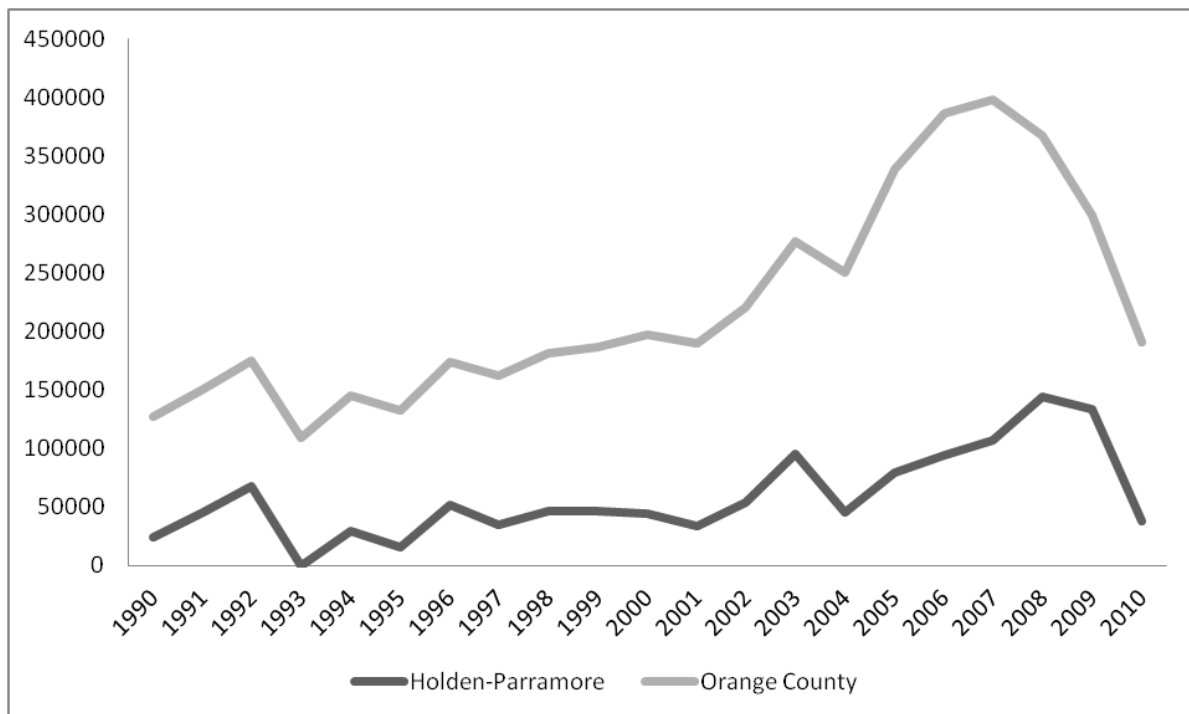


Figure 5-40. A trend of average sale prices in Holden-Parramore and Orange County.

CHAPTER 6 CONCLUSION

This chapter explores some of the policy implications of these findings. This study casts doubt on whether the Low Income Housing Tax Credit program and the Housing Choice Voucher program can increase property values in poor neighborhoods. Neighborhood revitalization entails a complex challenge requiring multiple strategies to bring about positive effects on community and sustain long-term change (Galster, 2006). Creating stable and safe housing opportunities for low-income households is critical in revitalization. The LIHTC program and the HCV program are two major public tools that can provide for the inclusion of displaced low-income households in neighborhood revitalization efforts directed at improving the property tax base.

The central argument of this dissertation is that the newly built LIHTC projects in impoverished neighborhoods could increase sale prices by stimulating new investment, removing dilapidated features of old housing, and promoting new physical features in neighborhoods. These increased housing prices could promote economic revitalization. Along with economic revitalization, the HCV program contributes to equitable revitalization based on the notion that voucher holders may have positive impacts on sale prices when they move to their revitalized areas. When this process of neighborhood change is sustained, a sustainable revitalization can be achieved through the combination of economic and equitable revitalization. The results and findings of this study corroborate important policy implications for subsidized housing development in the context of equitable neighborhood revitalization.

Justification for Proposed Policy

The previous chapters identify several key factors – consistent with the impoverished neighborhood classification – that are related to neighborhood revitalization, and in particular to maintaining relatively high property values in depressed neighborhoods. The first, and perhaps most critical is the economic revitalization issue by the LIHTC projects by way of the following reasoning. The neighborhoods with 30% of AMI and 50-60% of AMI as well as medium-poverty neighborhoods have positive price impacts of LIHTC projects. The LIHTC projects encourage new construction and new investment in declining neighborhoods. Rather, the property values of single homes remain stable or increase in some depressed neighborhoods (Green et al. 2002; Schwartz et al., 2006; Ellen et al., 2007; Baum-Snow, 2009; Edmiston 2011; Deng, 2011b). The LIHTC-hosted communities have lower poverty rates, and lower number of assisted tenants than other neighborhoods without the LIHTC projects (Deng, 2011a). In fact, the previous suggest that the effects of LIHTC projects may be more positive in high-poverty areas than other middle-class communities (Deng, 2011a). Even, the consequences of LIHTC projects tend to be related to declines in racial segregation in high-poverty neighborhoods at the metropolitan level (Horn and O'Regan, 2011). These positive impacts may be a result of continuous efforts in maintenance of single-family homes that are located nearby the new LIHTC projects with mixed-income units (Edmiston, 2011). In addition, a good collaboration with the housing authorities and the city's efforts to promote social mixing may dodge the negative effects of the LIHTC projects on the property values (Funderburg and McDonald, 2010).

However, as discussed, developers receive additional credits for construction of LIHTC projects in Qualified Census Tracts (QCT) which are defined as areas that have more than 20% of poverty rate in a census tract. Even though the QCT incentivizes siting the LIHTC funded developments, the concentration of the LIHTC projects may not decrease property values in medium poverty areas. But, according to the analysis results, the high poverty neighborhoods that have more than 40% poverty rate have negative effects on property values, implying that the stigmatization of the concentrated affordable housing developments and the poor residents may not mitigate the negative price impacts as pointed by Freeman and Botein (2002).

Yet, neighborhood revitalization based on the subsidized housing programs is not inevitably doomed to depressed neighborhoods in Orange County. According to the analysis results, the HCV households have positive effects on property values, indicating that voucher-based revitalization strategies can attenuate detrimental values in revitalizing neighborhoods. The voucher holders in LIHTC projects also have positive impacts on property values with less magnitude. In addition, the degree of the utilization of HCV program depends on existing stock of affordable housing within communities rather than neighborhood types.

More specifically, instead of providing only the LIHTC funded units for low-income households, the strategies combined with some elements of the LIHTC projects, HCV holders, and assisted housing developments have much more significant value in promoting equitable revitalization. The results of econometric analyses provide evidence that the existing LIHTC units and the assisted rental units can attract more HCV holders for the twenty year period regardless of different types of neighborhoods.

For the same period of time, the positive price impacts of the HCV holders may facilitate the equitable revitalization process. Indeed, studies found that the LIHTC funded developments are good housing resources in neighborhoods because they provide quality affordable housing units for low-income households (Baum-Snow, 2009, Deng, 2011a, Deng, 2007). While successfully providing affordable housing to low-income families, the LIHTC projects may benefit those who earn less than 30% of AMI (Desai, Dharmapala, and Singhal, 2008, Leviner, 2004). Above all, the estimated parameters from all price impact models present that the control variables such as density of assisted rental housing and density of multifamily housing developments both have positive impacts on property values. These positive price impacts indicate that there are some possibilities of neighborhood revitalization effect from new subsidized housing stocks as well as affordable market rate housing.

However, the volatile housing market during the 2000s affects relocation of the HCV holders. Based on the econometric results, increasing housing prices displace voucher holders. Indeed, high property values might result in the displacement of low income households due to lack of affordable housing, thus creating middle income neighborhoods (Lees, 2008). In the case studies, LIHTC projects accommodate a small share of voucher holders who are displaced in the planned revitalizing neighborhoods such as Lake Height Eola and South Eola. On contrary, the increasing number of voucher holders in Holden-Parramore in 2010 is associated with more stable housing market in the communities, more existing affordable housing stocks, and the city's strenuous efforts to turn back the neighborhoods as if it was prior to the 1960s.

Yet, we have to be cautious about the usage of the vouchers in various neighborhoods contexts. The econometric results suggest that there are negative effects of HCV program on property values in depressed or low-income neighborhoods. This implies that the assisted residents with the lowest stringent income restriction may harm the property values in communities despite the revitalization efforts.

Some studies raised concerns about the concentration of the voucher holders and the re-concentration of the poverty. Indeed, poor neighborhoods are more segregated and reconcentrated by the poor. Despite strenuous efforts to deconcentrate poverty through housing programs such as voucher or moving opportunity programs, the poor become reconcentrated in impoverished neighborhoods (Turner, 1998). Also, the neighbors take further action to re-segregate because people like to be in homogenous neighborhoods with similar location choice (Dawkins, 2004). The desegregation and reconcentration bipolarize neighborhood wealth and social capital. Subsequently, the higher segment of income groups facilitate to increase property values by moving to better location and more expensive home while the influx of low income groups may aggravate property values, losing the possibility of reinvestment in neighborhoods.

Moreover, the use of vouchers still leaves some questions. Will the displaced residents use vouchers and return to the revitalized neighborhoods? Will they be satisfied with the new housing units? Are they willing to move back to the redeveloped projects? According to Brooks, Lewinson, Aszman, and Wolk (2012), 6 years after they were displaced by HOPE VI projects, the percentage of residents who returned to the redeveloped community is only 8%, which is consistent with other results (Popkin, Levy

and Buron, 2009; Crowley, 2009). The residents who returned to the revitalized projects strongly felt that their financial situation and economic well-being is better than voucher users (Brooks, Lewinson, Aszman, and Wolk, 2012). This low percentage of the returned residents is largely due to residents' unwillingness to move out because they do not want to leave the neighborhoods where they were rooted (Buron, Popkin, Levy, Harris, Khadduri, 2002). For the purpose of equal revitalization, the voucher program seems to be working, but needs further exploration of how the vouchers can be effectively utilized for the neighborhood revitalization.

Despite the criticism that the HCV program may be "a bottomless pit" that can never be filled with constant annual funding, the HCV program could play an important role in revitalization. The HCV program may assist eligible low-income households who are displaced by neighborhood revitalization when there is the de-concentration of poverty and positive impacts on neighborhoods. But, this ideal story may not be achievable in reality.

According to Gayle Plowden, the program manager at the Orlando Housing Authority, the eligible applicants for the HCV program can be on a waiting list for up to ten years based HUD guideline, but the housing authorities maintain the record of the contact people on the waiting list for up to three years. The people in the waiting list do not wait for ten years to get vouchers. They usually close the case, leave for other jurisdictions, and can be deceased. For the first three years, they are usually live near to the neighborhoods.

Many planners in OHA express concerns over the recent economy and rental housing market which made it more difficult for renters to find affordable units. In

general, utility allowance payments are allotted for around \$150 per a unit. As the rental market increased about 25% of market price last year, managing the HCV program became more difficult for the housing authorities. To ensure quality of rental units for low-income households, a thorough inspection process needs to be ensured. Because landlords, on occasion, take advantage of vouchers recipients by imposing ridiculously high rent and giving poor-quality units, it is highly sensitive to renter's decision to find the units.

In addition, although managers and advisors provide information about local rental housing, and recommend using newspapers and public services, the voucher recipients do not have sufficient resources to visit all the places. Subsequently, they might rely on information from friends and their familiar relatives who reside in already poor areas.

By promoting residential mobility, a governmental entity could achieve better outcomes in making revitalization efforts such as poverty de-concentration and the attraction of middle-income groups. However, the case for equal revitalization and social integration is less certain, since voucher recipients generally make less than 40% of AMI. They are extremely poor households who find it hard to mingle with new neighbors and local residents. As pointed out in the literature review, voucher holders might feel a significant reduction in their social network and connection with a community. Parents, friends and children might lose the solidarity of relations in their living communities. This may create segregated communities within neighborhoods. Therefore, in order to create more sustainable and equitable neighborhoods with the LIHTC and HCV programs,

specific and combined strategies, funding programs and incentives should be implemented. Next section discusses the future policies based on the reasoning.

