

PUBLICLY SUPPORTED RENTAL HOUSING AND
AFFORDABILITY FOR VERY-LOW INCOME SUBURBANITES:
A STUDY OF METROPOLITAN AMERICA

by

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ABSTRACT

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This dissertation is about subsidized housing and its provision in the contemporary metropolis, with particular focus on suburbs. Subsidized housing has typically been conceived as fundamentally an urban issue given its historical roots largely centered on addressing destitute slums and inner-city poverty (Stoloff, 2004). Yet today's American metropolis is fundamentally different from that which existed one hundred, fifty, or even twenty-five years ago. Suburbs are more prominent now than ever before, both as economic centers and diverse cultural mosaics in metropolitan America (Zhang & Logan, 2017). In fact, suburbs are now home to more impoverished Americans than principal cities (Kneebone, 2017).

Research on the evolution of subsidized housing programs, the geographic and policy landscape of the suburbanizing metropolis, and components of regional cohesion inform the hypotheses of this study. Three regression models were used to evaluate these hypotheses using 107 of the largest Metropolitan Statistical Areas in the United States. The first hypothesis suggests that greater availability of publicly supported rental housing (PSRH) will be associated with lower levels of cost burden among Very Low-Income (VLI) renters, whereas the second emphasizes the importance of equitable distributions of PSRH. The third hypothesis posits that greater regional cohesion will be associated with increased availability of PSRH in metropolitan areas.

The analysis supports the first hypothesis, showing a strong relationship between higher PSRH levels and lower rates of cost burden for VLI renters in suburbs and throughout metropolitan areas. Regression analysis also supports the theoretical significance of PSRH distribution in limiting cost burden among VLI renters. The impact of regional cohesion on PSRH availability is substantiated in looking at metropolitan areas as a whole, but not within their suburbs alone.

Findings suggest the production of additional subsidized housing can help combat cost burden among VLI renters. The analysis also suggests fair share agreements and collaboration among regional entities can serve to promote the production and equitable distribution of subsidized housing within metropolitan areas. Further research might build on this dissertation through case studies focused more closely on relationships between public and private subsidized housing providers within individual metropolitan regions.

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CHAPTER 1

Introduction

Roughly four out of five American renters with incomes below 50% of Area Median Income incur cost burden (HUD, 2020b). These Very Low-Income renters have become increasingly likely to live in suburbs (Kneebone, 2017). The increased prominence of suburbs within expanding metropolitan areas is among the foremost changes manifested in suburban population growth and increased suburban diversity. At the same time, suburbs have also become more and more important within metropolitan economies, resulting in the emergence of important employment subcenters where new jobs tend to relocate (Kneebone & Berube, 2013). As a result, access to affordable suburban units is vital for Very Low-Income renters within contemporary metropolitan areas.

Despite population shifts in the suburbs with more of them concentrating poor households, the structure of the subsidized housing system intended to assist Very Low-Income renters remains geared overwhelmingly toward central cities, while housing subsidization efforts have increasingly been devolved to local governments, with little oversight or interjurisdictional cooperation to speak of. As a result, jurisdictions are largely isolated in their housing policy implementation (J. Hanlon, 2008), which could prove detrimental to the creation and maintenance of subsidized housing, particularly in suburbs. This dissertation is rooted in the idea that the existing publicly subsidized housing system might be ill-suited to effectively serve the housing needs of Very Low-Income renters in contemporary metropolitan areas.

Problem Statement and Research Justification

This research seeks a better understanding of the capacity of subsidized housing to benefit Very Low-Income renters in America's metropolitan areas. Examining the suitability of existing subsidized housing policy mechanisms is particularly important given the continued suburbanization of America's poverty (Frey et al, 2009). Given this suburbanization, the scope of anti-poverty efforts must extend beyond major cities to fully address equity concerns in contemporary metropolitan areas.

In their 2013 book *Confronting Poverty in Suburban America*, Elizabeth Kneebone and Alan Berube write that “the unparalleled magnitude and geographic reach of poverty in metropolitan America today call into question the basic theories that undergird the piecemeal, fragmented efforts to address the complex connections between poverty and place” (p 88). Here the authors call attention to the reality that policy implementation in the suburbanizing metropolis is complicated by today's postmodern geographic and administrative landscape, which adds an ever-increasing number of layers to governing efforts (Deslatte et al, 2017). The fact that responsibility for subsidized housing policy is dispersed across an array of largely independent entities (Sard & Thorpe, 2016) raises the question of whether the system currently employed can be expected to adequately aid Very Low-Income suburbanites.

After all, many of America's suburban jurisdictions dedicate relatively few resources to the provision of subsidized housing (Cowan, 2006). This can largely be attributed to either a lack of available revenue (in low-income suburbs) or the absence of political will (in upper-income suburbs). Beyond a fairly common widespread shortage of dedicated resources, subsidized housing policy is complicated by the fact that governing bodies do not necessarily work with one another to provide solutions for residents within the emerging labyrinth network of responsibility

in which they operate. If anything, cities are linked largely by competition to attract investment (Blokland et al, 2015). This competition is often thought to impede an emphasis on subsidized housing given the simple fact that Very Low-Income populations do not bring as much economic power as other groups (Imbroscio, 2011).

The absence of either a mandate or desire for jurisdictions to provide subsidized housing can leave a dearth of available assistance in suburbs. Existing research by Downs (1994), Covington (2015), Goetz (1995; 2000), as well as Kneebone and Berube (2013), among others, delves into this issue. However, despite the invaluable contributions by these authors and others, there has been relatively little quantitative analysis of factors pertaining to subsidized housing, its availability, and its distribution in metropolitan areas.

This dissertation seeks to fill that gap, making use of quantitative analysis to evaluate the extent to which the availability and distribution of publicly supported rental housing impact the metropolitan rate of cost burden among Very Low-Income Renters and that of suburbs within these metro areas. Further analysis explores the impact of regional cohesion on the availability of publicly supported rental housing in metropolitan regions and their suburbs. Theories explaining complications in housing subsidization amidst federal devolution, policy fragmentation, the changing metropolis, and regional coordination, are particularly foundational to this dissertation.

Dissertation Outline

Chapter 2 explores changes in subsidized housing efforts in the United States over the years. Literature regarding evolving suburban dynamics contextualizes the importance of suburbs in the contemporary metropolis. The effects of policy fragmentation and regional coordination, respectively, are elucidated in light of the perceived importance of regional cohesion to effective policy implementation.

Chapter 3 articulates the research purpose and the means of carrying out the analysis. Building on the literature review, the research questions and hypotheses are formulated in order to set the stage for the regression analysis assessing the research hypotheses, including the variables utilized in the regression models. Chapter 4 then provides geographic and social context for the sample of MSAs used within this research, offering the backdrop for the analysis. Further assessment of the MSA's sample statistics (recorded for each of the four key variables) offers additional insight into the particular characteristics of the study's MSAs. These statistics offer some preliminary indication of the urban and suburban diversity of the sample and the merits of the research hypotheses.

Chapter 5 presents the results and analysis for Models 1 and 2 assessing the two research hypotheses that focus on the impact of publicly supported rental housing's availability and distribution on cost burden. The regression analysis strongly supports the notion that higher levels of publicly supported rental housing are associated with lower levels of cost burden among Very Low-Income renters in metropolitan areas, their suburbs, and their principal cities. Regression analysis also supports the theoretical significance of publicly supported rental housing's distribution between suburbs and principal cities within MSAs. The analysis shows higher levels of cost burden for Very Low-Income renters in MSAs and their suburbs where

publicly supported rental housing is disproportionately located in principal cities relative to the population of Very Low-Income renters.

Chapter 6 presents regression results and analysis for Model 3, which tests the research hypothesis that greater regional cohesion will be associated with higher levels of publicly supported rental housing. Though the analysis of MSAs in terms of their suburban values alone does not lend support to the hypothesis, the metropolitan-wide test does show a statistically significant relationship between higher Cohesion Index values and relative levels of publicly supported rental housing. This supports the notion that pursuing greater metropolitan regional cohesion could prove beneficial in the provision of publicly supported rental housing.

Chapter 7 summarizes the contributions of the dissertation. This includes a review of quantitative analysis examined in Chapters 5 and 6. The final chapter reasserts the value of publicly supported rental housing in combating metropolitan rates of cost burden for Very Low-Income renters, both in suburbs of metropolitan areas and throughout the MSA. While the importance of publicly supported rental housing's distribution and regional cohesion are not as obvious, the analysis shows both do have an impact.

The conclusion goes on to explore policy ramifications of the research, with an emphasis on the importance of maximizing subsidized housing in pursuing improved outcomes for Very Low-Income renters. A few options that might permit greater availability of subsidized housing are put forth, including recognition of the need for greater monetary investment in subsidized housing programs. Finally, the dissertation closes with the suggestion that future research could utilize case studies to further investigate factors pertaining to publicly supported housing in suburbs and metropolitan regions.

CHAPTER 2

Literature Review

This chapter begins by exploring the evolution of subsidized housing efforts in the United States, examining the shift toward a devolution of responsibility that has increased the role of local entities, both public and private in subsidizing affordable housing. This change is examined both from a practical and geographic perspective in an attempt to scrutinize its benefits and shortcomings. The place of suburbs in the new geographic and policy landscape is emphasized in order to call attention to the potential incongruity between existing means of subsidization and the changing metropolis. Potential remedies to policy fragmentation through regional coordination are investigated in light of the perceived importance of regional cohesion to effective policy implementation.

Contemporary Housing Subsidization

The roots of publicly subsidized housing in the United States can be traced to the early 1900s, when growing recognition of deteriorating conditions within dense urban areas sparked a desire for action. This new attention toward urban environments eventually served to create the conditions that laid the foundation of contemporary subsidized housing. The most substantive piece of that foundation came to fruition with the New Deal. First there was the *Housing Act of 1934*, and, three years later, its more robust 1937 follow-up (Stoloff, 2004, p 3). These two acts created a mechanism through which housing agencies would be subsidized by government funding (United States, 1937; Hunt, 2005).

The *Housing Act of 1937* and its successors from 1949 on offered a platform for the creation of ambitious, publicly funded housing projects that have subsequently served as the face for subsidized housing in the United States. Biles (1990) argues that the United States Housing

Authority created by the 1937 Wagner-Steagall Act relegated public housing to a cost-cutting afterthought designed to warehouse poor Americans and ensure the clearance of unsightly slums. The housing projects built after the 1937 legislation played a role in urban renewal efforts that frequently decimated neighborhoods, concentrated poverty, and fell short of their goal to provide sufficient affordable housing stock for the poor (Smith, 2006, pp 25-27). Elizabeth Carter (2016) paints a picture of neglect, false promises, and ineptitude, describing how the modernist housing project exacerbated segregation, rather than doing anything to aid ailing communities.

Such glaring shortcomings contributed to housing policy's negative image and eventual overhaul within the United States (Bloom, 2014, pp 1-2). Since the 1970s there has been an effort to change the emphasis of America's affordable housing, placing the administration of newly founded voucher and regulatory programs under the Department of Housing and Urban Development, or HUD (Lee & McNamara, 2017, p 2). This coincided with the Nixon administration's moratorium on new public housing projects in 1973, which led directly to the creation of Project-Based Section 8 Rental Assistance (Gold et al, 2018, p 14) and the eventual prominence of the Housing Choice Voucher, or HCV (Vale & Freemark, 2012). The shift toward private administration of privately-owned units has since been further embedded by the creation of the Low-Income Housing Tax Credit (LIHTC), which has effectively put an end to federal financing of public housing construction (Eriksen & Rosenthal, 2010).

With the rise of LIHTC and HCVs, HUD has been charged with offering affordability to Very Low-Income households without actively taking part in the construction of housing. As a result, HUD's primary strategy in providing for affordable housing has shifted dramatically from that which it employed before 1973. With this shift, HUD has followed a path similar to that of many other agencies amidst devolution and the pressures of neoliberalization.

The Low-Income Housing Tax Credit is lauded for its capacity to create a large quantity of affordable units in diverse environments, including suburban areas. A 2018 report by the Government Accountability Office notes that “the LIHTC program gives allocating agencies flexibility to address local housing needs and agency priorities through their award processes. As a result, the characteristics of each agency’s LIHTC projects generally can be expected to reflect the real estate conditions, built environment, and populations of the areas they serve. For example, in locations with less density and inexpensive land, low-rise multibuilding developments may be more cost-effective, while in locations with higher density and expensive land, taller single-building developments may be more cost-effective” (p 25).

The flexibility of LIHTC projects seemingly makes them a perfect fit for the array of settings found within the modern, evolving metropolis. Yet the effectiveness of LIHTC in producing housing is not clear, given that “congress has not specifically designated an agency to evaluate the program’s performance. Without a designated entity for collecting, maintaining, and assessing data on LIHTC project costs, federal agencies and Congress lack information needed to oversee billions of dollars in tax expenditures” (p 66). Compounding those concerns, Blumgart (2019) finds that LIHTC is severely inhibited by changes to the tax code that make credits less appealing to investors. Tax reform under the Trump administration has had a negative impact on LIHTC’s usefulness, creating a significant funding gap in the existing system.

We do know that Low Income Housing Tax Credits generated or preserved roughly 2.3 million units between inception in 1987 and 2018 (Gold et al., 2018, p. 5). This is indeed a considerable accomplishment, but one tempered somewhat by the fact that tax credit properties typically provide a relatively shallow subsidy that does not tend to make units available to the lowest-income households (Pavone, 2005, p 118). Van Zandt, Giusti, and Jourdan (2008)

examine the effects of Low-Income Housing Tax Credits on affordable housing's effectiveness, using available quantitative data to determine that the program has seemingly perpetuated inefficiencies. Among those inefficiencies cited is an urban bias, particularly toward central cities.

Weicher argues that HCVs in particular are ideal for the contemporary landscape (2012, p 250). He cites the efficiency and flexibility of vouchers as key attributes. The efficiency is rooted in low costs stemming from the ability to forego construction of units. Flexibility is generated through the ability for voucher households to combine HCVs with the amount they are willing to spend in order to find a unit that fits their needs.

This malleability is an important characteristic of Housing Choice Vouchers. In theory, vouchers offer an array of options to their recipients not available under Public Housing, granting them the ability to live outside areas with concentrated poverty. Access to opportunity is seen as a vital component of contemporary subsidized housing. Particular emphasis is placed on the location of affordable housing in low-poverty, mixed-race neighborhoods (Chetty, Hendren, & Katz, 2016). Judy Geyer finds that “voucher households have better housing and neighborhood outcomes than those in public housing” (2011, p 5), pointing toward an apparent benefit of the voucher program.

In a HUD study conducted by Mary Cunningham et al., the authors note that “voucher holders can, in theory, move anywhere in the country where the program is administered” (2018, p 1). Upon further investigation, however, there is both the perception and application of discrimination against voucher holders (p 9). Research by Cunningham and her colleagues finds clear evidence of landlords denying vouchers across their five study areas. This serves to prevent those using vouchers from moving to many desirable locales, including a large number of

suburbs. Landlords are especially likely to deny voucher holders in low-poverty areas compared with higher-poverty areas. Access to opportunity is diminished as a result, and many voucher recipients are therefore consigned to the exact negative outcomes vouchers are intended to combat.

Implications of Devolution and Policy Fragmentation for Subsidized Housing

Ten states and over fifty cities have passed legislation prohibiting source of income discrimination, requiring that landlords accept vouchers. Yet those laws only cover about a third of voucher holders (Bell et al, 2018), and some conservative states preempt cities from passing such legislation (Tighe et al, 2017, p 7). This exposes potential pitfalls in a system that simultaneously contains so many diverse interests and relies upon the involvement of private actors. On the public side, it is frequently difficult to align priorities throughout so many levels of governance, and on the private side there is no mandate to act in the public's interest.

Attempts to oblige further action on the public side have been quelled by political complications. Proposed in 2013 and implemented in 2015, the Affirmatively Furthering Fair Housing rule is the most significant of these efforts. It was put in place to “refine existing requirements with a fair housing assessment and planning process that will better aid HUD program participants fulfill their statutory obligation” as they “affirmatively further the purposes and policies of the Fair Housing Act” (HUD, 2013). In January 2018 HUD suspended the implementation of the rule under the direction of Secretary Ben Carson, once again devolving all decision-making to the local level (HUD Public Affairs, 2020).

There is uncertainty as to whether devolution and policy reliant upon public-private partnerships is truly successful. Hackworth writes that “the ostensible goal of devolving power

was to give states and localities more political autonomy, but most local governments were relatively powerless on their own at realizing the ‘autonomy’ that sat before them” (2007, p 67). He goes on to paint a picture of how private interests with the necessary capital to fill gaps left by devolution have benefitted from this arrangement, whereas undesirable areas and impoverished communities have been left behind.

Edward Goetz (1995) traces housing policy’s devolution back to the Nixon administration. The trend toward local control seemingly runs contrary to conventional wisdom, which indicates local government is not typically an appropriate venue for equity efforts, given the fiscal incentive to seek residents and businesses that will expand the tax base (Craw, 2015; Downs 1994). Indeed, Goetz suggests “suburban communities are no more anxious to develop affordable housing now than they have ever been” (2000, p 70).

Guillermo Cejudo and Cynthia Michel (2017) assess the complications brought about by devolution. They describe a situation in which an emphasis on efficiency, responsiveness, and accountability has brought about decentralized governance and the proliferation of single-purpose organizations. This devolution of responsibility is premised on the notion that local administrators are likely to know what is best for their jurisdiction. Unfortunately, the authors find that this has created artificial segmentation of policy issues, thus rendering them practically insolvable by fragmenting efforts.

Koschinsky and Swanstrom relate that concept back to subsidized housing, stating that “housing policy implementation is not only fraught with political and policy decisions, but is also highly fragmented - between levels of government, between agencies in the same level of government, and, most importantly, between public, private, and nonprofit organizations”. They

describe how even “within each level of government, responsibility for housing policy is fragmented between different agencies” (2001, p 111).

Brian Connolly demonstrates the effects of local divergence through his examination of local responses to the Affirmatively Furthering Fair Housing rule, which was briefly enforced by HUD from 2015 through 2018. Examining the case of Douglas County, Colorado, Connolly finds that “one of the clear goals of the AFFH Rule (was) ensuring that lower income members of protected classes have access to opportunities on par with residents of affluent communities. But if affluent communities...elect to withdraw from HUD funding programs, HUD (would) lose influence over these areas, and by necessity, the AFFH Rule (would) be left to burden only those communities that already (had) significant diversity and disproportionately lower levels of educational, economic, and social opportunity.”

Illuminating the effects of both geographic and political fragmentation and their effects on policy, Connolly concludes “that outcome would simply compound existing problems of metropolitan segregation patterns, undermining the entire principle of the AFFH Rule... The AFFH Rule thus relie(d) to a significant degree upon market forces and individual decision-making--two factors that have arguably caused the current, intractable patterns of segregation in U.S. metropolitan regions--to achieve its integrationist ends” (2016, p 819).

Serkin and Wellington reach a similar conclusion, writing that “regional exclusion occurs when too many separate local governments within a particular region enact exclusionary measures... the more local governments within a region adopt exclusionary measures, the more pressure it puts on the remaining local governments to do the same” (2012, p 1687). The authors lament that “spatial inquiry is regularly confined to individual municipalities and inter-local affordable housing burdens, rather than the experience of exclusion by lower-income households

at various scales” (p 1674). The result is regionally fragmented policy implementation, diminishing access to subsidized housing for low-income households.

Andrew Downs (1994) describes how the pre-eminence of private capital and the relative absence of public investment has contributed to the preponderance of luxury units and single-family homes that have proliferated with outward expansion of the metropolis. In turn, this could prove detrimental to affordability, both in increasingly relevant suburbs and metropolitan areas as a whole. Though Downs’s writing is over 25 years old, it could just as easily come from the present day. The dynamic he depicts merits further investigation.

