

Cityscape

*A Journal of Policy
Development and Research*

GENTRIFICATION

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U.S. Department of Housing and Urban Development
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Symposium

Gentrification

Guest Editors: Ingrid Gould Ellen and Lei Ding

Guest Editors' Introduction

Advancing Our Understanding of Gentrification

Ingrid Gould Ellen

New York University

Lei Ding

Federal Reserve Bank of Philadelphia

The opinions expressed in this guest editors' introduction and in the following articles and commentaries are those of the authors and do not necessarily reflect the views of the Federal Reserve Bank of Philadelphia or the Federal Reserve System.

The term *gentrification* inevitably generates controversy and disagreement. People disagree about its definition, its causes, and, above all, its consequences. All seem to agree, however, that whatever gentrification is, it is becoming more prevalent in U.S. cities. Articles in the popular media now regularly highlight gentrification's increasing reach and pace. One *Boston Globe* reporter wrote in 2016, "Transformation has always been part of city living, and part of life. But in neighborhoods like East Boston and South Boston, rents are rising so fast that they're dramatically speeding up the natural order of things" (Teitell, 2016).

Despite this sense of accelerating change and anxiety about its consequences, rigorous research on the extent, causes, and consequences of gentrification remains rare. Even less research exists on the efficacy of potential policy responses. Thus, the Federal Reserve Banks of Philadelphia and Minneapolis, the New York University (NYU) Furman Center for Real Estate and Urban Policy, and the U.S. Department of Housing and Urban Development (HUD) decided to jointly convene a research conference (Research Symposium on Gentrification and Neighborhood Change) on May 25, 2016, to bring together a set of multidisciplinary researchers to explore what we know about gentrification and its effects. Selected papers from that conference are included in this Symposium section of *Cityscape*.

Recent Trends

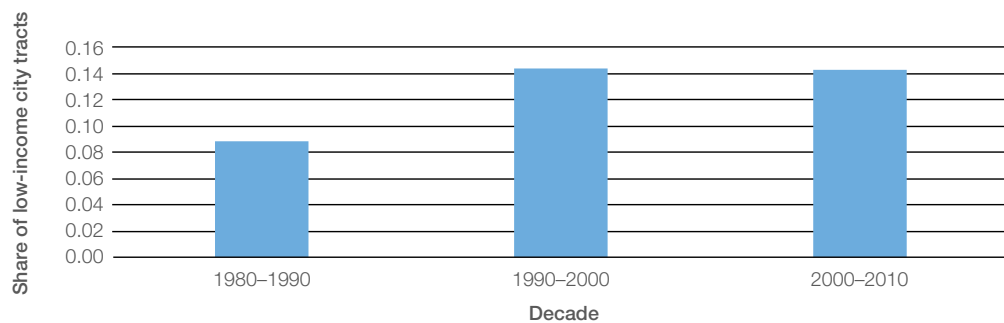
Although the articles included in this symposium adopt slightly different definitions, they generally view gentrification as increases in household income, education, and/or housing costs in previously low-income, central city neighborhoods. Some also consider increases in the percentage of White households.

Using variants of this basic definition, exhibits 1 through 4 make it clear that gentrification is indeed growing more common in U.S. cities. The exhibits show the share of initially low-income, central city neighborhoods (defined as census tracts with mean household incomes at less than the 40th percentile of the metropolitan area at the start of a decade) that saw large gains in socioeconomic status or the percentage of White residents relative to the rest of the metropolitan area during the 1980s, 1990s, and 2000s. Large relative gains are defined as increases in the ratio of the census tract value to the metropolitan area average of more than 10 percentage points (for example, from 60 percent to 75 percent of the average metropolitan income). Exhibit 1, for example, shows that, in metropolitan areas around the country, the fraction of low-income, central city tracts that saw a large increase in the ratio of their mean household income to the mean household income of the metropolitan area rose from about 9 percent during the 1980s to 14 percent during the 1990s and 2000s. By this definition, the prevalence of gentrification looks similar in the 1990s and 2000s.

Exhibits 2 through 4, however, show an acceleration since 2000; they suggest that gentrification was far more common during the 2000s than during the 1990s and involved a more dramatic set of economic and demographic changes. The share of initially low-income city tracts that saw large gains relative to the rest of the metropolitan area in their percentage of college-educated households climbed from 25 percent during the 1990s to 35 percent during the 2000s, and the share seeing large increases in the percentage of White households rose from 7 to 18 percent. The biggest difference between neighborhood changes in the 1990s and 2000s, however, concerns rents. The share of initially low-income city tracts that saw large gains in rents relative to their metropolitan area jumped from 10 to 24 percent between the two decades, raising the specter of displacement. Regardless of how much direct displacement is taking place, it seems clear that low- and moderate-income households are likely finding it increasingly difficult to afford to remain in or settle in many historically low-income, central-city neighborhoods, raising doubts about whether gentrification can produce neighborhoods that remain economically and racially integrated over the longer term.

Exhibit 1

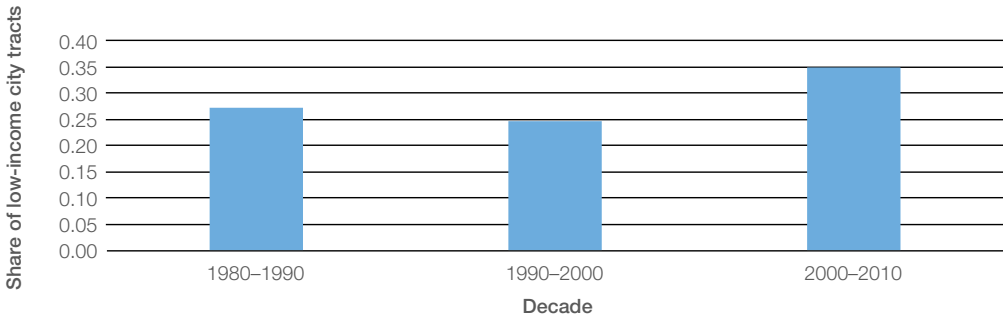
Share of Low-Income City Tracts in U.S. Metropolitan Areas Seeing a Large Gain in Income Relative to the Metropolitan Area



Source: *Neighborhood Change Database*

Exhibit 2

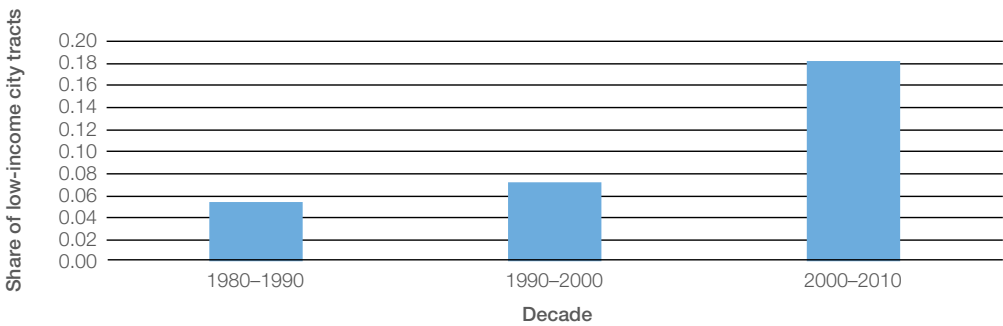
Share of Low-Income City Tracts in U.S. Metropolitan Areas Seeing a Large Gain in Percent College Educated Relative to the Metropolitan Area



Source: Neighborhood Change Database

Exhibit 3

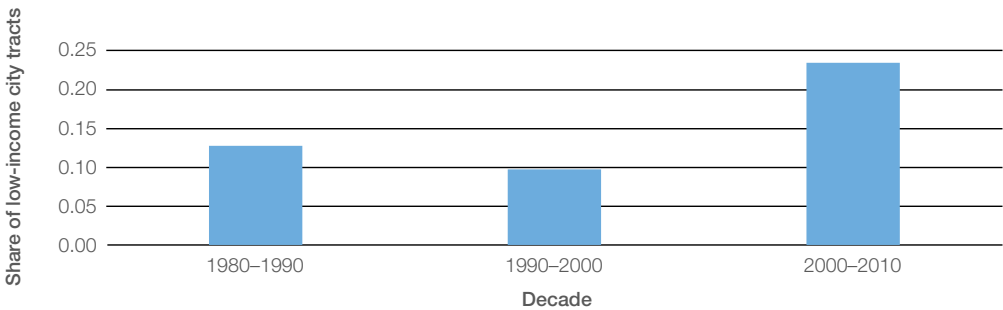
Share of Low-Income City Tracts in U.S. Metropolitan Areas Seeing a Large Gain in Percent White Relative to the Metropolitan Area



Source: Neighborhood Change Database

Exhibit 4

Share of Low-Income City Tracts in U.S. Metropolitan Areas Seeing a Large Gain in Rents Relative to the Metropolitan Area



Source: Neighborhood Change Database

Articles in the Symposium

The articles included in this *Cityscape* symposium delve into the causes of this growing gentrification, its consequences, and appropriate policy responses. The first article is Jackelyn Hwang and Jeffrey Lin's review of what we know about the causes of gentrification. They start by highlighting recent trends in gentrification, showing that a growing number of downtown neighborhoods are experiencing a growth in socioeconomic status. The authors then review evidence about the role that changes in amenities, changes in preferences for amenities, and shifts in labor demand are playing in spurring gentrification. They also point to several additional factors as potential contributors to gentrification, including public policies, new technology, housing finance, and demographic changes. They end by raising a set of questions about whether the recent gentrification trends are self-sustaining (Hwang and Lin, 2016).

The next two articles examine the consequences of gentrification, focusing on the relatively under-studied impacts of gentrification on residents' financial outcomes and on local business activity. Lei Ding and Jackelyn Hwang examine the relationship between gentrification and the financial health of residents, using unique data on credit scores. The article highlights the uneven consequences of gentrification: Less advantaged residents who are able to stay in gentrifying neighborhoods enjoy an improvement in their financial outcomes, but those who leave are more likely to suffer financially. The article also shows that more advantaged residents see a larger gain in financial well-being than less well-off residents as neighborhoods gentrify (Ding and Hwang, 2016). Rachel Meltzer's article then turns to gentrification's impact on local businesses. She addresses an interesting, policy-relevant question: Does neighborhood income upgrading pose an opportunity or a threat to local businesses? She finds existing small businesses in New York City, in general, are no more likely to be displaced in gentrifying neighborhoods than in nongentrifying neighborhoods, although shifting consumer demand may attract outside investment, such as retail chains (Meltzer, 2016). These two studies represent some of the novel research to evaluate the economic consequences of gentrification.

The three remaining articles explore the potential of federal and local strategies to address neighborhood revitalization and prevent displacement. First, Samuel Dastrup and Ingrid Gould Ellen explore the role of public housing in buffering gentrification and displacement. Focusing on New York City, they show that, in the wake of recent neighborhood changes, most of the city's public housing buildings are now surrounded by neighborhoods with household incomes *above* the citywide median. Further, they find that public housing residents living in developments surrounded by higher-income neighborhoods are significantly more likely to be employed and enjoy higher earnings than are other public housing residents. These results suggest that public housing can help low-income households remain in areas as they gentrify and allow them to benefit from the opportunities these communities offer. The authors acknowledge that the benefits are not unqualified and call for additional research to learn if results are generalizable beyond New York City (Dastrup and Ellen, 2016).

Second, Karen Chapple and Miriam Zuk turn to the potential of early warning systems to predict gentrification. They survey the existence, characteristics, and use of demographic data systems that present information on gentrification and/or displacement. Although local governments and

practitioners have strong interests in these early warning systems, as the authors point out in the article, the policies and tools have not been readily available to help policymakers prepare for and respond to gentrification. For example, the systems generally are not yet reliable enough to use to design for specific policies, and the existing models suffer from a high rate of false positives. Of course, these systems could be more useful predictors, with the improvements in new technology and newly available data in the future (Chapple and Zuk, 2016).

Third, Jeffrey Lubell's article reviews the range of policy tools that local governments might adopt to address neighborhood change and rapidly rising rents. He divides policies designed to increase access to affordable housing in gentrifying areas into six categories and urges local governments to develop an overarching strategy to respond to gentrification, which would involve not just one, but a range of policies that fall into these categories. He stresses that communities should act as early as possible and strive for long-term affordability. He also argues that effective and comprehensive strategies will inevitably involve reducing barriers to development and increasing density, but that working with community groups and long-time residents to address their concerns about this growing density is essential (Lubell, 2016).

Finally, this *Cityscape* symposium includes three thoughtful commentaries about the key insights and contributions offered by the articles, written by researchers who have studied extensively about gentrification. Katherine M. O'Regan provides a national perspective on policy tools to address the affordability crisis and to boost the supply of affordable housing. She discusses several important policies and regulations with the potential to encourage more equitable development and mitigate the side effects from gentrification, such as the reduction of Federal Housing Administration insurance premiums for affordable housing financing, the Rental Assistance Demonstration program for preserving and improving existing public housing properties, and the Affirmatively Furthering Fair Housing rule (O'Regan, 2016). The last two commentaries, by Lance M. Freeman and Derek Hyra, highlight the contributions of the symposium articles and of related literature on gentrification and suggest lessons for policy (Freeman, 2016; Hyra, 2016).

Conclusion

The articles in this symposium collectively shed new light on the causes and consequences of gentrification and offer useful insights about potential policy responses. The authors provide original research to help people better understand this complicated issue. Readers hoping to get a clear-cut answer about whether gentrification is good or bad or to obtain a simple rulebook for policymakers may be disappointed. The articles suggest that gentrification is a complex phenomenon with no easy answers, but the richer understanding of gentrification they provide can help governments and communities craft policies that capture the potential benefits from neighborhood improvement while mitigating its potential costs.

Acknowledgments

With the exception of the three commentaries, all the articles in this *Cityscape* symposium were peer reviewed. The guest editors thank the authors who contributed to this symposium, the discussants

and participants at the conference, and the many anonymous referees who provided timely and thoughtful reviews. They also are grateful to the Federal Reserve Banks of Philadelphia and Minneapolis, the NYU Furman Center, and HUD for their support for the research conference on which this symposium is based. The editors especially thank Theresa Singleton at the Federal Reserve Bank of Philadelphia for her invaluable support and advice for the conference and this symposium.

Guest Editors

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Lei Ding is a community development economic advisor in the Community Development Studies and Education Department at the Federal Reserve Bank of Philadelphia.

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What Have We Learned About the Causes of Recent Gentrification?

Jackelyn Hwang
Princeton University

Jeffrey Lin
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The views expressed here are those of the authors and do not necessarily represent the views of the Federal Reserve Bank of Philadelphia or the Federal Reserve System.

Abstract

Since 2000, increased gentrification in an expanding section of cities and neighborhoods has renewed interest from policymakers, researchers, and the public in the causes of gentrification. The identification of causal factors can help inform analyses of welfare, policy responses, and forecasts of future neighborhood change. We highlight some features of recent gentrification that popular understandings often do not emphasize, and we review progress on identifying some causal factors. A complete account of the relative contribution of many factors, however, is still elusive. We suggest questions and opportunities for future research.

Introduction

The gentrification of neighborhoods in U.S. central cities has attracted notice since at least the 1970s. Since 2000, however, greater changes in an expanding section of cities and neighborhoods have renewed interest from policymakers, researchers, and the public in the causes and consequences of gentrification. Many central-city neighborhoods have seen increased investment and housing prices, stabilized tax bases, improvements in amenities, dramatic shifts in cultural and demographic characteristics, and an influx of new residents of higher socioeconomic status (SES). Questions about residential, cultural, social, and political displacement have accompanied these changes. Is recent gentrification different from earlier instances in the 1970s and 1980s? How costly or beneficial are these shifts in the internal structure of cities to households, firms, and

society? Which households benefit and which ones lose as neighborhoods turn over? What are the likely consequences of policies intended to mitigate or slow the pace of gentrification? Will the recent gentrification of U.S. central cities revert, persist, or expand further, eventually inverting the dominant 20th-century pattern of rich suburbs and poor central cities?

An understanding of the causes of recent gentrification can inform answers to these questions. For example, the relative importance of supply and demand for neighborhood housing and amenities may have implications for policies intended to slow the pace of gentrification. If gentrification is primarily caused by an increase in the supply of housing, then restrictions on such supplies might effectively mitigate some of the negative consequences for existing residents. If gentrification is primarily caused by an increase in the demand for amenities, however, then development restrictions may perversely amplify housing price increases and subsequent displacement effects. An understanding of the changes in the geography of jobs or amenities can help us understand gentrification's consequences for commuting and consumption by low- and high-income households. Another example is that the relative importance of temporary policies, unstable amenities, durable factors, or changes in tastes may help policymakers, households, and businesses forecast future neighborhood changes.

A main challenge for understanding the relative importance of the causes of recent gentrification is the tendency for endogenous factors to reinforce neighborhood change. Just as development activity might attract new residents of higher SES, those residents may subsequently attract new retail stores and employers and also more new residents of higher SES. Very strong responses in endogenous factors to small initial causal factors can potentially further increase neighborhood status, creating a self-sustaining cycle for gentrifying neighborhoods. Although we may be able to make progress on understanding the proximate causes of gentrification, it may be more difficult to uncover deep, fundamental factors.

In this article, we first highlight some features of recent gentrification that popular understandings of gentrification often do not emphasize to provide background for our subsequent discussion. Then, we survey recent progress on understanding the causes of gentrification in U.S. cities since 2000, focusing on four papers presented at the 2016 Research Symposium on Gentrification and Neighborhood Change. (Other articles in this symposium of *Cityscape* focus on characterizing recent gentrification and understanding the consequences of gentrification.) Although some progress has been made in identifying some causal factors, we still do not have a complete account of the relative contribution of many factors. We suggest remaining questions and opportunities for future research.

Features of Recent Gentrification

The term *gentrification* elicits many definitions. In this article, we refer to gentrification as the process in which neighborhoods with low SES experience increased investment and an influx of new residents of higher SES. Other markers of gentrification include changes in physical, cultural, and demographic characteristics. Improvements in amenities, such as safety or shopping, and increases in housing values and rents also commonly characterize gentrification.