Policies for the Future

To ensure revitalization of neighborhoods and provide affordable housing, local governments should include a revitalization plan and a housing plan in their comprehensive plans. The City of Orlando and Orange County adopted comprehensive plans and growth management plans. These plans set aside the neighborhood revitalization plan as part of their policy goals. In particular, the City of Orlando recognizes the importance of preserving affordable housing and achieving equitable housing development in neighborhoods that, by no means, are re-incorporated into economic systems. However, although the City of Orlando has a planned housing development strategy to address the affordable housing issue, the plans coinciding with the revitalization plan are only limited to several communities. The revitalization plans for Callahan, Holden, and Parramore communities are such cases.

Most of the affordable housing communities in the City of Orlando are operated by public/private partnerships. Some of these organizations have primarily aimed to increase production of affordable housing. Developing more affordable housing projects with these organizations is one of several strong strategies for providing affordable housing. However, effective and explicit plans are not elaborated on in the neighborhood revitalization plan. Compared to the City of Orlando, Orange County does not strongly support neighborhood revitalization through housing elements, except for developing the assisted housing projects for low-income workforce, homeless and elderly in suburbs.

The City of Orlando and Orange County established a comprehensive plan – though not a conscious policy – that incorporates some of the elements of neighborhood revitalization. However, the City and County have not provided a big picture for neighborhood revitalization at a regional level. As seen in the Holden-Parramore and Eola communities, the two central city communities were developed by separately tailored programs – despite their close locations. Because of this, the subsidized housing developments did not promote property values and neighborhood revitalization.

Nevertheless, Orlando Housing Authority continues to seek partnerships with for-profit/non-profit developers to provide affordable units. Indeed, OHA continues to advocate for the LIHTC program in order to build more stable HOPE VI projects, and public and private partnership through its participation in the Florida Association of Housing and Redevelopment Officials (FAHRO) (Orlando Housing Authority, 2006). Also, the City of Orlando is initiating a year-long planning process in the Parramore area as part of the HUD Sustainable Communities Regional Planning Grant (SCRPG) process. The Parramore Comprehensive Neighborhood Plan will be focusing on a number of issues including land use, education, housing, health and sustainability. The East Central Florida Regional Planning Council oversees the larger HUD SCRPG planning effort which includes affordable housing and fair housing, particularly in the areas around the Sunrail stations. As part of ECF 2060 plan, the region's sustainable development plan, the Sunrail plan is to incentivize Transit Oriented Development to revitalize existing low-income communities adjacent to commuter rail stations, and to promote social equity and access to job/health opportunity within the half mile radius of

Sunrail stations. Apart from business, employment and accessibility issues, the plan is still in the process of conducting affordable and fair housing assessment for the demand for such housing, and any related Fair Housing issues. In the study, several significant components as means of identifying the need for affordable housing are considered, such as existing housing programs to provide affordable housing, exiting programs to renovate or rehabilitate existing affordable housing, already approved projects intended to provide affordable housing, and existing public/assisted rental housing (Regional Planning Council, 2013).

Regarding the revitalization plan for the downtown area, Orlando Housing Authority (OHA) specifically emphasizes on the Downtown West Transformation Plan that includes the Holden-Parramore community. OHA is in the process of applying a Choice Neighborhood Planning Grant in order to create a vision and feasible transformation plan for the Downtown West neighborhood, and includes building the Creative Village Development. This project encompasses office space, a community school, mixed income housing, and other commerce and employment centers. Such development will add more affordable housing with mixed-income developments for a better neighborhood environment.

In this regard, there are several strategies to revitalize communities to the point which social equity is achieved: (1) creating a siting plan for affordable housing projects to promote community's economy and mixed income housing developments through the combination of LIHTC and HCV programs, (2) relocating or reserving low income households in neighborhoods in central city areas through the LIHTC and HCV program, (3) preserving existing affordable housing stocks, (4) preventing involuntary

displacement of low-income residents using the HCV program, (5) promoting affirmative incentive programs to promote neighborhood revitalization, and (6) administering regional and national housing programs. These strategies are summarized in Table 6-1.

First, sound siting plans are needed for affordable housing that could promote community's economy and mixed-income developments. The estimated parameters from the analysis results imply that deciding the location of affordable housing projects is important for the host neighborhoods. QCT may play an important role to incentivize developers to construct LIHTC projects, but the price impacts are varied according to different poverty rate of neighborhoods. The decision making process for the location of the LIHTC projects depends on developers rather than local housing authorities. For instance, for-profit developers tend to prefer a land with a good accessibility – which the land prices are expensive in most cases – but non-profit developers may like to purchase less expensive lands due to budget constraints. These different location choices may result in the current location of the LIHTC projects. In fact, the price effects of various developers for the LIHTC projects are significantly different (Deng, 2011b). While further explanation on the location choices by different developers needs to be examined, careful long-term plans for those neighborhoods may improve the neighborhoods' conditions. As explained, OHA and the City of Orlando are focusing on the western downtown area to provide diverse housing options, better job accessibility, and mixed income developments. The Holden community starts to change with these endeavors even though these initiatives are not applied to other inner city areas and slow growth areas yet.

Second, revitalization efforts based on subsidized housing developments should be focused in the central city area. As discussed in the case study, the revitalization through the LIHTC and HCV programs are progressing. Collaborating with non-profit developers and for-profit developers, the City of Orlando needs to incorporate an affordable housing plan into mixed-use development in the central city area. For instance, the city can establish a guideline in the construction of mixed-used developments by setting aside a minimum percentage of market rate housing, subsidized housing and commercial and office spaces. In building multifamily housing developments, a certain percentage of market rate housing and LIHTC funded development can be set aside. This guideline will allow developers to provide affordable housing units in the central city. In addition, the usage of HCV program in the LIHTC program should be promoted. Under the strong market situation, this combined program will allow the eligible low-income households to have better housing choices.

Third, preserving the LIHTC projects and other affordable housing stocks is another important component for the equitable neighborhood revitalization. As discussed in literature review, the assisted housing developments including LIHTC projects faces expiration of assistance contracts, prepayment of assisted mortgages or fail-out because of the land owner's inability to maintain physical and financial conditions of the properties. The loss of affordable housing could result in loss of living spaces for low-income households. To preserve the existing LIHTC projects and other assisted rental housing, guidelines should be created and strictly followed. The fundamental strategies may include: (1) rehabilitate and upgrade quality of assisted rental housing stocks and LIHTC projects, (2) ensure maintenance in the existing

assisted rental housing stocks and LIHTC projects, (3) ensure retention of the assisted housing stocks and LIHTC projects which expires within three years, (4) establish land bank to purchase and assemble land parcels in reserve for future development of affordable housing projects, (5) enact inclusionary zoning ordinances set for a certain portion of affordable units.

In fact, OHA is making a good progress in this regard although the affordable housing plan should be expanded to incorporate the LIHTC program and the HCV program. OHA creates an annual Moving To Work Plan and reports it to HUD since 2011. The plans provide information about the number of public housing units and other rental housing available as of the initial year of MTW plan. They also summarize the number of MTW and non-MTW Housing Choice Vouchers. Additionally, planned significant capital expenditures, added units, removed units, non-MTW HCV units, and waiting list information for the HCV program are summarized in the reports. This information is used to manage eligible applicants to find public rental units in the City of Orlando as well as outside the city. However, the LIHTC projects are not explicitly demonstrated in the accommodation plan for the low-income residents. As seen in Carver Park and Jackson Court apartment, OHA has sought to provide affordable housing units in Downtown Orlando Area, but these affordable housing projects account for only small share of total affordable housing in the central city.

Fourth, in order to achieve sustainable and equitable neighborhood revitalization, preventing involuntary displacement of low-income residents needs to be incorporated to local entities' housing plans. In fact, the project-based housing such as the LIHTC developments is valuable to a neighborhood because it provides relatively long-term

affordability for 15 to 30 years depending on the subsidy programs. These properties are assets for the low-income residents who are displaced by a rise in the housing market. In contrast, the HCV program has difficulty in providing long-term affordability because of unstable funding system changes every fiscal year, and landlords' reluctance to participate in the program. To mitigate the involuntary displacement, the government needs to establish plans that include: (1) providing relocation assistance with the HCV program using counseling services, (2) ensuring affordability of assisted rental housing by encouraging landlords to remain in the affordable housing market, (3) providing incentives to landlords in exchange for maintaining affordability, (4) enacting a law that empowers tenants to be resilient to landlord's unjust use of power. Goetze and Colton (1980) support these strategies. In declining neighborhoods, direct housing assistance to all eligible low-income residents is required. When these direct housing allowances and income supports are combined with job security, and counseling services, they could help improve the lives of low-income residents (Goetz and Colton, 1980). Instead of focusing on housing units, providing a broader range of housing options to low-income households can be a better solution for changing residential structure in the declining neighborhoods.

Fifth, affirmative incentive programs integrated into housing development plan are potentially effective, aligning with the policy actions by the fragmented government entities. Despite being limited to a local governmental entity, such efforts tend to be significantly more promising when undertaken not at the individual neighborhood level or small suburban town, but rather the metropolitan level. If a broader geographic area is covered, a program can offer more alternatives to households and have more

significant effect on neighborhood revitalization patterns. By this reasoning, such affirmative programs can be more effective if operated at the national level, so low-income households in almost exclusive high-middle income neighborhoods in the City of Orlando can be informed about housing options in the lower-income neighborhoods in some cities of Georgia and other states. Encouraging people to move such long distances are not desirable, but at least the shared information can be utilized to inform the low-income residents of better choices. As stated, such policies for sustainable and equitable revitalization cannot be promoted unless the plans are understood comprehensively.

Last but not least, the neighborhood revitalization efforts should incorporate a smart growth strategy in the context of growth management planning. As discussed, the applicants for affordable housing developments should follow the alternative development standards for low and very-low income housing based on the Orlando city code. The alternative development standards are utilized in the context of growth management schemes such as variations of density by locations, projected housing growth, and various housing options to diverse income groups. In fact, the growth pattern of housing developments can be varied depending on locations. In regions with high population growth, limiting suburban growth may incentivize high density developments for central cities. Other areas with low population growth may prefer to block housing developments entirely due to amenity and environmental issues. Therefore, the fair share of housing developments for low- and very-low income residents should be allocated with a region-wide approach. Municipalities and other unincorporated areas may develop an intergovernmental housing assistance program to

share information on affordable housing projects and encourage housing mobility for voucher users.

It is critical for policymakers to recognize how central governmental policies can affect property values of urban and suburban neighborhoods, and neighborhood revitalization may be better achieved with multiple governmental entities rather than a single central-city government. The City of Orlando plays a significant role in revitalizing downtown areas and providing affordable housing to low-income residents. The central government may be efficient in delivering the local housing needs for low-income residents. However, controlling housing supply by a central city may produce negative consequences such as concentration of affordable housing, and imbalance of affordable housing developments.

In fact, Basolo (2000) finds the determinants that promote the city's spending on affordable housing development rather than economic development are largely attributed to the multiple local governments that compete with adjacent jurisdictions. Indeed, Aurand (2007) suggests that fragmented governments are more likely to provide a greater number of affordable housing for low-income residents than a consolidated central government. These decentralized governments may perform better at placing affordable housing throughout Orange County, in contrast to a sole central government. These efforts of affordable housing are focused in not the federal housing programs, but rather local-based housing programs in each local governmental entity.