Suburban Dynamics

Nearly 30 years ago it was postulated “every single American city that is growing, is growing in the fashion of Los Angeles” (Garreau, 1991), a concept linking geographic fragmentation with suburbanization. Garreau’s prophetic statement on Los Angeles came amidst a broader movement to deconstruct the emergence of urban multiplism. Michael Dear writes that “postmodernism is about complication, which is manifest in Los Angeles as an intense localization and fragmentation of social process ... One way to understand Los Angeles, then, is as an accretion of the local. There is never a single reality to the city” (2000).

In using Los Angeles as the reference for a new American archetype, Garreau and Dear referred to the seemingly irrational menagerie of disparate locales that came together to form its urban and suburban terrain. Eduard Soja refers to this as the creation of “exopolis”. He says that exopolis is where “everything is possible and nothing is real...where tax cuts for the rich magically benefit the poor and social spending for the poor is seen as hurting those that receive it” (1996, p 278).

Given the shape of contemporary subsidized housing, fragmentation is a natural byproduct of the trend to split housing policy between public and private actors, not to mention local, state, and national entities. While that split is not inherently bad, its effects must be reckoned with. Those effects are especially relevant in light of the burgeoning of “exopolis”. As suggested by Goetz (1995), policy fragmentation is not the only divisive force relevant to subsidized housing; geographic fragmentation can also impact the effectiveness of contemporary housing policy.

In their 2013 book entitled *Confronting Suburban Poverty in America*, Elizabeth Kneebone and Alan Berube describe how suburbs are often viewed as monolithic areas without low-income residents (p 23). This could help explain why suburbs are often overlooked within subsidized housing discourse. Kneebone and Berube also point out that American community development institutions are largely geared toward central cities, largely because those institutions were created in response to evolving conditions in big cities (p 19). Though there are now several million more impoverished Americans living in suburbs than central cities (p 6; Kneebone 2017), such institutions have not been modernized to meet changing circumstances (p 25). The result is a gap between the metropolitan environment that American institutions are suited for and the reality of the contemporary metropolis.

Suburbs are an increasingly vital part of those contemporary metropolitan areas. A report by the Urban Land Institute notes that “from 2000 to 2015, suburban areas accounted for 91 percent of population growth and 84 percent of household growth in the top 50 metro areas” (2016, p 2). With that growth, suburbs have increasingly become the nexus for economic opportunity in many metropolitan environments. This has often coincided with the introduction of greater ethnic and economic diversity, including greater numbers of Very Low-Income

residents (Orfield & Luce, 2013). The increased prominence of suburbs within many metropolitan areas is the most important shift palpable in the metropolitan dynamic.

Bernadette Hanlon (2007) highlights the concurrent deterioration of older, inner-ring suburbs. She points out that “suburban politics (are) frequently caught up with issues of growth rather than decline” (p 25). In her view, poor suburbs are therefore in an even more disadvantaged position than central cities due to their relative “invisibility” and their lack of political power.

Kenya Covington further explores the emergence of “low-income suburbs” (2015, p 80). She points out that poverty suburbanization has grown at an accelerated rate in recent years, partially as a result of insufficient housing supply and a filtering process that sees poorer households increasingly unable to afford housing in core cities (2015 p 74). Without access to truly affordable housing, people are forced out of the city to find the cheapest available housing, regardless of its quality or location in relation to jobs and amenities. The trend described by Covington reinforces the heterogeneity of suburbs and the need to better understand the role of publicly supported rental housing in suburbs.

Neil Brenner (2002) attributes this to the way “the contemporary neoliberal political offensive has exacerbated the problem of metropolitan administrative fragmentation by splintering the delivery of public services among diverse private or quasi-private agencies which are no longer subsumed within the encompassing organizational web of the local state...these rescalings of state power have institutionalized a survival of the fittest among subnational administrative units based upon the logic of cost-cutting, deregulation, interspatial competition and enhanced commodification, they have also severely intensified uneven geographical development, sociospatial polarization and fiscal inequities” (p 16).

Some observers have even questioned whether the pursuit of value-laden community goals is even a possibility amidst postmodernism (Rakšnys et al, 2015). If isolation can serve to further disempower marginalized groups, it follows that fragmentation (Weiher, 1991) and suburbanization (Lamb, 2005) might have detrimental effects on equity. It makes sense to ask what consequences the exponential growth of suburbs and emergence of new metropolitan forms might have for Very Low-Income households. A 2019 HUD study shows “that the challenge posed by the lack of affordable housing is generally greater in urban suburbs than in central cities” for Very Low-Income renters (p 5), seemingly substantiating concerns.

Exhibit 3. Percentage of Very Low-Income Renters with Worst Case Housing Needs by Region and Metropolitan Location in 2015

Region	Central Cities	Suburbs, Urban	Suburbs, Rural	Nonmetropolitan Areas	Total
Northeast	39.7	43.0	33.7	29.7	40.0
Midwest	37.3	42.1	39.5	29.2	37.3
South	45.9	52.6	30.8	31.1	43.7
West	50.9	55.4	40.0	36.4	50.4
Total	44.2	48.8	34.8	31.1	43.2

Figure 1- A 2019 study shows worst case housing needs among Very Low-Income renters are greater within urban suburbs than in central cities (HUD, 2019, p 5)

On the whole, subsidized housing is far less likely to be provided when there is no pressure to do so. “Every region needs some low-wage workers...but no particular municipality wants to house them”, as Serkin and Wellington put it (2012, p 1672). Amidst the plethora of suburban municipalities that exists within many metropolitan areas, there is a tendency to assume some other jurisdiction can always pick up the slack and offer housing affordable to those low-wage workers. That dynamic plays out across entire metropolitan areas, creating a situation in

which jurisdictions fail to take ownership of the situation. This can potentially leave Very Low-Income households without adequate access to affordable housing.

Andrew Downs describes how many suburban jurisdictions have been created almost purely because residents “do not want certain externalities effecting them”, and prefer to “influence who their neighbors are” in order to ensure those neighbors are around their income level (1994, p 19). Soja suggests that “up to the present, the urban has tended to take precedence, as in the use of the term “urban region. Perhaps the time has come to shift the emphasis to the region to absorb the urban into the regional, to see the urbanization process and the development of urbanism as a way of life as simultaneously a process of regionalization and the process of regionality” (2000, p 179).

Regional Coordination, in Theory and Practice

Metropolitan planning organizations (MPOs) have been formed throughout the United States in response to federal mandates on regional transportation planning. The Intermodal Surface Transportation Efficiency Act of 1991 expanded on that mandate, carving out a larger role for MPOs (Gage & McDowell, 1995). There are now more than 400 MPOs across the country. Many of these are housed within councils of governments, or COGs, which can also address other issues such as emergency preparedness, economic development, subsidized housing (NCTCOG, 2020).

In some instances, COGs serve to carry out housing plans required at the state level. This is the case in California, where COGs allocate projected housing needs at different income-levels for jurisdictions within their region. That process is conducted under state-supervision, implying that compliance is mandatory. Yet a 2003 Planning Advisory Service Report notes that “the statute does not require the state or COGs to report on the number of all affordable housing units

actually constructed in compliance with regional plans. Enforcement provisions are weak” (Meck et al, p 43). This serves to undermine the state’s housing plan and reduce its effectiveness.

The situation in California is seemingly indicative of broader shortcomings in the capacity of COGS to affect local policy. While councils of governments do indeed produce regional plans, the specifics of those plans are fundamentally dependent upon the local, state, and federal agencies who wield most of the power. If the specifics of a regional plan do not conform to the wishes of a local government, that local government can often simply choose not to implement the plan. As a result, there is frequently an inability to take meaningful long-term action in the interest of the region as a whole (Sciara, 2017).

It should also be noted that California is an outlier in even attempting to implement housing goals through COGs. This is seemingly due to the absence of any binding capacity for councils of governments to act on issues other than transportation. The Department of Housing and Urban Development (HUD) briefly attempted to address that gap with the cross-sector Sustainable Communities Initiative, implemented for four years during the Obama administration. Indeed, “from 2011-2015, HUD supported regional and local planning efforts that helped communities integrate housing, transportation, infrastructure, and environmental goals to realize their visions for a more prosperous future” (HUD Exchange, 2020b). For a brief period, the Sustainable Communities Initiative incentivized regional coalitions through grants designed to facilitate regional planning. The initiative quickly fell by the wayside, however, leaving a gap once more.

The death of the Sustainable Communities Initiative and the absence of the same sort of mandate that applies to transportation leaves efforts to coordinate housing subsidization regionally on precarious footing. Any regional housing initiatives that do currently exist are

either required at the state level or are undertaken voluntarily. While many COGs and other MPOs still attempt to engage in housing initiatives, they are often thought to lack adequate authority to initiate meaningful action (McCartney, 2019; Basolo & Hastings, 2003).

Despite that absence of authority to implement compulsory policy, efforts to coordinate regional housing action have actually become more widespread in recent years. These regional coordination efforts attempt to manufacture regional cohesion in the absence of a broader mandate to do so. Interest in regional coordination has grown because even voluntary regionalism has the potential to help overcome the issues of policy fragmentation and create greater regional cohesion (Knaap & Lewis, 2011). Innes and Booher (2010) suggest that even informal arrangements can succeed based upon dedication to the concept of collaborative rationality, with all parties eventually profiting from a mutually beneficial relationship.

Dustin Allred (2013) conducts an in-depth study of the Sacramento-area's award-winning Blueprint regional planning process and attempts to ascertain if voluntary efforts can be effective in promoting equity. He finds that there is "selective incorporation of the regional vision based on what makes sense to a specific urban development regime, or the place-based characteristics of a particular jurisdiction. Although Blueprint has successfully inserted a regional awareness into the agendas of local planners, politicians, the development community, and the public, the influence of the regional plan is limited to the degree that it advances the interests of local stakeholders in the development process or resolves a particular governance dilemma" (p 7). Allred concludes that his findings "raise important questions about the ability of processes like Blueprint to address redistributive issues" (p 8).

A 2003 entitled *Regional Approaches to Affordable Housing* investigates housing-specific efforts at regional coordination across the country. It finds that several states mandate

some level of regional cooperation, but there is little in the way of enforcement (Meck et al, 2003). In New Jersey, for instance, just 48% of local jurisdictions participated in the New Jersey Council on Affordable Housing despite an anti-exclusionary ruling that prompted the New Jersey Fair Housing Act (Southern Burlington County NAACP v. Township of Mount Laurel, 92 N.J. 158, 1983). In California only around half of cities and counties were in compliance with state requirements on fair-share housing (pp 42-43), and in Portland the voluntary Metro Council was barred from mandating set-aside affordable housing by the state of Oregon (p 68).

The report concludes that “evaluating quantitatively the success of (regional affordable housing) programs in determining and meeting affordable housing production needs is extremely difficult. The exceptions are those states or regions where there exist:(a) an agreed-upon mechanism for establishing present and future need and (b) a system for monitoring the production. Only in states like Connecticut, Massachusetts, New Jersey, and Rhode Island is evaluation clearly possible: each relies on uniform methodologies or a fixed percentage for gauging need, and each has a state-level agency charged with tracking affordable units” (p 187).

Among the most successful examples of regional coordination highlighted in the 2003 report is one from the Twin Cities in Minnesota. Though it was voluntary, participation in the Metropolitan Council’s Livable Communities Act was far higher than in many other instances of regional affordable housing coordination. As a result, there was an uptick in affordable rental and ownership units within suburban jurisdictions. Still, the voluntary nature of the program was criticized as an important factor in ensuring Minneapolis and St. Paul continued to maintain a disproportionate percentage of the area’s publicly supported and affordable rental housing (p 88).

Gerald Frug (2002) examines possible means to implement more binding regional coordination. He first considers central-city expansion as one option, though he concedes that

this is truly only possible in nascent metropolitan areas, and even if successful a significant portion of the population would continue to live outside the city limits (p 1770). This limitation is what makes two-tier regionalism attractive in Frug's eyes. Two-tier governments have been implemented to varying degrees, with Miami-Dade County proving an extreme example. Voluntary regional councils are more common because they are minimally disruptive, yet Frug, like the APA study, finds them insufficient to truly combat inequality (pp 1773-1778).

Frug looks to the European Union as a stronger version of the two-tier model that could be emulated in American regions. He envisions how this could potentially be built on regional legislatures backed by federal support. Frug posits that the federal government could essentially mandate participation as a condition of financial support for major projects in various realms, including subsidized housing. He suggests that this would go some way in resolving policy fragmentation within regions. In his view, a regional arrangement modeled after the European Union would maintain a significant amount of local jurisdictions' power to implement policy while making jurisdictions far more responsive to regional needs (pp 1790-1835). Though intriguing, Frug's idea would necessitate a significant recalibration of American government.

Subsidized Housing Provision and Cost Burden for Very Low-Income Renters

The principal focus of this research is whether and to what extent the subsidized housing system that has emerged is impactful in suburbs. Having explored factors influencing the capacity of subsidized housing to achieve its goals, it is necessary to further examine the magnitude of subsidized housing and its impact. This means quantifying the number of subsidized units and the extent to which they have an effect.

A 2017 Urban Institute report entitled *Housing as a Safety Net* contends that the number of affordable units being generated by LIHTC and HCVs is insufficient. In that report, Galvez et al. write that “rental markets nationwide are tightening, more and higher-income households are renting instead of purchasing their homes, the private market does not create an adequate supply of housing that is affordable to the lowest-income households, housing assistance is scarce, and low- or minimum-wage work cannot sustain housing costs” (Galvez et al, 2017, p 6).

The report goes on to note that under a quarter of eligible Very Low-Income households are able to take advantage of subsidized housing due to its scarcity. Kirk McClure (2017) contends that among other shortcomings, the Low-Income Housing Tax Credit does not produce additional units in areas that need them. Instead it simply subsidizes unnecessary rental housing in areas without a rental shortage, while failing to adequately subsidize units where they are truly necessary. National Low-Income Housing Coalition’s *Gap Report* (2018) describes a shortage in rental units as the biggest obstacle to overcome. The report suggests the shortage could be partially remedied through the production of additional subsidized units. The existing shortage is evident in the image below, which depicts the extent to which there is either a deficit or surplus of rental homes affordable to each income level across the United States. In total there is a deficit of 7.6 million rental units affordable to extremely and Very Low-Income households in comparison to what would be necessary to meet the need.

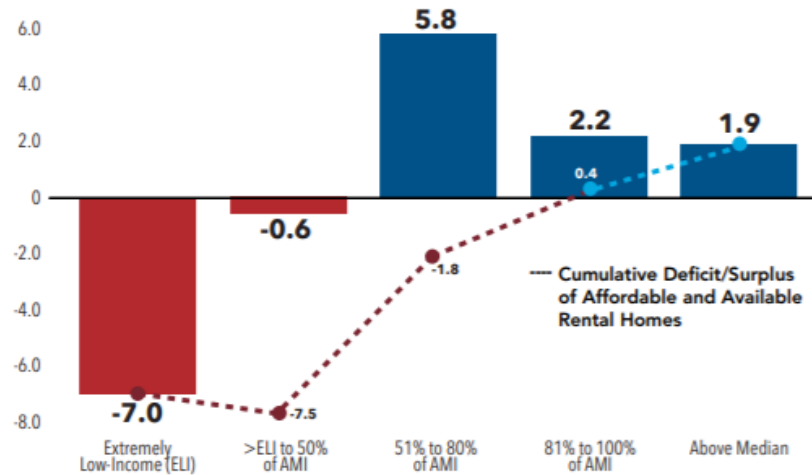


Figure 2- Deficit/Surplus of Affordable Rental Homes by Income Level, in millions NLIHC, 2020, p 6)

Two income groups are the primary beneficiaries of subsidized housing. The first one corresponds to Extremely Low-Income (ELI) households, which are at or below 30% of HUD Area Median Family Income (Joice, 2013, p 3). This group is most likely to seek subsidized housing due to a severe need for assistance, but steep subsidies are often necessary to make housing affordable at the ELI level. The second group corresponds to Very Low-Income households, which are between 31% and 50% of Area Median Income. This is the maximum income level for eligibility to take part in the Housing Choice Voucher program (HUD, 2020c).

Having established who is most likely to benefit from subsidized housing, it is important to ascertain how one might judge whether they are benefitting from its existence. First is the seemingly self-evident notion that subsidized housing exists as part of an effort to reduce the number of individuals whose housing situations represent an undue burden (von Hoffman, 1996, p 426). A household is considered cost burdened if it spends more than 30 percent of income on housing.

This is a somewhat arbitrary figure that has evolved over the years, going from 20 percent in 1940 to 25 percent in 1969 before the present figure was instituted in 1981 (Schwartz and Wilson, 2008). Thirty percent is the convention for HUD, however, and therefore the easiest point of comparison. As is depicted in the image below, more than 17 million extremely low-income rental households experience some level of cost burden, in addition to over 7 million very-low income rental households.

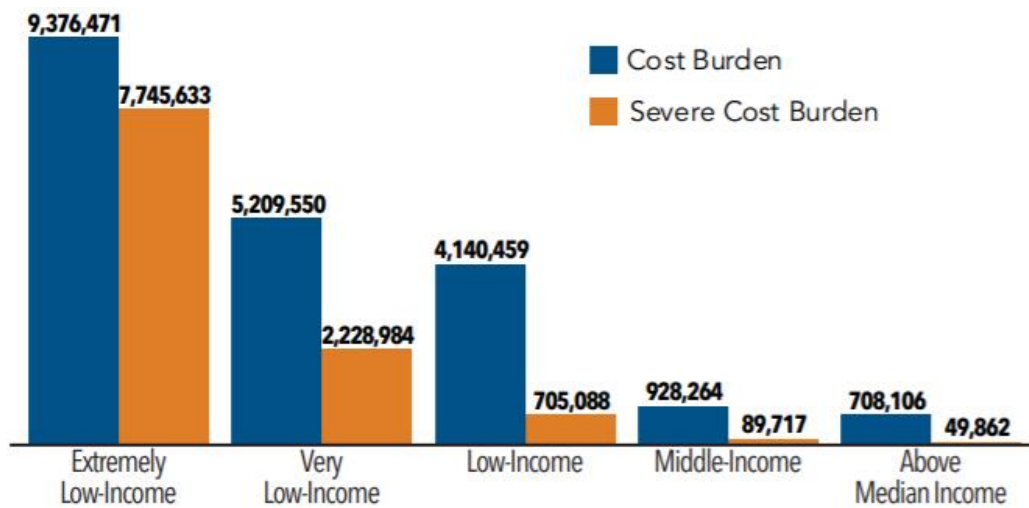


Figure 3- Number of Burdened Renters by Income Level (NLIHC, 2020, p 6)

Where subsidized housing is more impactful, one might expect a lower percentage of its target beneficiaries to incur any level of cost burden. Yet critics have purported that these programs do not actually accomplish anything, and such claims became more prominent with the ascension of the Trump administration in 2017 (Qiu, 2017). Given those claims and potential pitfalls of subsidized housing provision in suburbanizing metropolitan environments, it makes sense to test the impact of subsidized housing with quantitative analysis of metropolitan areas.

Summary

The literature provides a foundation for better understanding how an array of evolving conditions impact the production of publicly supported rental housing, its distribution, and its capacity to assist Very Low-Income renters. Very Low-Income renters are the primary beneficiaries of subsidized housing, but the extent to which subsidized housing facilitates a reduction in cost burden among those renters is not established. The tendency to locate a large portion of subsidized housing in central cities raises the question of whether subsidized housing might differently impact cost burden among Very Low-Income renters across metropolitan areas, their suburbs, and their principal cities.