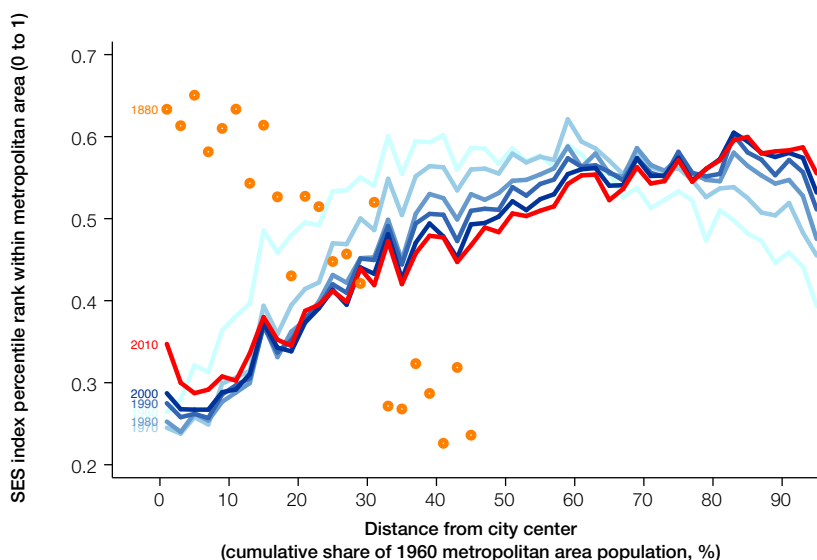
Beginning in the 1970s and 1980s, some isolated cities and neighborhoods in the United States saw reversals in status declines, inspiring an early wave of research on inner-city gentrification.

Gentrification in this period was typically slow, was confined to downtowns in the largest cities, and occurred in historically White or mixed neighborhoods (Freeman, 2009; Smith, 1996). On average, though, U.S. downtowns continued to have low SES. Since 2000, the revival of central-city or downtown neighborhoods has expanded, as noted by many researchers, including Baum-Snow and Hartley (2016); Couture and Handbury (2016); Edlund, Machado, and Sviatschi (2015); and Lee and Lin (2015).

Exhibit 1 summarizes some of these findings by displaying neighborhood SES in 1880 and between 1960 and 2010 within 168 large U.S. cities, using consistent-boundary census tracts, U.S. decennial censuses, and American Community Survey (ACS) data (Lee and Lin, 2015).¹ We

Exhibit 1

U.S. City Structure and Neighborhood Status, 1880 to 2010



SES = socioeconomic status.

Notes: The 168 Core Based Statistical Areas (CBSAs) had a combined population of 203 million in 2010. The reported averages are weighted by each tract's population share within CBSA, so each CBSA is weighted equally. SES index = average of within-CBSA percentile ranks in (1) college-educated share of 25+ population and (2) average household income. In 1880, SES index = within-CBSA percentile rank in occupational income score. Distance from city center = ring containing nearest consistent-boundary tracts to city center comprising (n) percent of the 1960 CBSA population but excluding (n-1) percent of the 1960 CBSA population, where n is an integer between 1 and 100. For example, tracts in the 10-percent ring include the nearest tracts to the city center comprising 10 percent of the 1960 CBSA population but exclude the nearest tracts to the city center comprising 9 percent of the 1960 CBSA population. Tracts in the 10-percent ring are, on average, 3.3 kilometers (km) from the city center (standard deviation = 2.9 km, 10th percentile = 1.5 km, median = 2.6 km, 90th percentile = 5.0 km). City centers are from the 1982 Census of Retail Trade (Fee and Hartley, 2013).

Source: Authors' calculations using 48,068 consistent-boundary census tracts in 168 large U.S. metropolitan areas (CBSAs) in 1960 and 31 CBSAs in 1880 (for more details, see Lee and Lin [2015])

¹ These data draw from Lee and Lin (2015), based on decennial censuses from 1880 to 2010 and 5-year ACS data from 2006 to 2010 (Logan et al., 2011; Logan, Zengwang, and Stults, 2014; Minnesota Population Center, 2011; Ruggles et al., 2010; Tatian, 2003). Lee and Lin (2015) selected these 168 large metropolitan areas based on available census tract data in 1960, and these metropolitan areas contain about two-thirds of the total U.S. population today. Tract data are harmonized to 2010 census boundaries.

compute an SES index for each census tract (or “neighborhood”). This index averages a neighborhood’s percentile rank within its metropolitan area’s distribution of (1) the share of adults 25 years and older with at least a college degree and (2) average household income.² Because each index input is scaled as a neighborhood’s percentile rank within a metropolitan area, the SES index ranges between 0 and 1.

To better reflect the structure of the average U.S. metropolitan area, rather than the experience of the average neighborhood, our measure of city center proximity depends flexibly on the historical within-metropolitan area distribution of population. We classified tracts into fixed categories based on the cumulative share of the total metropolitan population nearest to the city center in 1960. For example, tracts in the “10-percent ring” contain the closest 10 percent, but exclude the closest 9 percent, of the metropolitan area population in 1960. (Across cities, the average tract centroid in the 10-percent ring is 3.3 kilometers from the city center and the median distance is 2.6 kilometers.) Although similar patterns can be seen using geographic distance instead (see appendix exhibit A-1), our flexible measure of centrality adjusts for generally larger downtowns in larger metropolitan areas. For example, one would generally find dense urban neighborhoods 8 kilometers from the center of Chicago, Illinois, but, at the same distance from central Green Bay, Wisconsin, one would be more likely to find farmland. The effect of our measure is to compress geographic distances in larger cities so that comparisons across cities at a fixed “distance” are more likely to compare neighborhoods with similar access to jobs and amenities. Further, changes in tract SES are weighted by the tract share of the total population in each ring, reducing the influence of the preponderance of neighborhoods in large cities such as New York, New York, or San Francisco, California.

Since the 1970s, and especially since 2000, downtown gentrification has strengthened and a growing number of neighborhoods have gentrified. As exhibit 1 indicates, the average SES index for downtown neighborhoods has steadily increased since the 1970s, and these increases strengthened after 2000. Panel A of exhibit 2 shows the share of downtown tracts³ experiencing a 2-quartile increase in the SES index since 1960—for example, from the lowest-SES index neighborhood in a metropolitan area to the median-SES index neighborhood or from the median-SES index neighborhood to the highest-SES index neighborhood. In 1970, only 1.1 percent of downtown tracts in big cities⁴ had experienced such large increases in SES since 1960. By 2010, that share had increased to 7.7 percent. A smaller share of downtown tracts in small cities have also seen increases in SES since 1960, and that share has also increased.

Panel B of exhibit 2 also illustrates one reason why public awareness of gentrification has grown: the increasing share of *metropolitan areas* with at least one downtown tract that has experienced a 2-quartile increase in the SES index since 1960. In 1970, only one in four large cities and virtually no small cities had at least one gentrifying downtown neighborhood by this measure. By 2010,

² Neighborhood change can be characterized in many ways. The inputs to this index are easily obtained and highly correlated with other measures of SES. Baum-Snow and Hartley (2016) use standardized scores instead of percentile ranks to normalize their SES index inputs to similar effect. They also include percent non-Hispanic White in their index.

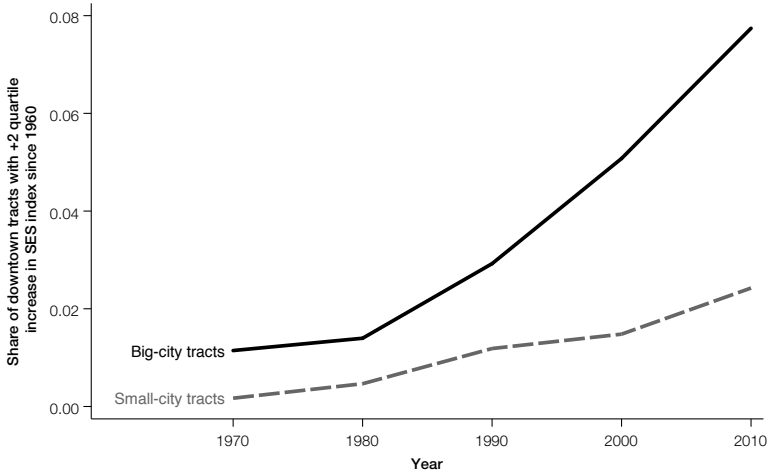
³ “Downtown tracts” in exhibit 2 are those consistent-boundary tracts closest to the city center comprising 10 percent of the metropolitan area population in 1960.

⁴ “Big cities” in exhibit 2 are the 26 metropolitan areas in 1960 that had populations of at least 1 million.

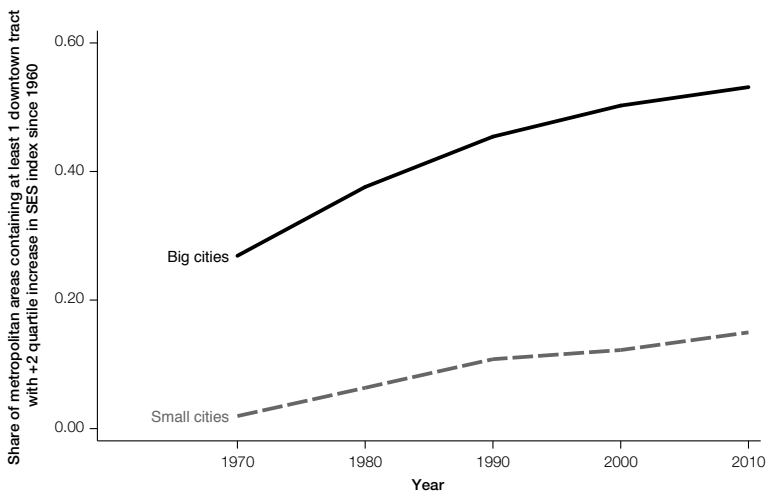
Exhibit 2

Gentrification Has Spread to More Neighborhoods and Metropolitan Areas Since 1960

Panel A. Downtown Tracts



Panel B. Metropolitan Areas



SES = socioeconomic status.

Notes: Downtown tracts are consistent-boundary census tracts closest to the city center comprising 10 percent of the Core Based Statistical Area population in 1960. Big cities (solid lines) are 26 metropolitan areas with populations of at least 1 million in 1960. Panel A shows the share of downtown tracts. Panel B shows the share of metropolitan areas.

Source: Authors' calculations using census data

more than one-half of all large cities and 15 percent of smaller metropolitan areas had seen such changes. Thus, during recent decades, an increase in SES near city centers has occurred along with an expansion of this pattern to more neighborhoods and more cities than before.

Researchers have also noted that recent downtown changes are characterized not by population growth but by large shifts in the composition of households—toward higher-SES residents. Baum-Snow and Hartley (2016), Couture and Handbury (2016), and Kolko (2016), on the basis of census table decompositions by race, age, and education, found that White, prime-age, college-educated households have been more likely to choose downtown neighborhoods since 2000 compared with earlier periods. A complementary finding, consistent with large composition shifts seen in downtown neighborhoods, is that other race, age, and education groups are living in downtown neighborhoods at similar or less frequent rates since 2000 compared with earlier periods.

Another common finding by Baum-Snow and Hartley (2016); Edlund, Machado, and Sviatschi (2015); and others is that, since 2000, the employment of college-educated workers is no longer declining in traditional downtowns (and is even increasing in some cities), while jobs that require less education and lower-skilled jobs continue to decline downtown. Results by Baum-Snow and Hartley (2016) and Couture and Handbury (2016), discussed in more detail later, suggest that high-SES households moving downtown appear to have increased their valuation of downtown amenities since 2000 compared with earlier periods. Many researchers, including Ellen, Horn, and Reed (2016), also have noted the large decline in crime, especially violent crime, in central cities.

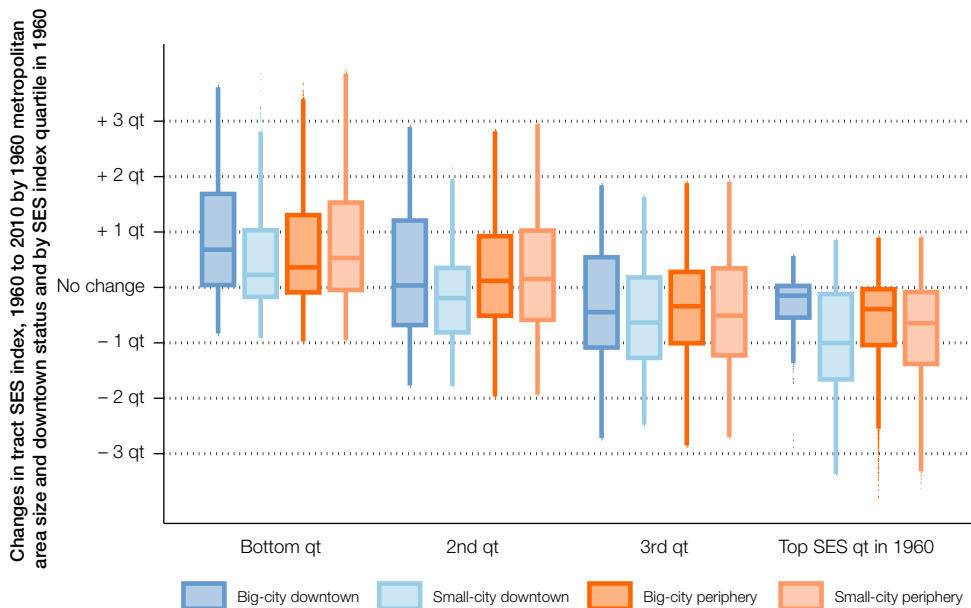
Several features of recent gentrification often are not highlighted in the existing literature. For example, exhibit 1 also shows that more socioeconomically advantaged populations used to live in U.S. downtowns, based on occupational income scores for 31 metropolitan areas in 1880. (Because neighborhood income is not reported in the 1880 census, Lee and Lin [2015] used occupational income scores, which are national averages of income by occupation, weighted by the share of each neighborhood's residents employed in each occupation.) Despite improving fortunes, downtowns as a whole are still less advantaged than metropolitan areas as a whole. Baum-Snow and Hartley (2016) noted that, among the largest 120 metropolitan areas, only 2 had downtowns that had a higher SES compared with that of the average neighborhood in the metropolitan area in 1980. By 2010, that figure had improved to just 11 of 120 metropolitan areas. Further, downtown revival is still limited to a narrow geographic area: on average, neighborhoods beyond 3 kilometers of city centers have a lower SES index in 2010 compared with 1960. A recent study by Guerrieri, Hartley, and Hurst (2013) highlights the fact that recent gentrification is strongly spatially dependent on historical patterns of neighborhood incomes. This spatial dependence points to the importance of localized rather than regional or global factors in recent gentrification.

A final feature of recent gentrification that we highlight is the heterogeneity of changes across neighborhoods and metropolitan areas. Exhibit 3 shows some of this heterogeneity in neighborhood change by metropolitan area size and downtown status.⁵ Each box shows the 25th, 50th, and 75th percentiles of changes in the neighborhood SES index from 1960 to 2010 according to the quartiles of tracts' initial SES index value in 1960 and separated by small and big metropolitan areas and downtown and peripheral neighborhoods. (Changes in the neighborhood SES index depend on tracts'

⁵ Definitions for “downtown tracts” and for “big” and “small” cities are the same as in exhibit 2.

Exhibit 3

Heterogeneity in Neighborhood Change, 1960 to 2010



qt = quartile. SES = socioeconomic status.
 Notes: Boxes show 25th, 50th, and 75th percentile of changes in tract SES index, 1960 to 2010. Dots outside whiskers exceed 1.5 times interquartile range.
 Source: Authors' calculations using census data

initial SES index value in 1960. For example, tracts in the bottom quartile in 1960 cannot experience declines in their SES index by more than one quartile, or 25 percentile points. Tracts in the top quartile in 1960 similarly cannot experience increases in their SES index by more than one quartile.)

Starting with the bottom quartile of neighborhoods by the SES index in 1960 on the left, the exhibit shows that the median big-city downtown neighborhoods experienced greater increases in the SES index compared with outlying big-city neighborhoods and all small-city neighborhoods. About one-fourth of these tracts, however, saw no increase or they declined. Further, many bottom-ranked small-city and peripheral neighborhoods saw increases of more than three quartiles in the SES index. This finding is consistent with some recent work finding gentrification outside of downtowns (Hackworth and Smith, 2001) and a broadening trend of gentrification in historically Black neighborhoods (Freeman and Cai, 2015; Hyra, 2008; Owens, 2012). Last, the divergence between big- and small-city downtown neighborhoods indicates that gentrification, in general, is more prevalent in larger cities than in smaller cities.

Turning to the middle (2nd and 3rd) quartiles of neighborhoods by the SES index in 1960, the exhibit shows that downtown neighborhoods experienced similar changes in the SES index compared with other neighborhoods. One potential implication of this pattern is that factors driving the gentrification of low-SES downtown neighborhoods are absent or less prevalent in middle-SES downtown neighborhoods.

Finally, the top quartile of neighborhoods by the SES index in 1960 reveals a sharp distinction between big-city downtown neighborhoods and other neighborhoods. By contrast with the 25 to 50 percent of small-city downtown or peripheral neighborhoods that have seen declines in the SES index between 1960 and 2010, only a handful of such neighborhoods in big-city downtowns have seen declines.

In sum, since 2000, U.S. cities have seen greater increases in the SES index and other measures in downtown neighborhoods and an expansion of SES index increases to more cities and neighborhoods. Compositional shifts toward White, prime-age, and college-educated households—not population growth—are more characteristic of recent changes. Although lower-skilled or lower-education jobs continue to suburbanize, jobs employing college-educated workers have stopped declining or have even increased in traditional downtowns. Downtown safety and amenity values appear to have increased. A sizable number of downtown neighborhoods in big cities, however, have not seen increases in our SES index at all, and a number of peripheral neighborhoods in smaller metropolitan areas have seen dramatic changes. Despite improving fortunes, the average downtown neighborhood is of lower status compared with its metropolitan area as a whole. Moreover, gentrifying neighborhoods exhibit a strong spatial dependence on historical patterns of income, and, on average, downtown revival has still improved the SES of only those neighborhoods within relatively short distances of U.S. city centers (but more so in big cities). Finally, changes in neighborhoods with middle-SES indexes are similar in big-city downtowns compared with small cities or peripheral areas, but neighborhoods with high-SES indexes in big cities have shown remarkable persistence since 1960.

Interpreting Recent Evidence

In theory, many factors may cause these neighborhood changes. Households might be more attracted to a particular neighborhood because of (1) increases in access value, (2) increases in amenity value, or (3) declines in the prices of houses relative to other neighborhoods. Changes or investments in neighborhood factors (such as new highways or improved safety), changing tastes for those neighborhood factors, or demographic shifts toward households that value those factors may cause increases in access or amenity value. Relaxed credit constraints might decrease the cost of housing in certain neighborhoods. Disinvestment and the deterioration of houses also might ease redevelopment. Relative prices may also decline with increasing demand for nearby areas with inelastic housing supply. In this section, we review and interpret findings of the recent literature, which has focused on changes in job access, changes in amenities, and changes in the valuation of those amenities.

Jobs

Recent studies suggest that changes in job access have affected recent gentrification. For example, Edlund, Machado, and Sviatschi (2015) emphasize increases in the opportunity cost of commuting among college-educated workers, and Baum-Snow and Hartley (2016) cite high-skilled jobs shifting toward central cities. Of course, high-skilled jobs and employers requiring college degrees may simply follow household movements. If that is the case, then changes in the geography of jobs are a symptom, rather than a cause, of recent downtown gentrification.