In 2010, an estimated 924,147 renter households in Florida were considered low-income households (Shimberg Center for Housing Studies, 2013). Among them, 67% of total of low-income renter households are cost-burdened (Shimberg Center for Housing

Studies, 2013). In Orange County, renter households who earn less than 60% of AMI and are cost burdened numbered 45,457 in 2010. This number accounts for 29.3% of total renter households in the county and 7.3% of total renter households in Florida. The number of cost-burdened households increased to 47,517 in 2013, comprising 7.5% of total households in Florida. These numbers indicate that there is still an increasing need for more affordable housing. Indeed, cities like Apopka, Ocoee, Winter Garden, and Winter Park individually make efforts to provide affordable housing with an increasing range of housing options. The notion that the various operating systems of these municipalities may provide affordable housing units needs an examination in the future study.

Limitation and Future Study

There are several limitations to this study. First, this dissertation only analyzes property value impacts of the LIHTC and the HCV programs based on income difference. The future study needs to investigate other socio-demographic factors such as age, race, and ethnicity.

Second, this study focuses only on Orange County. In order to generalize the results, the price impacts of the LIHTC and HCV programs in other states should be examined. More specifically, several central city areas in other states can be selected for a pilot study. It is important to examine and compare the neighborhoods in the central city areas in terms of the number of assisted units and its causality with property values at a parcel and block group levels. Also, how these subsidized housing developments have affected neighborhood change such as poverty rate, housing prices, race, and education performance can be analyzed in the comparative study.

Third, more spatial variables such as proximity to industrial areas may improve the output of the analysis. In fact, many housing developments are already developed nearby industrial areas, which may generate negative externalities. Since home buyers normally do not prefer to buy a home in proximity to the unlikable land uses such as factories, and land fill areas, it is likely that property values are lower near these areas.

Third, this study shows that there is a systematic decline in property values in high-poverty areas, and the regression model for the neighborhood types that are classified by a cluster analysis demonstrates complicated results. Unlike other regression models, some dummy variable of the individual neighborhood type are estimated to be negative at a significance level, but others are not. This means that the cluster analysis might not categorize the neighborhood types in a proper manner. The neighborhoods within a county boundary and a city boundary should be treated differently in the future study since the mechanism of the neighborhood change is different.

Fourth, the displacement effect of HCV holders may indirectly reflect the neighborhood revitalization process because the actual displacement of low-income residents is still unknown. To address this issue, Public Use Microdata Sample (PUMS) can be used to identify migration of low-income households from each neighborhood. The use of PUMS enables explaining the relationship between housing market change and displacement of revitalized area, and can help address how resettlement should be dealt with.

Fifth, future land use management should be considered when planning to locate subsidized housing. Each neighborhood has different characteristics of income, poverty,

housing market, and population composition. Thus, the supply of affordable housing could be decided based on these complex neighborhood characteristics.

APPENDIX A
THE REGRESSION RESULTS OF PRICE IMPACTS OF LIHTC PROJECTS

Table A-1. Baseline regression results of price impacts of LIHTC projects

Variable	Estimates	Robust Standard Error	Significance
Intercept	10.6417	0.1264	<.0001
Property Age	0.0002	0.0000	<.0001
Total Living Area	0.4263	0.0009	<.0001
Lot Size	0.0000	0.0000	<.0001
In_TREND	-0.0001	0.0006	0.8945
AFTER_In_TREND	-0.0026	0.0003	<.0001
INNER	0.0522	0.0084	<.0001
AFTER_INNER	0.0000	0.0000	0.3512
AFTER_DIST	-0.0074	0.0057	0.1956
AFTER_In_Small	0.0111	0.0135	0.412
AFTER_In_Medium	-0.0142	0.0082	0.0829
AFTER_Inner_GRAV_T	-36.6765	11.6173	0.0016
AFTER_Inner_GRAV_A	-327.5082	154.7237	0.0343
AFTER_Inner_GRAV30	108.1774	26.6264	<.0001
AFTER_Inner_MHden_pre90	0.0000	0.0000	0.264
AFTER_Inner_MHden_new	0.0000	0.0000	0.0591
AFTER_Inner_AHden_pre90	0.0000	0.0000	<.0001
AFTER_Inner_AHden_new	0.0000	0.0000	0.5528
AFTER_Inner_30DEN	-0.0004	0.0001	<.0001
AFTER_Inner_50DEN	-0.0001	0.0000	0.0847
AFTER_Inner_AH_tot	0.0000	0.0000	0.6632
AFTER_Inner_MH_tot	0.0000	0.0000	0.0109
Housing Density in 1990	0.0000	0.0000	<.0001
Poverty Rate in 1990	-0.2052	0.0155	<.0001
X coordinate	2.1815	0.2392	<.0001
Y coordinate	-2.0145	0.2280	<.0001
TIME quarter 1	-0.0423	0.0016	<.0001
TIME quarter 2	-0.0201	0.0015	<.0001
TIME quarter 3	-0.0032	0.0015	0.0339
Year 90	-0.1789	0.0043	<.0001
Year 91	-0.1775	0.0044	<.0001
Year 92	-0.1728	0.0043	<.0001
Year 93	-0.1612	0.0041	<.0001
Year 94	-0.1434	0.0041	<.0001
Year 95	-0.1338	0.0041	<.0001
Year 96	-0.1119	0.0039	<.0001
Year 97	-0.0891	0.0038	<.0001
Year 98	-0.0460	0.0037	<.0001

Table A-1. Continued.

Variable	Estimates	Robust Standard Error	Significance
Year 99	0.0042	0.0036	0.248
Year 00	0.0790	0.0036	<.0001
Year 01	0.1400	0.0037	<.0001
Year 02	0.2162	0.0037	<.0001
Year 03	0.3057	0.0036	<.0001
Year 04	0.4288	0.0036	<.0001
Year 05	0.6966	0.0035	<.0001
Year 06	0.8762	0.0037	<.0001
Year 07	0.8362	0.0043	<.0001
Year 08	0.4060	0.0042	<.0001
Year 09	0.0822	0.0041	<.0001
190 census tracts			
Observation	203,928		
R-Square	0.8387		

Table A-2. Regression results of price impacts of LIHTC projects by income group

Variable	Estimates	Robust Standard Error	Significance
Intercept	10.6452	0.1262	<.0001
Property Age	0.0002	0.0000	<.0001
Total Living Area	0.4258	0.0009	<.0001
Lot Size	0.0000	0.0000	<.0001
In_TREND	0.0003	0.0006	0.6048
AFTER_In_TREND	-0.0026	0.0003	<.0001
INNER	0.0310	0.0085	0.0003
AFTER_INNER	-0.0005	0.0057	0.9247
AFTER_DIST	0.0000	0.0000	<.0001
AFTER_In_Small	0.0174	0.0135	0.1984
AFTER_In_Medium	-0.0118	0.0082	0.1499
AFTER_Inner_GRAV_T	-34.3029	11.6076	0.0031
AFTER_Inner_GRAV_A	-183.2001	155.9973	0.2402
AFTER_Inner_GRAV30	102.9659	26.6000	0.0001
AFTER_Inner_MHden_pre90	0.0000	0.0000	0.003
AFTER_Inner_MHden_new	0.0000	0.0000	0.0707
AFTER_Inner_AHden_pre90	0.0001	0.0000	<.0001
AFTER_Inner_AHden_new	0.0000	0.0000	0.3847
AFTER_Inner_30DEN	-0.0004	0.0001	<.0001
AFTER_Inner_50DEN	-0.0001	0.0000	0.0561
AFTER_Inner_AH_tot	0.0000	0.0000	0.925
AFTER_Inner_MH_tot	0.0000	0.0000	0.0044
BEFORE_Inner_30LIN	-0.0047	0.0679	0.9452

Table A-2. Continued.

Variable	Estimates	Robust Standard Error	Significance
BEFORE_Inner_50LIN	-0.1786	0.0314	<.0001
BEFORE_Inner_80LIN	0.0416	0.0154	0.0068
AFTER_Inner_30LIN	0.1628	0.0389	<.0001
AFTER_Inner_50LIN	-0.1590	0.0111	<.0001
AFTER_Inner_80LIN	-0.0918	0.0058	<.0001
Housing Density in 1990	0.0000	0.0000	<.0001
Poverty Rate in 1990	-0.1891	0.0155	<.0001
X coordinate	2.2379	0.2389	<.0001
Y coordinate	-2.0623	0.2277	<.0001
TIME quarter 1	-0.0421	0.0016	<.0001
TIME quarter 2	-0.0200	0.0015	<.0001
TIME quarter 3	-0.0030	0.0015	0.0442
Year 90	-0.1795	0.0043	<.0001
Year 91	-0.1786	0.0044	<.0001
Year 92	-0.1733	0.0043	<.0001
Year 93	-0.1616	0.0041	<.0001
Year 94	-0.1437	0.0040	<.0001
Year 95	-0.1343	0.0041	<.0001
Year 96	-0.1123	0.0039	<.0001
Year 97	-0.0905	0.0038	<.0001
Year 98	-0.0466	0.0037	<.0001
Year 99	0.0040	0.0036	0.2759
Year 00	0.0785	0.0036	<.0001
Year 01	0.1399	0.0037	<.0001
Year 02	0.2162	0.0037	<.0001
Year 03	0.3055	0.0036	<.0001
Year 04	0.4286	0.0036	<.0001
Year 05	0.6965	0.0035	<.0001
Year 06	0.8763	0.0037	<.0001
Year 07	0.8363	0.0043	<.0001
Year 08	0.4059	0.0042	<.0001
Year 09	0.0820	0.0041	<.0001
190 census tracts			
Observation	203,928		
R-Square	0.8391		

Table A-3. Regression results of price impacts of LIHTC projects by poverty status

Variable	Estimates	Robust Standard Error	Significance
Intercept	10.6409	0.1263	<.0001
Property Age	0.0002	0.0000	<.0001
Total Living Area	0.4262	0.0009	<.0001
Lot Size	0.0000	0.0000	<.0001
In_TREND	0.0005	0.0006	0.3918
AFTER_In_TREND	-0.0027	0.0003	<.0001
INNER	0.0563	0.0086	<.0001
AFTER_INNER	-0.0140	0.0059	0.0177
AFTER_DIST	0.0000	0.0000	<.0001
AFTER_In_Small	0.0129	0.0135	0.3399
AFTER_In_Medium	-0.0162	0.0082	0.0488
AFTER_Inner_GRAV_T	-38.9875	11.6602	0.0008
AFTER_Inner_GRAV_A	-362.7577	154.8947	0.0192
AFTER_Inner_GRAV30	112.0237	26.7011	<.0001
AFTER_Inner_MDEN	0.0000	0.0000	0.1958
AFTER_Inner_NMH	0.0000	0.0000	0.1477
AFTER_Inner_ADEN	0.0000	0.0000	<.0001
AFTER_Inner_NAH	0.0000	0.0000	0.7696
AFTER_Inner_30DEN	-0.0003	0.0001	<.0001
AFTER_Inner_50DEN	0.0000	0.0000	0.16
AFTER_Inner_AH_tot	0.0000	0.0000	0.5355
AFTER_Inner_MH_tot	0.0000	0.0000	0.0192
BEFORE_MiddlePOOR	-0.0236	0.0066	0.0003
BEFORE_HighPOOR	-0.2112	0.1714	0.2179
AFTER_MiddlePOOR	0.0105	0.0038	0.005
AFTER_HighPOOR	-0.2289	0.0199	<.0001
Housing Density in 1990	0.0000	0.0000	<.0001
Poverty Rate in 1990	-0.1859	0.0157	<.0001
X coordinate	2.1647	0.2393	<.0001
Y coordinate	-1.9975	0.2281	<.0001
TIME quarter 1	-0.0424	0.0016	<.0001
TIME quarter 2	-0.0201	0.0015	<.0001
TIME quarter 3	-0.0033	0.0015	0.0317
Year 90	-0.1787	0.0043	<.0001
Year 91	-0.1772	0.0044	<.0001
Year 92	-0.1726	0.0043	<.0001
Year 93	-0.1610	0.0041	<.0001
Year 94	-0.1433	0.0040	<.0001
Year 95	-0.1337	0.0041	<.0001
Year 96	-0.1118	0.0039	<.0001
Year 97	-0.0890	0.0038	<.0001

Table A-3. Continued.