Meanwhile, subsidized housing's devolution has seemingly left subsidized housing provision prone to policy fragmentation. In the absence of active efforts to overcome obstacles to the adequate supply of suburban affordable housing resulting from such devolution, policy fragmentation could further aggravate the scarcity of publicly supported rental housing affordable to Very Low Income households in suburbs. A lack of regional cohesion might therefore reduce access to opportunity and harm efforts to promote affordability. Conversely, reducing policy fragmentation and coordinating regionally could lead to the production of more publicly supported rental housing, distributed more equitably within metropolitan regions.

CHAPTER 3

Research Questions and Methodology

Chapter 3 identifies the purpose of this research and the aims of the regression models used to evaluate the study's research questions. The questions are articulated in terms of three hypotheses derived from the literature and operationalized into quantitative variables. The regression analysis evaluates the merit of each hypothesis.

Purpose

At a metropolitan level, the vast majority of financial resources dedicated to equity efforts are concentrated in the largest cities. Despite continued metropolitan expansion and growth in suburban jurisdictions, regional housing cooperation is typically sparse at best. It often seems as if subsidized provision is not keeping pace with the changing metropolitan environment. While there are roughly 6.9 publicly supported rental housing units per 100 households in principal cities, there are just 3.35 in suburbs (HUD, 2020b).

This dissertation relies on the use of quantitative analysis in order to better understand the various dynamics at play in influencing rates of cost burden for Very Low-Income renters within American metropolitan areas and their suburbs. This analysis will help evaluate at the metropolitan level, the relationship between the amount of publicly supported rental housing and the rate of cost burden among Very Low-Income renters. Rental affordability is particularly crucial because the rental market is the principal focus of subsidized housing efforts. The critical nationwide shortage of rental units affordable to Very Low-Income households leads one to ask if at the metropolitan area level and in suburbs of these metropolitan areas, is there adequate supply of existing publicly supported rental housing?

Of course, the shortage of affordable rental units is attributable to a variety of factors that extend beyond publicly supported rental housing, including an increase in the cost of building materials, increasingly scarce land, and zoning issues (Harvard University, 2018). The significance of these other factors should not be ignored, but subsidized housing is the focus of this research. Subsidized housing clearly intends to make a headway in closing the gap between units affordable to very-low income renters and the number necessary to satisfy all demand. As a result, it is vital to understand the impact of publicly supported rental housing on affordability for very low income-renters.

The relationship between publicly supported rental housing and affordability for Very Low-Income renters takes on another dimension given the devolution of subsidized housing and suburbanization of contemporary metropolitan areas. If publicly supported rental housing is indeed vital in promoting affordability, an inability or unwillingness to assist very low-income suburban populations within today's metropolitan areas would be expected to have particularly severe consequences. This could effectively leave a vulnerable population mired in cost burden. Such an arrangement is extremely worrying in the context of affordable housing policy, which is tasked with overcoming isolation and empowering Very Low-Income populations. A determination that contemporary subsidized housing policy is ill-suited for increasingly suburbanized metropolitan areas would seemingly undermine its effectiveness.

Research Questions

As noted in the summary of Chapter 2, existing literature provides a foundation for better understanding how an array of evolving conditions relates to the production of subsidized housing, its distribution, and its capacity to assist Very Low-Income renters in metropolitan areas. Yet quantitative assessment has rarely addressed the impact on affordability of subsidized housing's differing availability and distribution across metropolitan areas, their suburbs, and their principal cities. For instance, a 2019 HUD study entitled *Addressing Housing Affordability in High-Cost Metropolitan Areas in the United States* that was highlighted in Chapter 2 does compare housing needs for VLI renters in suburbs versus principal cities of metropolitan regions. That study does not, however, quantify the effects of differing levels of housing subsidization between MSAs. Additionally, while the literature has provided a basis to believe that the absence of regional cohesion could be associated with reduced availability of subsidized housing in metropolitan areas and their suburbs, quantitative evidence has not substantiated that relationship. This research seeks to fill those gaps through evaluation of the following questions:

- 1.** What role does publicly supported rental housing play in offering affordability to Very Low-Income households in suburbs vs. principal cities of America's metropolitan areas, and what role does it play in looking at metropolitan areas as a whole? Does the distribution of publicly supported rental housing between suburbs and principal cities impact affordability for Very Low-Income renters?
- 2.** To what extent does the presence or absence of regional cohesion impact the availability of publicly supported rental housing in a metropolitan region and its suburbs?

Research Approach

The first research question asks what role the availability and distribution of publicly supported rental housing play in offering affordability to Very Low-Income households. In evaluating research question one, multiple regression analysis based on 107 MSAs explores the relationships between the quantity as well as the principal city-suburban distribution of publicly supported rental housing and rental affordability for very-low income households. This analysis will help examine the impact of publicly supported rental housing in metropolitan areas, their suburbs, and their principal cities, controlling for the effects of the geographic region in which MSAs are located, the percentage of the population that is White, the percent of households renting their home, as well as the poverty rate.

Research question two asks to what extent the presence or absence of regional cohesion is associated with the availability of publicly supported rental housing in metropolitan regions and their suburbs. As with the first question, the second research question will be evaluated through multiple regression analysis of the relationship between the prevalence of publicly supported rental housing and the presence of regional cohesion. Evaluation of this relationship will also control for the effects of the geographic region in which MSAs are located, the percentage of the population that is White, the percent of households renting their home, as well as the poverty rate.

Analyses are carried out for the 107 Metropolitan Statistical Areas across the United States with a population of at least 500,000. Where appropriate, data is also aggregated for the suburbs within each MSA and principal cities within each MSA. As an example, the number of Very Low-Income renter households in the suburbs in a particular MSA represents the summation of Very Low-Income renter households in each individual suburb within that

Metropolitan Statistical Area. Conversely, the figure for the MSA's principal cities would represent the sum of Very Low-Income renter households in each principal city within that MSA. This tact permits analysis of regions as a whole, their suburbs, and their principal cities.

Data derived from a variety of sources serves as the basis for the quantitative analysis, among them, the American Community Survey, Comprehensive Housing Affordability Strategy, Picture of Subsidized Housing, and HUD's Low-Income Housing Tax Credit (LIHTC) Database. These resources provide a wealth of information spanning several subjects, including demographic characteristics, location of publicly supported rental housing, economic attributes, and cost burden at different income levels. HUD's *Picture of Subsidized Housing* provides data on the number of units that are available and utilized at every geographic level, including which publicly supported program those units are part of. Supplemented with LIHTC data, these two sources provide fantastic insight regarding the location of publicly supported units. In combination with data from the *Comprehensive Housing Affordability Strategy* (CHAS), it is possible to analyze the impact of publicly supported rental housing on cost burden among Very Low-Income renters. And finally, the *American Community Survey* offers the population numbers and demographic detail necessary to provide the regional, suburban, and principal city social context to all this information.

To ensure uniformity, all data is through 2016. Where necessary, data is aggregated so as to ensure all analysis is carried out at the same geographic level. This process has required substantial data filtering and re-calculation to ensure accuracy and comparability. For example, in order to calculate metropolitan-wide cost burden raw county-level data from CHAS is combined based upon the counties located within each MSA. Similarly, data from the *Picture of Subsidized Housing* often required re-aggregation to match MSA boundaries. Conversely, raw

data from CHAS is used to dis-aggregate cost burden and permit focus on individual income groups.

Key Terms

Before describing variables used within the research, it is important to ensure a common understanding of important terms used throughout the remainder of the dissertation.

1. The literature review features many references to subsidized housing, which is a concept central to the dissertation as a whole. Whereas subsidized housing refers broadly to all public, private, or non-profit forms of economic assistance aimed toward alleviating housing costs, the more precise term publicly supported rental housing is used to refer specifically to HUD program data captured for quantitative analysis within this research. Publicly supported rental housing (or PSRH, as referred to within this dissertation) includes an array of programs at least partially under the auspices of the federal government. Focusing solely on publicly supported rental housing does mean some affordable housing created by private and non-profit entities is excluded, but that tradeoff is made worthwhile by the fact that HUD offers data on all publicly supported rental housing programs.

The following programs are included under the term **publicly supported rental housing** within this research:

- a. *Housing Choice Vouchers*- Also known as Section 8, this “is a federal program assisting Very Low-Income families, the elderly, and the disabled so that they can afford decent, safe, and sanitary housing in the private market” (City of Dallas, 2019, p 79). Vouchers are administered locally by public housing agencies, or PHAs. “The PHA determines a payment

standard that is the amount generally needed to rent a moderately-priced dwelling unit in the local housing market and that is used to calculate the amount of housing assistance a family will receive...the payment standard does not limit and does not affect the amount of rent a landlord may charge or the family may pay. A family which receives a housing voucher can select a unit with a rent that is below or above the payment standard. The housing voucher family must pay 30% of its monthly adjusted gross income for rent and utilities, and if the unit rent is greater than the payment standard the family is required to pay the additional amount.” (HUD, 2020c).

Housing Choice Vouchers do not increase the supply of rental housing, but instead make the existing supply more affordable for households which might otherwise be unable to afford their desired unit. Over 2 million vouchers are currently in circulation. About 68% of the 5 million individuals assisted are seniors, children, or people with disabilities (CBPP, 2020).

b. Public Housing- A HUD-funded program “that provides financial assistance to local housing agencies to develop and operate decent and safe rental housing for eligible low-income families, the elderly, and persons with disabilities. Public housing comes in all sizes and types, from scattered single-family houses to high-rise apartments for elderly families. While Public Housing is no longer the main piece of HUD’s publicly supported housing portfolio, it continues to house a large number of families, particularly in and around New York City. Overall, there are approximately 1.2 million households living in public housing units, managed by some 3,300 Housing Authorities throughout the country. The U.S. Department of Housing and Urban Development (HUD) administers Federal aid to local housing agencies (HAs) that manage the housing for low-income residents at rents they can

afford. HAs use income limits developed by HUD. HUD sets the Lower Income limits at 80% and Very Low-Income limits at 50% of the median income for the county or metropolitan area in which you choose to live” (HUD, 2020d).

c. *Low-Income Housing Tax Credits*- Also known as LIHTC. Credits are “an indirect federal subsidy used to finance the construction and rehabilitation of low-income affordable rental housing... The LIHTC gives investors a dollar-for-dollar reduction in their federal tax liability in exchange for providing financing to develop affordable rental housing. Investors’ equity contribution subsidizes low-income housing development, thus allowing some units to rent at below-market rates. In return, investors receive tax credits paid in annual allotments, generally over 10 years.” (Novogradac, 2020).

Low-Income Housing Tax Credits are intended to increase the total supply of rental housing and, specifically, the supply of rental units affordable to low-income households. LIHTC typically creates a relatively shallow subsidy when compared to Housing Choice Vouchers or other mechanisms. Vouchers are sometimes applied to LIHTC units in order to make them more affordable for the lowest income groups. LIHTC is administered by the Internal Revenue Service, which allocates funds to each state based on population and other factors. States create Qualified Allocation Plans in accordance with federal law, and these plans dictate the allocation of tax credits to developers within each state (Congressional Research Service, 2019). The Department of Housing and Urban Development refers to *Low Income Housing Tax Credits* as “the most important resource for creating affordable housing in the United States today”, and says that over 3 million units were placed in service with LIHTC between 1987 and 2017 (HUD User 2, 2020).

d. *Other HUD programs*- Several far smaller programs are also considered publicly supported housing and included in statistics.

- Section 202 Supportive Housing is a HUD-funded program that provides interest-free capital advances to private, non-profit sponsors to fund the development and operating costs of affordable housing with support services for Very Low-Income elderly persons (HUD, 2020h).
- Section 811 Supportive Housing for Persons with Disabilities is a HUD-funded program that provides interest-free capital advances to private, non-profit sponsors to fund the development and operating costs of affordable housing with support services for persons with disabilities. The program also provides assistance to state housing agencies for new and existing multi-family housing developments (HUD, 2020i).
- Project-based Section 8 is similar to the *Housing Choice Voucher* program, except in this instance the subsidy only applies to a particular privately operated unit. Anyone leaving that unit no longer has access to the subsidy, and the subsidy may not be applied to units which are not part of the Project-based Section 8 program.
- The Rent Supplement Program is a legacy of Section 101 of the Housing and Urban Development Act of 1965, which authorized rent supplements on behalf of needy tenants living in privately owned housing and was the first Project-Based Assistance program for mortgages insured by the Office of Housing. Units counted in the Rent Supplement Program today have been converted to Project-Based Section 8 but are counted separately (HUD, 2020f).
- The Section 236 Preservation Program intends to preserve the affordability of rental housing units originally developed through the Section 236 mortgage program (HUD

Exchange, 2020a), which “used FHA mortgage insurance on private loans with an interest reduction payment (IRP) to effectively lower the mortgage interest rate to 1%” (National Housing Preservation Database, 2020).

- “The Moderate Rehabilitation Program provides project-based rental assistance for low income families. The program was repealed in 1991 and no new projects are authorized for development. Assistance is limited to properties previously rehabilitated pursuant to a housing assistance payments (HAP) contract between an owner and a Public Housing Agency (PHA)” (HUD, 2020e).

2. Focusing on *Very Low-Income* renters requires delineation of **income levels**. Income levels are set through looking at household income in relation to *HUD Area Median Family Income*.

- a. HUD Area Median Family Income (HAMFI)* represents the midpoint of the household income distribution within a geographic region. HUD uses *Metropolitan Statistical Areas (MSAs)* to define geographic regions, and median income can vary drastically based on the region in question (HUD User, 2018).
- b. Very Low-Income (VLI)* households are at or below 50% of HUD Area Median Family Income. VLI households can take part in all publicly supported rental housing programs and are the primary beneficiaries of those programs. *Extremely Low-Income* households, a category comprising households below 30% of HAMFI, are included within this group (HUD User, 1998).

- 3. Metropolitan Statistical Areas (MSAs)** represent regions defined by the Office of Management and Budget. They are densely populated areas with a high level of economic and social integration amongst their communities. All MSAs have at least one designated principal city, which is the largest within the given area. Designation of additional principal cities is based upon population and employment patterns. All cities within an MSA that are not principal cities are considered **suburbs**. This tact is compatible with the National Center for Health Statistics' Urban-Rural Classification Scheme for Counties. Similar approaches are utilized by Berube and Kneebone (2006), Covington (2015), Beauregard (2006), Lucy and Phillips (2000), as well as Lubell and Wolff (2018), among others.

- 4. Regional Cohesion** refers to the extent to which there is an absence of policy fragmentation and presence of regional coordination in a given metropolis. As noted by Cejudo and Michel (2017), concepts such as cohesion, fragmentation, and coordination are often used somewhat interchangeably. Here, regional cohesion is as an all-encompassing concept, with policy fragmentation and regional coordination serving as component parts. This tact is inspired by Cejudo and Michel's conceptualization of coherence and Einstein's use of cohesion in her 2012 work on regional fragmentation.

Policy fragmentation inhibits implementation of subsidized housing policy uniformly throughout a metropolitan area, though that problem can be mitigated through regional coordination (Kneebone & Berube, 2013). Even in the absence of policy fragmentation, however, a lack of regional coordination can undermine the ability to effectively implement subsidized housing policy throughout an entire metropolitan area. Regional cohesion is therefore greatest where there is regional coordination and no policy fragmentation.

Key Variables

The following variables were used in evaluating the two research questions. A conceptual description and their operationalization is presented below. A more detailed description of how these variables were calculated is presented in the Hypotheses and Regression Models section:

- **Burden Among VLI Renters-** is a means of operationalizing affordability for the primary beneficiaries of subsidized housing. This variable's use is informed by the 2020 Gap Report produced by the National Low-Income Housing Coalition. That report highlights the particularly large gap in units affordable to renters below 50% of HUD Area Median Family Income (HAMFI). Households within this income-band are eligible for every form of publicly supported rental housing. *HUD Area Median Family Income* represents the midpoint of the household income distribution within a geographic region. HUD uses Metropolitan Statistical Areas (MSAs) to define geographic regions, and median income can vary drastically based on the region in question (HUD User, 2018). MSAs represent regions defined by the Office of Management and Budget (OMB, 2010). They are densely populated areas with a high level of economic and social integration amongst their communities. All MSAs have at least one designated principal city, which is the largest city within the given area. Additional principal cities are designated based upon population and employment patterns.

- **Publicly Supported Rental Housing Units (PSRH) per 100 VLI Renters-** This variable is similar to one used by Todd Sinai and Joel Waldfogel, who employ subsidized units per capita as the basis for their 2005 exploration of the relationship between subsidies and housing occupancy. Schwartz (2015) looks at subsidized housing as a percentage of housing units to provide context regarding the magnitude of housing subsidies in the United States. The variable ‘Publicly Supported Rental Housing Units per 100 VLI Renters’ is used in order to relate the availability of subsidized units directly to the population it most benefits.

- **Cohesion Index-** is composed of two component parts capturing the effects of policy fragmentation and regional coordination.

- **Policy Fragmentation (PF) Score-** The PF Score is intended to quantify policy fragmentation in publicly supported housing provision within MSAs by comparing the number of housing authorities per county to other MSAs within the study. A similar tact is also taken by Einstein (2012), who seeks a relationship between racial segregation and greater numbers of housing authorities. In her eyes, the presence of additional housing authorities reflects fragmentation given the ability for these housing authorities to set their own individual policies without regard for the needs of the region as a whole.

The same approach to measuring fragmentation has been applied by other researchers. Goodman (2020) uses a count of government units in quantifying political fragmentation in U.S. metropolitan areas. Goel and Nelson (2011) do the same as they attempt to ascertain the relationship between fragmentation and

corruption. Finally, Hatfield et al (2019) investigate the impact the number of local governments in a metropolis has on housing values, with the quantity of local government units once again serving as a proxy for fragmentation. The underlying idea in each case is that the presence of each additional governmental unit in a region further fragments the landscape regardless of the circumstance, including population or geographic size of the region.

- **Regionalism Score-** In her 2012 work on divided regions and fragmentation, Katherine Einstein operationalized regional coordination in affordable housing provision through a review of consolidated plans in eleven segregated regions. In doing so, she simply evaluates the plans for evidence of regional coordination, finding none in the eleven relevant MSAs. This is similar to the tact taken by Rachel Madsen in her 2018 examination of affordable housing and regional sustainability, in which she utilizes a case study heavily dependent upon planning documents to evaluate the nature of regional coordination efforts.
- **PSRH Ratio-** The PSRH Ratio compares the availability of publicly supported rental housing in relation to need within a metropolitan area's suburbs and principal cities. Through capturing the number of units relative to need in both suburbs and principal cities, the PSRH Ratio provides a sense of the extent to which a metropolitan area's suburbs offer a fair share of the region's publicly supported rental housing. This concept is based off existing efforts to capture disproportionate concentrations of subsidized housing.

Kenya Covington (2015) looks at the disproportionate concentration of suburban Housing Choice Voucher recipients in low-income areas. Orfield et al. (2015) go a step further with their focus on the disproportionate share of the Twin Cities' subsidized housing in racially diverse areas. They quantify this by comparing the population of these areas as a percentage of the whole to the percentage of the region's publicly supported housing in diverse areas. The authors are then able to examine the nature of the discrepancy in publicly supported housing location and what would represent a fair share approach. A ratio makes sense for this research in order to directly compare the availability of publicly supported rental housing in an MSA's principal cities and suburbs.

Control Variables

Control variables, known to relate to housing affordability particularly for low and very low income households, will serve to add context and provide a fuller picture of factors impacting change in the dependent variables used to test each hypothesis. Three of these variables are renters as a percentage of households, poverty rate, and percentage of the population that is White, non-Hispanic, a fourth variable, geographic region, controls for national regional differences in affordable housing provision.