A common strategy to deal with the potential endogeneity of this relationship is to use Bartik (1991) or shift-share indexes to identify possibly exogenous changes in job growth for different locations. These indexes use historical job locations and national, industry-specific employment growth to predict local job growth, thus (hopefully) obtaining measures of job location that are not affected by changes in household location decisions. Using regressions of housing-price changes from 1980 to 2010 for 27 large U.S. cities, Edlund, Machado, and Sviatschi (2015) found that housing in census tracts closest to city centers of metropolitan areas experiencing increases in demand for college-educated workers (instrumented with a Bartik index) tended to increase in price. Baum-Snow and Hartley (2016) regress changes in an SES index against changes in demand for workers at both the metropolitan area level and the central business district level, instrumented with a metropolitan-level Bartik index and a downtown-specific Bartik index. Overall, they found that metropolitan-level labor demand shocks are not likely to be causing central neighborhood gentrification and that downtown-oriented labor demand shocks only partially explain recent changes.

Despite controls for observable characteristics, such as natural amenities and historical factors, a standard concern about the use of these instruments is the presence of omitted factors correlated with both initial job locations and changes in the geography of workers. Although the use of these instruments is standard among labor and urban economists studying the employment and wage effects of local labor demand shifts, it is worth thinking about whether the identification assumptions hold in this context. One specific concern is the secular increase in household expenditures on education and health services. Employment at hospitals and universities, many located in and near traditional downtowns, has benefited as a result. These long-lasting institutions, however, may also have increasingly produced significant amenities (public safety, retail serving employees and students, cultural events, and so on) that have also attracted high-income workers (Diamond, 2016).

Of course, job access is not the only kind of access that might matter for attracting individuals with higher SES to central cities. For example, the scarcer leisure time among high-income households that Edlund, Machado, and Sviatschi (2015) highlight may increase the value of proximity to both work and consumption opportunities available downtown. As more high-income households have been attracted to denser, more urban neighborhoods, economies of density may have further lowered the cost or increased the variety and availability of outsourced home production services (dry cleaners, restaurant meals, and so on). New trends in urban design that enhance walking or biking may also complement economies of density, and new technologies, such as Yelp, complement urban amenity consumption.

In a detailed analysis of census commuting tables, holding job location fixed, Couture and Handbury (2016) found increased flows of high-income workers from downtown to the suburbs from 2000 to 2011. In other words, many high-income workers with jobs in the suburbs chose longer commutes in 2011 compared with 2000, a pattern that was even stronger in the 10 largest metropolitan areas. At least for those workers, better job access appears subordinate to increasing demand for downtown amenities.

Amenities

In contrast to mixed evidence on the role of job access, there appear to be more robust changes in amenity values in the neighborhoods chosen by particular households, including (but not limited to) White, prime-age, and college-educated workers. Baum-Snow and Hartley (2016) leave open

whether these shifts are due to diverging amenities or diverging tastes for amenities that tend to be located downtown. By contrast, Couture and Handbury (2016) attempt to directly estimate the effect on neighborhood change by neighborhood-specific consumption amenity indexes composed of 11 types of retail and cultural establishments, including theaters, museums, restaurants, grocery stores, and personal service establishments. Again, these consumption amenities may be responding to household movements and may be a symptom, rather than a cause, of recent gentrification. Couture and Handbury (2016) constructed a neighborhood shift-share index using initial establishment locations in 2000 combined with national industry- or chain-specific entry and exit patterns since 2000. Again, an identifying assumption is that no omitted factors are correlated with initial establishment locations or national changes in entry and exit patterns and changes in consumer locations.

Using these instruments, Couture and Handbury (2016) found that many measured consumption amenities in 2000 levels explain the neighborhood entry of young, college-educated workers, but changes in consumption amenities from 2000 to 2011 generally do not. Couture and Handbury's (2016) preferred interpretation is that diverging preferences (rather than diverging amenities) for retail, entertainment, and service establishments explain the diverging location decisions of the young and college-educated. Their model, however, is less able to explain why gentrification has been stronger in big-city downtowns compared with smaller cities.

Crime has also fallen significantly in central cities. Kneebone and Garr (2010) found that violent crime fell faster in central cities compared with their suburbs in 90 of the 100 largest metropolitan areas between 1990 and 2008. Ellen, Horn, and Reed (2016) found that high-income and college-educated households were more likely to choose central-city neighborhoods with faster declines in violent crime between 1990 and 2010, and these choices were more sensitive to crime declines compared with lower-income or less-educated households. Couture and Handbury (2016) similarly noted a strong correlation between downtown neighborhood increases in SES and declines in the central city-suburb crime gap.

These associations suggest that declines in crime increased the attractiveness of downtown neighborhoods, especially to high-SES households, but these associations may also be consistent with gentrification causing declines in crime (Kirk and Laub, 2010). Couture and Handbury (2016) noted that 80 percent of the two-decade decline in crime occurred in the 1990s, but central-city gentrification was more intense in the 2000s. Thus, timing suggests that reverse causation may not be a significant factor. Further, households may be slow to update their beliefs about neighborhood safety. Ellen, Horn, and Reed (2016) found that intrametropolitan movers are much less sensitive to drops in central-city crime. By contrast, movers from different metropolitan areas, who may have weaker preexisting beliefs or have updated their beliefs more recently, are much more likely to choose central-city neighborhoods in response to declines in crime.

Although these studies all agree that changes in the amenity value of downtowns are important for understanding recent gentrification, other studies suggest that changes in the geography of amenities might correlate with omitted factors. Some of the trends highlighted earlier suggest important features and roles of other factors in explaining recent gentrification. The historical affluence of downtown neighborhoods seen in exhibit 1 and the persistence of high-SES downtown neighborhoods since 1960 seen in exhibit 3 suggest very durable or historical fixed factors in central cities.

Some of these factors include natural amenities (Lee and Lin, 2015); transportation infrastructure and networks (LeRoy and Sonstelie, 1983; Lin, 2002); or civic, educational, or cultural institutions (Taub, Taylor, and Dunham, 1984). Further, the strong spatial dependence of recent gentrification on historical patterns of housing prices (Guerrieri, Hartley, and Hurst, 2013) and the still-limited spatial extent of downtown revival suggest extremely local, perhaps building- or block-level, factors. One important implication may be that only *slight* shifts in preferences, such as those highlighted by Couture and Handbury (2016), may be necessary to explain the rapid gentrification of downtown neighborhoods endowed with persistent, localized factors.

Expanding the Scope of Causal Factors

Although establishing causation of a particular factor is a worthy goal, as many of the studies reviewed so far set out to do, a full account of a broad range of factors is still elusive. Further, the wide dispersion in socioeconomic changes across neighborhoods suggests that many factors are at work in gentrifying neighborhoods. In the remaining two sections of this article, we discuss an expanded scope of causal factors, potential next steps, and opportunities for future research.

Public Policy

Many scholars have noted an increased role of state actors and public policy in facilitating gentrification in recent decades—a characteristic that they note is markedly different from the gentrification of the past (Hackworth and Smith, 2001). Hackworth (2007) argues that, in recent decades, city leaders' policymaking shifted from a welfare state based on direct public intervention to a reliance on free market solutions, promoting business friendly and public-private partnerships in arenas that previously had relied solely on public funding, such as housing for low-income households. Such policies, he argues, facilitate the gentrification of central cities. Wyly and Hammel (1999) and Goetz (2011) link the demolition of public housing projects and redevelopment efforts through the U.S. Department of Housing and Urban Development's HOPE VI Program to gentrification. They argue that such efforts target areas that are more likely to have greater returns on market-rate housing and generally promoted gentrification in or near minority neighborhoods that middle-class residents once avoided.

Others have argued that programs like historical preservation, business improvement districts, zoning and land use changes, tax-increment financing practices, ordinances imposed on public space (for example, homelessness removal), and the beautification of public spaces all contribute to efforts that can shift the amenity value of neighborhoods (Mitchell, 2003; Ward, 2007; Weber, 2002; Wilson, 2004; Zukin et al., 2009). An additional policy arena that may influence gentrification is education. Although the empirical evidence on the relationship between gentrification and school reform is weak, the growth of charter schools and school choice options may encourage more households with higher SES to move to or stay in central cities (Jordan and Gallagher, 2015).

New Technologies

New technologies and business models reduce access disadvantages previously associated with downtown locations. Access to suburban big-box retailers may be less important with the advent of

mass same-day delivery services for groceries, apparel, general merchandise, and more. Increasing traffic congestion in suburban neighborhoods and new technologies such as ride-sharing apps improve the relative accessibility of city centers. Further, new flexible work scheduling and telecommuting may decrease the importance of job access for some workers. These changes may have ameliorated some of the past inconveniences of dense urban living.

Race, Ethnicity, and “Diversity”

Changes in the racial and ethnic compositions of urban neighborhoods may also have attracted gentrification. During the past few decades, U.S. cities have seen declines in racial segregation and an increasing prevalence of multiethnic neighborhoods (Logan and Zhang, 2010). Further, surveys indicate improving racial attitudes over time across the general population (Bobo and Charles, 2009). Changing racial attitudes coupled with the growth of multiethnic neighborhoods may reduce the disamenity of living near other groups for high-SES households. Powerful actors, however, can also manipulate these tastes. For example, ethnographic studies demonstrate how developers market neighborhoods in certain ways to attract gentrifiers, such as repackaging ethnic histories of neighborhoods and marketing the neighborhood’s “diversity” or creating areas that seem “culturally authentic” (Anderson and Sternberg, 2013; Mele, 2000; Zukin, 2011). These actors can also play important roles in altering how people perceive neighborhoods, thereby changing the amenity value of neighborhoods without causing shifts in measured neighborhood characteristics. For example, Hwang and Sampson (2014) found that neighborhood perceptions of disorder have an independent effect on the pace of gentrification in Chicago neighborhoods.

Family Structure and Demography

Changes in household formation and demographic structure may also explain the growth in downtown living. The millennial generation, whose earliest cohorts entered their 20s beginning in 2000, exceeds the size of the baby boomer generation and is highly educated relative to past generations (Myers, 2016). This generation has also exhibited patterns of delayed household formation and homeownership. Studies document the increases in nonfamily households (for example, roommates), childless families, and young adults in gentrifying neighborhoods (Furman Center for Real Estate and Urban Policy, 2016). Although some scholars argue that millennials have distinct preferences for urban living or other neighborhood features relative to past generations, Myers (2016) argues that these patterns are a feature of the timing of their workforce entry and the Great Recession. Thus, these demographic shifts may have contributed to the gentrification of downtowns in recent decades.

Housing Finance

The structure of housing finance also shifted in recent decades in a way that may have promoted gentrification. Hyra (2012) argues that the increased availability of capital and credit due to shifts in the banking industry, such as the loosening of mortgage markets and securitization, facilitated gentrification in many areas, particularly in minority neighborhoods that had previously faced discrimination in mortgage financing practices. Further, Wyly and Hammel (1999) demonstrate that discriminatory mortgage investment is more likely to occur in gentrifying neighborhoods, suggesting that these lending practices contributed to the increased share of White households into gentrifying areas.

Housing Supply

The similar fortunes of neighborhoods in the middle range of the SES index both downtown and elsewhere from 1960 to 2010 suggest that recent downtown gentrification depends on factors specific to low-SES-index downtown neighborhoods compared with middle-SES-index downtown neighborhoods. Given their spatial proximity, one possible distinction is the role of developers, builders, policymakers, and deterministic depreciation in reducing the value of houses, roads, and infrastructure. This depreciation eventually makes neighborhood redevelopment profitable, as emphasized by Smith (1979), Brueckner and Rosenthal (2009), and others. Many of these declining neighborhoods also experienced dramatic declines in population and high rates of vacancies, providing accessible points of entry and opportunity for development.

High-SES households have increasingly sorted into “superstar cities,” or high-amenity, low-housing construction metropolitan areas (Gyourko, Mayer, and Sinai, 2013; Diamond, 2016). Broader pressures for urban living in these metropolitan areas where overall demand exceeds housing supply may also cause gentrification in neighborhoods that would not have gentrified otherwise. These factors may help explain the divergence between big-city and small-city downtowns noted earlier.

Next Steps and Future Research

Recent studies suggest that changes in the geography of jobs and changes in the amenity value of neighborhoods have caused recent gentrification in the United States, especially in downtown neighborhoods. The literature, however, still lacks an account of the relative contribution of a broad range of factors; thus, the causal mechanisms are still unclear. Counterfactual exercises, similar to one performed by Couture and Handbury (2016), might help in understanding the extent and scope of gentrification absent exogenous changes in particular factors. An expansion in the scope of factors considered would strengthen the credibility of such exercises and might better account for the heterogeneity in observed neighborhood change, both across metropolitan areas and even among a relatively narrow group of primarily downtown neighborhoods. Finally, additional creative identification strategies, perhaps using natural experiments or matching estimators, would complement the existing evidence that relies mostly on Bartik-style instrumental variables identification (Bartik, 1991). Nonetheless, such identification exercises may still face challenges, given the complex range of factors that we described previously. Research designs that can support causal inference, such as strategic case selection in qualitative research, and the increasing scope of available data can enhance this effort.

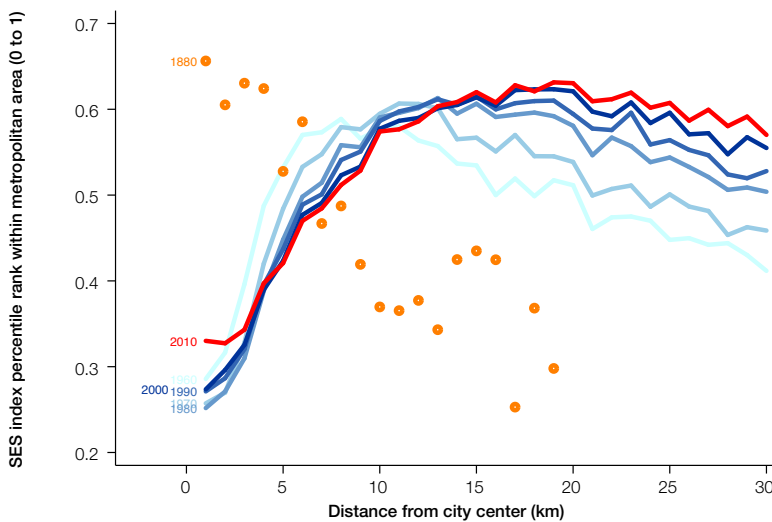
Based on the evidence reviewed here, we have partial answers to some of the motivating questions mentioned in the introduction. Demand for certain neighborhoods, especially in central cities, has increased since 2000. Although we have some evidence that the presence of jobs and amenities is spurring gentrification in some neighborhoods, we have less understanding of the causal role of redevelopment decisions, supply constraints, or shifting preferences. Both jobs and amenities seem to have reinforced an inversion in the once dominant pattern of rich suburbs and poor central cities—high-skilled jobs and high-skilled workers are centralizing, but low-skilled jobs and low-skilled workers continue to suburbanize. What is less clear is the durability of recent changes. A perhaps unsatisfying side effect of explaining recent gentrification with changes in tastes

is that doing so may not be a useful guide for forecasting future changes. Will subsequent cohorts of college-educated workers continue to choose downtowns? Or will their locational choices tilt back toward the suburbs? The historical affluence and remarkable persistence of the handful of high-SES downtown neighborhoods suggest fundamental, long-lived advantages. The century-long decline of U.S. downtowns suggests, however, that these fundamental advantages do not uniquely determine neighborhood outcomes. Are responses to endogenous policies and amenities so strong that recent gentrification is self-sustaining? Or does recent gentrification revert if subsequent cohorts no longer value urban amenities as much as today's gentrifiers? In sum, research devoted to understanding the causes of gentrification that considers a broader range of factors and creative research strategies is necessary to help us come closer to answering such questions.

Appendix A

Exhibit A-1

U.S. City Structure and Neighborhood Status, 1880 to 2010



km = kilometer. SES = socioeconomic status.

Notes: The 168 Core Based Statistical Areas (CBSAs) had a combined population of 203 million in 2010. The reported averages are weighted by each tract's population share within CBSA, so each CBSA is weighted equally. SES index = average of within-CBSA percentile ranks in (1) college-educated share of 25+ population and (2) average household income. In 1880, SES index = within-CBSA percentile rank in occupational income score. Distance from city center = ring containing nearest consistent-boundary tracts to city center comprising (n) percent of the 1960 CBSA population but excluding (n-1) percent of the 1960 CBSA population, where n is an integer between 1 and 100. For example, tracts in the 10-percent ring include the nearest tracts to the city center comprising 10 percent of the 1960 CBSA population but exclude the nearest tracts to the city center comprising 9 percent of the 1960 CBSA population. Tracts in the 10-percent ring are, on average, 3.3 km from the city center (standard deviation = 2.9 km, 10th percentile = 1.5 km, median = 2.6 km, 90th percentile = 5.0 km). City centers are from the 1982 Census of Retail Trade (Fee and Hartley, 2013).

Source: Authors' calculations using 48,068 consistent-boundary census tracts in 168 large U.S. metropolitan areas (CBSAs) in 1960 and 31 CBSAs in 1880 (for more details, see Lee and Lin [2015])

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The Consequences of Gentrification: A Focus on Residents' Financial Health in Philadelphia

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The views expressed in this article are those of the authors and do not necessarily reflect the views of the Federal Reserve Bank of Philadelphia or the Federal Reserve System.

Abstract

Considerable debate and controversy continue regarding the effects of gentrification on neighborhoods and the people residing in them. This article draws on a unique large-scale consumer credit database to examine the relationship between gentrification and the credit scores of residents in the city of Philadelphia from 2002 to 2014. We find that gentrification is positively associated with changes in residents' credit scores, on average, for those who stay, and this relationship is stronger for residents in neighborhoods in the more advanced stages of gentrification. Gentrification is also positively associated with credit score changes for less-advantaged residents (those with low credit scores, older residents, longer-term residents, or those without mortgages) if they do not move, though the magnitude of this positive association is smaller than for their more advantaged counterparts. Nonetheless, moving from gentrifying neighborhoods is negatively associated with credit score changes for less-advantaged residents, residents who move to lower-income neighborhoods, and residents who move to any other neighborhoods within the city (instead of outside the city) relative to those who stay. The results demonstrate how the association between gentrification and residents' financial health is uneven, especially for less-advantaged residents.

Introduction

Debates surrounding the consequences of gentrification have focused largely on the displacement of incumbent residents, though recent studies generally have not found evidence that less-advantaged residents in gentrifying neighborhoods move at a significantly higher rate than similar households in nongentrifying neighborhoods (Ding, Hwang, and Divringi, 2016; Ellen and O'Regan, 2011; Freeman, 2005; Freeman and Braconi, 2004; McKinnish, Walsh, and White, 2010; Vigdor, 2002). Gentrification, the socioeconomic upgrading of a previously low-income central city neighborhood, however, may affect the social and economic welfare of the residents in gentrifying neighborhoods in ways beyond just residential displacement.