Variable	Estimates	Robust Standard Error	Significance
Year 98	-0.0460	0.0037	<.0001
Year 99	0.0043	0.0036	0.242
Year 00	0.0790	0.0036	<.0001
Year 01	0.1400	0.0037	<.0001
Year 02	0.2162	0.0037	<.0001
Year 03	0.3058	0.0036	<.0001
Year 04	0.4289	0.0036	<.0001
Year 05	0.6967	0.0035	<.0001
Year 06	0.8763	0.0037	<.0001
Year 07	0.8362	0.0043	<.0001
Year 08	0.4062	0.0042	<.0001
Year 09	0.0821	0.0041	<.0001
190 census tracts			
Observation	203928		
R-Square	0.8389		

Table A-4. Regression results of price impacts of LIHTC projects by neighborhood type

Variable	Estimates	Robust Standard Error	Significance
Intercept	10.6494	0.1262	<.0001
Property Age	0.0002	0.0000	<.0001
Total Living Area	0.4258	0.0009	<.0001
Lot Size	0.0000	0.0000	<.0001
In_TREND	0.0023	0.0006	0.0003
AFTER_In_TREND	-0.0011	0.0003	0.0008
INNER	-0.0395	0.0098	<.0001
AFTER_INNER	0.0564	0.0070	<.0001
AFTER_DIST	0.0000	0.0000	<.0001
AFTER_In_Small	0.0065	0.0136	0.6317
AFTER_In_Medium	0.0060	0.0083	0.469
AFTER_Inner_GRAV_T	5.9231	11.7347	0.6137
AFTER_Inner_GRAV_A	-433.0391	154.9849	0.0052
AFTER_Inner_GRAV30	33.8225	26.7571	0.2062
AFTER_Inner_MDEN	0.0000	0.0000	<.0001
AFTER_Inner_NMH	0.0000	0.0000	0.1261
AFTER_Inner_ADEN	0.0000	0.0000	<.0001
AFTER_Inner_NAH	0.0000	0.0000	0.495
AFTER_Inner_30DEN	-0.0001	0.0001	0.2001
AFTER_Inner_50DEN	0.0000	0.0000	0.5656
AFTER_Inner_AH_tot	0.0000	0.0000	0.3912

Table A-4. Continued.

Variable	Estimates	Robust Standard Error	Significance
AFTER_Inner_MH_tot	0.0000	0.0000	0.6233
BEFORE_Revitalizing	-0.1041	0.0230	<.0001
BEFORE_Economically-Distress	-0.0524	0.0073	<.0001
BEFORE_Mddle-Declining	-0.0831	0.0074	<.0001
AFTER_Revitalizing	-0.1230	0.0067	<.0001
AFTER_Economically-Distress	-0.1272	0.0059	<.0001
AFTER_Mddle-Declining	-0.1223	0.0059	<.0001
Housing Density in 1990	0.0000	0.0000	<.0001
Poverty Rate in 1990	-0.2008	0.0155	<.0001
X coordinate	2.2669	0.2388	<.0001
Y coordinate	-2.0050	0.2276	<.0001
TIME quarter 1	-0.0422	0.0016	<.0001
TIME quarter 2	-0.0198	0.0015	<.0001
TIME quarter 3	-0.0033	0.0015	0.0302
Year 90	-0.1815	0.0043	<.0001
Year 91	-0.1792	0.0044	<.0001
Year 92	-0.1747	0.0043	<.0001
Year 93	-0.1629	0.0041	<.0001
Year 94	-0.1459	0.0040	<.0001
Year 95	-0.1363	0.0041	<.0001
Year 96	-0.1139	0.0039	<.0001
Year 97	-0.0929	0.0038	<.0001
Year 98	-0.0502	0.0037	<.0001
Year 99	0.0013	0.0036	0.7238
Year 00	0.0762	0.0036	<.0001
Year 01	0.1402	0.0037	<.0001
Year 02	0.2162	0.0037	<.0001
Year 03	0.3058	0.0036	<.0001
Year 04	0.4284	0.0036	<.0001
Year 05	0.6966	0.0035	<.0001
Year 06	0.8763	0.0037	<.0001
Year 07	0.8361	0.0043	<.0001
Year 08	0.4053	0.0042	<.0001
Year 09	0.0820	0.0041	<.0001
190 census tracts			
Observation	203,928		
R-Square	0.8393		

APPENDIX B
THE REGRESSION RESULTS OF PRICE IMPACTS OF HCV RECIPIENTS

Table B-1. Baseline regression results of price Impacts of HCV holders

Variable	Estimates	Robust Standard Error	Significance
Intercept	10.4657	0.1565	<.0001
Property Age	0.0002	0.0000	<.0001
Total Living Area	0.4371	0.0011	<.0001
Lot Size	0.0000	0.0000	<.0001
In_TREND	-0.0014	0.0002	<.0001
AFTER_In_TREND	0.0000	0.0000	<.0001
INNER	-0.0120	0.0029	<.0001
AFTER_INNER	0.0001	0.0000	<.0001
AFTER_DIST	-0.0035	0.0026	0.1762
AFTER_In_Small	-0.1032	0.0029	<.0001
AFTER_In_Medium	-0.0037	0.0062	0.5505
AFTER_Inner_GRAV_T	-2.2339	1.4866	0.1329
AFTER_Inner_MDEN	0.0000	0.0000	0.0106
AFTER_Inner_NMH	0.0000	0.0000	0.8292
AFTER_Inner_ADEN	0.0001	0.0000	<.0001
AFTER_Inner_NAH	0.0001	0.0000	0.0008
AFTER_Inner_30DEN	0.0002	0.0001	0.0019
AFTER_Inner_50DEN	-0.0001	0.0000	0.006
AFTER_Inner_AH_tot	-0.0001	0.0000	0.0126
AFTER_Inner_MH_tot	-0.0001	0.0000	0.0002
Housing Density in 1990	0.0000	0.0000	<.0001
Poverty Rate in 1990	-0.0423	0.0170	0.0129
X coordinate	-0.7127	0.2831	0.0118
Y coordinate	0.8706	0.2692	0.0012
TIME quarter 1	-0.0262	0.0017	<.0001
TIME quarter 2	0.0168	0.0017	<.0001
TIME quarter 3	-0.0171	0.0017	<.0001
Year 90	-0.0343	0.0045	<.0001
Year 91	-0.0275	0.0047	<.0001
Year 92	-0.0255	0.0045	<.0001
Year 93	-0.0093	0.0042	0.0266
Year 94	0.0118	0.0040	0.0035
Year 95	0.0280	0.0041	<.0001
Year 96	0.0499	0.0039	<.0001
Year 97	0.0757	0.0037	<.0001
Year 98	0.1178	0.0035	<.0001
Year 99	0.1710	0.0033	<.0001
Year 00	0.2452	0.0032	<.0001

Table B-1. Continued.

Variable	Estimates	Robust Standard Error	Significance
Year 01	0.3170	0.0033	<.0001
Year 02	0.3928	0.0033	<.0001
Year 03	0.4798	0.0031	<.0001
Year 04	0.6086	0.0030	<.0001
Year 05	0.8798	0.0029	<.0001
Year 06	1.0598	0.0032	<.0001
Year 07	1.0100	0.0042	<.0001
Year 08	0.5876	0.0041	<.0001
Year 09	0.2709	0.0038	<.0001
190 census tracts			
Observations	271,220		
R square	0.8257		

Table B-2. Regression Results of Price Impacts of HCV holders by Income Group

Variable	Estimates	Robust Standard Error	Significance
Intercept	10.4037	0.1649	<.0001
Property Age	0.0002	0.0000	<.0001
Total Living Area	0.4342	0.0011	<.0001
Lot Size	0.0000	0.0000	<.0001
In_TREND	-0.0015	0.0003	<.0001
AFTER_In_TREND	0.0000	0.0000	<.0001
INNER	-0.0314	0.0030	<.0001
AFTER_INNER	-0.0008	0.0028	0.7764
AFTER_DIST	0.0000	0.0000	0.0037
AFTER_In_Small	-0.0750	0.0030	<.0001
AFTER_In_Medium	0.0134	0.0062	0.0293
AFTER_Inner_GRAV_T	-2.4198	1.4769	0.1013
AFTER_Inner_MDEN	0.0000	0.0000	0.0036
AFTER_Inner_NMH	0.0000	0.0000	0.8575
AFTER_Inner_ADEN	0.0002	0.0000	<.0001
AFTER_Inner_NAH	0.0001	0.0000	0.0037
AFTER_Inner_30DEN	-0.0024	0.0001	<.0001
AFTER_Inner_50DEN	-0.0018	0.0001	<.0001
AFTER_Inner_AH_tot	-0.0001	0.0000	0.0338
AFTER_Inner_MH_tot	-0.0001	0.0000	0.0002
BEFORE_Inner_30LIN	0.1768	0.0611	0.0038
BEFORE_Inner_50LIN	-0.1501	0.0141	<.0001
BEFORE_Inner_80LIN	-0.0815	0.0064	<.0001
AFTER_Inner_30LIN	-0.0006	0.0681	0.9929
AFTER_Inner_50LIN	-0.3073	0.0096	<.0001

Table B-2. Continued.

Variable	Estimates	Robust Standard Error	Significance
AFTER_Inner_80LIN	-0.1753	0.0044	<.0001
Housing Density in 1990	0.0000	0.0000	<.0001
Poverty Rate in 1990	0.0597	0.0171	0.0005
X coordinate	-0.1488	0.2814	0.597
Y coordinate	0.3314	0.2676	0.2155
TIME quarter 1	-0.0253	0.0017	<.0001
TIME quarter 2	0.0164	0.0017	<.0001
TIME quarter 3	-0.0164	0.0017	<.0001
Year 90	-0.0376	0.0046	<.0001
Year 91	-0.0321	0.0048	<.0001
Year 92	-0.0287	0.0046	<.0001
Year 93	-0.0127	0.0042	0.0028
Year 94	0.0090	0.0041	0.0274
Year 95	0.0243	0.0041	<.0001
Year 96	0.0470	0.0039	<.0001
Year 97	0.0712	0.0037	<.0001
Year 98	0.1151	0.0035	<.0001
Year 99	0.1682	0.0033	<.0001
Year 00	0.2423	0.0032	<.0001
Year 01	0.3153	0.0033	<.0001
Year 02	0.3905	0.0033	<.0001
Year 03	0.4774	0.0031	<.0001
Year 04	0.6066	0.0030	<.0001
Year 05	0.8780	0.0028	<.0001
Year 06	1.0578	0.0032	<.0001
Year 07	1.0074	0.0042	<.0001
Year 08	0.5853	0.0041	<.0001
Year 09	0.2705	0.0038	<.0001
190 census tracts			
Observations	271,220		
R square	0.8281		

Table B-3. Regression Results of Price Impacts of HCV holders by Poverty Status

Variable	Estimates	Robust Standard Error	Significance
Intercept	10.4558	0.1558	<.0001
Property Age	0.0002	0.0000	<.0001
Total Living Area	0.4368	0.0011	<.0001
Lot Size	0.0000	0.0000	<.0001
In_TREND	-0.0019	0.0003	<.0001
AFTER_In_TREND	0.0000	0.0000	<.0001

Table B-3. Continued.