- **Percent Renters-** Todd Sinai (2014) details how larger quantities of rental housing are often thought to bring rental prices down due to the economics of supply and demand. A decline in rental prices would presumably make units more affordable for everyone, including Very Low-Income renters; this could bring the rate of cost burden among renters below 50% of Area Median Income down. In his 2015 examination of housing policy, Alex Schwartz notes that expanding the supply of rental housing is a key portion of efforts to ensure affordability.

- **Poverty Rate-** Hongwei Dong (2018) looks at the relationship between income inequality and rental affordability in the United States. He concludes that deterioration into increasingly unequal conditions correlates with elevated levels of severe cost burden. Dong's study also finds that growing poverty rates correlate with higher rates of severe cost burden. Michael Lens (2018) notes the same trend, with greater affordability issues occurring where there are higher poverty rates. Considering this evidence, models testing all three hypotheses will include poverty rate as a control variable.
- **Percent White-** Eileen Diaz McConnell (2013) looks at which demographic groups tend to struggle with affordability issues. She writes that foreign-born populations tend to suffer elevated levels of cost burden. Colburn and Allen (2018) examine the effects of the Great Recession on cost burden and find that non-White households suffer higher levels of cost burden than White ones. This result is supported more generally by data from the Comprehensive Housing Affordability Strategy (2020). In accordance with that data, this research utilizes the percentage of the population that is White as a control variable.
- **Geographic region-** The Metropolitan Statistical Areas forming the research sample are split into the four geographic regions delineated by the U.S. Census Bureau: Northeast, Midwest, South, and West (U.S Census Bureau, 2020). Including these geographic controls filters out any geographic variation in testing the three hypotheses described above, permitting more accurate results. This is especially important given geographic disparities in publicly supported housing provision (O'Connor, 2011, p 175).

Hypotheses and Regression Models

Three hypotheses inform the models utilized within this research, grouped by the research question they fall under:

- Research Question #1- What role does publicly supported rental housing play in offering affordability to Very Low-Income households in suburbs vs. principal cities of America's metropolitan areas, and what role does it play in looking at metropolitan areas as a whole? Does the distribution of publicly supported rental housing between suburbs and principal cities impact affordability for Very Low-Income renters?

Hypothesis #1- Greater availability of publicly supported rental housing will be associated with lower rates of cost burden for Very Low-Income renters within metropolitan areas, their suburbs, as well as their principal cities.

Model 1 tests Hypothesis #1. Separate metropolitan-wide, suburban, and principal city tests are run in order to assess the relationship between publicly supported rental housing and cost burden for Very Low-Income renters in each setting. Variables used in tests for Model 1 are depicted in the images on the following pages.

Model 1 Metropolitan-Wide Test

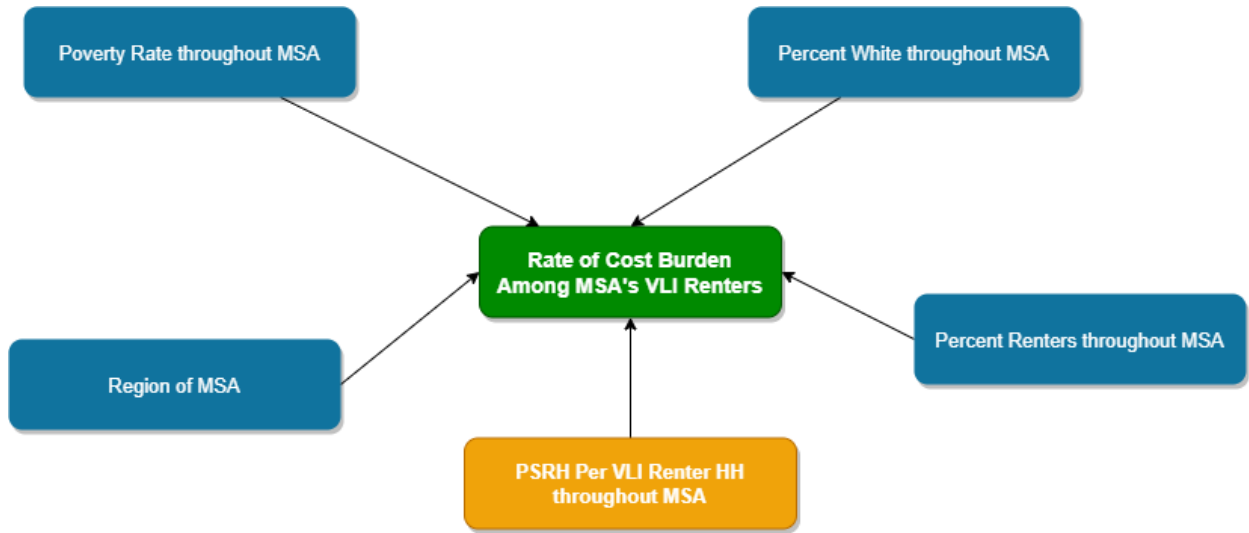


Figure 4- Variable relationship for model 1 MSA test

Model 1 Suburban Test

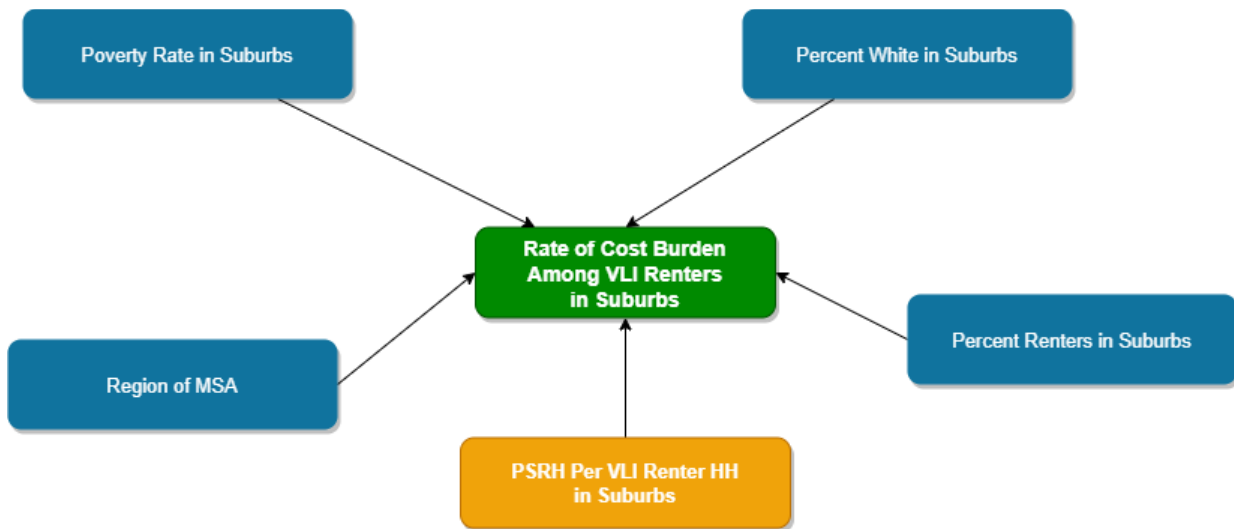


Figure 5- Variable relationship for model 1 suburban test

Model 1 Principal City Test

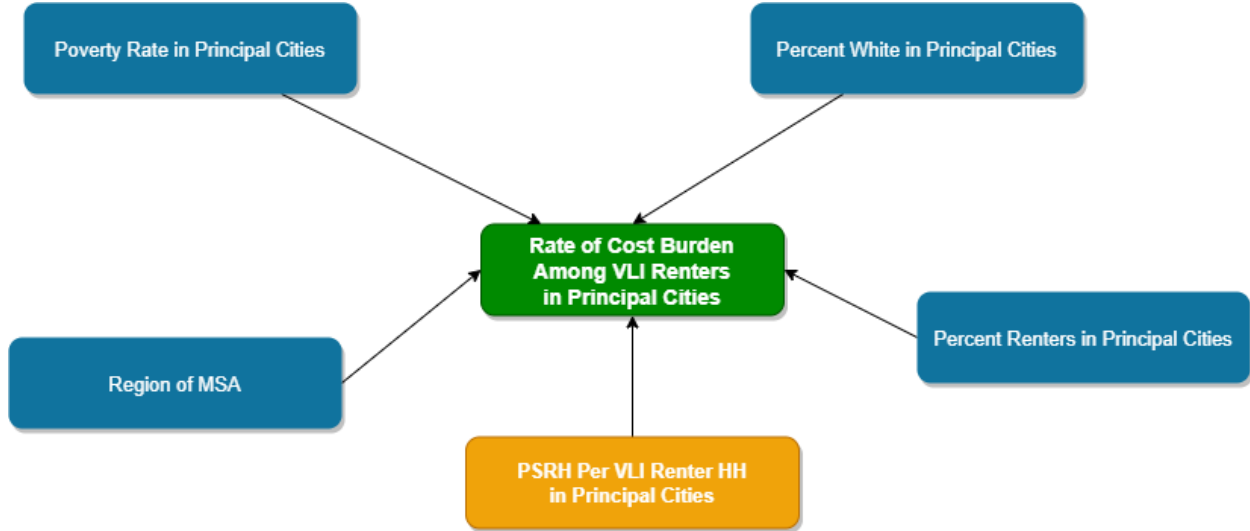


Figure 6- Variable relationship for model 1 principal city test

Hypothesis #2- Disproportionate concentrations of publicly supported rental housing in principal cities will be associated with higher rates of cost burden for Very Low-Income renters in metropolitan areas and their suburbs.

Model 2 tests Hypothesis #2. Metropolitan-wide and suburban tests are run in order to assess the relationship between PSRH Ratio and cost burden among Very Low-Income renters in both settings. Variables used in Model 2 are depicted in the images on the following page.

Model 2 Metropolitan-Wide Test

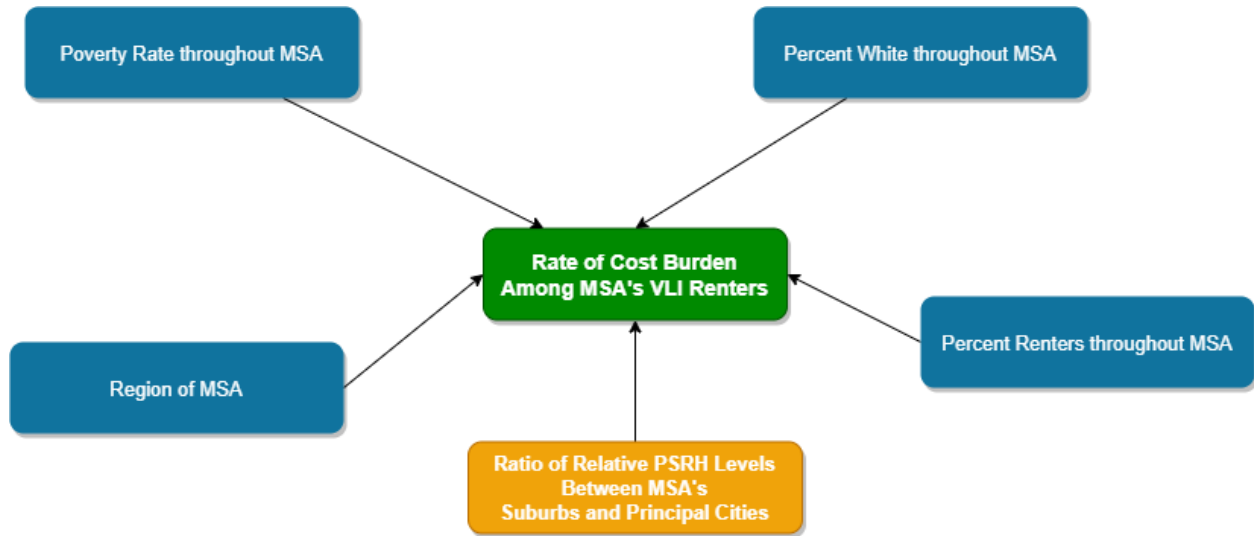


Figure 7-Variable relationship for model 2 MSA test

Model 2 Suburban Test

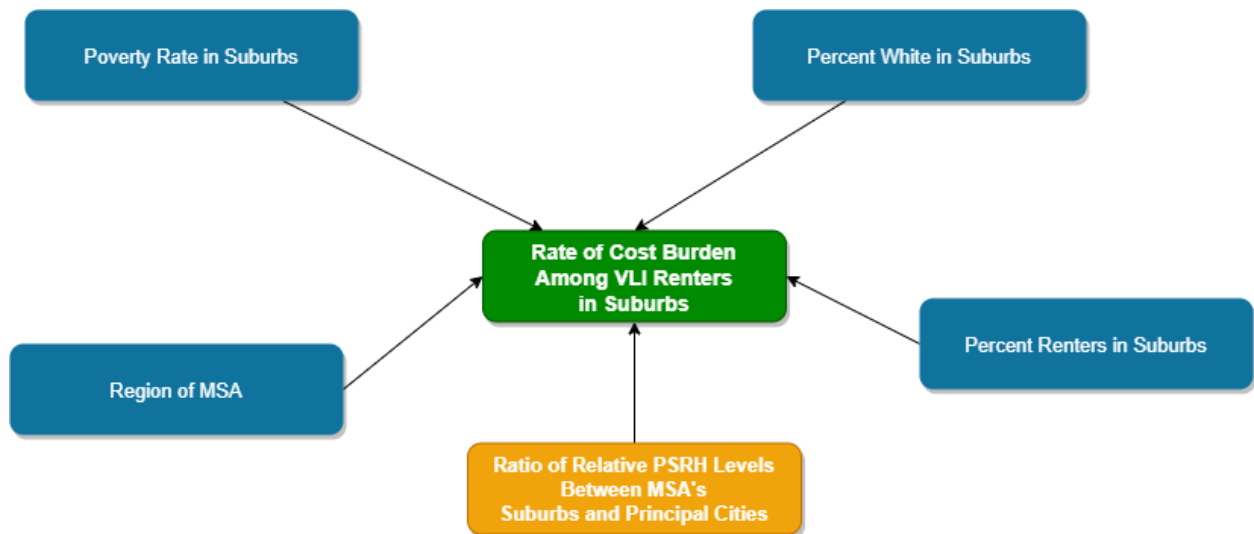


Figure 8- Variable relationship for Model 2 suburban test

- Research Question #2- To what extent does the presence or absence of regional cohesion impact the availability of publicly supported housing in a metropolitan region and its suburbs?

Hypothesis #3- There will be greater availability of publicly supported rental housing in MSAs and their suburbs where there is more regional cohesion.

Model 3 tests Hypothesis #3. Metropolitan-wide and suburban tests are employed in order to assess the relationship between the Cohesion Index and levels of PSRH per 100 VLI renters. Variables used in Model 3 are depicted in the images below.

Model 3 Metropolitan-Wide Test

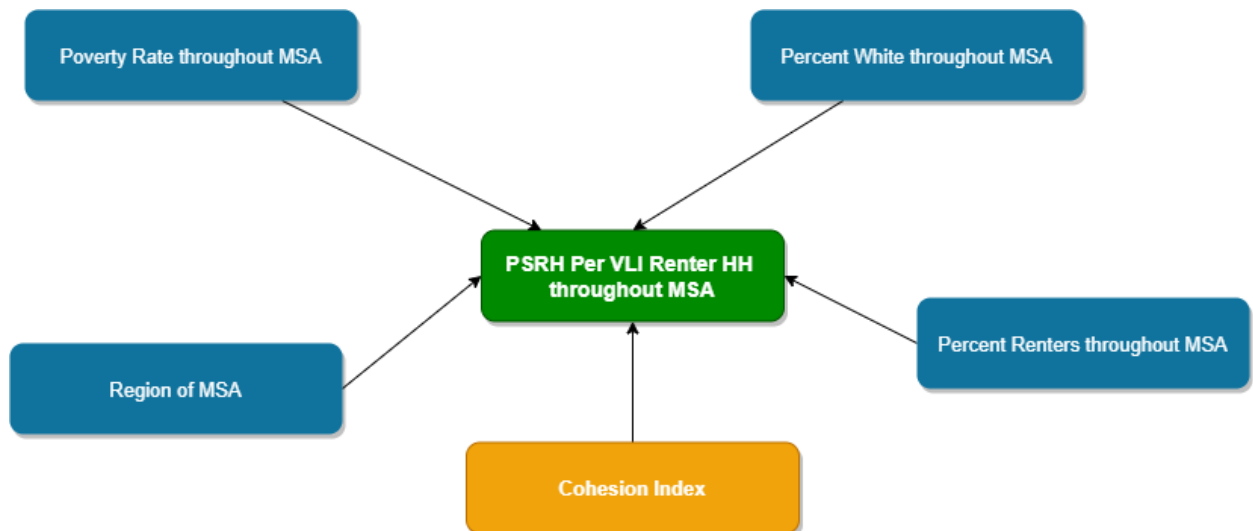


Figure 9- Variable relationship for model 3 MSA test

Model 3 Suburban Test

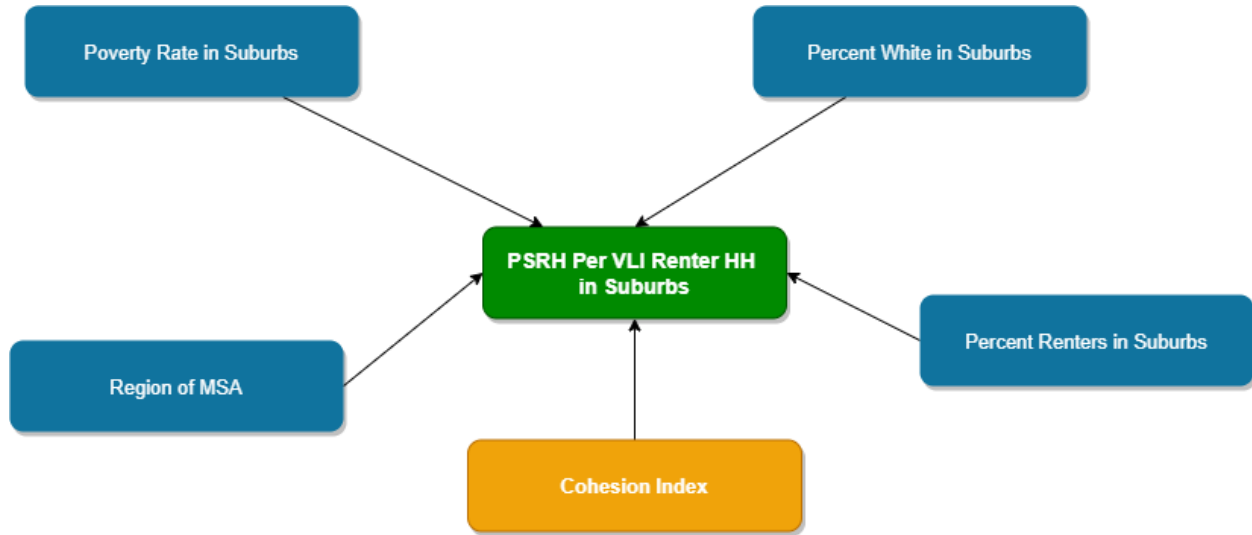


Figure 10- Variable relationship for model 3 suburban test

Operationalizing Key Variables

The means of assigning a value for each variable utilized the three regression models is described below:

- **Burden Among VLI Renters-** This dependent variable is derived from the Comprehensive Housing Affordability Strategy’s data for 2016 and aggregated to the MSA level from county level data. Suburban and principal city data is an aggregation place-level data. Burden Among VLI Renters is calculated by dividing the number Very Low-Income renters that experience some level of cost burden by the total number Very Low-Income renters. Mathematically, this can be represented as follows:

$$\text{Burden Among VLI Renters} = \text{Burdened VLI Renters} \div \text{Total VLI Renters}$$