In this article, we contribute to this body of research by examining the relationship between gentrification and the financial health among residents, measured by individuals' credit scores, in Philadelphia from 2002 to 2014. We use a unique individual-level data set—the Federal Reserve Bank of New York Consumer Credit Panel/Equifax (hereafter noted as CCP)—and more precise gentrification measures in the city of Philadelphia. The CCP data provide extensive information on residential location and consumer financial health and credit use, which enables us to observe residents' mobility patterns and how their financial status changes in relation to the changing characteristics of the neighborhood where they live, including gentrification.

Gentrification could affect residents' financial health indirectly in many ways, though existing studies do not suggest a direct link between gentrification and residents' credit scores. With the inflow of new lending institutions and improved access to financial services that can accompany gentrification, existing residents in gentrifying neighborhoods could gain improved access to mainstream financial products. Furthermore, gentrification could lead to increased labor market opportunities if the local economy improves, which could also help people make debt payments on time and improve their credit scores. Given the rising home values and the resulting increased home equity that often come with gentrification, existing mortgage borrowers may have greater incentive to keep current with their mortgage, which would help maintain or improve their financial health status. The rising housing and living costs that come with gentrification, however, could cause liquidity problems for many residents in gentrifying neighborhoods, especially those who are more financially vulnerable. Such liquidity problems could be manifested by increased levels of delinquencies on credit payments, tax foreclosures, evictions, and bankruptcies, all of which would negatively affect an individual's financial health. Further, financially vulnerable residents who move from gentrifying neighborhoods as a result of the rising costs accrue additional financial burdens from moving and may also face additional financial burdens from broader declines in affordability as neighborhoods gentrify throughout the city. Nonetheless, individuals who expect to experience larger improvements in financial health may be more likely than others to live in gentrifying neighborhoods, but individuals who anticipate large decreases in their financial health may be more likely to move from gentrifying neighborhoods. Despite reasons to believe that gentrification is associated with residents' financial health outcomes, few studies have examined this relationship.

In this study, we examine the relationship between gentrification and residents' financial health in general and across different subpopulations based on a random sample of adult residents in Philadelphia from 2002 to 2014. We find that residents who do not move from gentrifying neighborhoods experience an

average increase of 11.3 points in their Equifax risk scores, a widely used credit score and our measure of individuals' financial health (higher scores indicate better financial health), over 3 years. Stayers in neighborhoods undergoing intense gentrification experience an average increase of 22.6 points, doubling the average increase across all gentrifying neighborhoods. The improvement in risk scores of residents in neighborhoods experiencing moderate or weak gentrification is much smaller.

We also find that gentrification is positively associated with the financial health of less-advantaged residents in gentrifying neighborhoods if they are able to stay. Less-advantaged residents in gentrifying neighborhoods—those with low risk scores, older residents, longer-term residents, or those without mortgages—who are likely more vulnerable to financial instability resulting from gentrification but who do not move experience some improvement, on average, in their risk scores, but the magnitude of their positive association with risk score changes is smaller compared with their more advantaged counterparts in gentrifying neighborhoods.

Relative to staying in the neighborhood, moving out of gentrifying neighborhoods is negatively associated with changes in the financial health of less-advantaged residents. In other words, their financial health would have been better off if they were able to remain in the gentrifying neighborhood. Changes in movers' financial health vary significantly depending on the quality of the destination neighborhoods: Moving to neighborhoods with lower income than their origin neighborhoods or to other neighborhoods within the city (instead of the suburbs or other metropolitan areas) is negatively associated with the changes in movers' risk scores. Altogether, the results demonstrate how the association between gentrification and residents' financial health is uneven, particularly for less-advantaged residents.

This article proceeds as follows: The second section reviews relevant literature on gentrification and credit scores, and the third section provides a detailed description of the data sets and methodology used in the study. Using multiple regression analysis, the fourth section examines the relationship among gentrification and residents' financial well-being, and the final section summarizes the results and discusses their implications.

Background and Literature

This section reviews the literature on the consequences of gentrification and discusses the possible links, either direct or indirect, between gentrification and residents' financial health as measured by their credit scores.

Economic and Financial Consequences of Gentrification

The term *gentrification* describes neighborhood changes that are characterized by the influx of new residents of a higher socioeconomic status relative to incumbent residents and rising housing values and rents into low-income, central city neighborhoods.¹ Given the rising housing and living

¹ This definition, in general, is consistent with the existing literature. Definitional debates involve whether to include neighborhoods beyond the central city and the socioeconomic upgrading of already well-off neighborhoods ("super-gentrification"), and whether to consider if displacement and racial turnover are essential (Brown-Saracino, 2010). For purposes of the study, we focus on characteristics for which there is broad agreement in the field.

costs that characterize gentrification, many argue that gentrification imposes increasing pressures of affordability on existing residents. As housing and living costs rise, less financially advantaged residents may become increasingly unable to afford to live in the neighborhood and may have to move out. This process is often called “residential displacement.” Most research and debate on the consequences of gentrification have focused on residential displacement. The empirical evidence in these studies on residential displacement in U.S. cities, however, generally does not observe consistent and statistically significant differences in mobility rates between less-advantaged residents, such as less-educated, renting, minority, low-credit score, and lower-income households, in gentrifying neighborhoods and those in nongentrifying neighborhoods (Ding, Hwang, and Divringi, 2016; Ellen and O’Regan, 2011; Freeman, 2005; McKinnish, Walsh, and White, 2010).² These findings may be a result of the fact that gentrification can take place through infill development or in areas with high vacancy rates and also the fact that residents in these comparable neighborhoods, in general, have high mobility rates because they more often face financial instability and eviction (Newman and Wyly, 2006; Slater, 2009). Further, incumbent residents may incur financial burdens, may “double up” in their housing arrangements to afford the increased housing and living costs that come with gentrification, or may be protected from moving through policies like rent control and subsidized housing (Freeman, 2005; Newman and Wyly, 2006). Therefore, less-advantaged residents may face financial struggles as their neighborhoods gentrify, but they may not necessarily move out of the neighborhood in the limited time periods that these studies examined (Freeman, 2005).

Only a handful of researchers have examined the financial and economic consequences, such as income and job opportunities, of gentrification. McKinnish, Walsh, and White (2010) found that income gains were greatest among Black high school graduates, who made up a substantial proportion of the population of the neighborhoods identified as gentrifying at the beginning of their study, but they are unable to distinguish between whether these gains were among incumbent residents or higher-income Black households entering the neighborhood. Using a different data set, Ellen and O’Regan (2011) found that residents who remain in gentrifying neighborhoods experience greater income gains compared with residents who remain in nongentrifying neighborhoods. Due to data limitations, however, they were unable to examine residents who move. Lester and Hartley (2014) documented more rapid employment growth and more rapid industrial restructuring (the replacement of goods-producing industries by jobs in the service sector, like restaurants and retail services) in gentrifying neighborhoods than in nongentrifying neighborhoods. Meltzer and Ghorbani (2015) found that, at the ZIP Code level, the number of jobs going to local residents increases significantly and that these jobs are primarily in the service sector and going to low- and moderate-income earners, but they did not find consistent and meaningful gentrification effects on local employment at the census tract level. These latter two studies suggest that gentrification may provide economic opportunities to local residents, but they do not examine the trajectories of individual residents.

Hartley (2013) used data that are similar to the data used in our study and examined changes in Equifax risk scores from 2001 to 2007 in gentrifying and nongentrifying neighborhoods across the

² Many ethnographic accounts of gentrifying neighborhoods also document the political and cultural displacement that occurs as neighborhoods gentrify, alienating many of a neighborhood’s less-advantaged residents (for example, Hyra, 2014; Martin, 2007; Zukin, 2010).

United States. He documented increases in financial well-being among residents who remain in or move from gentrifying tracts: Living in a neighborhood that gentrified between 2001 and 2007 is associated with an 8-point higher increase in risk scores compared with living in a nongentrifying neighborhood. Hartley (2013) also found that gentrification is negatively correlated with the existence of delinquent accounts among residents. Our study extends from Hartley's (2013) work by examining a period beyond the Great Recession. We also examine heterogeneity across additional subpopulations that Hartley (2013) does not consider, such as those in neighborhoods in various stages of gentrification and those who move to neighborhoods with a higher or lower level of income. These distinctions are important to consider when studying the effects of gentrification, because previous research shows that mobility from gentrifying neighborhoods is largely due to higher-score residents moving to wealthier neighborhoods and that gentrification can impose different burdens depending on the stage and pace of gentrification in a neighborhood (Ding, Hwang, and Divringi, 2016).

Gentrification and Residents' Financial Health

We use a credit score, the Equifax risk score, to measure a resident's financial health. What does a credit score³ like the risk score represent? Why and how do we expect it to be associated with gentrification? A credit score is indicative of the probability that an individual will repay his or her debts without defaulting. It reflects the likelihood that a borrower will become seriously delinquent on any open credit account within 18 to 24 months. A higher risk score represents a lower level of estimated credit risk for a consumer, and a lower risk score indicates that the likelihood that the individual will default on his or her debt is higher. No score indicates a thin file—too little information is available for a score to be estimated. In short, a credit score provides a summary measure of a person's financial health and creditworthiness, which often determines credit access and pricing. Since their introduction in the 1970s, credit scores have played a central role in consumers' economic lives and have become an important determinant of individuals' financial and economic opportunities. In addition to serving as a key determinant for access to credit for individual consumers, credit scores have been increasingly used in the evaluation of individuals' applications for insurance, rental housing, utilities, and employment (Mester, 1997; Newman and Newman, 2013). Credit scores also represent an important and understudied dimension of financial health that can capture more than traditional measures of financial health, like income or wealth. Individuals rely not only on income but also on other resources, such as savings, assets, family contributions, or financial knowledge, for financial stability. Overall, credit scores provide a more comprehensive measure of the financial health of residents that directly reflects financial consequences that can come with the rising costs and shifting economy associated with gentrification.

Although credit scores have been widely used in the United States, almost no research has examined the determinants of credit scores or what triggers changes in credit scores. Credit bureaus may use many credit characteristics that relate to loan performance to compute credit scores, but they have not disclosed to the public their precise credit scoring models (Board of Governors of the Federal Reserve System [Federal Reserve Board], 2007). The Federal Reserve Board (2007)

³ Among the various types of credit scores, such as *lender-specific scores* used to underwrite individual financial products and *generic credit history scores* developed by major credit bureaus—Experian, Equifax, and TransUnion (Mester, 1997)—our study focuses on the generic credit history scores.

disclosed a list of 312 credit characteristics compiled by TransUnion in borrower credit records that could be used in its credit scoring models. An industry report states that the factors used to compute individuals' credit scores fall into the following categories, weighted in the model in this order: previous payment history, outstanding debts, length of credit history, new accounts opened, and types of credit used (Fair Isaac Corporation, 2005).⁴ Although credit scores reflect important aspects of an individual's financial health, they only directly reflect debt levels and debt payment behavior and do not incorporate income and asset holdings. Credit scoring models constantly update with new information (Poon, 2009), and particular events, such as delinquency, very large changes to one's debt, and events of public record (for example, bankruptcy or foreclosure), in general, have greater effects on credit scores than other factors (Anderson, 2007). Studies also show that the change in a consumer's credit score over time is negatively correlated with his or her initial score, exhibiting a pattern of "mean-reversion" (Musto, 2004). Put differently, individuals with lower scores are expected to experience larger increases in their risk scores, which likely is because the impact of negative or positive events an individual experiences on his or her credit score decreases over time (that is, time decay of information), and the score differences between borrowers with good credit and those with bad credit tend to revert toward the population average (Anderson, 2007).

The Equal Credit Opportunity Act prohibits discrimination in computing credit scores on the basis of race, ethnicity, religion, national origin, gender, marital status, and age (Federal Reserve Board, 2007). The Federal Reserve Board (2007) confirms that none of the credit characteristics included in a credit scoring model serves as a proxy for race, ethnicity, gender, or income.⁵ When focusing on the outcomes from the credit scoring models, however, several studies documented sizeable differences in mean credit scores across income and racial/ethnic groups; homeowners and renters; and individuals with different education levels, ages, and health conditions (Bostic, Calem, and Wachter, 2005; Federal Reserve Board, 2007; Newman and Newman, 2013). Bostic, Calem, and Wachter (2005) found that low-score individuals are disproportionately more likely to have low incomes and be of a minority group, and they found that the magnitude of the differences across different subpopulations increased between 1989 and 2001. Although income often correlates with financial indicators associated with one's ability to repay his or her debt, reasons for such differences are still unclear for researchers because the scoring models incorporate only debt—not income, asset holdings, or employment status. The Federal Reserve Board (2007) attributed these differences in credit scores to differences in the documented payment histories and outstanding debts of low-income and minority individuals. Spader (2010) further suggested that credit scores create a "feedback loop": People with low scores have limited choices in credit products because of their scores, and these products (for example, subprime mortgages), by their nature, usually have higher default risk, which could further hurt low-score borrowers' credit scores when they default.

Credit scoring models do not use very fine geographic information, so existing studies generally do not suggest a direct link between neighborhood characteristics and individuals' credit scores.

⁴ The credit bureau provides some information about the weight given to different sets of predictors: previous payment history (35 percent), outstanding debts (30 percent), length of credit history (15 percent), new accounts opened (10 percent), and types of credit used (10 percent) (Fair Isaac Corporation, 2005).

⁵ The only exception is that Federal Reserve Board (2007) found that a consumer's length of credit history correlates with the consumer's age.

Several possible mechanisms exist, however, in which gentrification could have differential impacts on residents' credit scores indirectly. On the one hand, gentrification not only attracts residents with higher socioeconomic status but also ushers in services that were previously absent in those neighborhoods (Meltzer and Schuetz, 2012). The inflow of new investment and improved access to mainstream financial services that typically come with gentrification can have direct or indirect positive effects on residents' financial health. For example, the influx of new bank branches, automatic teller machines, and financial service firms that come with gentrification makes it easier for existing residents to access safer and more affordable financial products. Further, the increase in job opportunities in gentrifying neighborhoods as the local economy improves could also increase residents' incomes and help them make timely payments on various credit accounts. In addition, the increase in housing values in gentrifying neighborhoods could help improve consumers' credit performance. Existing studies generally agree that the most important predictor of mortgage default is the level of equity in the property: the higher the level of equity in the property, the less likely the mortgage borrower will default on the mortgage (for a review, see Quercia and Stegman, 1992). Thus, rising housing prices increase the level of equity in a property, which can improve the mortgage performance of existing borrowers, though this channel is relevant only for homeowners with mortgages. We expect that the likely improved credit access and credit performance for existing residents in gentrifying neighborhoods will improve their credit scores.

The increase in rents and property taxes and rising costs of living that come with gentrification, however, could make gentrifying neighborhoods increasingly unaffordable for many existing residents. They may have difficulty in paying rents, property taxes, or other credit accounts, thus hurting their financial health. Further, if they cannot afford to stay in gentrifying neighborhoods and have to move, the move itself could incur various costs, including, but not limited to, transportation costs, storage costs, replacement costs, and job search costs, not to mention the cost of the psychological and social challenges associated with the move. Housing searches also require time and resources that can have negative consequences on individuals' credit scores. In particular, putting together a downpayment for a house or a deposit for rental housing, going through additional credit checks for mortgage and rental applications, or taking on new debt with a mortgage can have negative consequences for an individual's financial health, particularly for those who are residentially displaced from a gentrifying neighborhood. All these factors could have significant negative effects on the financial health of residents in gentrifying neighborhoods, and we expect them to hit vulnerable movers even harder because of their lack of a financial cushion. In sum, gentrification can affect residents' credit scores as a result of the various changes that come with gentrification, which could influence individuals' payment histories and access to credit. We expect that credit scores will be negatively associated with moving from gentrifying neighborhoods for less-advantaged residents relative to those who are able to stay, but the credit scores of less-advantaged stayers could either be positively or negatively associated with gentrification.

Of course, residents who experience greater improvement in their credit scores could self-select into gentrifying neighborhoods in the first place. For example, young recent college graduates, who are more likely to experience larger improvements in their credit scores as they build credit, may be more likely to live in gentrifying neighborhoods. At the same time, less-advantaged residents living in gentrifying neighborhoods, who are more likely to have lower credit scores and are

more likely to be older or longer-term residents, may be less likely to experience improvements in their credit scores because they were more vulnerable to economic insecurity during the Great Recession.

Data and Methodology

This section first discusses the measures we developed for identifying gentrification in the city of Philadelphia. Then, the section describes the consumer credit panel data we used to track the mobility of residents and changes in their credit scores over time. The final part of the section explains our methodology for examining the relationship between gentrification and the financial health of residents.

Data: Gentrification Measures

Gentrification is broadly the socioeconomic upgrading of a previously low-income neighborhood characterized by the influx of higher socioeconomic status residents and an increase in housing prices. Therefore, we measure gentrification by specifically concentrating on shifts in the socioeconomic status of residents and neighborhood housing prices. We focus on the city of Philadelphia in this study to isolate effects in a single housing market and to draw from local knowledge and alternative data sources to verify our measures of gentrification.

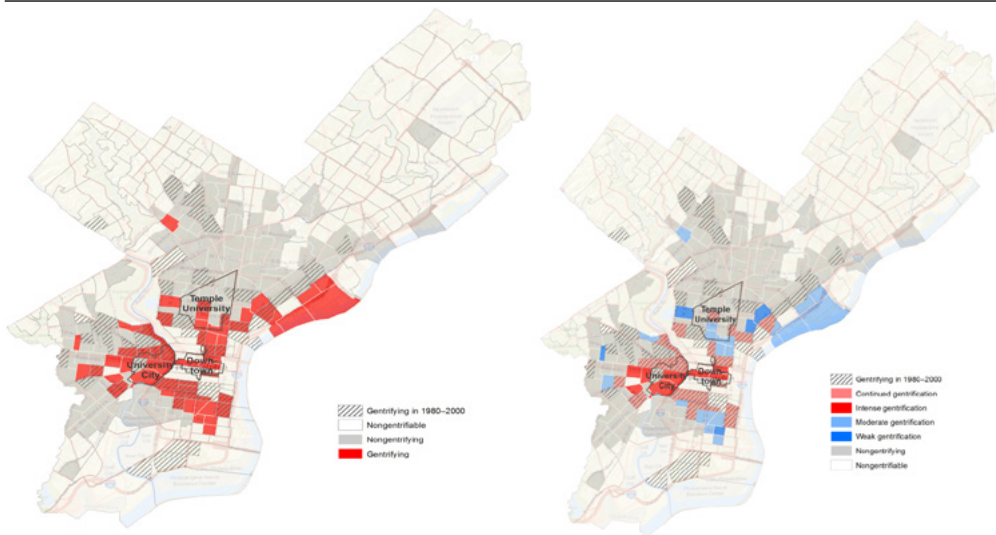
By definition, for tracts to gentrify, they have to have been lower-income tracts at the beginning of the period. Because the CCP data used in this study track individuals from 2002 to 2014, we consider tracts to be *gentrifiable* if their median household income was below the citywide median household income in the year 2000, using estimates from the 2000 U.S. census.⁶ We consider a tract to be *gentrifying* if it was gentrifiable in 2000 and experienced both a percentage increase above the citywide median increase in either its median gross rent or median home value *and* an increase above the citywide median increase in its share of college-educated residents from 2000 to 2013 based on data from the 2000 U.S. census and the American Community Survey (ACS) 5-year estimates from 2009 to 2013. We rely on housing values and rents because they reflect the demand for various amenities and investment in the neighborhood. We include changes in *either* rents or home values because these changes do not necessarily occur in step with each other but nonetheless indicate changing affordability in a previously low-income neighborhood. We additionally include criteria for demographic changes to deal with issues with past strategies of misidentifying gentrification in neighborhoods experiencing housing price spillovers without demographic changes. We rely on increases in the share of college-educated residents rather than incomes to capture young professionals who may have relatively lower incomes and to better distinguish an influx of new residents from incumbent upgrading (Clay, 1979; Freeman, 2005; Ley, 1996).⁷ Exhibit 1 (left) provides a map of gentrifying neighborhoods based on our measure.