Variable	Estimates	Robust Standard Error	Significance
INNER	-0.0180	0.0031	<.0001
AFTER_INNER	0.0089	0.0030	0.0031
AFTER_DIST	0.0000	0.0000	<.0001
AFTER_In_Small	-0.1020	0.0029	<.0001
AFTER_In_Medium	-0.0040	0.0062	0.5226
AFTER_Inner_GRAV_T	-2.4357	1.4804	0.0999
AFTER_Inner_MDEN	0.0000	0.0000	<.0001
AFTER_Inner_NMH	0.0000	0.0000	0.7433
AFTER_Inner_ADEN	0.0001	0.0000	<.0001
AFTER_Inner_NAH	0.0001	0.0000	0.0021
AFTER_Inner_30DEN	-0.0024	0.0001	<.0001
AFTER_Inner_50DEN	-0.0018	0.0001	<.0001
AFTER_Inner_AH_tot	-0.0001	0.0000	0.0644
AFTER_Inner_MH_tot	-0.0001	0.0000	<.0001
BEFORE_MiddlePOOR	0.0072	0.0033	0.0303
BEFORE_HighPOOR	-0.2215	0.0203	<.0001
AFTER_MiddlePOOR	-0.0346	0.0029	<.0001
AFTER_HighPOOR	-0.3106	0.0129	<.0001
Housing Density in 1990	0.0000	0.0000	<.0001
Poverty Rate in 1990	0.1596	0.0200	<.0001
X coordinate	-0.6664	0.2818	0.018
Y coordinate	0.8433	0.2680	0.0016
TIME quarter 1	-0.0262	0.0017	<.0001
TIME quarter 2	0.0168	0.0017	<.0001
TIME quarter 3	-0.0167	0.0017	<.0001
Year 90	-0.0441	0.0047	<.0001
Year 91	-0.0370	0.0048	<.0001
Year 92	-0.0346	0.0046	<.0001
Year 93	-0.0182	0.0043	<.0001
Year 94	0.0038	0.0041	0.3575
Year 95	0.0203	0.0042	<.0001
Year 96	0.0428	0.0039	<.0001
Year 97	0.0687	0.0037	<.0001
Year 98	0.1117	0.0035	<.0001
Year 99	0.1648	0.0033	<.0001
Year 00	0.2390	0.0032	<.0001
Year 01	0.3125	0.0033	<.0001
Year 02	0.3882	0.0033	<.0001
Year 03	0.4753	0.0031	<.0001
Year 04	0.6040	0.0030	<.0001
Year 05	0.8754	0.0029	<.0001

Table B-3. Continued.

Variable	Estimates	Robust Standard Error	Significance
Year 06	1.0560	0.0032	<.0001
Year 07	1.0059	0.0042	<.0001
Year 08	0.5844	0.0041	<.0001
Year 09	0.2688	0.0038	<.0001
190 census tracts			
Observations	271,220		
R square	0.8273		

Table B-4. Regression results of price impacts of HCV holders by neighborhood type

Variable	Estimates	Robust Standard Error	Significance
Intercept	10.4422	0.1558	<.0001
Property Age	0.0002	0.0000	<.0001
Total Living Area	0.4369	0.0011	<.0001
Lot Size	0.0000	0.0000	<.0001
In_TREND	-0.0011	0.0003	0.001
AFTER_In_TREND	0.0000	0.0000	<.0001
INNER	-0.0167	0.0042	<.0001
AFTER_INNER	0.0302	0.0074	<.0001
AFTER_DIST	0.0000	0.0000	0.0066
AFTER_In_Small	-0.1008	0.0030	<.0001
AFTER_In_Medium	0.0154	0.0063	0.0142
AFTER_Inner_GRAV_T	-2.3260	1.4798	0.116
AFTER_Inner_MDEN	0.0000	0.0000	<.0001
AFTER_Inner_NMH	0.0000	0.0000	0.3808
AFTER_Inner_ADEN	0.0001	0.0000	<.0001
AFTER_Inner_NAH	0.0001	0.0000	0.0001
AFTER_Inner_30DEN	-0.0024	0.0001	<.0001
AFTER_Inner_50DEN	-0.0018	0.0001	<.0001
AFTER_Inner_AH_tot	-0.0001	0.0000	0.0062
AFTER_Inner_MH_tot	-0.0001	0.0000	<.0001
BEFORE_Revitalizing	-0.0245	0.0052	<.0001
BEFORE_Economically-Distress	-0.0094	0.0048	0.05
BEFORE_Mddle-Declining	-0.0031	0.0042	0.4611
AFTER_Revitalizing	-0.0350	0.0077	<.0001
AFTER_Economically-Distress	-0.1061	0.0076	<.0001
AFTER_Mddle-Declining	-0.0160	0.0073	0.0295
Housing Density in 1990	0.0000	0.0000	<.0001
Poverty Rate in 1990	-0.0234	0.0171	0.1703
X coordinate	-0.3919	0.2824	0.1651

Table B-4. Continued.

Variable	Estimates	Robust Standard Error	Significance
Y coordinate	0.5746	0.2686	0.0324
TIME quarter 1	-0.0262	0.0017	<.0001
TIME quarter 2	0.0164	0.0017	<.0001
TIME quarter 3	-0.0171	0.0017	<.0001
Year 90	-0.0433	0.0049	<.0001
Year 91	-0.0343	0.0050	<.0001
Year 92	-0.0326	0.0048	<.0001
Year 93	-0.0166	0.0045	0.0002
Year 94	0.0041	0.0043	0.3381
Year 95	0.0207	0.0043	<.0001
Year 96	0.0424	0.0040	<.0001
Year 97	0.0682	0.0038	<.0001
Year 98	0.1111	0.0035	<.0001
Year 99	0.1639	0.0033	<.0001
Year 00	0.2375	0.0032	<.0001
Year 01	0.3113	0.0033	<.0001
Year 02	0.3868	0.0033	<.0001
Year 03	0.4739	0.0031	<.0001
Year 04	0.6020	0.0030	<.0001
Year 05	0.8728	0.0029	<.0001
Year 06	1.0524	0.0032	<.0001
Year 07	1.0021	0.0042	<.0001
Year 08	0.5802	0.0041	<.0001
Year 09	0.2646	0.0038	<.0001
190 census tracts			
Observations	271,220		
R square	0.8275		

APPENDIX C
THE REGRESSION RESULTS OF PRICE IMPACTS OF HCV HODLERS IN LIHTC
PROJECTS

Table C-1. Baseline regression results of price impacts of HCV holders in LIHTC projects

Variable	Estimates	Robust Standard Error	Significance
Intercept	10.4716	0.1561	<.0001
Property Age	0.0002	0.0000	<.0001
Total Living Area	0.4374	0.0011	<.0001
Lot Size	0.0000	0.0000	<.0001
In_TREND	-0.0013	0.0002	<.0001
AFTER_In_TREND	0.0000	0.0000	<.0001
INNER	-0.0210	0.0029	<.0001
AFTER_INNER	0.0001	0.0000	<.0001
AFTER_DIST	-0.0138	0.0026	<.0001
AFTER_In_Small	-0.0928	0.0029	<.0001
AFTER_In_Medium	-0.0017	0.0061	0.7815
AFTER_Inner_GRAV_T	-2.0147	1.4833	0.1744
AFTER_Inner_MDEN	0.0000	0.0000	0.0238
AFTER_Inner_NMH	0.0000	0.0000	0.2925
AFTER_Inner_ADEN	0.0001	0.0000	<.0001
AFTER_Inner_NAH	0.0001	0.0000	0.0006
AFTER_Inner_30DEN	-0.0004	0.0001	<.0001
AFTER_Inner_50DEN	-0.0003	0.0000	<.0001
AFTER_Inner_AH_tot	-0.0001	0.0000	0.0062
AFTER_Inner_MH_tot	-0.0001	0.0000	0.0016
v_inTC	0.0805	0.0023	<.0001
Housing Density in 1990	0.0000	0.0000	<.0001
Poverty Rate in 1990	-0.0483	0.0170	0.0045
X coordinate	-0.5544	0.2825	0.0497
Y coordinate	0.7093	0.2687	0.0083
TIME quarter 1	-0.0261	0.0017	<.0001
TIME quarter 2	0.0167	0.0017	<.0001
TIME quarter 3	-0.0171	0.0017	<.0001
Year 90	-0.0253	0.0045	<.0001
Year 91	-0.0186	0.0047	<.0001
Year 92	-0.0163	0.0045	0.0003
Year 93	-0.0002	0.0042	0.9561
Year 94	0.0206	0.0040	<.0001
Year 95	0.0370	0.0041	<.0001
Year 96	0.0586	0.0039	<.0001
Year 97	0.0846	0.0037	<.0001

Table C-1. Continued.

Variable	Estimates	Robust Standard Error	Significance
Year 98	0.1267	0.0035	<.0001
Year 99	0.1802	0.0033	<.0001
Year 00	0.2546	0.0032	<.0001
Year 01	0.3249	0.0033	<.0001
Year 02	0.4008	0.0033	<.0001
Year 03	0.4880	0.0031	<.0001
Year 04	0.6175	0.0030	<.0001
Year 05	0.8886	0.0029	<.0001
Year 06	1.0681	0.0032	<.0001
Year 07	1.0189	0.0042	<.0001
Year 08	0.5968	0.0041	<.0001
Year 09	0.2803	0.0038	<.0001
190 census tracts			
Observation	271,262		
R square	0.8264		

Table C-2. Regression Results of Price Impacts of HCV holders in LIHTC projects by Income Group

Variable	Estimates	Robust Standard Error	Significance
Intercept	10.4014	0.1651	<.0001
Property Age	0.0002	0.0000	<.0001
Total Living Area	0.4352	0.0011	<.0001
Lot Size	0.0000	0.0000	<.0001
In_TREND	-0.0015	0.0003	<.0001
AFTER_In_TREND	0.0000	0.0000	<.0001
INNER	-0.0391	0.0030	<.0001
AFTER_INNER	-0.0118	0.0028	<.0001
AFTER_DIST	0.0000	0.0000	0.0005
AFTER_In_Small	-0.0670	0.0030	<.0001
AFTER_In_Medium	0.0192	0.0062	0.0019
AFTER_Inner_GRAV_T	-2.2543	1.4787	0.1274
AFTER_Inner_MDEN	0.0000	0.0000	0.0028
AFTER_Inner_NMH	0.0000	0.0000	0.3245
AFTER_Inner_ADEN	0.0002	0.0000	<.0001
AFTER_Inner_NAH	0.0001	0.0000	0.0022
AFTER_Inner_30DEN	-0.0003	0.0001	<.0001
AFTER_Inner_50DEN	-0.0003	0.0000	<.0001
AFTER_Inner_AH_tot	-0.0001	0.0000	0.016
AFTER_Inner_MH_tot	-0.0001	0.0000	0.0015
v_inTC	0.0767	0.0023	<.0001

Table C-2. Continued.

Variable	Estimates	Robust Standard Error	Significance
BEFORE_Inner_30LIN	0.2273	0.0611	0.0002
BEFORE_Inner_50LIN	-0.1574	0.0141	<.0001
BEFORE_Inner_80LIN	-0.0864	0.0064	<.0001
AFTER_Inner_30LIN	-0.0137	0.0681	0.8402
AFTER_Inner_50LIN	-0.3084	0.0096	<.0001
AFTER_Inner_80LIN	-0.1716	0.0044	<.0001
Housing Density in 1990	0.0000	0.0000	<.0001
Poverty Rate in 1990	0.0551	0.0171	0.0013
X coordinate	-0.0288	0.2818	0.9187
Y coordinate	0.2067	0.2680	0.4404
TIME quarter 1	-0.0249	0.0017	<.0001
TIME quarter 2	0.0166	0.0017	<.0001
TIME quarter 3	-0.0169	0.0017	<.0001
Year 90	-0.0279	0.0046	<.0001
Year 91	-0.0223	0.0048	<.0001
Year 92	-0.0188	0.0046	<.0001
Year 93	-0.0026	0.0043	0.5362
Year 94	0.0188	0.0041	<.0001
Year 95	0.0344	0.0042	<.0001
Year 96	0.0569	0.0039	<.0001
Year 97	0.0813	0.0037	<.0001
Year 98	0.1252	0.0035	<.0001
Year 99	0.1787	0.0033	<.0001
Year 00	0.2529	0.0032	<.0001
Year 01	0.3247	0.0033	<.0001
Year 02	0.3999	0.0033	<.0001
Year 03	0.4870	0.0031	<.0001
Year 04	0.6169	0.0030	<.0001
Year 05	0.8886	0.0029	<.0001
Year 06	1.0679	0.0032	<.0001
Year 07	1.0182	0.0042	<.0001
Year 08	0.5959	0.0041	<.0001
Year 09	0.2797	0.0038	<.0001
190 census tracts			
Observation	271,262		
R square	0.8277		