- PSRH Per 100 VLI Renters-** Quantifying the availability of publicly supported rental housing in relation to its target population, this is an independent variable in the model testing Hypothesis 1 and a dependent variable in the model for Hypothesis 3. It is also used in calculating the PSRH Ratio, which is explained below. The variable PSRH per 100 VLI Renters is derived from data in the Picture of Subsidized Housing and broader household statistics from the Comprehensive Housing Affordability Strategy. The variable is taken at the metropolitan level from MSA level data, while suburban and principal city data is an aggregation from place level data. The variable is calculated as total publicly supported rental housing units divided by the number of Very Low-Income renter households, with the result multiplied by 100. This can be represented mathematically as follows:

$$PSRH \text{ Per } 100 \text{ VLI Renter HHs} = (\text{units PSRH} \div \text{VLI Renter HHs}) \times 100$$

- PSRH Ratio** - An independent variable derived from the Picture of Subsidized Housing and Comprehensive Affordability Strategy. Data for suburbs and principal cities in the sample of 107 MSAs is aggregated from place level data. The PSRH Ratio is calculated through dividing the number of PSRH per VLI renter household in suburbs by the number of PSRH per VLI renter household in principal cities then multiplying the result by 100. The result effectively represents PSRH per 100 VLI renters in suburbs as a percentage of PSRH per 100 VLI renters in principal cities. The calculation of the PSRH Ratio can be represented mathematically as follows:

$X = \text{PSRH Per VLI Renter HH in Suburbs} = (\text{units PSRH in Suburbs} \div \text{VLI Renter HHs in Suburbs})$

$Y = \text{PSRH Per VLI Renter HH in Principal Cities} = (\text{units PSRH in Principal Cities} \div \text{VLI Renter HHs in Principal Cities})$

$\text{PSRH Ratio} = (X \div Y) \times 100$

- **Cohesion Index-** An independent variable utilized in testing Hypothesis 3. The Cohesion Index value can range from 0 to 6, with higher index values representing greater regional cohesion. The Cohesion Index calculated by combining the scores for its two component parts, Policy Fragmentation (PF) Score and Regionalism Score. Those component parts are explained below:
 - **Policy Fragmentation (PF) Score-** An independent variable derived from the Picture of Subsidized Housing's HA level data and population data from the American Community Survey. Calculation of the PF Score is done in two parts. First it is necessary to calculate the number of housing authorities per county present in a given MSA. This comparison of housing authorities to the number of counties located within an MSA is intended to offer a glimpse of how much policy fragmentation there is in housing provision. Second, the 107 MSAs in the sample are ranked in inverse order by the number of housing authorities per county. A score from 0 to 3 is assigned to each MSA based on their place in the rank ordered list, with a higher score indicating lower levels of policy fragmentation. The MSA with the fewest housing authorities per county within its region would therefore have a score of 3,

and the MSA with the most housing authorities per county in its region would have a score of 0. Each step down the inverse ranking of MSAs by housing authorities per county corresponds to a MSA's PF Score decline of approximately .028 points. This is equal to 3 divided by 106. A mathematical representation of how PF Score is calculated in two steps:

First,

$$HAs\ per\ county = Housing\ Authorities \div \#\ of\ counties\ in\ MSA$$

Rankings are then determined allotted in inverse order of MSAs by HAs per county.

At which point,

$$PF\ Score = 3 - (3 \div 106) \times (Ranking - 1)$$

- **Regionalism Score-** An independent variable derived from a review of Housing Authority documents in each MSA. Regionalism is a variable ranging from 0 to 3 that is very straight-forward to assign. If no effort toward regionally coordination is discernible in any of the MSA's documents pertaining to publicly supported housing provision, an MSA is deemed not to have regionalism, which is recorded as '0'. Where there is any reference to regional coordination in publicly supported housing, that MSA is considered to have regionalism. The level of regionalism is then assigned a score of either 1, 2, or 3 depending on the extent of regional coordination in subsidized housing provision. The same set of resources are used as a reference for each MSA. Scores are assigned as follows:

- 3- Extensive coordination demonstrated through collaborative efforts between jurisdictions to ensure a fair share of subsidized housing is distributed throughout the MSA. Extensive coordination is evident through the active maintenance of a fair share agreement or monetary resources among regional agencies.
- 2- Moderate coordination evident through the presence of a metropolitan housing authority working throughout the MSA or an agency actively pursuing regional subsidized housing solutions.
- 1- Some coordination palpable among jurisdictions. This is often demonstrated through the presence of a fair share agreement that is not necessarily adhered to by many jurisdictions. Other MSAs demonstrate some level of coordination through the presence of a regional agency working only in one portion of the MSA.

Based on the literature review describing the forms of regional coordination and potential pitfalls in existing efforts toward regionalism, a variety of documents and websites are included amongst those resources utilized in determining the level of coordination present in subsidized housing provision within each MSA. These include PHA annual plans, five-year plans, consolidated plans, administrative plans, Comprehensive Annual Performance Evaluation Reports, research papers, and organizational websites. All resources used in determining Regionalism Scores for the 107 MSAs are included in the references section.

Operationalizing Control Variables

Each control variable used in the analysis was previously described and justified within this chapter. Below a detailed description of their operationalization is presented.

- Poverty Rate- Control variable derived from the American Community Survey. Metropolitan data comes straight from MSA level data. Suburban and principal city data is an aggregation from place-level data. Calculated as households in poverty divided by total households. Mathematically, this can be represented as follows:

$$\text{Poverty Rate} = \text{HH in Poverty} \div \text{Total Households}$$

- Percent White- Control variable derived from the American Community Survey. Metropolitan data comes straight from MSA level data. Suburban and principal city data is an aggregation from place-level data. Calculated as number of residents who are White, Non-Hispanic divided by the total population. This can be represented mathematically as follows:

$$\% \text{ White} = \text{White, Non-Hispanic Population} \div \text{Total Population}$$

- Percent Renters- Control variable derived from the American Community Survey. Aggregated to the MSA-level from county-level data. Suburban and principal city data is an aggregation from place-level data. Calculated as number of renter households divided by total households. This can be represented mathematically as follows:

$$\% \text{ Renters} = \text{Renter Households} \div \text{Total Households}$$

- Geographic Region- A control variable taken from the U.S. Census Bureau, which splits states into four geographic regions: Northeast, Midwest, South, and West (U.S Census Bureau, 2020). Within each model the Northeast region serves as the reference, or default. Three variables are then defined to control for whether a particular MSA is located in either the Midwest, South, or West.

Research Shortcomings

The data analysis of this study offers only a small glimpse of the dynamics surrounding publicly supported rental housing and cost burden for Very Low-Income renters. Apart from the limited ability of the regression models to provide a complete view of the factors affecting subsidized housing policy, like with most regression analyses, this study shares limitations associated with measurement error and data quality. The data utilized here is drawn from a variety of sources and relies upon inputs from several levels of government, meaning its accuracy is predicated upon the efforts of many different actors.

Capturing data covering the full array of elements influencing cost burden for Very Low-Income renters or the availability and distribution of publicly supported rental housing would require several hundreds of variables and might in fact be impossible. This research does not embark on capturing real estate prices, fluctuations in the job market, or several other among the vast array of forces and factors at play. This research captures only a small number of those considerations in an attempt to evaluate the questions brought forth in this dissertation, and such evaluation is in no way definitive.

The absence of a definitive evaluative answer is further evident in the results of the statistical analysis itself. Though the dissertation's analysis draws from the existing literature in

an effort to relay an accurate picture of the metropolitan landscape of publicly subsidized housing for Very Low Income households, it cannot possibly capture the particular context of each of the 107 MSAs. This means that there is an inherent limit to how much this dissertation can possibly reveal. Case studies focused on particular metropolitan regions and states could offer additional information and provide significant context for the tentative findings of this study.

Finally, the analysis within this dissertation only serves to broadly capture conditions in the metropolitan regions comprising the research sample. The analysis of metropolitan variation between suburbs and principal cities aggregates jurisdictional variation into one-size-fits-all categories to capture suburbs and principal cities within those metropolitan areas. This approach precludes further investigation of differences among suburban and urban jurisdictions. As a result, inferences of conditions in metropolitan areas, their suburbs, or their principal cities can only be made as tentative generalities.

CHAPTER 4

Characteristics of the MSAs in the Research Sample

This chapter explores traits of the Metropolitan Statistical Areas (MSAs) that form the research sample. MSAs are identified by geographic region. Statistics describing the sample as a whole are presented to give context to models explored in Chapters 5 and 6. Further assessment of the sample delves into both the highest and lowest values recorded for each of the four key variables. These statistics provide context regarding the diversity of environments present within the sample, in addition to offering further insight on the particular characteristics of sample MSAs. Statistics presented here can offer some hint as to the merits of the research hypotheses.

MSAs by Geographic Region

Northeast Region

MSA	Population
New York-Newark-Jersey City, NY-NJ-PA Metro Area	20,275,179
Philadelphia-Camden-Wilmington, PA-NJ-DE-MD Metro Area	6,077,152
Boston-Cambridge-Newton, MA-NH Metro Area	4,805,942
Pittsburgh, PA Metro Area	2,341,536
Providence-Warwick, RI-MA Metro Area	1,615,878
Hartford-West Hartford-East Hartford, CT Metro Area	1,210,075
Buffalo-Cheektowaga-Niagara Falls, NY Metro Area	1,134,914
Rochester, NY Metro Area	1,078,352
Bridgeport-Stamford-Norwalk, CT Metro Area	949,141
Worcester, MA-CT Metro Area	936,723
Albany-Schenectady-Troy, NY Metro Area	882,801
Allentown-Bethlehem-Easton, PA-NJ Metro Area	835,233
Syracuse, NY Metro Area	656,931
Springfield, MA Metro Area	630,661
Harrisburg-Carlisle, PA Metro Area	568,008
Scranton-Wilkes Barre-Hazleton, PA Metro Area	555,171
Lancaster, PA Metro Area	539,137
Portland-South Portland, ME Metro Area	528,261

Table 1-MSAs in the Northeast and their populations

There are 19 MSAs located in the Northeast portion of the United States included within the sample. The Northeast covers the smallest geographic area of the U.S.'s four regions, but it includes three of the country's largest MSAs by population. These metropolitan regions are centered around New York City, Philadelphia, and Boston, respectively. New York State and Pennsylvania are home to a majority of these Northeastern MSAs, though Rhode Island, Connecticut, Massachusetts, and Maine also have representatives in the sample. The regions listed in Table 1 span a wide range of attributes in terms of density and population characteristics. Relatively Lancaster MSAs such as those built around Lancaster, Pennsylvania and Portland, Maine embodying a staunch contrast to the Northeast's largest metropolitan regions.

Midwest Region

Nineteen sample MSAs are located in the Midwest, equal to the number found in the Northeast. Looking at Table 2 on the following page, we see that Chicago, Illinois is the focal point of the Midwest's largest metropolitan region. Once again, we see a significant contrast in the nature of MSAs located in the Midwest, with the likes of Omaha and Des Moines differing largely from St. Louis or Detroit in terms of economic and racial characteristics. Ohio is the focal point for seven of the metropolitan regions in the sample, the most of any state in the Midwest. In total there are ten states in the Midwest with at least one MSA located primarily within their boundaries.

MSA	Population
Chicago-Naperville-Elgin, IL-IN-WI Metro Area	9,546,326
Detroit-Warren-Dearborn, MI Metro Area	4,305,869
Minneapolis-St. Paul-Bloomington, MN-WI Metro Area	3,557,276
Saint Louis, MO-IL Metro Area	2,806,782
Cincinnati, OH-KY-IN Metro Area	2,166,029
Kansas City, MO-KS Metro Area	2,106,382
Cleveland-Elyria, OH Metro Area	2,060,065
Columbus, OH Metro Area	2,046,977
Indianapolis-Carmel-Anderson, IN Metro Area	2,005,612
Milwaukee-Waukesha-West Allis, WI Metro Area	1,576,143
Grand Rapids-Wyoming, MI Metro Area	1,048,826
Omaha-Council Bluffs, NE-IA Metro Area	924,003
Dayton, OH Metro Area	800,886
Akron, OH Metro Area	702,556
Madison, WI Metro Area	647,432
Wichita, KS Metro Area	644,680
Des Moines-West Des Moines, IA Metro Area	634,740
Toledo, OH Metro Area	604,591
Youngstown-Warren-Boardman, OH-PA Metro Area	544,543

Table 2-MSAs in the Midwest and their populations

South Region

MSA	Population
Dallas-Fort Worth-Arlington, TX Metro Area	7,253,424
Houston-The Woodlands-Sugar Land, TX Metro Area	6,798,010
Washington-Arlington-Alexandria, DC-VA-MD-WV Metro Area	6,150,681
Miami-Fort Lauderdale-West Palm Beach, FL Metro Area	6,107,433
Atlanta-Sandy Springs-Roswell, GA Metro Area	5,795,723
Tampa-St. Petersburg-Clearwater, FL Metro Area	3,036,525
Baltimore-Columbia-Towson, MD Metro Area	2,801,028
Charlotte-Concord-Gastonia, NC-SC Metro Area	2,475,519
Orlando-Kissimmee-Sanford, FL Metro Area	2,453,333

Table 3-MSAs in the South and their populations (continued on next page)

MSA	Population
San Antonio-New Braunfels, TX Metro Area	2,426,211
Austin-Round Rock, TX Metro Area	2,060,558
Nashville-Davidson-Murfreesboro-Franklin, TN Metro Area	1,868,855
Virginia Beach-Norfolk-Newport News, VA-NC Metro Area	1,722,766
Jacksonville, FL Metro Area	1,476,503
Oklahoma City, OK Metro Area	1,372,463
Memphis, TN-MS-AR Metro Area	1,345,193
Raleigh, NC Metro Area	1,304,896
Louisville/Jefferson County, KY-IN Metro Area	1,284,848
Richmond, VA Metro Area	1,282,205
New Orleans-Metairie, LA Metro Area	1,271,195
Birmingham-Hoover, AL Metro Area	1,146,888
Tulsa, OK Metro Area	987,465
Greenville-Anderson-Mauldin, SC Metro Area	884,512
Knoxville, TN Metro Area	867,870
McAllen-Edinburg-Mission, TX Metro Area	850,187
El Paso, TX Metro Area	841,220
Baton Rouge, LA Metro Area	835,596
Columbia, SC Metro Area	817,443
North Port-Sarasota-Bradenton, FL Metro Area	788,442
Charleston-North Charleston, SC Metro Area	761,904
Greensboro-High Point, NC Metro Area	756,564
Little Rock-North Little Rock-Conway, AR Metro Area	733,461
Cape Coral-Fort Myers, FL Metro Area	722,506
Lakeland-Winter Haven, FL Metro Area	667,018
Winston-Salem, NC Metro Area	661,708
Deltona-Daytona Beach-Ormond Beach, FL Metro Area	636,843
Augusta-Richmond County, GA-SC Metro Area	594,889
Jackson, MS Metro Area	579,558
Palm Bay-Melbourne-Titusville, FL Metro Area	577,899
Durham-Chapel Hill, NC Metro Area	558,920
Chattanooga, TN-GA Metro Area	551,957
Fayetteville-Springdale-Rogers, AR-MO Metro Area	525,176
Lexington-Fayette, KY Metro Area	506,760

Table 4-MSAs in the South and their populations (continued from previous page)

In total 43 of the sample’s 107 MSAs are located in the South, by far the most of any region in the United States. This speaks to the geographic breadth and expansion of that region, which spans from Texas to Washington D.C. and includes states such as Georgia, Florida, and North Carolina. As one might expect, the 43 metropolitan regions located in the South includes a wide range of population totals and density levels. MSAs located within the south tend to be more sprawling in nature than those in other parts of the country, reflecting the large amount of land available across the Sunbelt. Five metropolitan regions with populations of at least five million are located in the South, including the Dallas-Fort Worth Metroplex, Greater Houston, the National Capital Region, Greater Miami, and Metro Atlanta.

West Region

MSA	Population
Los Angeles-Long Beach-Anaheim, CA Metro Area	13,328,261
San Francisco-Oakland-Hayward, CA Metro Area	4,699,077
Phoenix-Mesa-Scottsdale, AZ Metro Area	4,648,498
Riverside-San Bernardino-Ontario, CA Metro Area	4,523,653
Seattle-Tacoma-Bellevue, WA Metro Area	3,802,660
San Diego-Carlsbad, CA Metro Area	3,317,200
Denver-Aurora-Lakewood, CO Metro Area	2,851,848
Portland-Vancouver-Hillsboro, OR-WA Metro Area	2,423,102
Sacramento-Roseville-Arden-Arcade, CA Metro Area	2,295,233
Las Vegas-Henderson-Paradise, NV Metro Area	2,156,724
San Jose-Sunnyvale-Santa Clara, CA Metro Area	1,990,910
Salt Lake City, UT Metro Area	1,185,978
Tucson, AZ Metro Area	1,012,519
Urban Honolulu, Hawaii Metro Area	992,761
Fresno, CA Metro Area	979,534
Albuquerque, NM Metro Area	906,877
Bakersfield, CA Metro Area	885,086
Oxnard-Thousand Oaks-Ventura, CA Metro Area	851,096

Table 5-MSAs in the West and their populations (continued on next page)

MSA	Population
Stockton-Lodi, CA Metro Area	734,294
Colorado Springs, CO Metro Area	710,746
Boise, ID Metro Area	690,810
Ogden-Clearfield, UT Metro Area	652,995
Provo-Orem, UT Metro Area	601,478
Spokane-Spokane Valley, WA Metro Area	554,777
Modesto, CA Metro Area	541,353
Santa Rosa, CA Metro Area	503,833

Table 6-MSAs in the West and their populations (continued from previous page)

Twenty-six of the MSAs within the research sample are located in the West, second most of the four regions in the United States. Twelve of those are in California alone, easily the largest number of MSAs with a population of at least 500,000 located in any single state. California's metropolitan regions include relatively small MSAs focused on Santa Rosa and Modesto as well as much larger areas such as Greater Los Angeles and the Bay Area. Outside California, sample MSAs come from a variety of states, including Arizona, Washington, Colorado, Nevada, New Mexico, Utah, Idaho, and Hawaii. While Greater Los Angeles is the only MSA within the West with at least five million residents, several additional MSAs have a population over three million. These include metropolitan regions centered around San Francisco, California, Phoenix, Arizona, Riverside, California, Seattle, Washington, and San Diego, California.

Descriptive Statistics

Beyond variables categorizing MSAs by region, there are 21 additional variables employed across this research, which were utilized within the three models constructed to evaluate research hypotheses.

	N	Minimum	Maximum	Mean	Std. Deviation
Poverty Rate	107	8.40	32.80	14.63	3.62
Suburban Poverty Rate	107	4.02	36.89	11.92	4.54
Principal Poverty Rate	107	9.63	34.50	20.57	5.35
Burden Among VLI Renters	107	71.98	92.41	82.71	4.23
Burden Among VLI Renters in Suburbs	107	70.05	92.99	80.94	5.13
Burden Among VLI Renters in Principal Cities	107	72.10	93.59	83.73	4.47

Table 7- Descriptive statistics for variables relating to poverty and variables relating cost burden for VLI renters

Table 7 shows descriptive statistics for variables pertaining to poverty and cost burden for VLI renters. The mean poverty rate in the 107 MSA sample is 14.6%, with a low of 8.4% and high of 32.8%. In the principal cities of the sample MSAs the average poverty rate is 20.6%, spanning from 9.6% to 34.5% of the population. Suburban poverty rates are lower, with an average value of 11.9% across the sample. This includes a range from 4% to 36.9%.

There are three variables pertaining to cost burden for VLI renters. On average, about 83% of VLI renters in the 107 MSA sample incur some level of cost burden. This ranges from a rate of about 72% in the MSA with the lowest rate of cost burden for VLI renters to approximately 92% in the MSA with the highest rate. Looking at just the suburban portion of MSAs, cost burden for VLI renters is a little bit lower, with a mean rate of about 81%. In principal cities alone that mean is about 84% of households.