⁶ Some studies used the median household income for metropolitan areas as the threshold, but the median household income for the Philadelphia metropolitan area is much higher than the median household income of most of the census tracts within the city of Philadelphia. Thus, we consider only lower-income tracts relative to the city as gentrifiable tracts in this study.

⁷ Of all the gentrifiable tracts, 99 had above-citywide median increases in either home values or rents, but 43 of these tracts did not have above-citywide median increases in their shares of college-educated residents.

Exhibit 1

Gentrifying Neighborhoods in the City of Philadelphia (left: binary measure; right: categorical measure)



Sources: Authors' definition is based on 2000 U.S. census and 2009–2013 American Community Survey 5-year data and on the U.S. Census Bureau TIGER/Line Shapefiles

Of Philadelphia's 365 tracts with substantial population sizes, we categorized 56 of its 184 gentrifiable tracts as gentrifying from 2000 to 2013.⁸ The remaining 128 tracts are *nongentrifying*; that is, they were gentrifiable in 2000 but did not meet the criteria listed previously.

Gentrification is a dynamic process that occurs at varying paces. Therefore, we also constructed more refined categories of gentrification to assess if the financial health of residents varies by the pace or stage of gentrification a neighborhood is experiencing. We constructed a separate category for census tracts that experienced gentrification before 2000, either during the 1990-to-2000 decade or during the 20-year period of 1980 to 2000, using the same criteria listed previously. Among the tracts that were gentrifying before 2000 and were still gentrifiable in 2000, we categorized those that continued to gentrify from 2000 to 2013 as *continued gentrification*. These tracts, in general, are in the more advanced stages of gentrification. We classified the tracts that were gentrifying from 2000 to 2013 but were not gentrifying before 2000 into three categories—*weak gentrification*, *moderate gentrification*, and *intense gentrification*—to indicate the pace of gentrification in these areas. Tracts that we categorized as weak gentrification had both median rent prices and home values in the bottom quartile among these gentrifying tracts, according to the 2009-to-2013 5-year ACS estimates. Tracts that we categorized as intense gentrification had either median rent prices or median home values in the top quartile of these gentrifying tracts. We categorized the remaining tracts as moderate gentrification. Exhibit 2 provides a detailed description of these categories, and exhibit 1 (right) displays a map of Philadelphia's tracts based on these categories. Average demographic and socioeconomic characteristics of these tracts are displayed in appendix exhibit A-1.

⁸ The data exclude 16 census tracts that had fewer than 50 residents or had zero housing units during the entire period of analysis. This exclusion results in a sample of 365 census tracts.

Exhibit 2

Gentrification Measure (categorical, by stage of gentrification)

| Categories | Number of Tracts | Explanation |
|--------------------------|------------------|--|
| Nongentrifiable | 181 | Nongentrifiable in 2000 |
| Nongentrifying | | |
| Nongentrifying | 105 | Nongentrifying, pre-2000 and 2000–2013 |
| Stalled gentrification | 23 | Pre-2000 gentrification and not gentrifying 2000–2013 |
| Gentrifying | | |
| Continued gentrification | 24 | Pre-2000 gentrification and gentrifying 2000–2013 |
| Weak gentrification | 5 | Gentrifying 2000–2013 but in the bottom quartile of gentrifying tracts for rent and value in 2009–2013 |
| Moderate gentrification | 19 | Gentrifying 2000–2013 and in the second or third quartile for either rent or value in 2009–2013 |
| Intense gentrification | 8 | Gentrifying 2000–2013 and in the top quartile for rent or value in 2009–2013 |

Sources: Authors' calculations, using 1980, 1990, and 2000 U.S. census and 2009–2013 American Community Survey 5-year data

Most of the gentrifying neighborhoods in the city of Philadelphia are either close to the downtown or adjacent to major anchor institutions (for example, University of Pennsylvania and Temple University). Gentrifying tracts can be grouped into five clusters. (1) The Center City cluster contains tracts in the central business district (CBD) and residential neighborhoods adjacent to it, and most of the other tracts in the cluster are wealthy, nongentrifiable tracts. (2) The South Philadelphia cluster comprises a diverse array of neighborhoods spanning the southern section of the city; a large proportion of the tracts in this cluster were gentrifying before 2000. (3) The Lower North cluster contains areas just north of the CBD, including areas by Temple University and areas adjacent to the city's major park—Fairmount Park. (4) The River Wards cluster encompasses a number of neighborhoods that have strong historical ties to Philadelphia's industrial economy along the Delaware River, expanding from neighborhoods that had gentrified during 1980s and 1990s. (5) The West Philadelphia cluster primarily includes tracts surrounding the University of Pennsylvania and Drexel University (University City), where nearly one-half of tracts had been gentrifying since before 2000.

Data: Federal Reserve Bank of New York Consumer Credit Panel/Equifax

This study primarily relies on the CCP data, which consist of an anonymized 5 percent random sample of U.S. consumers with credit bureau records. The sample is constructed by selecting consumers with at least one public record or one credit account currently reported and with one of five numbers in the last two digits of their Social Security numbers (SSNs)⁹ (see details in Lee and van der Klaauw, 2010). The CCP data report the credit characteristics, including extensive information on consumer credit use and credit performance, quarterly, beginning in 1999, for individuals in the sample. The CCP data also include the census geography identifiers (block, tract, county, and state) associated with each consumer's credit file, so we are able to identify whether an

⁹ The CCP data do not include actual SSNs. Equifax uses SSNs to assemble the data set, but the SSNs are not shared with researchers. In addition, the data set does not include any names, full addresses, demographics (other than age), or other codes that could identify specific consumers or creditors.

individual has moved across neighborhoods and to track the origin and destination neighborhood of a mover. We use data from the second quarter in each year during the study period for this study.

We carefully evaluated the representativeness of the CCP data and find that the age distribution and population estimates of the CCP sample are quite similar to those based on the ACS sample in Philadelphia, especially for individuals 25 years of age or older (see details in Ding, Hwang, and Divringi, 2016). We further compare the mobility rates derived from the CCP data with those derived from the ACS data and find that the interstate and intercounty mobility rates in general, are similar. The ACS data report slightly higher overall mobility rates than our study does, but this discrepancy is likely due to intraneighborhood moves that we do not count in our study.

A few caveats with the CCP data are worth mentioning. First, the CCP data set samples only individuals with a credit history and an SSN, so individuals who have never applied for or qualified for a loan are not included.¹⁰ Thus, the results may not represent the behavior of individuals without credit records or SSNs, such as those who do not use credit at all or young individuals or new immigrants who have no credit history. The CCP data set, however, does include individuals with thin files—those with too little information for scores to be estimated and also individuals whose credit files consist of only a collection or public record item (such as bankruptcy) or contain only authorized user accounts or closed accounts. Second, the CCP data have a significantly lower proportion of individuals aged 18 to 24 years old compared with ACS estimates; this difference is because younger adults are less likely to have a credit history than are older individuals.¹¹ The data also have a slightly higher proportion of older individuals (ages 65 years and older), likely because of the delay in the removal of deceased individuals' records from the CCP data (Lee and van der Klaauw, 2010). Finally, the sample design of the CCP data prevents us from tracking the change in financial health for a very small share of consumers newly added to or dropped from the panel. We estimate that 1 to 3 percent of consumers in the original CCP sample were dropped, but a similar share of consumers was added to the panel each year.¹² Therefore, we do not use a longitudinal panel design and instead construct our data set as individual annual cohorts whom we track for 3-year periods.

Keeping these caveats in mind, the CCP data provide a unique sample at the individual level for investigating the relationship between gentrification and financial health for financially independent adults, which has been largely unexplored before now. Our analysis includes individuals whom we initially observe in 2002 and 2003 and from 2005 to 2011, and for whom we have geographic data and risk scores for the initial year and 3 years later in the data set.¹³ About 11.5 percent of

¹⁰ The Consumer Financial Protection Bureau estimated that, as of 2015, 26 million Americans (1 in 10 adults) do not have any credit history with a nationwide consumer reporting agency (Brevoort, Grimm, and Kambara, 2016). Brown et al. (2011) estimated that about 8.3 percent of households do not include a member with a credit report.

¹¹ Although the younger population (18 to 24 years old) is slightly underrepresented in the CCP data, we keep them in the analysis because millennials may contribute to the gentrification process. We have conducted additional analyses excluding these young adults, and the results are similar.

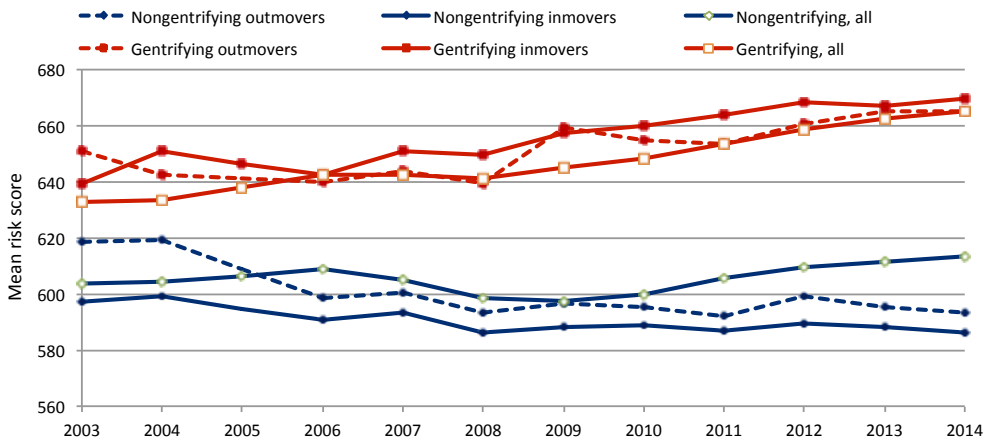
¹² The CCP data continue to add new individuals who develop a credit history or immigrate to the United States over time and drop consumers when they die, emigrate, or “age off,” following a prolonged period of inactivity and no new items of public record appearing.

¹³ Our study period begins in the second quarter of 2002 because the geographic information in the data before then is less precise (Wardrip and Hunt, 2013). Also, the 2004 cohort was excluded from the analysis because the mobility rate in 2005 was abnormally high, likely due to a change in the geocoding system in that year.

individuals had no risk scores (that is, thin files) and another 2 percent of individuals had missing values on other demographic variables, all of whom were excluded from the final sample. Exhibit 3 shows the mean risk scores for each year during the study period of all residents, in-movers, and out-movers in gentrifying neighborhoods and nongentrifying neighborhoods in Philadelphia. As the exhibit shows, the average scores for in-movers and out-movers in gentrifying neighborhoods increase over time, though in-movers have higher scores, on average. In nongentrifying neighborhoods, the average scores for in-movers and out-movers decrease over time, with out-movers having slightly higher scores, on average.

Exhibit 3

Mean Risk Score of Movers in Gentrifying and Nongentrifying Neighborhoods, Philadelphia, 2003 Through 2014



Notes: A mover is defined as one who lives in a census tract that is different from the census tract where he or she lived 1 year ago. Includes individuals 18 to 84 years old only.

Source: Authors' calculations, using data from the Federal Reserve Bank of New York Consumer Credit Panel/Equifax

Methodology: Gentrification and Financial Health of Residents

To examine the relationship between gentrification and changes in the financial health of residents, we first track the changes in the risk scores of residents who stay in gentrifying or nongentrifying neighborhoods in Philadelphia in 3 years after when we first observe them by the yearly cohorts that we constructed. We focus on an interval of 3 years to balance the need for an adequate followup time and the potential bias introduced by the attrition and adjustment of the study sample over time. We use the following linear model to estimate the relationship between gentrification and changes in residents' risk scores.

$$\Delta SCORE_{i,t+3} = \alpha + \beta \times GENTRIFY_{i,t} + \gamma \times SCORE_{i,t} + \delta \times X_{i,t} + \zeta \times YEAR_{i,t}, \tag{1}$$

where

- $\Delta SCORE_{i,t+3}$ is the change in the risk score for the same stayer i from year t to year $t+3$, or $(SCORE_{i,t+3} - SCORE_{i,t})$.

- **GENTRIFY_{it}** is the gentrification measure (binary or categorical) for the census tract where *i* lives in year *t*.
- **SCORE_{it}** is stayer *i*'s initial risk score in year *t*.
- **X_{it}** includes a set of individual and household characteristics for stayer *i* in year *t*: *i*'s age (categorical), the number of individuals with credit in *i*'s household (categorical), a dummy if *i* or anyone in *i*'s household has at least one mortgage as a rough proxy for homeownership,¹⁴ a dummy of whether *i* has any accounts in serious delinquency (90+ days), a measure of the distance from *i*'s census tract centroid to the city center (city hall), and *i*'s length of residency¹⁵ (categorical).
- **YEAR_{it}** is a dummy to indicate stayer *i*'s cohort in the data set.

In this pooled model, the same individual can appear in the sample multiple times in different cohorts because of how we constructed the sample. We include the cohort dummy variables, which enable us to estimate within-cohort differences to deal with this issue. In addition, according to the notion of “mean-reversion,” the change in a consumer’s risk score decreases with his or her initial score and the score differences between high-score and low-score groups tend to decrease over time and cluster around the mean risk score (Musto, 2004). We include a resident’s initial risk score in the model to adjust for baseline differences,¹⁶ and we examine the differences between individuals in gentrifying and nongentrifying neighborhoods with different levels of initial risk scores and compare these differences across initial risk score levels.

In a separate analysis, we focus only on residents who start off in gentrifying neighborhoods to examine if differences in financial health changes exist between residents who stay in or move from gentrifying neighborhoods. We use the following linear model to estimate the risk score change for movers relative to stayers from gentrifying neighborhoods.

$$\Delta SCORE_{it+3} = \alpha + \beta \times MOVE_{it} + \gamma \times SCORE_{it} + \delta \times X_{it} + \zeta \times YEAR_{it} \quad (2)$$

As equation (2) shows, we replaced the gentrification measure in equation (1) with the **MOVE** variable, a dummy indicator for whether the individual has moved after the initial observation year. Other controls in *X* are the same as in equation (1) except it includes a new control for frequent movers (those who also moved in the second or third year).¹⁷ The coefficient **β** indicates the relationship between moving and the change in risk scores.

¹⁴ According to the ACS, about 50 to 60 percent of households in Philadelphia are homeowners, and about 40 percent of owner-occupied units do not have a mortgage. Thus, approximately only two-thirds of the individuals without mortgages in our sample are likely renters.

¹⁵ Length of residency applies only to cohorts after 2005.

¹⁶ The results may still reflect mean reversion because we cannot fully adjust for the trajectory of baseline differences with the available data.

¹⁷ This control better captures the consequences of moving: For movers who moved multiple times in the observation period, **β** may capture both the gentrification effect and the moving effects. In a separate analysis excluding frequent movers from the sample, the results are consistent (with the magnitude of the estimates of **β** slightly smaller).

For both models, we further include interaction terms for individuals' initial risk scores (categorical),¹⁸ ages (categorical), lengths of residency (categorical), and mortgage statuses with the variable of interest (gentrification status or mobility status) to test whether less-advantaged groups in the context of gentrification experience the same level of improvement as other subpopulations. Standard errors are clustered at the census tract level to allow for unobserved characteristics of individuals to correlate within individual neighborhoods.

In summary, our analytic strategy is to compare changes in risk scores between residents in gentrifying neighborhoods and those in nongentrifying neighborhoods and also between movers and stayers in gentrifying neighborhoods. The empirical results enable us to document shifts in the financial health of residents in the context of gentrification, but they preclude causal claims. First, selection issues may exist for which we do not have the data to control: Individuals who expect to see larger improvements in risk scores may select to live in gentrifying neighborhoods. For example, recent "gentrifiers" tend to be young college graduates (Hwang and Lin, 2016), and these residents are likely to see greater increases in their credit scores as they establish credit. Second, stayers who experience larger improvements in financial health may also have unobserved characteristics that enable them to stay in gentrifying neighborhoods rather than move. Finally, the gentrification of a neighborhood is a process that is unfolding as we observe changes in residents' financial health, and the precise timing between gentrification and risk score changes is difficult to disentangle with the data that we use in the study.

Exhibit 4 shows descriptive statistics of the study sample (1) for all residents in gentrifiable neighborhoods (second column) and (2) split by the type of neighborhood in which they are living in their cohort year (third and fourth columns). The mean risk score for individuals in gentrifying tracts is higher than for individuals in nongentrifying neighborhoods (645 and 604, respectively). Individuals in gentrifying tracts are also slightly younger, are more likely to have mortgages, are less likely to have delinquent accounts, and have fewer adults in the household, on average. The risk score changes, however, were positive, on average, and were only slightly higher for residents in gentrifying neighborhoods than for those in nongentrifying tracts (an average increase of 12.2 points versus 11.6 points). Some important differences exist, however, between residents within these neighborhoods. For example, residents in nongentrifying neighborhoods have lower risk scores, on average, than those in gentrifying neighborhoods, and individuals with lower scores are more likely to experience increases in their credit scores. Residents in gentrifying neighborhoods also have higher mobility rates on average.

¹⁸ We use the categorical risk score variables only when interacting the risk score variable with the variable of interest to make it easier to interpret interaction terms. In other models, we control for the continuous variable of an individual's initial risk score.