Table C-3. Regression results of price impacts of HCV holders in LIHTC projects by poverty status

Variable	Estimates	Robust Standard Error	Significance
Intercept	10.4618	0.1559	<.0001
Property Age	0.0002	0.0000	<.0001
Total Living Area	0.4378	0.0011	<.0001
Lot Size	0.0000	0.0000	<.0001
In_TREND	-0.0019	0.0003	<.0001
AFTER_In_TREND	0.0000	0.0000	<.0001
INNER	-0.0265	0.0031	<.0001
AFTER_INNER	-0.0030	0.0030	0.3297
AFTER_DIST	0.0000	0.0000	<.0001
AFTER_In_Small	-0.0934	0.0029	<.0001
AFTER_In_Medium	0.0018	0.0062	0.766
AFTER_Inner_GRAV_T	-2.2492	1.4822	0.1292
AFTER_Inner_MDEN	0.0000	0.0000	<.0001
AFTER_Inner_NMH	0.0000	0.0000	0.6056
AFTER_Inner_ADEN	0.0001	0.0000	<.0001
AFTER_Inner_NAH	0.0001	0.0000	0.0012
AFTER_Inner_30DEN	-0.0004	0.0001	<.0001
AFTER_Inner_50DEN	-0.0003	0.0000	<.0001
AFTER_Inner_AH_tot	-0.0001	0.0000	0.0307
AFTER_Inner_MH_tot	-0.0001	0.0000	<.0001
AFTER_inTC	0.0795	0.0023	<.0001
BEFORE_MiddlePOOR	0.0078	0.0033	0.0186
BEFORE_HighPOOR	-0.2274	0.0203	<.0001
AFTER_MiddlePOOR	-0.0333	0.0029	<.0001
AFTER_HighPOOR	-0.3035	0.0129	<.0001
Housing Density in 1990	0.0000	0.0000	<.0001
Poverty Rate in 1990	0.1504	0.0201	<.0001
X coordinate	-0.5357	0.2822	0.0577
Y coordinate	0.7087	0.2683	0.0083
TIME quarter 1	-0.0258	0.0017	<.0001
TIME quarter 2	0.0170	0.0017	<.0001
TIME quarter 3	-0.0171	0.0017	<.0001
Year 90	-0.0343	0.0047	<.0001
Year 91	-0.0270	0.0048	<.0001
Year 92	-0.0244	0.0046	<.0001
Year 93	-0.0079	0.0043	0.0674
Year 94	0.0139	0.0041	0.0008
Year 95	0.0308	0.0042	<.0001
Year 96	0.0531	0.0039	<.0001
Year 97	0.0792	0.0037	<.0001

Table C-3. Continued.

Variable	Estimates	Robust Standard Error	Significance
Year 98	0.1222	0.0035	<.0001
Year 99	0.1757	0.0033	<.0001
Year 00	0.2502	0.0032	<.0001
Year 01	0.3224	0.0033	<.0001
Year 02	0.3982	0.0033	<.0001
Year 03	0.4853	0.0031	<.0001
Year 04	0.6148	0.0030	<.0001
Year 05	0.8865	0.0029	<.0001
Year 06	1.0666	0.0032	<.0001
Year 07	1.0171	0.0042	<.0001
Year 08	0.5954	0.0041	<.0001
Year 09	0.2784	0.0038	<.0001
190 census tracts			
Observation	271,262		
R square	0.8269		

Table C-4. Regression results of price Impacts of HCV holders in LIHTC projects by neighborhood type

Variable	Estimates	Robust Standard Error	Significance
Intercept	10.4501	0.1559	<.0001
Property Age	0.0002	0.0000	<.0001
Total Living Area	0.4379	0.0011	<.0001
Lot Size	0.0000	0.0000	<.0001
In_TREND	-0.0012	0.0003	0.0004
AFTER_In_TREND	0.0000	0.0000	<.0001
INNER	-0.0276	0.0042	<.0001
AFTER_INNER	0.0166	0.0075	0.0257
AFTER_DIST	0.0000	0.0000	0.0004
AFTER_In_Small	-0.0918	0.0030	<.0001
AFTER_In_Medium	0.0223	0.0063	0.0004
AFTER_Inner_GRAV_T	-2.1249	1.4814	0.1515
AFTER_Inner_MDEN	0.0000	0.0000	<.0001
AFTER_Inner_NMH	0.0000	0.0000	0.9526
AFTER_Inner_ADEN	0.0001	0.0000	<.0001
AFTER_Inner_NAH	0.0001	0.0000	<.0001
AFTER_Inner_30DEN	-0.0004	0.0001	<.0001
AFTER_Inner_50DEN	-0.0003	0.0000	<.0001
AFTER_Inner_AH_tot	-0.0001	0.0000	0.0027
AFTER_Inner_MH_tot	-0.0001	0.0000	<.0001
AFTER_inTC	0.0831	0.0023	<.0001

Table C-4. Continued.

Variable	Estimates	Robust Standard Error	Significance
BEFORE_Revitalizing	-0.0242	0.0052	<.0001
BEFORE_Economically-Distress	-0.0081	0.0048	0.0904
BEFORE_Mddle-Declining	0.0010	0.0042	0.812
AFTER_Revitalizing	-0.0286	0.0077	0.0002
AFTER_Economically-Distress	-0.1065	0.0076	<.0001
AFTER_Mddle-Declining	-0.0133	0.0073	0.0695
Housing Density in 1990	0.0000	0.0000	<.0001
Poverty Rate in 1990	-0.0259	0.0171	0.129
X coordinate	-0.2586	0.2827	0.3603
Y coordinate	0.4392	0.2689	0.1024
TIME quarter 1	-0.0258	0.0017	<.0001
TIME quarter 2	0.0166	0.0017	<.0001
TIME quarter 3	-0.0175	0.0017	<.0001
Year 90	-0.0344	0.0050	<.0001
Year 91	-0.0253	0.0050	<.0001
Year 92	-0.0233	0.0048	<.0001
Year 93	-0.0071	0.0045	0.1135
Year 94	0.0134	0.0043	0.0016
Year 95	0.0305	0.0043	<.0001
Year 96	0.0521	0.0040	<.0001
Year 97	0.0782	0.0038	<.0001
Year 98	0.1212	0.0035	<.0001
Year 99	0.1746	0.0033	<.0001
Year 00	0.2483	0.0033	<.0001
Year 01	0.3210	0.0034	<.0001
Year 02	0.3966	0.0033	<.0001
Year 03	0.4839	0.0031	<.0001
Year 04	0.6128	0.0030	<.0001
Year 05	0.8838	0.0029	<.0001
Year 06	1.0630	0.0032	<.0001
Year 07	1.0134	0.0042	<.0001
Year 08	0.5912	0.0041	<.0001
Year 09	0.2742	0.0038	<.0001
190 census tracts			
Observation	271,262		
R square	0.8277		

LIST OF REFERENCES

- Abt Associates, Inc., (2006). *Are states using the low income housing tax credit to enable families with children to live in low poverty and racially integrated neighborhoods?* Cambridge, MA: Report Prepared for the Poverty and Race Research Action Council and the National Fair Housing Alliance.
- Anselin, Luc. (1988). *Spatial econometrics: Methods and models*. Dordrecht: Kluwer Academic Publishers.
- Aurand, A. (2007). The Impact of Regional Government Structure on the Concentration and Supply of Affordable Housing. *Housing Policy Debate*, 18(2), 393–430.
- Babb, C.E., Pol, L.G. and Guy, R.F. (1984). The impact of federally assisted housing on single-family housing sales: 1970-1980. *Mid-South Business Journal*, 4(July), 13-17.
- Banfield, E. (1974). *The Unheavenly City Revisited*. Little Brown, New York.
- Bair, E., and Fitzgerald, J. M. (2005). Hedonic Estimation and Policy Significance of the Impact of HOPE VI on Neighborhood Property Values. *Review of Policy Research*, 22(6), 771-786.
- Basolo, V. (2000). City Spending on Economic Development Versus Affordable Housing: Does Inter-city Competition or Local Politics Drive Decisions? *Journal of Urban Affairs*, 22(3), 317–332.
- Baum-Snow, N, and Marion, J. (2009). The effects of low income housing tax credit developments on neighborhoods. *Journal of Public Economics*, 93(5-6), 654-66.
- Blanco, A. G., Chung, H., Kim, J., Ray, A. O'dell, W. J., and Stewart, C. (2011). *Leaving The Assisted Housing Inventory: Property, Neighborhood, and Regional Determinants*, A paper presented at the 52nd Annual Conference of the Association of Collegiate Schools of Planning (ACSP), Salt Lake, UT, October 13-16.
- Bratt, R. G., Vidal, A. C., Schwartz, A., Keyes, L. C., and Stockard, J. (1998). The status of nonprofit-owned affordable housing, *Journal of Planning Association*, 64, 39-51.
- Briggs, X. D. (2005). Politics and Policy: Changing the Geography of Opportunity. In X. D. Briggs (Ed.), *The Geography of Opportunity: Race and Housing Choice in Metropolitan America* (pp. 310-341). Washington, DC: The Brookings Institution.
- Briggs, X. D. S., Darden, J. T., and Aidala, A. (1999). In the Wake of Desegregation: Early Impacts of Scattered-Site Public Housing on Neighborhoods in Yonkers, New York. *Journal of the American Planning Association*, 65(1), 27-49.

- Brooks, F., Lewinson, T., Aszman, J., and Wolk, J. (2012). Voucher Users and Revitalized Public-Housing Residents 6 Years After Displacement. *Research on Social Work Practice*, 22(1), 10-19.
- Buron, L., Popkin, S., Levy, D., Harris, L., and Khadduri, J. (2002). *The HOPE VI resident tracking study: A snapshot of the current living situation of original residents from eight sites*. Washington, DC: The Urban Institute.
- Can, A. (1992). Specification and estimation of hedonic housing price models. *Regional Science and Urban Economics*, 22, 453-74.
- Carter, William H., Michael H. Schill, and Susan M. Wachter. (1998). Polarization, public housing, and racial minorities in U.S. cities. *Urban Studies*, 35(10), 1,889-1,911.
- Carmon, N. (1999). Neighborhood Regeneration: The State of the Art. *Journal of Planning Education and Research*, 17, 131-144.
- Casetti, E. (1972). Generating models by the expansion method: Applications to geographical research. *Geographical Analysis*, 4, 81-91.
- Churchman, A. (1999). Disentangling the Concept of Density. *Journal of Planning Literature*, 13(4), 389-411.
- City of Orlando (2009a). Housing Element, Supporting Document. Retrieved from <http://www.cityoforlando.net/planning/cityplanning/Policy%20Document/GMP%2009/Support%20Documents/04%20-%20Housing%20Support%206-8-09.pdf>
- City of Orlando (2009b). PATHWAYS FOR PARRAMORE: Pocket Guide to Parramore Planning. Retrieved from <http://www.cityoforlando.net/elected/venues/tigerii/appendixc/PathwaystoParramore.pdf>
- City of Orlando (2012). The Growth Management Plan. Retrieved from <http://www.cityoforlando.net/planning/cityplanning/GMP.htm>
- City of Orlando (n.d.a). Pathway for Housing. Retrieved from <http://www.cityoforlando.net/elected/parramore/housing.htm>
- City of Orlando (1994). Affordable Housing Ordinance. Orlando, FL: City of Orlando. Retrieved October 12, 2013 from http://library.municode.com/HTML/13349/level3/TITIICICO_CH67AFHO_PT6AL_DESTLOVELOINHOPR.html#TOPTITLE
- Clampet-Lundquist, S. and Massey, D. (2008). Neighborhood effects on economic self-sufficiency: A reconsideration of the Moving To Opportunity experiment., *American Journal of Sociology*, 114(1), 107-143.
- Cotterman, R. F. (2001). *Neighborhood effects in mortgage default risk. Prepared for the Office of Policy Development and Research*. Washington, DC: U.S. Department of Housing and Urban Development.