	N	Minimum	Maximum	Mean	Std. Deviation
Percent White	107	6.43	91.38	61.65	17.32
Percent White in Suburbs	107	4.58	92.93	67.22	19.38
Percent White in Principal Cities	107	9.74	84.53	49.71	15.24
Percent Renters	107	25.04	51.59	36.14	4.87
Percent Renters in Suburbs	107	18.17	47.38	28.76	5.28
Percent Renters in Principal Cities	107	34.91	68.35	49.27	6.48

Table 8- Descriptive statistics for additional demographic variables

Table 8 presents data on the percentage of residents who are White and the percentage of households who are renting their domicile. On average, White residents represent approximately 62% of the population in the sample MSAs, though there is significant differentiation between the minimum of 6.4% and maximum of 91.4%. White residents are a larger portion of the MSAs' suburban population on the whole, with an average value of 67.2%. Conversely, White residents are a much smaller portion of the MSAs' principal cities, with a mean value just below 50%.

The average percentage of households renting their home in sample MSAs is 36.1%, spanning from a low of 25% to just over 51%. On average, renters make up 28.8% of households in suburbs within the sample MSAs, ranging from 18.2% to 47.4%. These numbers are much lower than in principal cities of those same MSAs, where the average value is 49.3%. The percentage of households renting their homes in the principal cities of sample MSAs spans from 34.9% to 68.4%.

	N	Minimum	Maximum	Mean	Std. Deviation
PF Score	107	0.0	3.0	1.5	0.9
Regionalism Score	107	0.0	3.0	0.8	0.9
Cohesion index	107	0.0	5.7	2.3	1.3
PSRH per 100 VLI Renters	107	10.05	47.96	25.35	8.48
PSRH per 100 VLI Renters in Suburbs	107	6.18	47.73	20.52	8.50
PSRH per 100 VLI Renters in Principal Cities	107	10.74	58.93	30.64	11.01
PSRH Ratio	107	19.99	163.09	70.11	24.27

Table 9- Descriptive statistics for variables pertaining to publicly supported rental housing

Table 9 includes descriptive statistics directly pertaining to publicly supported rental housing and its provision. Policy Fragmentation Scores for each MSA are computed on a scale of 0 to 3 after ranking each metropolitan region based on the number housing authorities per 500,000 residents in an MSA. Naturally, these scores range from 0 to 3. Regionalism Scores are assigned on a scale from 0 to 3 as well, with a mean value of just .8. Cohesion Index values are calculated through adding Policy Fragmentation Scores and Regionalism Scores, and they range from a low of 0 to a high of 5.7. The mean Cohesion Index score assigned to sample MSAs is 2.3.

The mean number of publicly supported rental housing units per 100 VLI renters in sample MSAs is approximately 25. This value ranges from a low of around 10 to a high of almost 48. In the MSAs' suburbs alone the mean is approximately 21, with values ranging from a low of about 6 to a high of nearly 48. Values in principal cities are higher, with a mean of over 30 publicly supported rental housing units per 100 VLI renters. The range in principal cities goes from about 11 to approximately 59. In sample MSAs the average PSRH Ratio indicates the

number of PSRH per 100 VLI renters in suburbs is approximately 70% the level found in principal cities. This ranges from a low of 20% in one MSA to a high of 163% in another.

Highest and Lowest Values for Key Variables

Examining which MSAs have the highest and lowest values for the research's most important variables provides further context on metropolitan environments and the nature of the sample. Here both ends of the spectrum are explored for the four variables that serve as either a dependent or study variable in the three models employed within this research. This section looks at values for MSAs as a whole, suburbs alone, and principal cities alone.

Burden Among VLI Renters

The MSAs with the highest rates of cost burden among VLI renters are featured on page 65 in Tables 10, 11, and 12 for MSAs, suburbs, and principal cities, respectively. We can see that the metropolitan areas centered in Orlando and Las Vegas are included in all three, meaning that those two MSAs have very high levels of cost burden for VLI renters in both principal cities and suburbs. It is interesting to note that every MSA among those with the highest rates of cost burden for VLI renters in any portion of the metropolis is located in either the South or West.

Tables 13, 14, and 15 on page 66 depict the other side of the spectrum. MSAs with the lowest levels of cost burden among VLI renters are more geographically scattered, though several metropolitan regions in the Northeast are featured. This includes the Pittsburgh, Pennsylvania Metro Area, which has the lowest rate of metropolitan-wide cost burden for VLI renters. Contrary to what we saw on the opposite end of the scale, no MSA is featured among the five with the lowest rates of cost burden for VLI renters in both suburbs and principal cities.

Five Highest at MSA Level

MSA	Burden Among VLI Renters
Orlando-Kissimmee-Sanford, FL Metro Area	92.4
Las Vegas-Henderson-Paradise, NV Metro Area	92.0
Riverside-San Bernardino-Ontario, CA Metro Area	89.7
Cape Coral-Fort Myers, FL Metro Area	89.6
Austin-Round Rock, TX Metro Area	89.3

Table 10- 5 MSAs with the highest percentage of VLI renters who incur some level of cost burden

Five Highest in Suburbs Alone

MSA	Burden Among VLI Renters
Las Vegas-Henderson-Paradise, NV Metro Area	93.0
Orlando-Kissimmee-Sanford, FL Metro Area	91.9
Miami-Fort Lauderdale-West Palm Beach, FL Metro Area	89.9
Riverside-San Bernardino-Ontario, CA Metro Area	89.4
Tampa-St. Petersburg-Clearwater, FL Metro Area	89.1

Table 11-5 MSAs with the highest percentage of suburban VLI renters who incur some level of cost burden

Five Highest in Principal Cities Alone

MSA	Burden Among VLI Renters
Orlando-Kissimmee-Sanford, FL Metro Area	93.6
Cape Coral-Fort Myers, FL Metro Area	92.0
Las Vegas-Henderson-Paradise, NV Metro Area	91.2
Austin-Round Rock, TX Metro Area	91.1
Bakersfield, CA Metro Area	91.1

Table 12-5 MSAs with the highest percentage of VLI renters in principal cities who incur some level of cost burden

Five Lowest at MSA Level

MSA	Burden Among VLI Renters
Pittsburgh, PA Metro Area	72.0
Knoxville, TN Metro Area	73.7
El Paso, TX Metro Area	74.8
Scranton—Wilkes-Barre—Hazleton, PA Metro Area	75.2
Portland-South Portland, ME Metro Area	75.6

Table 13- 5 MSAs with the lowest percentage of VLI renters who incur some level of cost burden

Five Lowest in Suburbs Alone

MSA	Burden Among VLI Renters
Knoxville, TN Metro Area	70.1
Pittsburgh, PA Metro Area	70.1
Lexington-Fayette, KY Metro Area	70.3
Tulsa, OK Metro Area	71.6
Fayetteville-Springdale-Rogers, AR-MO Metro Area	71.7

Table 14- 5 MSAs with the lowest percentage of suburban VLI renters who incur some level of cost burden

Five Lowest in Principal Cities Alone

MSA	Burden Among VLI Renters
Ogden-Clearfield, UT Metro Area	72.1
Boston-Cambridge-Newton, MA-NH Metro Area	74.9
El Paso, TX Metro Area	75.2
Cincinnati, OH-KY-IN Metro Area	76.1
Scranton—Wilkes-Barre—Hazleton, PA Metro Area	76.1

Table 15- 5 MSAs with the lowest percentage of VLI renters in principal cities who incur some level of cost burden

PSRH Per 100 VLI Renters

MSAs with the highest levels of publicly supported rental housing per 100 VLI renters are depicted in Tables 16, 17, and 18 for MSAs, suburbs, and principal cities, respectively. Four of the five MSAs with the highest metropolitan-wide levels of PSRH per 100 VLI Renters are located in the Northeast. The metropolitan region centered upon Boston is the only one among the top five at all three geographic levels. It is interesting to note that this region also featured among those with the lowest levels of cost burden for VLI renters in principal cities. It is also fascinating to see that the highest levels of PSRH relative to the population of VLI renters are not typically found in extremely largest MSAs, although Boston and Atlanta are both exceptions to a certain extent.

Tables 19, 20, and 21 show MSAs with the lowest levels of publicly supported rental housing per 100 VLI renters. Contrary to what we see on the other side of the spectrum, none of the metropolitan regions with particularly low levels of PSRH per 100 VLI Renters are located in the Northeast. Given it has the highest rate of cost burden among VLI renters, it is notable that the Orlando-Kissimmee-Sanford, FL Metro Area has the lowest levels of PSRH per 100 VLI Renters. Similarly, the Austin-Round Rock, Texas Metro Area and Las Vegas-Henderson-Paradise, Nevada Metro Area also have particularly high rates of cost burden among VLI renters while simultaneously providing relatively little publicly supported rental housing to that population.

Five Highest at MSA Level

MSA	PSRH per 100 VLI Renters
Scranton--Wilkes-Barre--Hazleton, PA Metro Area	48.0
Boston-Cambridge-Newton, MA-NH Metro Area	46.3
Providence-Warwick, RI-MA Metro Area	43.2
New Orleans-Metairie, LA Metro Area	43.2
Springfield, MA Metro Area	40.4

Table 16- 5 MSAs with the highest levels of PSRH relative to the population of VLI renters

Five Highest in Suburbs Alone

MSA	PSRH per 100 VLI Renters
Scranton--Wilkes-Barre--Hazleton, PA Metro Area	47.8
Boston-Cambridge-Newton, MA-NH Metro Area	43.3
Providence-Warwick, RI-MA Metro Area	42.4
Albany-Schenectady-Troy, NY Metro Area	39.1
Lexington-Fayette, KY Metro Area	36.2

Table 17- 5 MSAs with the highest levels of PSRH relative to the population of VLI renters in suburbs

Five Highest in Principal Cities Alone

MSA	PSRH per 100 VLI Renters
Springfield, MA Metro Area	48.0
Columbia, SC Metro Area	46.3
Boston-Cambridge-Newton, MA-NH Metro Area	43.2
Atlanta-Sandy Springs-Roswell, GA Metro Area	43.2
Greenville-Anderson-Mauldin, SC Metro Area	40.4

Table 18- 5 MSAs with the highest levels of PSRH relative to the population of VLI renters in principal cities

Five Lowest at MSA Level

MSA	PSRH per 100 VLI Renters
Orlando-Kissimmee-Sanford, FL Metro Area	10.0
Fayetteville-Springdale-Rogers, AR-MO Metro Area	10.9
Phoenix-Mesa-Scottsdale, AZ Metro Area	11.1
Provo-Orem, UT Metro Area	11.3
Austin-Round Rock, TX Metro Area	11.4

Table 19- 5 MSAs with the lowest levels of PSRH relative to the population of VLI renters

Five Lowest in Suburbs Alone

MSA	PSRH per 100 VLI Renters
Bakersfield, CA Metro Area	6.2
Orlando-Kissimmee-Sanford, FL Metro Area	6.6
Tucson, AZ Metro Area	6.8
North Port-Sarasota-Bradenton, FL Metro Area	8.1
Los Angeles-Long Beach-Anaheim, CA Metro Area	8.3

Table 20- 5 MSAs with the lowest levels of PSRH relative to the population of VLI renters

Five Lowest in Principal Cities Alone

MSA	PSRH per 100 VLI Renters
Fayetteville-Springdale-Rogers, AR-MO Metro Area	10.7
Provo-Orem, UT Metro Area	10.8
Phoenix-Mesa-Scottsdale, AZ Metro Area	11.6
Austin-Round Rock, TX Metro Area	12.1
Las Vegas-Henderson-Paradise, NV Metro Area	12.3

Table 21- 5 MSAs with the lowest levels of PSRH relative to the population of VLI renters

PSRH Ratio

As explained in Chapter 3, the Publicly Supported Rental Housing (PSRH) Ratio compares the relative level of publicly supported rental housing availability in suburbs and principal cities. The top five and bottom MSAs by PSRH Ratio are shown on Tables 22 and 23 on the next page. Of the MSAs among those with either the highest or lowest PSRH Ratios, only the Atlanta-Sandy-Springs-Roswell, GA Metro Area has a population of over two million residents.

The low PSRH Ratio in the Atlanta MSA indicates that publicly supported rental housing is particularly disproportionately located in principal cities within that metropolitan area. This is not particularly surprising given the Atlanta MSA is in the top five for highest levels of PSRH in principal cities. The much smaller Greenville-Anderson-Mauldin, SC Metro Area, which has the lowest PSRH Ratio among the 107 MSAs in the sample, also is among the metropolitan regions with the highest levels of PSRH in principal cities.

Conversely, the Lexington-Fayette, Kentucky Metro Area has the highest PSRH Ratio, indicating a particularly high level of publicly supported rental housing in suburbs compared to principal cities. The same is true for the Albany-Schenectady-Troy, NY MSA second on this list. Those metropolitan regions are also in the top five for most PSRH per 100 VLI Renters in suburbs, which helps explain their presence here. That puts them on the other end of the spectrum from the Greenville and Atlanta MSAs.

Five Highest

MSA	PSRH Ratio
Lexington-Fayette, KY Metro Area	163.1
Albany-Schenectady-Troy, NY Metro Area	135.4
Wichita, KS Metro Area	121.4
Las Vegas-Henderson-Paradise, NV Metro Area	120.7
Urban Honolulu, HI Metro Area	118.3

Table 22- 5 MSAs with the highest PSRH ratio between suburbs and principal cities

Five Lowest

MSA	PSRH Ratio
Greenville-Anderson-Mauldin, SC Metro Area	20.0
Atlanta-Sandy Springs-Roswell, GA Metro Area	24.7
North Port-Sarasota-Bradenton, FL Metro Area	27.0
Bakersfield, CA Metro Area	27.7
Lancaster, PA Metro Area	30.4

Table 23- 5 MSAs with the lowest PSRH ratio between suburbs and principal cities

Cohesion Index

The means of calculating a Cohesion Index value is explained in Chapter 3. Essentially, a Cohesion Index is assigned based on both the level of policy fragmentation and regional coordination present within a given metropolitan region. The MSAs with the five highest and lowest Cohesion Index values are depicted in Tables 24 and 25 on the next page. While none of the top five MSAs by Cohesion Index are among those with the highest levels of PSRH, none of them are in the bottom five by that measure, either. Conversely, the appearance of the Albany-Schenectady-Troy, NY amongst those MSAs with the lowest Cohesion Index values runs contrary to what would have been expected given the high level of PSRH in the suburbs of that metropolitan region. It is also interesting to note that, despite the fact many MSAs with high

levels of PSRH are located in the Northeast, no Northeastern MSAs are among those with the highest Cohesion Index values.

MSA	Cohesion Index
Louisville/Jefferson County, KY-IN Metro Area	5.9
Toledo, OH Metro Area	5.0
Chicago-Naperville-Elgin, IL-IN-WI Metro Area	4.8
Portland-Vancouver-Hillsboro, OR-WA Metro Area	4.8
Washington-Arlington-Alexandria, DC-VA-MD-WV Metro Area	4.7

Table 24- 5 MSAs with the highest Cohesion Index values

MSA	Cohesion Index
Worcester, MA-CT Metro Area	0.1
Bridgeport-Stamford-Norwalk, CT Metro Area	0.1
Providence-Warwick, RI-MA Metro Area	0.2
Albany-Schenectady-Troy, NY Metro Area	0.2
Detroit-Warren-Dearborn, MI Metro Area	0.3

Table 25- 5 MSAs with the lowest Cohesion Index

CHAPTER 5

Effects of the Quantity and Distribution of Publicly Supported Rental Housing

Chapters 1 and 2 outlined the relationship between subsidized housing and cost burden among VLI renters and explored the potential ramifications of a principal cities vs. suburbs imbalance in the location of subsidized housing. Chapter 3 presented the methodological approach to testing the hypothesized relationships, while Chapter 4 explored specific sample statistics of the variables used in this dissertation's research models and discussed the characteristics of the top and bottom MSAs in the 107 MSA sample.

Chapter 5 offers results and analysis for Models 1 and 2, testing the first two research hypotheses. Model 1 is tested for MSAs as a whole as well as for suburbs alone and principal cities alone. Each test for Model 1 shows a strong relationship between higher levels of PSRH per VLI Renter and Burden among VLI Renters, supporting Hypothesis 1. Model 2 does not strongly support the first aspect of Hypothesis 2, that a tendency to disproportionately locate PSRH in principal cities (operationalized as low PSRH Ratios) will be associated with higher rates of cost burden for VLI renters through an MSA. Lower PSRH Ratios do, however, correspond with higher rates of cost burden among suburban VLI renters.

Regression Models

Model #1 (Hypothesis 1)

Hypothesis #1- Greater availability of publicly supported rental housing will be associated with lower rates of cost burden for Very Low-Income renters within metropolitan areas, their suburbs, as well as their principal cities.

Model 1 Metropolitan-Wide Test

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.746	.557	.525	2.90

Predictors: (Constant), Poverty Rate, West, Midwest, PSRH Per 100

VLI Renters, Percent Renters, Percent White, South

Table 26- Model summary for model 1 MSA test

ANOVA

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	1054.118	7	150.588	17.765	.000
	Residual	839.176	99	8.477		
	Total	1893.293	106			

Dependent Variable: Burden Among VLI Renters

Predictors: (Constant), Poverty Rate, West, Midwest, Subsidized Per 100 VLI Renters, Percent Renters, Percent White, South

Table 27- ANOVA for model 1 MSA test

Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	88.074	4.686		18.795	.000
	Midwest	-1.087	1.037	-.099	-1.048	.297
	South	.008	1.023	.001	.007	.994
	West	.124	1.224	.013	.101	.920
	Percent White	-.043	.025	-.174	-1.685	.095
	Percent Renters	.137	.078	.158	1.752	.083
	Poverty Rate	-.020	.091	-.017	-.214	.831
	PSRH Per 100 VLI Renters	-.286	.043	-.575	-6.619	.000

Dependent Variable: Burden Among VLI Renters

Table 28- Coefficients for Model 1 MSA test

$$\hat{y} = 88.074 - 1.087 (\text{Located in Midwest}) + .008 (\text{Located in South}) + .124 (\text{Located in West}) - .043 (\text{Percent White}) + .137 (\text{Percent Renters}) - .02 (\text{Poverty Rate}) - .286 (\text{PSRH per 100 VLI Renters})$$

The first multiple linear regression analysis run for this model is for metropolitan areas as a whole. The R Square of this test indicates nearly 56% of variation in the dependent variable is predicted by the model. For this analysis \hat{y} represents the predicted percentage of Very Low-Income (VLI) renters who suffer some level of cost burden in a given MSA. The study variable, PSRH per 100 VLI Renters, is the only variable significant at the .95 level. Its unstandardized coefficient value of $-.286$ indicates that for each additional unit of PSRH per 100 VLI Renters in a given MSA, the rate of cost burden among VLI renters is expected to drop by nearly .3 percentage points. The inverse association between the study variable and the dependent variable is in line with the relationship posited in Hypothesis #1. The significance of the variable allows a rejection of the null hypothesis of no relationship between the study variable and the dependent variable.

Poverty rate is far from attaining statistical significance in this test but is included for its theoretical significance. Both the percentage of an MSA's population that is White and the percent of households renting their domicile have a slight positive association with cost burden among VLI renters. None of the geographic regional variables prove significant in this model, though location in the Midwest is associated with an expected decline in the rate of cost burden among VLI Renters of nearly a percentage point. The correlations shown below do not point toward multicollinearity, though there is a relatively strong inverse relationship between the percentage of an MSA's population that is White and renters as a percentage of households.