Exhibit 4

Descriptive Statistics

| Variable | Gentrifiable Tracts (nongentrifying and gentrifying) | Nongentrifying Tracts | Gentrifying Tracts |
|---|--|--------------------------|-----------------------|
| Moved in 3 years | 26.0% | 24.3% | 30.4% |
| Moved within city | 16.2% | 16.0% | 16.6% |
| Moved out of city | 9.9% | 8.3% | 13.8% |
| Moved to a similar-income tract (same decile) | 11.4% | 12.0% | 10.0% |
| Moved to a lower-income tract (lower decile) | 3.7% | 4.1% | 2.9% |
| Moved to a higher-income tract (higher decile) | 10.9% | 8.2% | 17.4% |
| Equifax risk score | | | |
| 290–579 | 41.3% | 45.5% | 31.0% |
| 580–649 | 21.5% | 22.6% | 19.1% |
| 650–749 | 22.4% | 20.3% | 27.3% |
| 750+ | 14.8% | 11.6% | 22.6% |
| Mean Equifax risk score | 615.9 | 603.7 | 645.3 |
| Risk score change in 3 years | 11.8 | 11.6 | 12.2 |
| Age | | | |
| 18–24 | 10.8% | 11.0% | 10.4% |
| 25–34 | 22.0% | 20.5% | 25.6% |
| 35–44 | 19.4% | 19.5% | 19.0% |
| 45–54 | 19.0% | 19.7% | 17.1% |
| 55–64 | 13.8% | 14.1% | 12.9% |
| ≥ 65 | 14.3% | 14.3% | 14.3% |
| Household size (number of householders with credit info) | | | |
| 1 | 20.8% | 19.2% | 24.7% |
| 2 | 26.5% | 25.7% | 28.5% |
| 3 | 22.4% | 23.2% | 20.4% |
| 4 | 14.7% | 15.5% | 12.8% |
| 5+ | 15.6% | 16.4% | 13.6% |
| Having 1+ mortgages (household) | 22.3% | 21.3% | 24.8% |
| Having 1+ 90+day delinquent accounts (household) | 27.4% | 30.0% | 21.2% |
| Length in the tract (2005–2011 cohorts) | | | |
| < 2 years in the tract | 13.6% | 12.1% | 17.2% |
| 2–4 years in the tract | 16.6% | 15.8% | 18.6% |
| 5+ years in the tract | 69.8% | 72.1% | 64.2% |
| Distance to city hall (miles) | 3.6 | 4.2 | 2.1 |
| Person years (2002–2003; 2005–2011) | 165,160 | 116,805 | 48,355 |

Sources: Authors' calculations, using 2000 U.S. census, 2009–2013 American Community Survey 5-year, and Federal Reserve Bank of New York Consumer Credit Panel/Equifax data

Empirical Results

This section discusses the empirical results on the relationship between gentrification and the financial health of stayers, movers, and different subgroups of less-advantaged residents. These results are summarized in exhibits 5 through 8.

Exhibit 5

Estimated Equifax Risk Score Change in 3 Years for Individuals Who Stay in Gentrifying Neighborhoods, Relative to Individuals Who Stay in Nongentrifying Neighborhoods

| | All Individuals | Individuals With Mortgages | Individuals Without Mortgages | Tracts Within 0.5 Mile as the Control | Consumers With 2+ Accounts | Consumers 25-64 Years Old |
|--------------------------|-----------------|----------------------------|-------------------------------|---------------------------------------|----------------------------|---------------------------|
| Gentrify | 11,303*** | 14,710*** | 10,156*** | 4,354 | 11,757*** | 12,234*** |
| Weak gentrification | 3,100 | 1,549 | 3,388 | -0.060 | 2,092 | 3,204 |
| Moderate gentrification | 11,020*** | 15,426*** | 9,494*** | 5,686 | 11,711*** | 12,544*** |
| Intense gentrification | 22,589*** | 19,004*** | 24,379*** | 14,213*** | 21,896*** | 22,436*** |
| Continued gentrification | 11,599*** | 15,987*** | 9,690*** | 4,430 | 12,289*** | 12,517*** |
| R squared | 0.196 | 0.170 | 0.205 | 0.174 | 0.206 | 0.191 |
| Number of observations | 120,685 | 27,934 | 92,751 | 41,356 | 77,271 | 87,731 |

Significance: *** = 0.01, ** = 0.05, * = 0.1 level.

Notes: From ordinary least square regressions using pooled data. Different regressions are used for binary and categorical gentrification. Reference group is stayers in nongentrifying tracts. Standard errors are clustered at the tract level. Control variables include initial Equifax risk score (continuous), household size, age, mortgage status, serious delinquency, distance to city hall, and year dummies.

Sources: Estimation is based on 2000 U.S. census, 2009–2013 American Community Survey 5-year, and Federal Reserve Bank of New York Consumer Credit Panel/Equifax data

Exhibit 6

Estimated Equifax Risk Score Change in 3 Years for Individuals Who Stay in Gentrifying Neighborhoods, Relative to Individuals Who Stay in Nongentrifying Neighborhoods by Subpopulations

| | Coefficient | Standard Error | Coefficient | Standard Error | Coefficient | Standard Error | Coefficient | Standard Error |
|--|-------------|----------------|-------------|----------------|-------------|----------------|-------------|----------------|
| Gentrification and Equifax risk score | | | | | | | | |
| Gentrify | 8.722*** | 1.513 | | | | | | |
| Risk score 650–749 | 4.249*** | 0.919 | | | | | | |
| Risk score 580–649 | 10.125*** | 1.078 | | | | | | |
| Risk score <580 | 62.560*** | 0.983 | | | | | | |
| Gentrify and score 650–749 | 4.494*** | 1.807 | | | | | | |
| Gentrify and score 580–649 | 0.698 | 1.997 | | | | | | |
| Gentrify and score <580 | -5.742** | 1.331 | | | | | | |
| Gentrification and mortgage status | | | | | | | | |
| Gentrify | | | 17.641*** | 2.664 | | | | |
| No mortgage | | | -0.156 | 0.828 | | | | |
| Gentrification and no mortgage | | | -8.150*** | 2.030 | | | | |
| Gentrification and length of residency (2005–2011 cohorts) | | | | | | | | |
| Gentrify | | | 19.322*** | 3.311 | | | | |
| 2–4 years in the tract | | | 1.921 | 1.291 | | | | |
| 5+ years in the tract | | | 0.373 | 1.332 | | | | |
| Gentrify and 2–4 years in the tract | | | -6.565*** | 1.973 | | | | |
| Gentrify and 5+ years in the tract | | | -9.981*** | 2.410 | | | | |
| Gentrification and age | | | | | | | | |
| Gentrify | | | | | 13.124*** | 3.425 | | |
| Age 25–44 | | | | | 19.275*** | 1.377 | | |
| Age 45–64 | | | | | 32.175*** | 1.355 | | |
| Age ≥65 | | | | | 46.481*** | 1.685 | | |
| Gentrify and age 25–44 | | | | | 2.132 | 2.907 | | |
| Gentrify and age 45–64 | | | | | -3.249 | 2.865 | | |
| Gentrify and age ≥65 | | | | | -7.568** | 3.133 | | |
| Other controls | yes | | yes | | yes | | yes | |
| R squared | 0.196 | | 0.156 | | 0.188 | | 0.195 | |
| Number of observations | 120,685 | | 120,685 | | 94,263 | | 119,357 | |

Significance: *** = 0.01, ** = 0.05, * = 0.1 level.

Notes: From ordinary least squares regressions using pooled data. Reference group is stayers in nongentrifying tracts. Standard errors are clustered at the tract level. Control variables include Equifax risk score (continuous), household size, age, mortgage status, serious delinquency, distance to city hall, and year dummies.

Sources: Estimation is based on 2000 U.S. census, 2009–2013 American Community Survey 5-year, and Federal Reserve Bank of New York Consumer Credit Panel/Equifax data

Exhibit 7

Estimated Equifax Risk Score Change in 3 Years for Individuals Who Move Out of Gentrifying Neighborhoods, Relative to Individuals Who Stay in Gentrifying Neighborhoods

| | Coefficient | Standard Error | Coefficient | Standard Error | Coefficient | Standard Error | Coefficient | Standard Error |
|------------------------------------|-------------|----------------|-------------|----------------|-------------|----------------|-------------|----------------|
| Any move | -2.986* | 1.779 | | | | | | |
| Move within city or not | | | | | | | | |
| Move within city | | | -8.158*** | 1.638 | | | | |
| Move out of city | | | 4.012* | 2.166 | | | | |
| Move downward or not | | | | | | | | |
| Move to a similar-income tract | | | | | -5.747** | 2.624 | | |
| Move to a lower-income tract | | | | | -12.162*** | 2.995 | | |
| Move to a higher-income tract | | | | | 0.033 | 1.039 | | |
| Move and origin neighborhood type | | | | | | | | |
| Mover | | | | | | | -11.224** | 4.426 |
| Moderate gentrification | | | | | | | 3.962 | 3.035 |
| Intense gentrification | | | | | | | 8.606*** | 3.225 |
| Continued gentrification | | | | | | | 2.663 | 2.803 |
| Mover and moderate gentrification | | | | | | | 2.596 | 4.845 |
| Mover and intense gentrification | | | | | | | 13.100*** | 4.838 |
| Mover and continued gentrification | | | | | | | 11.891** | 5.072 |
| Other controls | yes | | yes | | yes | | yes | |
| R squared | 0.144 | | 0.146 | | 0.144 | | 0.120 | |
| Number of observations | 48,296 | | 48,296 | | 48,296 | | 48,296 | |

Significance: *** = 0.01, ** = 0.05, * = 0.1 level.

Notes: From ordinary least squares regressions using pooled data. Reference group is stayers in nongentrifying tracts. Standard errors are clustered at the tract level. Control variables include Equifax risk score (continuous), household size, age, mortgage status, serious delinquency, a dummy for frequent moves, and distance to city hall.

Sources: Estimation is based on 2000 U.S. census, 2009–2013 American Community Survey 5-year, and Federal Reserve Bank of New York Consumer Credit Panel/Equifax data

Exhibit 8

Estimated Equifax Risk Score Change in 3 Years for Individuals Who Move Out of Gentrifying Neighborhoods, Relative to Individuals Who Stay In Gentrifying Neighborhoods by Subpopulations

| | Coefficient | Standard Error | Coefficient | Standard Error | Coefficient | Standard Error | Coefficient | Standard Error |
|---|-------------|----------------|-------------|----------------|-------------|----------------|-------------|----------------|
| Mover and Equifax risk score | | | | | | | | |
| Mover | - 1.296 | 1.416 | | | | | | |
| Risk score 650-749 | 6.165*** | 1.518 | | | | | | |
| Risk score 580-649 | 9.429*** | 1.761 | | | | | | |
| Risk score < 580 | 54.781*** | 1.426 | | | | | | |
| Mover and score 650-749 | 5.473* | 2.812 | | | | | | |
| Mover and score 580-649 | - 4.284 | 2.853 | | | | | | |
| Mover and score < 580 | - 5.692*** | 1.981 | | | | | | |
| Mover and mortgage status | | | | | | | | |
| Mover | | | - 1.800 | 2.383 | | | | |
| No mortgage | | | - 4.900*** | 1.416 | | | | |
| Mover and no mortgage | | | - 1.561 | 2.237 | | | | |
| Mover and length of residency (2005-2011 cohorts) | | | | | | | | |
| Mover | | | 4.136 | 2.816 | | | | |
| 2-4 years in the tract | | | - 3.596** | 1.526 | | | | |
| 5+ years in the tract | | | - 5.376*** | 1.896 | | | | |
| Mover and 2-4 years in the tract | | | - 1.255 | 2.682 | | | | |
| Mover and 5+ years in the tract | | | - 14.706*** | 2.781 | | | | |
| Mover and age | | | | | | | | |
| Mover | | | 5.466 | 4.002 | | | | |
| Age 25-44 | | | 22.879*** | 2.533 | | | | |
| Age 45-64 | | | 29.421*** | 2.659 | | | | |
| Age ≥ 65 | | | 36.228*** | 2.820 | | | | |
| Mover and age 25-44 | | | - 5.244 | 3.556 | | | | |
| Mover and age 45-64 | | | - 17.078*** | 3.866 | | | | |
| Mover and age ≥ 65 | | | - 20.108*** | 5.084 | | | | |
| Other controls | yes | | yes | | yes | | yes | |
| R squared | 0.144 | | 0.120 | | 0.134 | | 0.144 | |
| Number of observations | 48,296 | | 48,296 | | 37,552 | | 47,961 | |

Significance: *** = 0.01. ** = 0.05. * = 0.1 level.

Notes: From ordinary least squares regressions using pooled data. Reference group is stayers in nongentrifying tracts. Standard errors are clustered at the tract level. Control variables include Equifax risk score (continuous), household size, age, mortgage status, serious delinquency, a dummy for frequent moves, and distance to city hall.

Sources: Estimation is based on 2000 U.S. census, 2009-2013 American Community Survey 5-year, and Federal Reserve Bank of New York Consumer Credit Panel/Equifax data

Financial Health of Stayers in Gentrifying Neighborhoods

We find that the change in risk scores of residents who remain in their neighborhoods is positively associated with gentrification. The results summarized in exhibit 5 indicate that staying in a gentrifying neighborhood is associated with an increase of 11.3 points in a resident's risk score over 3 years relative to staying in a nongentrifying neighborhood. This increase is slightly higher than Hartley's (2013) findings—an increase of 8 points during the period of 2001 to 2007. Gentrification is associated with a slightly larger increase in risk scores for mortgage holders than for residents without mortgages (14.7 points versus 10.2 points; see exhibit 5). It is notable that non-mortgage holders experience greater increases than mortgage holders in intensely gentrifying neighborhoods (24.4 points vs. 19.0 points; see exhibit 5). The positive association for both mortgage holders and non-mortgage holders and the larger increase for non-mortgage holders in intensely gentrifying neighborhoods suggest that increases in home equity may not be the primary mechanism through which gentrification impacts residents' credit scores.

Nonetheless, significant heterogeneity exists in the effect of gentrification on the risk score changes for stayers, depending on the stage of gentrification of the neighborhood (see exhibit 5). Intense gentrification is associated with a larger increase in stayers' risk scores compared with other gentrifying neighborhoods and nongentrifying ones. For example, those staying in neighborhoods undergoing intense gentrification see a 22.6-point higher increase in their risk scores than stayers in nongentrifying neighborhoods, doubling the average increase across all gentrifying neighborhoods of 11.3 points. The risk score change for residents in neighborhoods with moderate gentrification or in neighborhoods that have been gentrifying for many years (continued gentrification) is about 11 points higher, similar to the average increase. The association of risk score changes for residents in neighborhoods with weak gentrification is insignificant and the magnitude is much smaller (3.1 points). Exhibit 5 also contains results from various models to test the robustness of our findings, which we describe in more detail in the following paragraphs.

An 11.3-point improvement in individuals' risk scores, on average, may not seem big (about 1.8 percent of the mean score), but even a small improvement in a consumer's risk score can increase the chance of success for mortgage, credit card, apartment, and job applications, especially for those around cutoff points often used by creditors to determine whether individuals qualify for particular products (Quercia, Ding, and Reid, 2012). Credit score levels also impact pricing on mortgages, credit cards, and other debts, in addition to access to particular products (Agarwal et al., 2015). For example, an interest rate of a Fannie Mae loan with an 80 to 85 percent loan-to-value ratio would be 125 basis points lower for a borrower with a credit score between 680 and 699 compared with one with a credit score between 660 and 679 (as of March 2016);¹⁹ if a borrower has a credit score below 620, the chance that the borrower can get a Fannie Mae loan would be extremely low. Therefore, even seemingly small increases in credit scores can significantly improve credit availability and/or lower the financing costs for many consumers, especially those less-advantaged ones.

Exhibit 6 shows that residents with lower risk scores, those without mortgages, long-term residents, and older residents in gentrifying neighborhoods all experience greater positive changes in

¹⁹ More details about the loan-level price adjustments for Fannie Mae mortgages are available at <https://www.fanniemae.com/content/pricing/lpa-matrix.pdf>. Different lenders, however, may use different credit scores and different thresholds in their underwriting.

their risk scores relative to similar residents who do not move from nongentrifying neighborhoods. For example, low-score stayers in gentrifying neighborhoods see an average score change of 65.5 points in 3 years ($8.7 + 62.6 - 5.7$)²⁰ relative to the reference group (high-score [750+] stayers in nongentrifying neighborhoods), which is slightly higher than the average score change for a low-score stayer in a nongentrifying neighborhood (62.5 points higher than the reference group). Because not all stayers experience an absolute positive change in their risk scores, we discuss the score changes relative to the average estimated score changes for the reference groups.²¹

Results also suggest that low-score residents (below 580) and older residents (65 years or older) in gentrifying neighborhoods experience larger positive changes in risk scores than higher-score residents or younger residents in gentrifying neighborhoods. Although the score changes of low-score stayers in gentrifying neighborhoods, on average, are 65.5 points higher than those of the reference group, the changes for stayers with higher risk scores are lower (19.5 points for someone with a risk score between 580 and 649, 17.4 points for someone with a risk score between 650 and 749, and 8.7 points for someone with a score of more than 750). This finding is consistent with the pattern of mean reversion that others have found in credit scores: Consumers' credit score changes are negatively associated with their initial credit scores (Musto, 2004). The relative gains for long-term residents and those without mortgages are less than those of their more advantaged counterparts in gentrifying neighborhoods. The relative improvement in the risk score for a stayer in a gentrifying neighborhood with no mortgage is about 9.3 points ($17.6 - 0.2 - 8.2$), which is lower than the 17.6-point change for a resident with at least one mortgage in a gentrifying neighborhood.

When we consider the difference in the risk score changes between similar stayers in gentrifying versus nongentrifying neighborhoods, the changes in risk scores for less-advantaged residents in gentrifying neighborhoods are still positive but are lower than that for their more advantaged counterparts in gentrifying neighborhoods. For example, as mentioned earlier, the score changes of a low-score stayer in a gentrifying neighborhood is only about 3.0 points higher than those of a similar low-score stayer in a nongentrifying neighborhood (65.5 points versus 62.5 points higher compared with stayers in the reference group). This difference in risk score changes between low-score residents in gentrifying versus those in nongentrifying neighborhoods is less than that experienced by those with higher scores (9.4 points for residents with a risk score between 580 and 649, 13.2 points for residents with a risk score between 650 and 749, and 8.7 points for residents scoring higher than 750). In other words, the positive association between gentrification and risk scores is less for low-score stayers relative to their more advantaged counterparts. In a similar way, residents without mortgages, long-term residents (5 or more years), or older residents in gentrifying neighborhoods experience less improvement than their more advantaged counterparts in gentrifying neighborhoods. Older stayers (65 or more years old) in a gentrifying neighborhood, for example, experience a positive change that is 5.6 points higher than the change for similar

²⁰ We used F-tests to test whether the sum of two or more coefficients is significantly different from 0. All the sums of coefficients mentioned hereafter are significant at the 0.05 level or higher.