- Coulson, N. E., and Bond, E. W. (1990). A hedonic approach to residential succession. *Review of Economics and Statistics*, 72(3), 433-44.
- Crowley, S. (2009). HOPE VI: What went wrong. In H. Cisneros and L. Engdahl (Eds.), *Despair to hope: HOPE VI and the new promise of public housing in America's cities* (pp. 229-248). Washington, DC: Brookings Institution.
- Cummings, J. L. and DiPasquale, D. (1999). The Low-Income Housing Tax Credit: An Analysis of the First Ten Years. *Housing Policy Debate*, 10(2), 251-307.
- Cummings, J. L., DiPasquale, D., and Kahn, M. E. (2002). Measuring the Consequences of Promoting Inner City Homeownership. *Journal of Housing Economics*, 11, 330-359.
- Cummings, P. M., and Landis, J. D. (1993). Relationships Between Affordable Housing Developments and Neighboring Property Values. Institute of Urban and Regional Development: University of California at Berkeley
- Dawkins, C. J. (2004). Measuring the Spatial Pattern of Residential Segregation. *Urban Studies*, 41(4), 833 – 851.
- Dawkins, C. J. (2011). *Exploring the Spatial Distribution of Low Income Housing Tax Credit Properties*, Office of Policy Development and Research, HUD, February 2011.
- Deng, L. (2007). Comparing the Effects of Housing Vouchers and Low-Income Housing Tax Credits on Neighborhood Integration and School Quality, *Journal of Planning Education and Research*, 27, 20-35.
- Deng, L. (2011a). Low-income housing tax credit developments and neighborhood change: A case study of Miami-Dade County. *Housing Studies*, 26(6), 867-95.
- Deng, L. (2011b). The External Neighborhood Effects of Low-Income Housing Tax Credit Projects Built by Three Sectors. *Journal of Urban Affairs*, 33(3), 143-66.
- Deng L. and Freeman, L. (2011). Planning for Evaluation: Using Regression Discontinuity to Evaluate Targeted Place-Based Programs *Journal of Planning Education and Research*, 31(3), 308-318.
- DeSalvo, J. S. (1974). Neighborhood Upgrading Effects of Middle-Income Housing Projects in New York City. *Journal of Urban Economics*, 1(3), 269-277.
- Desai, M.A., Dharmapala, D., and Singhal, M. (2008). *Tax Incentives for Affordable Housing: The Low Income Housing Tax Credit*. National Bureau of Economic Research (NBER): Working Paper 14149.
- Devine, D. J., Gray, R. W., Rubin, L., and Tahiti, L. B. (2003). *Housing Choice Voucher Location Patterns: Implications for Participant and Neighborhood Welfare*. Washington, DC: Office of Policy Development and Research, U.S. Department of Housing and Urban Development.

- Ding, C., Simons, R., and Baku, E. (2000). The effect of residential investment on nearby property values: Evidence from Cleveland, Ohio. *Journal of Real Estate Research*, 19(1/2), 23–48.
- Downs, A. (1981). *Neighborhoods and urban development*. Washington, DC: Brookings Institution Press.
- Edmiston, K.D. (2011). Low Income Housing Tax Credit Developments and Neighborhood Property Conditions. Kansas City: Federal Reserve Bank of Kansas City Economic Research Department (FRBKC). 2011, December: RWP 11–10.
- Ellen, I. G. and O'Regan, K. M. (2011) How low income neighborhoods change: Entry, exit, and enhancement. *Regional Science and Urban Economics*, 41, 89-97.
- Ellen, I.G. & Turner, M.A. (1997) Does Neighborhood Matter? Assessing Recent Evidence. *Housing Policy Debate* 8, 833-866.
- Ellen, I. G., O'Regan, K., and Voicu, I. (2009). *Siting, Segregation, and Spillovers: A Re-examination of the Low Income Housing Tax Credit Program In Housing Markets and the Economy: Risk, Regulation, Policy: Essays in Honor of Karl Case*. Glaeser and Quigley (Ed.) Cambridge, MA: Lincoln Institute for Land Policy.
- Ellen, I. G., Schwartz, A. E., Voicu, I., and Schill, M. H. (2007). Does federally subsidized rental housing depress neighborhood property values? *Journal of Policy Analysis and Management*, 26(2), 257-280.
- Finkel, M., Hanson, C., Hilton, R., Lam, K., and Vandawalker, M. (2006). Multifamily properties: Opting in, opting out and remaining affordable. Washington, DC: Office of Policy Development and Research, U.S. Department of Housing and Urban Development.
- Fik, T. J., Ling, D. C. and Mulligan, G. F. (2003). Modeling Spatial Variation in Housing Prices: A Variable Interaction Approach. *Real Estate Economics*. 31(4), 623-646.
- Freeman, L., and Botein, H. (2002). Subsidized Housing and Neighborhood Impacts: A Theoretical Discussion and Review of the Evidence. *Journal of Planning Literature*, 16(3), 359-378.
- Freeman, L. (2004). *Siting Affordable Housing: Location and Neighborhood Trends of Low Income Housing Tax Credit Developments in the 1990s*. Center on Urban and Metropolitan Policy. Brookings Institution, Census 2000 Survey Series, March 2004.
- Freeman, L. (2006). Comment on Kirk McClure's The Low-Income Housing Tax Credit goes mainstream and moves to the suburbs. *Housing Policy Debate*, 17(3), 447-460.

- Frieden, B. J. and Kaplan, M. (1975). *The Politics of Neglect: Urban Aid from Model Cities to Revenue Sharing*, Cambridge, Massachusetts: MIT press.
- Funderburg, R, and MacDonald, H. (2010). Neighbourhood Valuation Effects from New Construction of Low Income Housing Tax Credit projects in Iowa: A Natural Experiment. *Urban Studies*. 47(8),1745–71.
- Galster, G. C. (2001). On the Nature of Neighborhood. *Urban Studies*, 38(12), 2,111-2,124.
- Galster, G. C. (2004). The effects of affordable housing and multifamily housing on market values of nearby homes. In *Growth management and affordable housing: Do they conflict?* Anthony Downs (ed.), 176–211. Washington, DC: Brookings Institution Press.
- Galster, G. C., and Booza, J. C. (2007). The Rise of the Bipolar Neighborhood. *Journal of the American Planning Association*, 73(4), 421-435.
- Galster, G. C., and Mincy, R. (1993). Understanding the changing fortunes of metropolitan neighborhoods. *Housing Policy Debate*, 4(3), 303-352.
- Galster, G. C., Booza, J. C. and Custinger, J. M. (2008). Income Diversity Within Neighborhoods and Very Low-Income Families. *Cityscape: A Journal of Policy Development and Research*, 10(2), 257-300.
- Galster, G. C., Cutsinger, J. and Lim, U. (2007). Are neighborhoods self-stabilizing? Exploring endogenous dynamics. *Urban Studies*, 44(1), 167-185.
- Galster, G. C., Mincy, R. and Mitchell, S. T. (1997). The disparate racial neighborhood impacts of metropolitan economic restructuring. *Urban Affairs Review*, 32(6), 797-824.
- Galster, G. C., Quercia, R. G. and Cortes, A. (2000). Identifying Neighborhood Thresholds: An Empirical Exploration. *Housing Policy Debate*, 11(3), 701-732.
- Galster, G., Tatian, P., and Accordino, J. (2006). Target investments for neighborhood revitalization. *Journal of the American Planning Association*, 72(4), 457–474.
- Galster, G., Tatian, P., and Smith, R. (1999). The impact of neighbors who use section 8 certificates on property value. *Housing Policy Debate*, 10(4), 879–917.
- Galster, G., Tatian, P., and Pettit, K. (2004). Supportive Housing and Neighborhood Property Value Externalities. *Land Economics*, 80(1), 33-54.
- Galster, G., Tatian, P., Santiago, A., Pettit, K., and Smith, R. (2003). *Why not in my backyard? Neighborhood impacts of deconcentrating assisted housing*. New Brunswick, NJ: Center for Urban Policy Research.

- Galster, G., Tatian, P., Santiago, A., Pettit, K., and Smith, R. (2003). *Why not in my backyard? Neighborhood impacts of deconcentrating assisted housing*. New Brunswick, NJ: Center for Urban Policy Research.
- Galster, G., Tatian, P., and Accordino, J. (2006). Target investments for neighborhood revitalization. *Journal of the American Planning Association*, 72(4), 457–474.
- Galster, G. C., Booza, J. C. and Cutsinger, J. M. (2008). Income Diversity Within Neighborhoods and Very Low-Income Families. Sociology Faculty Research Publications. Paper, 1. Retrieved from <http://digitalcommons.wayne.edu/socfrp/1/>
- Goering, J., Kraft, J, Feins, J. D. McInnis, D, Holin, M. J., and Elhassan, H. (1999). *Moving to Opportunity for Fair Housing demonstration program*. Washington, DC: U.S. Department of Housing and Urban Development.
- Goetz, E. G. (2004). *Clearing the way: Deconcentrating the poor in urban America*. Washington, DC: Urban Institute.
- Goetz, E. G., Lam, H. K., and Heitlinger, A. (1996). *There goes the neighborhood? The impacts of subsidized multifamily housing on urban neighborhoods*. Minneapolis, MN: Center for Urban and Regional Affairs.
- Goetze, R. and Colton, K. W. (1980). The Dynamics of Neighborhoods: A Fresh Approach to Understanding Housing and Neighborhood Change. *Journal of the American Planning Association*, 46(2), 184-194.
- Green, R. K., Malpezzi, S., and Seah, K.-Y. (2002). *Low Income Housing Tax Credit Housing Developments and Property Values* (pp. 1-33): The Center for Urban Land Economics Research, University of Wisconsin–Madison.
- Grigsby, W., Baratz, M., Galster, G. and Maclennan, D. (1987). *The Dynamics of Neighbourhood Change and Decline*. Oxford: Pergamon.
- Grigsby, W. G., and Steven C. Bourassa. (2004). Section 8: The time for fundamental program change? *Housing Policy Debate*, 15(4), 805–834.
- Guest, A. M. (1974). Neighborhood life cycles and social status. *Economic Geography* 50(3), 228-243.
- Guy, D. C., Hysom, J. L., and Ruth, S. R. (1985). The Effect of Subsidized Housing on Values of Adjacent Housing. *Journal of the American Real Estate and Urban Economics Association*, 13(4), 378-387.
- Hartung, J. M., and Henig, J. (1997). Housing Vouchers and Certificates as a Vehicle for Deconcentrating the Poor: Evidence from the Washington, D.C., Metropolitan Area. *Urban Affairs Review* 32(3), 403–419.
- Horn, K.M., and O'Regan, K.M. (2011). The Low Income Housing Tax Credit and Racial Segregation. *Housing Policy Debate*, 21(3), 443-473.