Correlations

		Midwest	South	West	Percent White	Percent Renters	Poverty Rate	PSRH per 100 VLI Renters
Midwest	Pearson Correlation	1	-.381	-.263	.329	-.182	-.082	.049
South	Pearson Correlation	-.381	1	-.464	-.234	-.119	.280	-.086
West	Pearson Correlation	-.263	-.464	1	-.331	.441	.001	-.437
Percent White	Pearson Correlation	.329	-.234	-.331	1	-.602	-.452	.288
Percent Renters	Pearson Correlation	-.182	-.119	.441	-.602	1	.176	-.232
Poverty Rate	Pearson Correlation	-.082	.280	.001	-.452	.176	1	-.085
PSRH Per 100 VLI Renters	Pearson Correlation	.049	-.086	-.437	.288	-.232	-.085	1

Table 29- Correlations for model 1 MSA test

Model 1 Suburban Test

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.716	.512	.478	3.71

Predictors: (Constant), PSRH per 100 VLI Renters in Suburbs, Midwest, Percent Renters in Suburbs, Suburban Poverty Rate, South, Percent White in Suburbs, West

Table 30- Model summary for model 1 suburban test

ANOVA

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	1429.862	7	204.266	14.855	.000
	Residual	1361.309	99	13.751		
	Total	2791.171	106			

Dependent Variable: Burden Among VLI Renters in Suburbs

Predictors: (Constant), PSRH per 100 VLI Renters in Suburbs, Midwest, Percent Renters in Suburbs, Suburban Poverty Rate, South, Percent White in Suburbs, West

Table 31- ANOVA for model 1 suburban test

Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	83.645	4.536		18.440	.000
	Midwest	-.604	1.297	-.045	-.466	.642
	South	-.515	1.312	-.049	-.393	.695
	West	-.132	1.553	-.011	-.085	.932
	Percent White in Suburbs	-.066	.030	-.249	-2.205	.030
	Percent Renters in Suburbs	.422	.088	.434	4.773	.000
	Suburban Poverty Rate	-.409	.103	-.362	-3.963	.000
	PSRH per 100 VLI in Suburbs	-.252	.055	-.418	-4.608	.000

Dependent Variable: Burden Among VLI Renters in Suburbs

Table 32- Coefficients for model 1 suburban test

$$\hat{y} = 83.645 - .604(\text{Located in Midwest}) - .515 (\text{Located in South}) - .132(\text{Located in West}) - .066(\text{Percent White in Suburbs}) + .422(\text{Percent Renters in Suburbs}) - .409(\text{Poverty Rate}) - .252(\text{PSRH Per 100 VLI Renters in Suburbs})$$

The second multiple linear regression analysis run for this model is for MSA's suburbs alone. The test's R Square indicates that approximately 51% of variance in the dependent variable is predictable within the model. In this analysis \hat{y} represents the predicted percentage of VLI renters in a given MSA's suburbs who suffer some level of cost burden. While none of the regional variables prove significant, every continuous variable is significant at the .95 level. This includes the study variable, PSRH per 100 VLI Renters in Suburbs, which is significant at the .999 level.

The study variable's unstandardized coefficient value of -.252 indicates that for each additional unit of PSRH per 100 VLI Renters in a given MSA's suburbs, the rate of cost burden among VLI renters in suburbs is expected to drop by roughly .25 percentage points. The standardized coefficient value is highest among all variables within this test, signaling that PSRH per 100 VLI Renters in Suburbs has the strongest predicted impact on the dependent variable. The inverse association between the study variable and dependent variable is in line with the relationship posited in Hypothesis #1. The significance of the variable allows rejection of the null hypothesis, a non-relationship between the study variable and dependent variable.

Renters as a percentage of suburban households has a positive relationship with burden amongst VLI renters, indicating that the level of cost burden amongst VLI renters is expected to go up with an increase in the percentage of the suburban population renting their home. Both the percentage of the suburban population that is White and the poverty rate in suburbs are predicted to have a negative relationship with the dependent variable, meaning that the level of cost burden among VLI renters in suburbs is expected to drop as both the white population and poverty rate increase. The association between poverty rate and cost burden for VLI renters is particularly surprising.

The table below shows no issue with multicollinearity among the variables in this test.

Increases in the percentage of the suburban population that is White are associated with reductions in both the percentage of renters and the poverty rate.

Correlations

		Midwest	South	West	Percent White in Suburbs	Percent Renters in Suburbs	Suburban Poverty Rate	PSRH per 100 VLI Renters in Suburbs
Midwest	Pearson Correlation	1	-.381	-.263	.371	-.191	-.243	.076
South	Pearson Correlation	-.381	1	-.464	-.211	-.173	.321	-.174
West	Pearson Correlation	-.263	-.464	1	-.414	.452	.115	-.369
Percent White in Suburbs	Pearson Correlation	.371	-.211	-.414	1	-.537	-.603	.374
Percent Renters in Suburbs	Pearson Correlation	-.191	-.173	.452	-.537	1	.321	-.101
Suburban Poverty Rate	Pearson Correlation	-.243	.321	.115	-.603	.321	1	-.247
PSRH per 100 VLI Renters in Suburbs	Pearson Correlation	.076	-.174	-.369	.374	-.101	-.247	1

Table 33- Correlations for model 1 suburban test

Model 1 Principal City Test

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.683	.466	.429	3.38

Predictors: (Constant), PSRH per 100 VLI Renters in Principal Cities, Midwest, Percent White in Principal, South, Percent Renters in Principal, Principal Poverty Rate, West

Table 34- Model summary for model 1 principal city test

ANOVA

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	987.518	7	141.074	12.354	.000
	Residual	1130.500	99	11.419		
	Total	2118.018	106			

Dependent Variable: Burden Among VLI Renters in Principal Cities

Predictors: (Constant), PSRH per 100 VLI Renters in Principal Cities, Midwest, Percent White in Principal, South, Percent Renters in Principal, Principal Poverty Rate, West

Table 35- ANOVA for model 1 principal city test

Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	90.702	4.341		20.895	.000
	Midwest	-1.580	1.257	-.136	-1.257	.212
	South	2.216	1.126	.244	1.967	.052
	West	1.732	1.359	.167	1.274	.206
	White Principal %	-.031	.024	-.106	-1.277	.205
	Principal Renters as %	-.033	.062	-.048	-.527	.600
	Principal Poverty Rate	.107	.079	.128	1.361	.177
	PSRH per 100 VLI Renters in Principal Cities	-.230	.038	-.567	-6.001	.000

Dependent Variable: VLI Renters with Burden in Principal Cities

Table 36- ANOVA for model 1 principal city test

$$\hat{y} = 90.702 - 1.58(\text{Located in Midwest}) + 2.216(\text{Located in South}) + 1.732(\text{Located in West}) - 0.031(\text{Percent White in Principal}) - 0.033(\text{Percent Renters in Principal}) + 0.107(\text{Principal Poverty Rate}) - 0.230(\text{PSRH per 100 VLI Principal})$$

The third and final multiple linear regression analysis run for this model is for MSA's principal cities. The R Square value of .466 indicates about 47% of variance in the dependent variable is predicted by the model. In this analysis \hat{y} represents the predicted percentage of VLI renters in a given MSA's principal cities who suffer some level of cost burden. Here there is just one variable significant at the .999 level. This is the study variable, PSRH per 100 VLI Renter Households in Principal Cities. The study variable's unstandardized coefficient value of -.230 indicates that for each additional unit of PSRH per 100 VLI Renters in a given MSA's principal cities, the rate of cost burden among VLI renters in those principal cities is expected to drop by roughly .23 percentage points. The standardized coefficient value is highest among all variables within this test, signaling that PSRH per 100 VLI Renters in Principal Cities has the strongest predicted impact on the dependent variable. The inverse association between the study variable and dependent variable is in line with the relationship posited in Hypothesis #1, as was the case for both the metropolitan-wide and suburban tests. The significance of the variable allows rejection of the null hypothesis, a non-relationship between the study variable and dependent variable.

No other variable is significant at the .95 level. Location in the Midwest has a negative relationship with burden amongst VLI renters in principal cities, while location in the South and West both have a positive relationship with the dependent variable. In this instance the poverty rate in principal cities has a positive relationship with the rate of burden, more in line with expectation than what we saw for the suburban test. Both the percentage of renters and White households in principal cities have a slight negative relationship with the dependent variable. The table below does not depict multicollinearity within this test.

Correlations

		Midwest	South	West	Principal Poverty Rate	Percent White Principal	Percent Renters Principal	PSRH per 100 VLI Renters in Principal Cities
Midwest	Pearson Correlation	1	-.381	-.263	.238	.198	-.066	-.016
South	Pearson Correlation	-.381	1	-.464	-.097	-.112	-.211	.041
West	Pearson Correlation	-.263	-.464	1	-.360	-.030	-.113	-.463
Principal Poverty Rate	Pearson Correlation	.238	-.097	-.360	1	-.264	.395	.412
Percent White Principal	Pearson Correlation	.198	-.112	-.030	-.264	1	-.284	-.064
Percent Renters Principal	Pearson Correlation	-.066	-.211	-.113	.395	-.284	1	.286
PSRH per 100 VLI in Principal Cities	Pearson Correlation	-.016	.041	-.463	.412	-.064	.286	1

Table 37- Correlations for model 1 principal city test

Model #2 (Hypothesis 2)

Hypothesis #2- Disproportionate concentrations of publicly supported rental housing in principal cities will be associated with higher rates of cost burden for Very Low-Income renters in metropolitan areas and their suburbs.

Model 2 Metropolitan-Wide Test

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.620	.385	.341	3.43

Predictors: (Constant), PSRH Ratio, West, Poverty Rate, Midwest, Percent Renters, Percent White, South

Table 38- Model summary for model 2 MSA test

ANOVA

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	728.521	7	104.074	8.846	.000
	Residual	1164.772	99	11.765		
	Total	1893.293	106			

Dependent Variable: Burden Among VLI Renters

Predictors: (Constant), PSRH Ratio, West, Poverty Rate, Midwest, Percent Renters, Percent White, South

Table 39- ANOVA summary for model 2 MSA test

Coefficients

Model		Unstandardized Coefficients		Standardized	t	Sig.
		B	Std. Error	Coefficients Beta		
1	(Constant)	79.418	5.272		15.064	.000
	Midwest	1.696	1.125	.154	1.508	.135
	South	3.128	1.060	.365	2.951	.004
	West	4.744	1.172	.484	4.049	.000
	Poverty Rate	-.104	.108	-.089	-.960	.339
	Percent White	-.041	.030	-.169	-1.383	.170
	Percent Renters	.183	.094	.212	1.948	.054
	PSRH Ratio	-.028	.014	-.164	-1.971	.051

Dependent Variable: Burden Among VLI Renters

Table 40- Coefficients for model 2 MSA test

$$\hat{y} = 79.418 + 1.696(\text{Located in Midwest}) + 3.128(\text{Located in South}) + 4.744(\text{Located in West}) - .104(\text{Poverty Rate}) - .048(\text{Percent White}) + .183(\text{Percent Renters}) - .028(\text{PSRH Ratio})$$

The first multiple linear regression analysis run for Model 2 for metropolitan areas as a whole. The R Square of .385 indicates approximately 39% of variance in the dependent variable is predictable with this model. In this analysis \hat{y} represents the predicted rate of cost burden among VLI renters. Here there are two variables that are significant at the .999 level and two more that approach significance at the .95 level. The study variable, PSRH Ratio, is among the latter. Its .949 significance is just short of the .95 level. PSRH Ratio's -.028 unstandardized coefficient indicates that a one point increase in the PSRH Ratio is predicted to lead VLI Renter Burden to drop by roughly .03 percentage points. This negative association is in line with Hypothesis 2, though the weakness of the relationship does not quite permit rejection of the null hypothesis, a non-relationship between the study variable and dependent variable.

Renter percentage is the other continuous variable approaching significance. It has a positive relationship with the dependent variable, indicating an increase in the percentage of

households renting their home is associated with an increase in VLI Renter Burden. Neither the percentage of the population that is White nor the poverty rate are significant, though each has a slight negative relationship with the dependent variable. Both strongly significant variables in this model are geographic regional variables. Location in the West and South are both strongly associated with an increase in the VLI Renter Burden in this test. A weaker positive relationship is also palpable between location in the Midwest and the dependent variable.

The table below shows there are not high levels of multicollinearity in this test. A negative relationship between percentage of the population that is White and poverty rate as well as percent renters is depicted in the correlation matrix. This indicates that where there are more White residents there are fewer renters and lower levels of poverty, which is unsurprising given the same relationships are identified in Model 1.

		Correlations						
		Midwest	South	West	Poverty Rate	Percent White	Percent Renters	PSRH Ratio
Midwest	Pearson Correlation	1	-.381	-.263	-.082	.329	-.182	.102
South	Pearson Correlation	-.381	1	-.464	.280	-.234	-.119	-.175
West	Pearson Correlation	-.263	-.464	1	.001	-.331	.441	.035
Poverty Rate	Pearson Correlation	-.082	.280	.001	1	-.452	.176	-.199
Percent White	Pearson Correlation	.329	-.234	-.331	-.452	1	-.602	.087
Percent Renter	Pearson Correlation	-.182	-.119	.441	.176	-.602	1	.138
PSRH Ratio	Pearson Correlation	.102	-.175	.035	-.199	.087	.138	1

Table 41- Correlations for model 2 MSA test

Model 2 Suburban Test

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.697	.486	.450	3.80

Predictors: (Constant), PSRH Ratio, Percent Renters in Suburbs, Midwest, Suburban Poverty Rate, West, Percent White in Suburbs, South

Table 42- Model summary for model 2 suburban test

ANOVA

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	1357.281	7	193.897	13.387	.000
	Residual	1433.890	99	14.484		
	Total	2791.171	106			

Dependent Variable: Burden Among VLI Renters in Suburbs

Predictors: (Constant), PSRH Ratio, Percent Renters in Suburbs, Midwest, Suburban Poverty Rate, West, Percent White in Suburbs, South

Table 43- ANOVA for model 2 suburban test

Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	83.965	4.721		17.784	.000
	Midwest	1.675	1.241	.125	1.350	.180
	South	1.857	1.209	.178	1.536	.128
	West	3.615	1.352	.304	2.675	.009
	Suburban Poverty Rate	-.474	.108	-.420	-4.406	.000
	Percent White in Suburbs	-.085	.030	-.320	-2.784	.006
	Percent Renters in Suburbs	.373	.090	.384	4.151	.000
	PSRH Ratio	-.061	.016	-.290	-3.892	.000

Dependent Variable: Suburban VLI Renter Burden

Table 44- Coefficients for model 2 suburban test

$$\hat{y} = 83.965 + 1.675(\text{Located in Midwest}) + 1.857(\text{Located in South}) + 3.615(\text{Located in West}) - .474(\text{Suburban Poverty Rate}) - .085(\text{Percent White in Suburbs}) + .373(\text{Percent Renters in Suburbs}) - .061(\text{PSRH Ratio})$$

The second multiple linear regression analysis run for this model is for just suburbs. The R Square value of .486 indicates the model predicts approximately 49% of variance in the dependent variable. In this analysis \hat{y} represents the predicted Suburban VLI Renter Burden. Five variables are significant at the .99 level. Among these is the study variable, PSRH Ratio. PSRH Ratio's -.061 unstandardized coefficient indicates that a one point increase in the PSRH Ratio is associated with a decrease of roughly .06 percentage points in Suburban VLI Rental Burden. This negative association is in line with Hypothesis 2, and its significance allows rejection of the null hypothesis, a non-relationship between the study variable and dependent variable.

Both the suburban poverty rate and percentage of suburban residents who are White are significant, and each variable is negatively correlated with the dependent variable. The standardized coefficient for suburban poverty rate is particularly high, and that variables negative relationship with Suburban VLI Renter Burden is somewhat counterintuitive. Suburban renters as a percentage of households is also significant, but that variable has a positive association with the dependent variable, meaning additional renters are expected to lead to higher levels of burden for VLI renters. All three regional variables have a positive relationship with the dependent variable, indicating that location outside the Northeast is associated with higher levels of Suburban VLI Renter Burden. The variable for the West region is particularly strong in its association with higher Suburban VLI Renter Burden in this test. The West variable is significant at the .99 level, and location in the West is associated with a predicted increase in VLI Renter Burden of over 3 percentage points.

The table below shows there are not high levels of multicollinearity in this test. Relationships are similar to those depicted in previous correlation matrices.

		Correlations						
		Midwest	South	West	Percent White in Suburbs	Suburban Poverty Rate	Percent Renters in Suburbs	PSRH Ratio
Midwest	Pearson Correlation	1	-.381	-.263	.371	-.243	-.191	-.159
South	Pearson Correlation	-.381	1	-.464	-.211	.321	-.173	.240
West	Pearson Correlation	-.263	-.464	1	-.414	.115	.452	-.048
Percent White in Suburbs	Pearson Correlation	.371	-.211	-.414	1	-.603	-.537	-.115
Suburban Poverty Rate	Pearson Correlation	-.243	.321	.115	-.603	1	.321	.278
Percent Renters in Suburbs	Pearson Correlation	-.191	-.173	.452	-.537	.321	1	.125
PSRH Ratio	Pearson Correlation	-.159	.240	-.048	-.115	.278	.125	1

Table 45- Correlations for model 2 suburban test

Summary and Implications

This chapter presents results for tests of the first two research hypotheses, analyzing the impact of publicly supported rental housing’s availability and distribution on cost burden among Very Low-Income renters. Regression analysis strongly supports the notion that higher levels of publicly supported rental housing are associated with lower levels of cost burden among VLI renters in metropolitan areas, their suburbs, and their principal cities. This supports suggestions made by the National Low-Income Housing Coalition (2018) and other affordable housing advocates in the literature that the major issue to overcome in combating cost burden is a shortage of subsidized units. Publicly supported rental housing’s impact on cost burden among VLI renters in the suburbs of metropolitan areas indicates that publicly supported rental housing can also prove vital outside the urban core of metropolitan regions.

Regression analysis also supports the theoretical importance of publicly supported rental housing's distribution, albeit not quite as vigorously. The analysis shows an association between lower levels of metropolitan-wide cost burden for Very Low-Income renters where there are higher PSRH ratios. The PSRH Ratio, a variable representing the distribution of publicly supported rental housing between suburbs and principal cities, also has a statistically significant relationship with cost burden for VLI renters in suburbs. This supports the concept put forth by Kneebone and Berube (2013), Cowan (2006), and Goetz (1995), who suggest that a failure to locate proportional levels of publicly supported rental housing in suburbs can prove detrimental.

In addition to relationships pertaining to publicly supported rental housing, the analysis consistently demonstrates a positive relationship between the percentage of households renting their domicile and cost burden among VLI renters. This indicates that where renters are a larger portion of households, cost burden among VLI renters tends to be higher. That relationship is particularly strong in the suburbs of metropolitan areas within tests of Models 1 and 2. This finding might be linked to increases in the number of Upper-Income rental households, which was cited as an important development by the Harvard Joint Center for Housing Study in their 2018 report on the State of the Nation's Housing. The presence of additional Upper-Income renters might crowd the rental market and make it more difficult for Very Low-Income households to access affordable rental units in order to avoid cost burden.

CHAPTER 6

Effects of Regional Cohesion on Publicly Supported Rental Housing Levels

Like Chapter 5, Chapter 6 builds on preceding chapters to offer analysis and results for regression Model 3, which tests the third research hypothesis regarding the relationship between regional cohesion and availability of publicly supported rental housing. Model 3 is tested for MSAs as a whole as well as for suburbs alone. The analysis supports the anticipated relationship between regional cohesion and higher levels of publicly supported rental housing in examining MSAs as a whole, but not when looking solely at MSAs' suburbs. Strong geographic regional differences in the availability of publicly supported rental housing was detected through the analysis.