²¹ The model predicts an average high-score stayer (with a risk score of 750 or higher and mean values for other characteristics) in a nongentrifying neighborhood would experience a decline of 26.1 points in 3 years (and a decline of 17.4 points in a gentrifying neighborhood). By contrast, a low-score resident is expected to experience a positive increase in either gentrifying neighborhoods (39.4 points) or nongentrifying neighborhoods (36.4 points). The changes, in general, are positive for other subgroups (classified by mortgage status, age, and length in residence).

stayers in a nongentrifying neighborhood, which is lower than the 9.9 points for those between the ages of 45 to 64 years, the 15.2 points for those between the ages of 25 to 44 years, and the 13.1 points for those under the age of 25 years.

Overall, results suggest that change in financial health for less-advantaged residents is positively associated with gentrification if they can stay, though the magnitude of the positive association is smaller for them compared with what other more advantaged counterparts in gentrifying neighborhoods experience.

Financial Health of Movers From Gentrifying Neighborhoods

In Philadelphia, residents in neighborhoods that have been gentrifying for many years or have rapidly gentrified in recent years have slightly higher mobility rates than those in nongentrifying neighborhoods, but vulnerable residents in gentrifying neighborhoods, in general, do not have significantly higher moving rates (Ding, Hwang, and Divringi, 2016). When we focus on residents in gentrifying neighborhoods only, we find that moving is negatively associated with risk score changes. The average change in risk scores for movers after moving from gentrifying neighborhoods is about 3.0 points lower than that of stayers (see exhibit 7). Although the magnitude of the change is relatively small and only marginally significant (at 0.1 level), this result is different from Hartley's (2013) finding that movers from gentrifying neighborhoods had a larger increase in risk scores than stayers (an additional 1.5 points). Our main results are consistent when we use a similar measure of gentrification as Hartley (2013), focusing on cohorts from the early 2000s and a longer study period. Thus, the differences here are likely due to average differences nationwide and the additional control variables that we use in our models.

Although we have limited information on movers' resources, the types of neighborhoods to which movers move reveal distinct results that provide insight into the selection of residents moving from gentrifying neighborhoods. Relative to stayers in gentrifying neighborhoods, movers who move from gentrifying neighborhoods to other neighborhoods within the city experience a negative change relative to stayers (8.2 points lower) in risk scores, but movers who move to neighborhoods outside the city, which, in general, are much more socioeconomically advantaged than neighborhoods within the city, experience a positive change relative to stayers (an additional 4.0 points), as shown in the second set of columns in exhibit 7. We also observe a similar pattern for movers who move from gentrifying neighborhoods to areas with different income levels: Movers who move to lower-income neighborhoods (based on deciles) relative to their neighborhood of origin experience a negative change in risk scores compared with those who stay in the gentrifying neighborhoods (12.1 points lower). By contrast, those who move to higher-income neighborhoods experience similar risk score changes relative to those who stay (the difference is close to zero and insignificant). These divergent outcomes for residents moving to neighborhoods with a different socioeconomic status likely reflect the differential effects that come for movers who move because of affordability issues and those who move by choice to neighborhoods with a higher socioeconomic status.

The magnitude of the changes in movers' risk scores is also sensitive to the types and stages of the gentrification from which movers are moving. Movers out of neighborhoods with weak

gentrification experience a negative change in their risk scores compared with stayers in gentrifying neighborhoods in similar stages: Movers from tracts with weak gentrification have score changes 11.2 points lower, on average, than stayers in those neighborhoods. Residents moving out of neighborhoods undergoing intense gentrification or that are in the advanced stages of gentrification (“continued gentrification”), however, experience insignificant changes in their scores relative to stayers (evidenced by the sums of the coefficients of the relevant gentrification category variable and corresponding interaction variables in exhibit 7).

The changes in risk scores for movers are uneven across different subpopulations as well. Moving from gentrifying neighborhoods is negatively associated with risk score changes for vulnerable residents (see results in exhibit 8). Because the risk scores exhibit a pattern of mean reversion, in which high-score residents are more likely to experience declines in their scores and low-score residents are more likely to experience larger increases in their scores, it is more useful to compare the differences between movers and stayers for each subpopulation and then compare those differences across subpopulations.²² The average change in risk scores for lower-score movers is 7.0 points lower ($-1.3 - 5.7 = -7.0$ points) than that of stayers with similar risk scores. By contrast, the average change in risk scores for movers with relatively high risk scores (650 to 749) is 4.2 points greater than that of stayers with similar scores, though the difference for movers and stayers with scores of 750 or higher is insignificant. In other words, moving is negatively associated with risk score changes for lower-score residents, but it is positively associated with risk score changes for those with higher risk scores. The average risk score change for older movers is significantly lower than their counterparts who are able to stay: 14.6 points lower for those ages 65 years and older, almost no difference for those ages 25 to 44 years, and a slightly greater change for those ages 24 years and younger. Movers who were previously long-term residents experience a change that is 10.6 points (4.1 - 14.7) lower than do long-term residents who stay, but the differences between the changes of short-term residents who move and those who stay are insignificant. Finally, movers with no mortgage experience a change in their risk scores that is 3.4 points lower (and significant at the 0.1 level) than stayers with no mortgages. These results indicate relatively worse financial outcomes associated with moving from (compared with staying in) a gentrifying neighborhood for less-advantaged residents.

In summary, moving out of gentrifying neighborhoods is negatively associated with change in residents' credit scores. Moving is negatively associated with risk score changes for movers from neighborhoods in early stages of gentrification (relative to later stages of gentrification) and for those who move to lower-income neighborhoods or to other neighborhoods within the city (instead of outside the city). Moving is also negatively associated with risk score changes in less-advantaged residents in gentrifying neighborhoods (relative to those who stay), at least for a 3-year period. Although moving as a result of the rising financial costs associated with gentrification may explain these findings, individuals may also move as a result of declining financial health.

Robustness Checks

We conducted additional analyses using different subsamples and control groups to discern how sensitive the relationship between gentrification and residents' financial health is to some of our

²² The absolute changes for an average mover in other subgroups (classified by mortgage status, age, and length in residence), in general, are positive.

analytical decisions. Using all nongentrifying neighborhoods as the control group may also raise concerns with selection bias: Because some nongentrifying neighborhoods may have fewer amenities or may be farther from other amenities, residents in those nongentrifying neighborhoods may be less comparable with residents in gentrifying neighborhoods because of unobserved characteristics. When we restrict the analysis to residents in nongentrifying neighborhoods within one-half mile from the nearest gentrifying neighborhoods as the control group, the magnitude of the coefficients becomes smaller (4.4 points) and insignificant, but the sign of the coefficients remains the same (see exhibit 5). Nonetheless, the risk score changes are greater and statistically significant for residents in tracts experiencing intense gentrification.

We also replicated the analysis using a sample of individuals who have at least two credit accounts. Addresses of these individuals are more likely to be updated in a timely manner, which reduces the potential bias related to tracking individuals' mobility. The results are quite consistent (see exhibit 5), with similar magnitudes of the gentrification coefficients. These results suggest that this concern at least does not bias our estimation upward. Finally, when the younger population (those 24 years old and younger) and the older population (those 65 years old and older) who are underrepresented and overrepresented, respectively, in our sample are dropped from the sample, the results are similar (with a slightly larger coefficient of 12.2 for the *gentrify* variable). Overall, the results from the various robustness tests, in general, are consistent with those in the original model.²³

Summary

Despite the increasing concern about the consequences of gentrification, existing studies on gentrification largely focus on the residential displacement of existing residents. The financial and economic consequences of gentrification have received less attention. This study provides new evidence contributing to understanding the consequences of gentrification on residents' financial health. Residents who stay in gentrifying neighborhoods, no matter whether they are residents who have high or low risk scores, have lived in the neighborhood long or short term, are older or younger, or are with or without mortgages, all experience positive changes on average in their risk scores relative to similar residents in nongentrifying neighborhoods. Residents who stay in neighborhoods in the more advanced stages of gentrification experience even greater positive changes in their risk scores than those in less advanced stages of gentrification. The magnitude of the overall positive association between gentrification and risk score change for those who do not move from their neighborhoods, however, is smaller for less-advantaged residents compared with their more advantaged counterparts. Moreover, among residents who start off in gentrifying neighborhoods, moving is negatively associated with risk score changes for less-advantaged residents. Further, residents who move to lower-income neighborhoods or other neighborhoods within the city, rather than to the suburbs or other metropolitan areas, experience a negative change in their risk scores relative to stayers.

²³ We also conducted two additional robustness tests but did not include the results in the article. First, we ran the risk score change model by cohort instead of using the pooled data. The results are consistent with those using the pooled data with the coefficients of the *gentrify* variable being significant for all cohorts and slight variations in the magnitude of the coefficients across cohorts. Second, a small share (about 5 percent) of households has multiple householders in the CCP sample. The empirical results are almost the same when we excluded these individuals from the analysis.

Credit scores play a central role in determining consumers' access to credit, housing, and economic opportunity. The empirical results of this study are consistent with the notion that gentrification directly or indirectly improves the financial well-being of existing residents, though the distribution of the benefits is uneven. Less-advantaged residents appear to gain less from gentrification, and, for less-advantaged residents in gentrifying neighborhoods, moving is negatively associated with their risk score changes. The results demonstrate how the positive and negative consequences of gentrification on individuals' financial health may be unevenly distributed. For example, the evidence suggests that having to move from gentrifying neighborhoods could have negative costs on residents' financial health.

Policymakers should anticipate these unequal consequences and develop strategies to amplify the potential benefits and mitigate the possible negative effects for the less-advantaged population. In particular, the results suggest that moving is negatively associated with credit score changes for less-advantaged residents in gentrifying neighborhoods and that those residents can realize benefits to their financial health if they are able to stay. Therefore, policies that prevent these residents from displacement can potentially provide these individuals with additional financial benefits that can result from gentrification. Policy interventions that keep housing affordable for these residents and keep the neighborhoods as desirable places to live for them can prevent their displacement. At the same time, services that connect these residents to the incoming financial resources and opportunities can help increase the potential benefits that come with gentrification.

Of course, the study is not without limitations. The data set used in this study does not include some extremely low-income residents and new immigrants who do not have any credit accounts or credit history, and we excluded individuals with no scores. Thus, future research should investigate the relationship between gentrification and the financial health of those residents who are likely the most financially vulnerable. Also, although the gentrification process in Philadelphia is similar to that in many other central cities across the country, particularly Rustbelt cities with similar economic histories, it may differ from other markets, like those with rapidly rising demand and limited supply, such as San Francisco or New York City, in many important ways. Thus, the findings may not necessarily be generalized for the whole nation or cities that have significantly different market conditions. Finally, unobserved differences between residents in gentrifying and those in nongentrifying neighborhoods and also between stayers and movers likely exist that limit the extent to which residents in nongentrifying neighborhoods or stayers in gentrifying neighborhoods can serve as a control group that enable us to make causal claims. Nevertheless, as a case study, the timely empirical work helps shed new light on the uneven distribution of the financial consequences of gentrification.

Appendix A

Exhibit A-1

Neighborhood Characteristics by Gentrification Category

| | Nongentrifying | Gentrifying | Nongentrifiable |
|---|----------------|-------------|-----------------|
| Initial neighborhood condition, 2000 | | | |
| Non-Hispanic White in 2000 (%) | 16.00 | 33.80 | 64.80 |
| Non-Hispanic Black in 2000 (%) | 65.40 | 50.20 | 24.90 |
| Average median household income in 2000 (\$) | 21,895 | 21,042 | 43,366 |
| College educated (%) | 8.40 | 16.50 | 27.80 |
| Average median rent in 2000 (\$) | 400 | 412 | 578 |
| Average median value in 2000 (\$) | 40,560 | 58,530 | 103,300 |
| Change in neighborhood indicators, 2000–2013 | | | |
| Change in Non-Hispanic White (%) | – 31.70 | 22.80 | – 14.50 |
| Change in Non-Hispanic Black (%) | – 4.70 | – 26.50 | 17.70 |
| Average % change in median household income (%) | – 18.20 | 41.90 | – 7.20 |
| Average change in % college educated (%) | 1.50 | 16.40 | 6.30 |
| Average change in median home value (%) | 65.80 | 163.30 | 61.00 |
| Average change in median rent (%) | 5.50 | 42.60 | 12.90 |
| Number of tracts | 128 | 56 | 181 |

Notes: Excludes 16 tracts because of no population or extremely small populations. Dollar values are in 2000 real dollars.

Sources: Authors' calculations, using 2000 U.S. census and 2009–2013 American Community Survey 5-year data

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Gentrification and Small Business: Threat or Opportunity?

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Abstract

Local, small businesses are very much tied to their surrounding communities. Therefore, when neighborhoods undergo meaningful economic and social changes, such as those that take place under gentrification, one would expect local businesses to feel the effects. Is gentrification, however, a threat or a boon for existing businesses? What are the implications for the residents who patronize these services? I test these questions here, using microdata on properties and businesses in New York City. I also drill down to three illustrative case neighborhoods, which reveal nuance beyond the average citywide effects. The results are mixed and show that gentrification is associated with both business retention and disruption. I find that most businesses stay in place, and displacement is no more prevalent in the typical gentrifying neighborhood than in nongentrifying neighborhoods. When businesses do leave gentrifying neighborhoods, however, the spaces tend to sit vacant for relatively longer periods of time than they do in nongentrifying neighborhoods. Gentrifying neighborhoods are more likely to attract new types of services than are nongentrifying and higher-income neighborhoods, and they more often attract multiple-establishment businesses (chains) to replace displaced businesses. As the neighborhood drill-downs show, however, cases still exist in which neighborhoods undergoing gentrification lose businesses without the upside of new amenities.

Introduction

Much of the literature on gentrification has focused on how it affects residents and housing. We know, however, that the nature and quality of neighborhoods, especially those in urban settings, are also determined by the commercial enterprises that serve the community. The “corner store,” an emblem of local retail, has long played an important economic and cultural role in neighborhood development and livelihood (Liebow, 1967). Retail services, particularly in mixed-use settings, not only provide material needs for those living nearby, but less-tangible social and cultural capital as well (Deener, 2007; Hyra, 2008; Zukin et al., 2009). Therefore, it follows that, when

neighborhoods undergo meaningful economic and social changes like those that transpire under gentrification, implications surely exist for the local business environment. These potential changes are important not only for the business proprietors but also for the residents who patronize their services and consume their goods.

We know that business location decisions and their subsequent survival are a function of the existing (and potential) consumer base in an area (Meltzer and Schuetz, 2012; Waldfogel, 2008). A gentrification-induced shift in its composition, certainly economically and often racially/ethnically, could mean several things for local businesses. These changes could be a boon for local businesses if they bring in new consumers; however, if the new consumers also have different tastes and usher in higher rents, then the incumbent businesses could suffer. For residents, the prospect of new services, new employment opportunities, and street vitality are weighed against the potential interruption in the culture and services on which they historically had relied.

To get at some of these tensions, I examine more closely the issue of business turnover and displacement under conditions of gentrification. I use microdata on business activity and neighborhood conditions in New York City to test what kinds of businesses tend to open, close, or persist in the face of gentrification. I also drill down to three illustrative case neighborhoods, which reveal nuance beyond the average citywide effects. I find that gentrification can bring both opportunities and threats for the businesses and the community as a whole. Citywide, most businesses stay in place over time. Furthermore, the rate of displacement/retention is no different across gentrifying and nongentrifying neighborhoods. When businesses do leave gentrifying neighborhoods, however, their spaces tend to sit vacant for relatively longer periods of time. Gentrifying neighborhoods more often attract *chains*—that is, businesses with multiple establishments or locations—to replace displaced businesses than do nongentrifying and higher-income neighborhoods and are more likely to attract services that are different from those that operated in the neighborhood before gentrification. As the neighborhood drill-downs show, however, cases still exist in which neighborhoods undergoing gentrification lose businesses without the upside of new amenities.

Neighborhoods and Small Business

In this section, I consider the role of small businesses in neighborhood life and the mechanisms through which they respond to localized gentrification.

Neighborhood-Based Small Businesses

Small, local businesses historically have played an important role in the cultural and economic capital of urban neighborhoods.¹ Before the 1970s and before inner cities faced decades of disinvestment, local businesses, like corner stores, markets, and eateries, were a central part of the neighborhood's fabric (Ehrenhalt, 1999; Lloyd, 2010; Oldenburg, 1999; Sutton, 2010). In addition, those businesses have long been considered vehicles for entrepreneurship, especially among

¹ Throughout the article, "small business" refers not only to establishments with fewer than 100 employees (as defined by the U.S. Census Bureau) but also to a set of businesses that tend to provide neighborhood services and goods. The current article does not dedicate much attention to the small businesses that do not necessarily rely on the local community for their livelihood (for example, small technology or finance firms).

minority and immigrant populations (Fairlie, 2012; Sutton, 2010). These neighborhood businesses epitomize “local” not only in terms of their consumer base and proprietors (many of whom often come from the immediate community) but also in terms of their cultural and economic reach (Hyra, 2015; Hyra, 2008). This geographic immediacy of their inputs and outputs is consistent with Jacobs’ argument (1961) that local small businesses are not only good for services and access to jobs but also are critical to the vitality of community life.

What Happens to Businesses When Neighborhoods Gentrify?

Patch (2008) suggests that retail change, or “street gentrification,” is an important harbinger of broader socioeconomic trends that has thus far been underappreciated. Gentrification, a term coined by Glass (1964), originally referred to a phenomenon of socioeconomic transition: one in which more affluent and more educated “gentry” enter a low-income neighborhood. These changes can bring new services and access to a wider choice of basic goods, more vital and safer streets, and even local employment opportunities. Gentrification, however, can also disrupt commercially driven neighborhood identities and introduce services and products that do not serve incumbent residents. The commercial activity and residential composition of a neighborhood are closely tied, and, when a neighborhood gentrifies, the consumer base and costs of operation for a local business can shift as well (Carree and Thurik, 1996; Hotelling, 1929; Meltzer and Schuetz, 2012; Zukin, 2008). Here I lay out the mechanisms through which gentrification might affect the livelihood and composition of neighborhood-based small businesses.