- Immergluck, D. and Smith, G. (2005). "There Goes the Neighborhood: The Effect of Single-Family Mortgage Foreclosures on Property Values. Woodstock Institute. June 2005. Obtained from http://ftp.nw.org/network/neighborworksprogs/foreclosuresolutions/reports/documents/TGTN_Report.pdf on April 27, 2012.
- Jargowsky, P. A. (1996). *Poverty and Place*. Russell Sage Foundation, NY.
- Johnson, M. P., Ladd, H. F. and Ludwig, J. (2002). The benefits and costs of residential mobility programmes for the poor. *Housing Studies*, 17(1), 125-138.
- Katz, B., Turner, M. A. Brown, K. D., Cunningham, M., Sawyer, N. (2003). *Rethinking local affordable housing strategies: lessons from 70 years of policy and practice*. The Brookings Institution Center on Urban and Metropolitan Policy and The Urban Institute, December 2003.
- Keating, W. D. (1990). The emergence of community development corporations. *Shelterforce*, 5 (47), 8–11.
- Keating, W. D., and Smith, J. (1996). *Past federal policy for urban neighborhoods*. In *Revitalizing urban neighborhoods*, W. Dennis Keating, Norman Krumholz, and Philip Star, (eds.) Lawrence: University of Kansas Press.
- Kingsley, T. G., Johnson J., and Pettit , K. L. S. (2003). Patterns of Section 8 Relocation in the HOPE VI Program. *Journal of Urban Affairs*, 25(4), 427–447.
- Koschinsky, J. (2009). Spatial heterogeneity in spillover effects of assisted and unassisted rental housing. *Journal of Urban Affairs*, 31(3), 319–348.
- Krivo, L. J., Peterson, R. D., Rizzo, H. and Reynolds, J. R. (1998). Race, segregation, and the concentration of disadvantage: 1980-1990. *Social Problems*, 45(1), 61-80.
- Landis, J. D., and McClure, K. M. (2010). Rethinking Federal Housing Policy. *Journal of American Planning Association*, 76(3), 319-348.
- Larsen, K. (2005). New urbanism's role in inner-city neighborhood revitalization. *Housing Studies*, 20(5), 795-813.
- Lauria, M. (1998). A new model of neighborhood change: Reconsidering the role of white flight. *Housing Policy Debate* 9(2), 395-424.
- Lee, C., Culhane, D. P., and Wachter, S. M. (1999). The differential impacts of federally assisted housing programs on nearby property values: A Philadelphia case study. *Housing Policy Debate*, 10(1), 75–93.
- Lees, L. (2008). Gentrification and Social Mixing: Towards an Inclusive Urban Renaissance?. *Urban Studies*, 45(12), 2,449-2,470.
- LeSage, J., and Pace, R. K. (2009). *Introduction to Spatial Econometrics*. Boca Raton, FL: Taylor and Francis Group.

- Levy, J. M. (2012). *Contemporary Urban Planning*, (10th Ed.). Upper Saddle River, NJ: Prentice Hall Press.
- Leviner, S. (2004). Affordable Housing and the Role of the Low Income Housing Tax Credit Program: A contemporary assessment. *Tax Lawyer*, 57(4), 869-904.
- Listokin, D. (Ed.) (1983). *Housing Rehabilitation: Economic, Social and Policy Perspectives*. Rutgers, The State University of New Jersey, New Brunswick, NJ.
- Lyons, R. F., and Loveridge, S. (1993). *A Hedonic Estimation of the Effect of Federally Subsidized Housing on Nearby Residential Property Values* (No. P93-6). St. Paul: Department of Agricultural and Applied Economics, University of Minnesota.
- Malpezzi, S., and Vandell, K. (2002). Does the Low Income Housing Tax Credit increase the supply of housing? *Journal of Housing Economics*, 11, 360-380.
- MaRous M. S. (1996). Low-income housing in our backyards: What happens to residential property values? *The Appraisal Journal*, 64(January), 27-33.
- Massey, D. S., and Denton, N. A. (1993). *American Apartheid: Segregation and the Making of the Underclass*. Cambridge: Harvard University Press.
- McClure, K. (2006). The Low-Income Housing Tax Credit Program Goes Mainstream and Moves to the Suburbs. *Housing policy Debate*, 17(3), 419–46.
- Melendez, E., Schwartz, A. and Montrichard, A. D. (2008) Year 15 and preservation of tax-credit housing for low-income households: An assessment of risk. *Housing Studies*, 23(1), 67-87.
- Newman, S. J., and Schnare, A. B. (1997). "...And a suitable living environment": The failure of housing programs to deliver on neighborhood quality. *Housing Policy Debate*, 8, 703-741.
- Nguyen, M. T. (2005). Does Affordable Housing Detrimentially Affect Property Values? A Review of the Literature. *Journal of Planning Literature*, 20(1), 15-26.
- Nourse, H. O. (1963). The Effect of Public Housing on Property Values in St. Louise. *Land Economics*, 39(4), 433-441.
- Nye, N., and Glickman, N. J. (2000). Working together: Building Capacity for Community Development. *Housing Policy Debate*, 11, 1-6.
- Obrinsky, M. and Stein, D. (2007). *Overcoming Opposition to Multifamily Rental Housing*. Prepared for Revisiting Rental Housing: A National Policy Summit, Joint Center for Housing Studies in Harvard University.

- Orange County (2011). Orange County, Florida Comprehensive Plan 2010-2030: Goals, Objectives and Policies. Orlando, FL: author. Retrieved from <http://www.ocfl.net/Portals/0/resource%20library/planning%20-%20development/Comprehensive%20Plan%202010%20-%202030%20Goals,%20Objectives,%20Policies.pdf>
- Orange County Property Appraiser (2013). [Photos of properties June 20, 2013] Retrieved from <http://maps.ocpafl.org/webmap/>
- Orlando Housing Authority. (2006). PHA Plans, 5 Year Plan for Fiscal Years 2005-2009, Retrieved from http://www.orl-oha.org/documents/5YP-2k5_2k9_Y2006.pdf
- Orlando Housing Authority (n.d.a). Carver Park: An Orlando Housing Authority HOPE VI Community. Retrieved from http://www.orl-oha.org/Carver_Park_Update.htm
- Orlando Housing Authority. (2013). Choice Neighborhood Planning Grant Application Exhibit A – Executive Summary Retrieved from <http://www.orl-oha.org/Choice%20Neighborhood/CNPG%20Application-ExecSummary.pdf>
- Orlando Neighborhood Improvement Corporation (2005, August). City View brings life to downtown. Retrieved from http://www.orlandoneighborhood.org/articles/CV_AFT%20_7-8%2005.pdf
- Orlebeke, C. J. (2000). The Evolution of Low-Income Housing Policy, 1949 to 1999, *Housing Policy Debate*, 11(2), 489-520.
- Pendall, R. (2000). Why Voucher and Certificate Users Live in Distressed Neighborhoods. *Housing Policy Debate*. 11(4), 881–909.
- Popkin, S. J. and Cove, E. (2007). Safety is the most important thing: How HOPE VI helped families. HOPE VI: Where do we go from here? Washington, DC: Urban Institute.
- Popkin, S., Levy, D., and Buron, L. (2009). Has HOPE VI transformed residents' lives? New evidence from the HOPE VI panel study. *Housing Studies*, 24, 477-502.
- Quercia, R. G. and Galster, G. C. (2000). Threshold Effects and Neighborhood Change. *Journal of Planning Education and Research*, 20, 146-162.
- Rabiega, W. A., Lin, T. W., and Robinson, L. M. (1984). The Property Value Impacts of Public Housing Projects in Low and Moderate Density Residential Neighborhoods. *Land Economics*, 60(2), 174-179.
- Ray, A. Nguyen, D., O'Dell, W., Roset-Zuppa, P. and White, D. (2009). The State of Florida's Assisted Rental Housing. Gainesville, FL: Retrieve from <http://flhousingdata.shimberg.ufl.edu/docs/AssistedHousingReport2009.pdf>

- Regional Planning Council. (2013). HUD Sustainable Communities Regional Planning Grant. "Transit as an Economic Catalyst" Retrieved from <http://enhancecfl.org/wp-content/uploads/2013/05/HUD-Grant-Overview-for-Affordable-Housing-Working-Group-on-Feb-26-2013-.pdf>
- Rohe, W. M. (2009). From Local to Global: One Hundred Years of Neighborhood Planning. *Journal of American Planning Association*, 75(2), 209-230.
- Rohe, W. M., and Bratt, R. G. (2003). Filures, downsizings, and mergers among community development corporations. *Housing Policy Debate*, 14, 1-46.
- Rohe, W. M., and Freeman, L. (2001). Assisted housing and residential segregation: The role of race and ethnicity in the siting of assisted housing developments. *Journal of the American Planning Association*, 67, 279-292.
- Rosenbaum, E. and Harris, L. E. (2001). Residential mobility and opportunities: Early impacts of the Moving to Opportunity demonstration program in Chicago. *Housing Policy Debate*, 12(2), 321-346.
- Ross, C. L. and Leigh, N. G. (2000). Planning, Urban Revitalization, and the Inner City: An Exploration of Structural Racism. *Journal of Planning Literature*, 14(3), 367-380.
- Rusk, D. (1993). *Cities without suburbs*. Washington, DC: The Woodrow Wilson Center Press.
- Santiago, A., Galster, G., and Tatian, P. (2001). Assessing the property value impacts of the dispersed housing subsidy program in Denver. *Journal of Policy Analysis and Management*, 20(1), 65–88.
- Schafer, R. (1972). The Effect of BMIR Housing on Property Values. *Land Economics*, 48(3), 282-286.
- Schill, M. H., Ellen, I. G., Schwartz, A. E., and Voicu, I. (2002). Revitalizing inner-city neighborhoods: New York City's ten-year plan. *Housing Policy Debate*, 13(3), 529–566.
- Schwartz, A. E., Ellen, I.G., Voicu, I., and Schill, M. H. (2006). The external effects of place-based subsidized housing. *Regional Science and Urban Economics*, 36, 679–707.
- Schwartz, A. (2010). *Housing Policy in the United States: An Introduction*. New York: Routledge.
- Schroder, M. and Reiger, A. (2000). Vouchers versus Production Revisited. *Journal of Housing Research*, 11(1), 91-107.
- Sedway and Associates. (1983). Impact of Affordable Housing on Property Values. San Rafael: Ecumenical Association for Housing.

- Shimberg Center for Housing Studies (2013). 2013 Rental Market Study: Public and Assisted Housing. Available at http://www.shimberg.ufl.edu/publications/RMS_supply_w_cov.pdf
- Temkin, K, and Rohe, W. (1996). Neighborhood change and urban policy. *Journal of Planning Education and Research*, 15(3), 159-79.
- Turner, M. A. (1998). Moving Out of Poverty: Expanding Mobility and Choice through Tenant-Based Housing Assistance. *Housing Policy Debate* 9(2), 373–94.
- Turner, M. A. (2003). *Strengths and weaknesses of the Housing Choice Voucher program*. Testimony to the Committee on Financial Services, Subcommittee on Housing and Community Opportunity, U.S. House of Representatives. June 17, 2003.
- Turner, M. A. and Ross, S. L. (2005). How racial discrimination affects the search for housing. Briggs, X. B. (Ed.), *The geography of opportunity: race and housing choice in metropolitan America*. Washington, DC: Brookings Institution.
- U.S. Department of Housing and Urban Development. (1996). Rental housing assistance at a crossroads: A report to Congress on worst case housing needs. Washington, DC: Author. Retrieved from <http://www.huduser.org/Publications/PDF/worstcse.pdf>
- U.S. Department of Housing and Urban Development. (2009). HUD National Low Income Housing Tax Credit (LIHTC) database: Projects placed in service through 2006. Cambridge, MA: Abt Associates Inc.
- Vandell, K. D. (1981). The effects of racial composition on neighborhood succession. *Urban Studies*, 18(3), 315-333.
- Warren, E., Aduddell, R., and Tatalovich, R. (1983). *The impact of subsidized housing on property values: A two-pronged analysis of Chicago and Cook County suburbs*. Chicago: Center for Urban Policy, Loyola University.
- Wallace, J. E. (1995). Financing affordable housing in the United State. *Housing Policy Debate*, 6, 785-814.
- Zielenbach, S. (2003a) Assessing economic change in HOPE VI neighborhoods, *Housing Policy Debate*, 14(4), 621–655.

BIOGRAPHICAL SKETCH

Hyung-chul Chung was born and raised in South Korea. He studied Architecture at Hongik University and received his master's degree in urban planning, development and management at Hanyang University in 2009. Prior to his graduation, he started to work as a researcher at Urban Governance and Management Research Institute to publish research documents and participate in grant writing. Upon quitting his work, Dr. Chung came over to USA to pursue Ph.D in urban and regional planning at the University of Florida in 2009 and worked as a research assistant for four years. He received his Ph.D. from the University of Florida in the fall of 2013. His research interests lie in neighborhood revitalization, housing policy, downtown planning, community development, and land use and transportation coordination. He believes that the social, and economic issues caused by housing market change and land use change are one of the major concerns in Urban Planning today and will remain until economical and equitable solutions are found. His research utilizes both qualitative and quantitative approaches.