Regression Model

Model #3 (Hypothesis 3)

Hypothesis #3- There will be greater availability of publicly supported rental housing in MSAs and their suburbs where there is more regional cohesion.

Model 3 Metropolitan-Wide Test

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.680	.462	.424	6.43

Predictors: (Constant), Cohesion Index, West, Poverty Rate, Percent Renters, Midwest, Percent White, South

Table 46- Model summary for model 3 MSA test

ANOVA

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	3525.674	7	503.668	12.157	.000
	Residual	4101.490	99	41.429		
	Total	7627.164	106			

Dependent Variable: PSRH per 100 VLI Renters

Predictors: (Constant), Cohesion Index, West, Poverty Rate, Renter Percentage, Midwest, White Percent, South

Table 47- ANOVA for model 3 MSA test

Coefficients

Model		Unstandardized Coefficients		Standardized	t	Sig.
		B	Std. Error	Coefficients Beta		
1	(Constant)	33.370	9.856		3.386	.001
	Midwest	-13.301	2.435	-.602	-5.463	.000
	South	-13.199	2.072	-.766	-6.371	.000
	West	-18.951	2.322	-.963	-8.160	.000
	Poverty Rate	.183	.200	.078	.915	.362
	Percent White	-.020	.057	-.042	-.361	.719
	Percent Renters	-.033	.173	-.019	-.190	.850
	Cohesion Index	1.738	.543	.280	3.202	.002

Dependent Variable: PSRH per 100 VLI Renters

Table 48- Coefficients for model 3 MSA test

$$\hat{y} = 33.370 - 13.301(\text{Located in Midwest}) - 13.199(\text{Located in South}) - 18.951(\text{Located in West}) + .183(\text{Poverty Rate}) - .020(\text{Percent White}) - .033(\text{Percent Renters}) + 1.738(\text{Cohesion Index})$$

The first multiple linear regression analysis run for Model 3 tests the model on MSAs as a whole. The R Square value of .462 indicates approximately 46% of variance in the dependent variable is predictable with this model. In this analysis \hat{y} represents the predicted level of PSRH per 100 VLI Renters. Four variables are significant at the .99 level. Among these is the study variable, Cohesion Index, which has a positive relationship with higher levels of PSRH per 100 VLI Renters. The statistical significance of the study variable permits rejection of the null hypothesis, no relationship between Cohesion Index and PSRH per 100 VLI Renters.

The standardized coefficient for Cohesion Index is actually lower than for the other three statistically significant variables within the test. These are the three regional variables representing location in the Midwest, South, and West. All of these variables have a strong negative association with the dependent variable, indicating that location in the Midwest, South, or West is associated with much lower levels of PSRH per 100 VLI Renters when compared with location in the Northeast. This relationship was previously explored in Chapter 4, where we saw that many of the MSAs with the highest levels of PSRH per VLI are located in the Northeast.

Both percentage of households renting their home and the percentage of the population that is White have a slight negative association with PSRH per 100 VLI Renters, though neither variable is significant. Poverty rate has a slight positive association with the dependent variable but also falls short of statistical significance. The table below does not indicate elevated multicollinearity among the independent variables in this test.

		Correlations						
		Midwest	South	West	Poverty Rate	Percent White	Percent Renters	Cohesion Index
Midwest	Pearson Correlation	1	-.381	-.263	-.082	.329	-.182	.439
South	Pearson Correlation	-.381	1	-.464	.280	-.234	-.119	-.107
West	Pearson Correlation	-.263	-.464	1	.001	-.331	.441	.019
Poverty Rate	Pearson Correlation	-.082	.280	.001	1	-.452	.176	-.046
Percent White	Pearson Correlation	.329	-.234	-.331	-.452	1	-.602	.197
Percent Renters	Pearson Correlation	-.182	-.119	.441	.176	-.602	1	-.100
Cohesion Index	Pearson Correlation	.439	-.107	.019	-.046	.197	-.100	1

Table 49- Correlations for model 3 MSA test

Model 3 Suburban Test

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.636	.404	.362	6.78

Predictors: (Constant), Cohesion Index, West, Suburban Poverty Rate, Percent Renters in Suburbs, Midwest, Percent White in Suburbs, South

Table 50- Model summary for model 3 suburban test

ANOVA

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	3093.033	7	441.862	9.587	.000
	Residual	4562.645	99	46.087		
	Total	7655.678	106			

Dependent Variable: PSRH per 100 VLI in Suburbs

Predictors: (Constant), Cohesion Index, West, Suburban Poverty Rate, Percent Renters in Suburbs, Midwest, Percent White in Suburbs, South

Table 51- ANOVA for model 3 suburban test

Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	20.161	8.098		2.490	.014
	Midwest	-9.545	2.564	-.431	-3.724	.000
	South	-11.123	2.255	-.645	-4.932	.000
	West	-15.644	2.546	-.793	-6.144	.000
	Suburban Poverty Rate	-.035	.189	-.019	-.187	.852
	Percent White in Suburbs	.052	.056	.118	.934	.353
	Percent Renters in Suburbs	.218	.161	.136	1.355	.178
	Cohesion Index	.424	.575	.068	.738	.462

Dependent Variable: PSH per 100 VLI in Suburbs

$$\hat{y} = 20.161 - 9.545(\text{Located in Midwest}) - 11.123(\text{Located in South}) - 15.644(\text{Located in West}) - .035(\text{Suburban Poverty Rate}) + .052(\text{Percent White in Suburbs}) + .218(\text{Percent Renters in Suburbs}) + .424(\text{Cohesion Index})$$

This multiple linear regression is for the suburbs of the 107 MSAs within the sample. It is the second test run for Model 3. The R Square value of .404 indicates the model predicts approximately 40% of variance in the dependent variable. In this analysis \hat{y} represents the predicted level of PSRH per 100 VLI Renters in Suburbs. Three variables are significant at the .99 level. Once again, the geographic regional variables representing location in the Midwest, South, and West are all statistically significant. All three variables have a strong negative association with the dependent variable, meaning that location in the Midwest, South, or West is associated with much lower levels of PSRH per 100 VLI Renters in Suburbs when compared to location in the Northeast portion of the United States. This same relationship is present in the metropolitan-wide test and affirms that MSAs in the Northeast tend to have much higher levels of PSRH per 100 VLI Renters than MSAs in other parts of the country.

The study variable, Cohesion Index, does not have a statistically significant relationship with the dependent variable. Cohesion Index has a slight relationship with PSRH per 100 VLI Renters in Suburbs, meaning that higher Cohesion Index values may be associated with higher levels of PSRH per 100 VLI Renters in Suburbs. However, the lack of statistical significance does not permit rejection of the null hypothesis, a no relationship between the study variable and the dependent variable.

The rate of renters in suburbs has a positive but statistically insignificant association with the dependent variable. The percentage of suburban residents who are White also has a slight positive, yet insignificant association with the dependent variable PSRH per 100 VLI Renters in Suburbs. Suburban poverty rate falls well short of statistical significance, but the variable remains in the model for its theoretical significance. It has a marginal negative relationship with

the dependent variable. The table below shows there are not high levels of multicollinearity among the independent variables in this test.

		Correlations						
		Midwest	South	West	Poverty Rate in Suburbs	Percent White in Suburbs	Percent Renters in Suburbs	Cohesion Index
Midwest	Pearson Correlation	1	-.381	-.263	-.243	.371	-.191	.439
South	Pearson Correlation	-.381	1	-.464	.321	-.211	-.173	-.107
West	Pearson Correlation	-.263	-.464	1	.115	-.414	.452	.019
Poverty Rate in Suburbs	Pearson Correlation	-.243	.321	.115	1	-.603	.321	-.097
Percent White in Suburbs	Pearson Correlation	.371	-.211	-.414	-.603	1	-.537	.187
Percent Renters in Suburbs	Pearson Correlation	-.191	-.173	.452	.321	-.537	1	-.029
Cohesion Index	Pearson Correlation	.439	-.107	.019	-.097	.187	-.029	1

Table 52- Correlations for model 3 suburban test

Summary and Implications

Regression analysis supports the hypothesis that there would be a positive relationship between regional cohesion and availability of publicly supported rental housing when looking at metropolitan areas as a whole. This is represented here by an association between Cohesion Index values and higher levels of PSRH per 100 VLI Renters within the metropolitan-wide test. It is interesting to note that the same relationship is not palpable when looking at suburbs alone, given regional cohesion is often pursued in an effort to ensure action within suburban jurisdictions. Nevertheless, the statistical support of the hypothesis when looking at MSAs in their entirety does point toward the value in attaining regional cohesion.

The analysis also shows a very strong relationship between geographic region and levels of publicly supported rental housing availability. Location in the Northeast portion of the United States is strongly associated with the presence of more publicly supported rental housing relative to the population of Very Low-Income renters. This might at be traced at least partially to the fact that public housing units are more abundant in the nation's oldest metropolitan areas, many of which are located in the Northeast (Newman & Harkness, 2002; DeKeseredy et al, 2003).

It is likely that differentiation in state-led initiatives also impacts production of publicly supported rental housing. Among the MSAs with the highest levels of PSRH per 100 VLI renters in the sample, the Scranton, Boston, Providence, and Springfield MSAs are all located in the Northeast. All four of those MSAs are in states at least partially controlled by Democrats, who tend to emphasize subsidized housing provision to a far greater extent than Republicans (Dougherty, 2018). Conversely, the Orlando, Fayetteville, and Austin MSAs in the South, as well as the Provo and Phoenix MSAs in the West, are all located in states controlled by

Republicans (NCSL, 2020). As depicted in Chapter 4, these five MSAs have the lowest metropolitan-wide levels of PSRH per 100 VLI renters within the research sample.

The extent to which jurisdictions are bound by state-led initiatives also differs geographically. As cited in Chapter 2, a 2003 Planning Advisory Service report by Stuart Meck et al notes that “only in states like Connecticut, Massachusetts, New Jersey, and Rhode Island is evaluation (of regional affordable housing programs) clearly possible...each relies on uniform methodologies or a fixed percentage for gauging need, and each has a state-level agency charged with tracking affordable units” (p 187). All four states mentioned are located in the Northeast. Two of the four states cited in the Planning Advisory Service Report, Massachusetts and Rhode Island, are home to three of the five MSAs with the highest levels of PSRH per 100 VLI renters.

CHAPTER 7

Conclusions

Contributions of Research and Summary

This research is rooted in an exploration of the metropolitan interconnections between publicly subsidized housing, the fragmented geographic and policy landscape of the suburbanizing metropolis, components of regional cohesion, and outcomes for Very Low-Income renters. The literature explored here demonstrates the purpose of subsidized housing as a means to ameliorate affordability, especially for Very Low-Income renters. However, the capacity of publicly subsidized housing programs to ameliorate affordability for Very Low-Income renters has yet to be proven and particularly, little research has been conducted to assess the impact of subsidized housing in metropolitan areas. Critics have gone so far as to ask if publicly subsidized housing accomplishes anything at all (Qiu, 2017).

The literature examined in this dissertation also delved into the suburbanizing metropolitan landscape amidst increased population and economic prominence of suburbs relative to that of central cities and metropolitan areas as a whole. Suburbanization has also made access to affordable rental units in suburbs increasingly important for Very Low-Income households (Kneebone & Berube, 2013). Providing for housing affordability in suburbanizing metropolitan regions could be complicated by the fact that publicly subsidized housing provision is increasingly devolved to local jurisdictions, many of which have no real desire to offer subsidized housing and attracting or retaining low income households (Goetz, 1995; Goetz, 2000). Amidst fast suburbanization and accretion of jurisdictions within metropolitan environments, locally devolved publicly subsidized housing provision might be expected to falter if jurisdictions do not work together to ensure an equitable distribution of subsidized housing

throughout metropolitan regions. Conversely, reducing policy fragmentation and increasing regional interjurisdictional coordination could lead to the production of more publicly supported rental housing, distributed more equitably within metropolitan regions.

The concepts detailed above inform the two research questions at the heart of this research. The first of those questions asked to what extent the availability and distribution of publicly supported rental housing in metropolitan areas, their suburbs, and their principal cities are associated with rates of cost burden among Very Low-Income renters in metropolitan regions. The second research question then queried whether regional cohesion has an impact on the provision of publicly supported rental housing in metropolitan areas and their suburbs. Research addressing the two questions at the heart of this dissertation seeks to contribute to the emerging set of studies grappling with subsidized housing in metropolitan regions.

Hypothesis 1 maintains that greater availability of publicly supported rental housing would be associated with lower rates of cost burden among Very Low-Income renters in sample MSAs, both within suburbs and across metropolitan areas. This concept was strongly supported by the results of all three tests employed in the analysis of Hypothesis 1. The analysis shows that higher levels of publicly supported rental housing are associated with lower levels of cost burden among Very Low-Income renters in MSAs on a metropolitan-wide basis. The same strong relationship between higher levels of publicly supported rental housing and lower levels of cost burden among Very Low-Income renters holds for suburbs and principal cities of sample MSAs.

Hypothesis 2 posits that disproportionate concentrations of publicly supported rental housing in principal cities would be associated with higher rates of cost burden among VLI renters in metropolitan areas and their suburbs. The regression analysis lends support to the theoretical significance of publicly supported rental housing's distribution, represented by the

PSRH Ratio. The analysis shows a relationship between higher levels of cost burden for Very Low-Income renters in sample MSAs and disproportionate location of publicly supported rental housing in the principal cities of those MSAs relative to the distribution of Very Low-Income renters. That relationship holds true on a metropolitan-wide basis as well as in looking particularly at suburbs of MSAs within the sample.

Hypothesis 3 surmises that there would be greater availability of publicly supported rental housing in MSAs and their suburbs when there is more regional cohesion. The regression analysis on metropolitan areas as a whole supports this hypothesis, showing a statistically significant relationship between higher Cohesion Index values and PSRH per 100 VLI renters. However, the regression analysis on just the suburbs of metropolitan regions in the research sample does not support the hypothesis that regional cohesion would enhance the availability of publicly supported rental housing in the suburbs of sample regions.

Additional relationships are palpable within the regression analysis conducted for this dissertation. A significant relationship between larger percentages of renter households in MSAs and higher cost burden among Very Low-Income renters in those metropolitan regions is revealed in several tests of Models 1 and 2. This relationship is supported by the literature showing that Mid and Upper-Income households have become increasingly likely to rent, potentially harming affordability for Very Low-Income renters (Harvard University, 2018). It is also interesting to note that there is a strong relationship between geographic region and levels of publicly supported rental housing availability in MSAs. Location in the Northeast portion of the United States is strongly associated with the presence of more publicly supported rental housing relative to the population of Very Low-Income renters. This can be linked with the prominence of Democratic regimes in many Northeastern states. Northeastern states such as Massachusetts

and Rhode Island also have far more binding state-led housing policy initiatives when compared to other portions of the country, particularly those governed by Republicans (Meck et al, 2003; Dougherty, 2018; NCSL, 2020).

Policy Implications

Regression analysis conducted within this research strongly supports the notion that subsidized housing has real benefits. Those benefits are demonstrated in the form of lower levels of cost burden for VLI renters in metropolitan areas, suburbs, as well as principal cities where there are higher levels of publicly supported rental housing. While this might seem to be somewhat self-evident or a foregone conclusion, that is not necessarily the case. Critics such as former Office of Management and Budget director Mick Mulvaney have expressed doubts as to the value of subsidized housing programs (Igoufe, 2018). Mulvaney is not alone in thinking housing subsidization accomplishes nothing, and Model 1's support of the first research hypothesis helps dispel that notion.

The fact that greater availability of publicly supported rental housing is strongly associated with lower levels of cost burden among VLI renters in suburbs is particularly important. This result takes on special significance amidst President Trump's 2020 campaign pledge to shield suburbs from the horrors of "low-income housing" (Yglesias, 2020). The findings of the analysis in this dissertation reinforces the benefits of "low-income housing" for an often overlooked suburban demographic. Data also undermines the idea that subsidized housing is simply unnecessary in suburban settings (Elkin, 2017). This finding supports assertions in the 2019 HUD study *Addressing Housing Affordability in High-Cost Metropolitan Areas in the United States*, which suggests that "that the challenge posed by the lack of affordable housing is generally greater in urban suburbs than in central cities" (p 5). Overall, the

findings within this research substantiate the notion that the production of additional subsidized housing is a worthy goal in pursuing greater equity and improving outcomes for Americans experiencing poverty.

The first step to paving the way for production of additional subsidized housing would be the repeal of the Faircloth Limit, which caps “the number of units for which local public housing authorities can receive federal subsidies” (Gowan & Cooper, 2018). Of course, the production of more subsidized housing also necessitates additional monetary resources. On a local level, this can be pursued through pressure on council members and representatives by advocacy groups. This advocacy is particularly lacking in suburbs, as noted by Kneebone and Berube (2013).

More broadly, the creation of additional subsidized housing becomes far more likely through federal support of HUD programs. In his 2020 campaign for the Democratic presidential nomination, candidate Bernie Sanders included a \$2.5 trillion federal investment in subsidized affordable housing within his “Housing for All” platform (Sanders, 2020). Sanders eventually fell short of the nomination, but the inclusion of such massive housing subsidies in a prominent candidate’s campaign suggests the concept of investing additional resources in this domain is somewhat plausible. Dedication to expansive federal housing subsidization through investment in HUD’s key programs could enhance affordability for Very-Low Income renters.

The analysis also supports the importance of regional cohesion and maintaining balance in the distribution of publicly supported rental housing between suburbs and principal cities. The location of a disproportionate share of publicly supported rental housing in principal cities relative to the distribution of VLI renters is associated with higher rates of cost burden for VLI renters, particularly in suburbs. This can be combated through the installation of fair share agreements, which have proved somewhat successful in regions such as the Twin Cities. State-

led initiatives in Northeastern states like Massachusetts and Rhode Island are similar to fair share agreements in promoting maintenance of subsidized housing throughout metropolitan regions. Implementation of fair share agreements can prove most beneficial if backed by appropriate enforcement mechanisms (Meck et al, 2003).

Additionally, renewed commitment to and enhanced enforcement of the Affirmatively Furthering Fair Housing rule would put pressure on suburban jurisdictions to uphold their fair share of subsidized housing. The rule has been watered down and abandoned so that it no longer has any weight (Bostic & Acolin, 2017; HUD Public Affairs 2020). Still, the rule has the potential to essentially mandate the maintenance of sufficient subsidized housing to provide protected classes access to opportunity (Connolly, 2016). The 2015 rule also offered a path toward joint regional subsidized housing policy formation, and its practical elimination at the time of writing represents a step backward for efforts to pursue regional cohesion.

Future Research

While the analysis conducted here offers insight into relationships pertaining to publicly supported rental housing provision and its impact, additional research would undoubtedly provide further context. Longitudinal quantitative analysis could provide evidence of the effect adding or subtracting subsidized housing might have on metropolitan affordability over time. Additionally, the inclusion of other forms of subsidized housing would offer greater understanding on the impact of different programs. Further exploration of the changing rental market might offer additional understanding of the extent to which the growing tendency for Upper-Income households to rent their home reduces the number of affordable options available to Very Low-Income renters.

Future research could also employ case studies focused on particular metropolitan regions. This type of qualitative study would enhance knowledge of the many factors influencing subsidized housing provision. A comparison of regions in different parts of the country could provide further insight into why, for instance, higher levels of publicly supported rental housing are found in the Northeast. Case studies would also allow better understanding of the finer details influencing the relationship between subsidized housing and regional cohesion, as well as permitting exploration of relationships between suburban jurisdictions and their neighbors. This dissertation does not offer any sort of definitive insight into the effects of policy fragmentation or regional coordination, and case studies would likely provide more clues as to how to generate useful cohesion in subsidized housing provision.

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