Changes in Consumer Demand

For existing businesses, a new pool of local residents could mean both more and less patronage. Waldfogel (2008) shows that preferences for retail services are strongly correlated with observable population characteristics, such as income, educational attainment, and race/ethnicity. Empirical evidence also shows that household residential preferences are influenced by local amenities like commercial services (Kolko, 2011; Meltzer and Capperis, forthcoming). If, on net, the local consumer base has tastes that do not align with the services or goods that existing establishments provide, then local businesses could suffer. On the other hand, new residential activity could be a stabilizing force if it provides an injection of cashflow that the neighborhood was previously lacking. In addition, these socioeconomic changes could draw new businesses and services into the neighborhood.²

Changes in Startup and Operating Costs

Gentrification can also change the costs of operating or opening a business. For existing businesses, the effect is very direct: because of increased demand for the area, rents can increase. Without a concomitant increase in revenues, the costs of operating could become unsustainable and force closure. It is important to note that the pressures from rising commercial rents can take a different form than residential ones. Commercial leases tend to be much longer than residential ones (Genesove, 2003; Mooradian and Yang, 2000), and, therefore, businesses can often sustain operations

² For example, empirical evidence exists about how crime can deter commercial activity (Bowes, 2007; Fisher, 1991; Greenbaum and Tita, 2004; Lens and Meltzer, 2016; Rosenthal and Ross, 2010). It follows, then, that if businesses know or understand an area to be less crime ridden, the likelihood of their opening up there (all else constant) should increase.

at the original, lower rents as properties in the neighborhood otherwise appreciate. Therefore, any displacement could take longer to transpire. Rising rents (and new investments more broadly) can also influence the kinds of businesses that opt into the neighborhood, and, by association, the range and prices of products that they sell. As an alternative, higher rent can also deter entry, leaving vacated commercial spaces empty for sustained periods of time.

What Is the Empirical Evidence?

The empirical literature on gentrification and commercial activity is less developed than that on residential outcomes. Much of this research gap is because of the fact that no census of businesses is conducted at a fine-grained level of geography that truly approximates a local neighborhood. We do know, however, that lower-income and minority neighborhoods have fewer and, in certain cases, less diverse retail establishments, smaller average establishments, and a higher proportion of “unhealthy” restaurants (Block, Scribner, and DeSalvo, 2004; Lewis et al., 2005; Meltzer and Schuetz, 2012). In addition, banks and supermarkets tend not to locate in poorer ZIP Code neighborhoods, even after controlling for purchasing power (Alwitt and Donley, 1997; Powell et al., 2007; Zenk et al., 2005). Therefore, the empirical evidence confirms that, as the demographics of an area change, so do the businesses that serve it.

Fewer studies have focused on how commercial services *change* under conditions of gentrification. In general, initially low-valued neighborhoods that experience faster price appreciation and/or larger income gains also get more retail establishments (Meltzer and Schuetz, 2012; Schuetz, Kolko, and Meltzer, 2012). Chapple and Jacobus (2009) and Zukin et al. (2009) all found that retail revitalization is most strongly associated with gains for middle-income neighborhoods (and, according to Zukin et al. [2009], largely for independent or local chains). Meltzer and Capperis (forthcoming) found that, although more business churn takes place in neighborhoods undergoing relative price appreciation, most of it is driven by new business births rather than business deaths or exits. The authors also found that retail churn is associated more with changes in the local consumer profile than in the commercial environment. Supply-side factors matter, too; evidence indicates that changes in local businesses are also driven by targeted investment (Koebel, 2002).

What are the implications for local residents and the businesses?³ One of the most comprehensive attempts to document these changes on the ground is a compendium of case studies from cities around the world by Zukin, Kasinitz, and Chen (2015). It is not surprising that they found that the experiences of local businesses and consumers vary, depending on the sociohistorical role of neighborhood businesses and the nature and degree of government intervention. A few other studies shed light on what gentrification-induced shifts in local retail services mean for incumbent residents in typically lower-income communities. Ellen and O’Regan (2011) observed that residents who stay in gentrifying census tracts report greater increases in their satisfaction with

³ Although not a focus in this article, gentrification can also affect local job opportunities. Meltzer and Ghorbani (2016) tested this idea for neighborhoods in the New York-Newark, NY-NJ-CT-PA Core Based Statistical Area and found that incumbent residents living in gentrifying census tracts experience job losses in the immediate neighborhoods but gain access to jobs at farther 1- to 2-mile distances. Another set of related papers on the local labor market impacts of big box store entry found that the opening of a Wal-Mart or other large retailers is associated with net job and business losses and drops in retail wages (Dube, Lester, and Eidlin, 2007; Ficano, 2013; Haltiwanger, Jarmin, and Krizan, 2010; Neumark, Zhang, and Ciccarella, 2008).

the neighborhood than those in other, nonupgrading low-income tracts. Another study (Dastrup et al., 2015) focused on how gentrification affects the residents of public housing in New York City. The authors found that, although residents appreciate improvements in safety, they are more hesitant about how new retail and services benefited them—the new commercial activity tended to cater to the new in-movers rather than the incumbent residents and signaled future threats of displacement. Less directly related is a paper by Ding and Hwang (2016), in which the authors found that those who stay in neighborhoods undergoing price appreciation show significant improvement in their credit risk scores. The result is increased access to credit and, possibly, a greater ability to patronize local businesses.

Empirical Strategy

Although case studies have been invaluable in drilling down and understanding the processes for particular neighborhoods, they tell us very little about how gentrification, writ large, can affect small businesses across municipalities. Here, I look at neighborhoods within a dense and diverse municipality—New York City—and exploit variation in gentrification and business activity across space and over time. I specifically test whether gentrifying neighborhoods are more likely to experience business displacement than are nongentrifying neighborhoods. I consider the implications both for businesses and for the local residents who consume their services and goods.

Although the forces of gentrification have been particularly acute in New York City and the unusually high density has been an advantage for small businesses, the city exhibits great diversity in its types of neighborhoods and retail markets. Indeed, many New York City neighborhoods are comparable with those in other large U.S. cities. For example, although the median resident lives in a much denser neighborhood than someone in an otherwise comparable city, the range of densities reflects those experienced in other large cities (Capperis et al., 2015). Typical education levels, unemployment rates, and racial/ethnic makeups are comparable with those in other large cities; incomes, in general, are also comparable, with the exception of slightly higher median household incomes and lower poverty rates (Been et al., 2013; Capperis et al., 2014).

Data

The primary data set for this analysis is the National Establishment Time-Series (NETS) Database, a longitudinal, establishment-level database that is constructed by Wall & Associates, Inc., from the Dun & Bradstreet business register. Unlike publicly available government data on establishments, the NETS data set does not suppress small-cell counts of employment and provides full street addresses for each establishment. In addition, NETS is more likely to capture nonemployer businesses than are other public records (Neumark, Zhang, and Wall, 2005). Industry is reported at the 6-digit North American Industry Classification System (NAICS) level to allow for a fine-grained distinction across establishment types and also across chains and stand-alone businesses.⁴ Most importantly for this analysis, because the NETS data are longitudinal and establishment specific, I can track

⁴ NAICS is a classification system for U.S. businesses that identifies the industry for the establishment's primary activities. NAICS are self-declared by the business and exist "for the purpose of collecting, analyzing, and publishing statistical data related to the U.S. economy" (<https://www.sba.gov/contracting/getting-started-contractor/determine-your-naics-code>).

the movement of businesses into and out of very precise locations (that is, single buildings). The establishments are identified specifically by a unique identification (a Dun & Bradstreet D-U-N-S[®] number), which stays with the establishment even as it changes addresses over time.⁵

I augment the NETS data with information about the properties' physical characteristics and assessments from the New York City Department of Finance's tax assessment roll files and the New York City Department of City Planning's Primary Land Use Tax Lot Output (known as PLUTO). I also merge in tract-level economic and demographic variables from the Geolytics Neighborhood Change Database (1980 to 2000, decennially), the 2010 census, and the American Community Survey's 3-year estimates from 2008 to 2010.

Analytics

I operationalize the neighborhood as the census tract, as defined in the 2010 census, which is an area optimally populated by 4,000 people (U.S. Census Bureau, 2012). Previous studies have used the census tract to capture neighborhood communities and markets (Ellen and O'Regan, 2008; McKinnish, Walsh, and White, 2010), because it is a level at which sociodemographic information is readily available over time. The census tract also captures a walkable market area in New York City, which, on average, can be traversed in 5 to 10 minutes. This market area is consistent with my focus on neighborhood businesses and the proximate impact of localized economic change. I consider only mixed-use neighborhoods (that is, census tracts with populations greater than 200 and with some kind of commercial activity).⁶ In the end, I end up with 1,990 tracts, which constitutes nearly 95 percent of all census tracts in New York City.

I classify neighborhoods as gentrifying if they improve in their relative economic position during the course of the study period; doing so will capture any meaningful shift in local consumer characteristics. This classification is consistent with previous approaches (see Ellen and O'Regan, 2008; McKinnish, Walsh, and White et al., 2010; Meltzer and Schuetz, 2012) and with the (empirically supported) assumption that local commercial markets respond to changes in consumer demand.⁷

⁵ I recognize several limitations with using NETS. Other studies have advised against using it to identify very short-term changes in firm characteristics (and firm births, specifically), and, therefore, I process any changes during periods of 5 or more years (Neumark, Zhang, and Wall, 2005). Doing so will mitigate any lags in the NETS data in observing new firm births (Yang and Aldrich, 2012). Furthermore, I note that the NETS data are less adept at capturing within-city moves (Kaufman et al., 2015); because I am not following businesses across space and only within single, fixed locations, this limitation should not affect the current analysis. Finally, because employment numbers in NETS often are rounded to an even number or even imputed, identifying changes (especially short-term changes) in employment is difficult (Neumark, Zhang, and Wall, 2005). NETS data are better suited for identifying employment levels and changes during longer periods of time (a few years or more). Although I do use the employment data reported in NETS, it is a secondary part of my analysis and I rely on levels.

⁶ I retain selected commercial properties (store, loft, and garage buildings) and mixed-use properties (residential and commercial together) and exclude properties that are wholly office or residential. I do this to ensure that I capture local, neighborhood-based businesses rather than more corporate establishments. I select on the building classification rather than the type of actual commercial activity to retain areas that may be underpopulated by businesses but that are still set up to host them (indeed, the gentrifying neighborhoods might be disproportionately composed of building areas that are underused).

⁷ I also replicate the analysis across strata that reflect other neighborhood differences (those related to supply-and-demand factors) that could be correlated with both gentrification and business displacement, such as property values, housing age, population growth, and change in the share of the foreign-born population (see Freeman, 2005; Hammel and Wyly, 1996; Lester and Hartley, 2014). In general, the differences across strata are nonexistent or consistent with what is observed using the income-based gentrification metrics.

To be specific, I (1) identify neighborhoods as “low income” if they have average household incomes that are in the bottom two quintiles of the neighborhood income distribution in 1990 or 2000⁸ and, (2) out of those low-income neighborhoods, identify those in which the relative average household income (compared with the broader metropolitan statistical area [MSA]) has increased by the end of the decade that follows (each analysis is conducted for the 1990s and 2000s separately). I rely on relative measures of income and how those change over time to account for the fact that macrometropolitan area economic shifts may or may not be reflected equally at the neighborhood level (Ellen and O’Regan, 2008; Rosenthal, 2008). Of all the census tracts in the study area, between 905 and 941 are designated as low income (for 1990 and 2000 respectively); of those low-income tracts, about 5 percent during the 1990s and nearly 30 percent during the 2000s are identified as gentrifying.⁹

To measure business retention and displacement, I consider the succession, or “lifecycle,” of businesses within individual properties during the course of the study period, 1990 to 2011.¹⁰ I divide the study period into four separate intervals of about 5 years each and, in turn, observe business retention and displacement during these smaller 5-year intervals. I consider 5 years a reasonable window during which to observe business succession, because the median lifespan of a neighborhood-based business is around 5 years as well.¹¹ I include only properties that contain their maximum number of businesses at the start of the 5-year interval, because I cannot account for changes in or additions to the number of commercial units over time.¹² Finally, I construct metrics for

⁸ To be specific, I use average household income for the tract relative to average household income for the MSA.

⁹ This income-based designation reflects other demographic, housing, and commercial differences across gentrifying and nongentrifying neighborhoods, and these differences vary, depending on the decade. Furthermore, many of these trends for the neighborhoods that gentrify during the 2000s are already present in the 1990s. These findings demonstrate why it is important to consider gentrification processes during long periods of time (Zuk et al., 2015) and to segment the different time periods of change.

¹⁰ I use the term “business” and “establishment” interchangeably here, to keep with the theme of “small businesses.” In practice, however, a business can have multiple establishments (or locations).

¹¹ Furthermore, the NETS data are not known to be reliable in their year-on-year changes; previous reviews and critiques of the NETS data have suggested that longer intervals, like 5 years, produce more accurate measures of business flows (Neumark, Zhang, and Wall, 2005).

¹² To be specific, I can observe the number of establishments per property over time; if that number is higher at the end of the 5-year interval (compared with the start) then I drop these properties from the analysis. My concern is about whether more vacant spaces are available for commercial activity than what is observed by establishment activity. This restriction on the sample is not much of a concern for the current analysis because my focus is on business retention and displacement (and for incumbent businesses in particular) and not for business entry and formation in general. In addition, the omitted businesses are largely similar on observables compared with those represented in the sample (especially those located in multiple-business properties). The omitted businesses, however, tend to locate in larger properties and tend to be newer, independent, and more concentrated in insurance and professional services. Still, I note that the statistics presented here on business retention and displacement will be lower-bound estimates, because any businesses that enter the neighborhood into new spaces could also contribute to ongoing retention and/or displacement. I do replicate the analyses with a constant sample of properties based on business occupation in 1990 (the start of the study period). The results are substantively the same and do not indicate any bias from properties/businesses that enter the sample during later intervals in the study period. These results are available on request from the author.

single-business properties and multiple-business properties separately. I do this not only because the businesses that occupy them could behave differently but also because the buildings in which they are located are likely distinct (in terms of size, location, and classification).¹³

For each property, I construct rates of retention (*Stay*) and displacement during each 5-year interval, the latter of which is operationalized in two ways: (1) leaving without a new establishment to replace them (*Leave*) and (2) leaving with a replacement (*Replace*).¹⁴ I disaggregate the displacement metric to better identify how the business's exit affects the local community—both in terms of the new service that replaces it and in terms of the vacant space it leaves behind. I use the business's 6-digit NAICS industry classification to identify the kind of goods or services it provides. I also use information on the number of reported employees for the establishment to capture the typical size of each business. The employee count serves as a proxy not only for the size of the business (in terms of the number and perhaps variety of products offered) but also for the number of potential local jobs. Note that, because I have restricted the property types to include only retail and mixed-used classifications, I am focusing on small businesses (that is, those with fewer than 100 employees; Caruso, 2015). As another proxy for service type, I identify establishments that are stand-alone businesses versus chains (that is, linked to at least one other establishment through a common headquarters). This distinction is also important in light of the controversies around small businesses' vulnerability to chains, which are seen as more pervasive in gentrifying neighborhoods (Basker, 2005; Haltiwanger, Jarmin, and Krizan, 2010; Neumark, Jhang, and Ciccarella, 2008).

The analysis is twofold. First, I exploit the larger sample of single- and multiple-business properties to look at the within-building succession of businesses over time. Second, I drill down to several neighborhoods that have undergone different degrees of economic change to better understand the nature of the small business dynamics observed in the large-N sample.

Findings

In this section, I present results first from the citywide analysis of business displacement and replacement and then from three illustrative drill-down neighborhood analyses.

¹³ These differences are confirmed in the data. In addition, it is slightly harder to identify new businesses that replace displaced businesses for multiple-business properties, because there is not always a one-to-one replacement and I do not have consistent information on the number of commercial units. The one-to-one replacement in single-business properties is a much cleaner identification and I wanted to keep that part of the analysis separate.

¹⁴ $Stay = \frac{\#_Estab_Stay_t}{\#_Estab_Total_{t-5}}$ where $\#_Estab_Stay$ is the number of establishments that were in operation at $t-5$ and at t ;

$Leave = \frac{\#_Estab_Leave_t}{\#_Estab_Total_{t-5}}$ where $\#_Estab_Leave$ is the number of establishments that were in operation at $t-5$, but not at t

(and no other new establishment had reoccupied its commercial space by time t); and $Replace = \frac{\#_Estab_Leave_Replace_t}{\#_Estab_Total_{t-5}}$

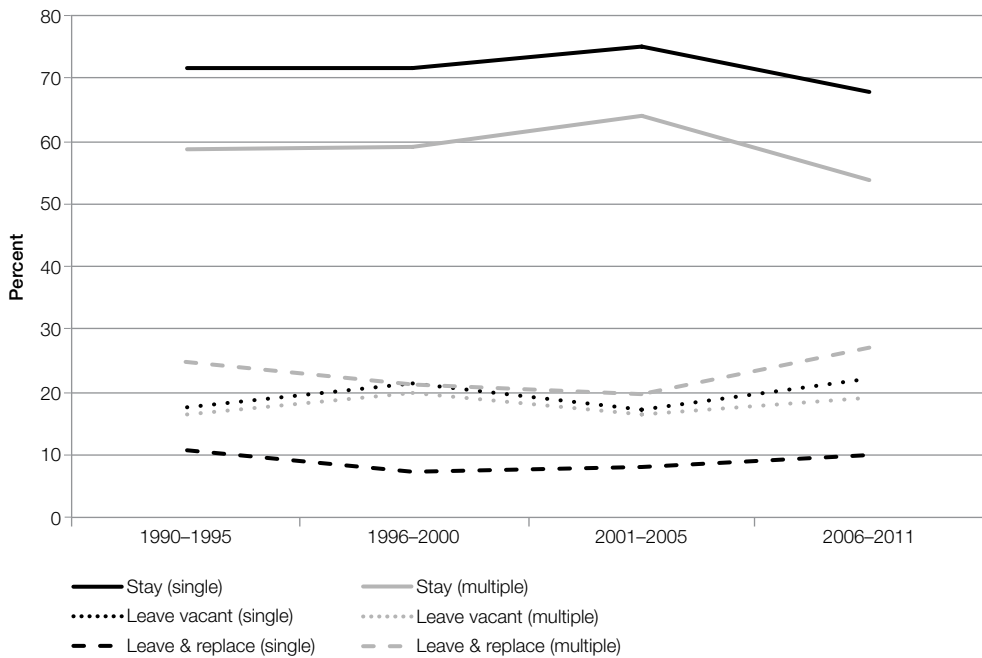
where $\#_Estab_Leave_Replace$ is the number of establishments that were in operation at $t-5$, but not at t (and with a new establishment in its commercial space by time t).

Citywide

Before looking at the association between business succession and gentrification, I establish some baseline retention and displacement rates for the overall sample. These rates are illustrated in exhibit 1. In general, businesses are more likely to stay in place than leave; this trend is consistent across both decades and both types of properties (single- and multiple-business), although the retention rate does go down in the second half of the 2000s and is lower for multiple-business properties throughout both decades. Businesses are also consistently more likely to leave without replacement, meaning that space is vacant by the end of the 5-year interval. This rate is relatively consistent across the decades, as is the share of those businesses that leave with a replacement establishment operating by the end of the 5-year interval. The likelihood of replacement, however, is substantially higher for multiple-business properties (about double), suggesting that commercial spaces in single-business properties are more likely to sit vacant after a business's displacement.¹⁵ I note that national retention rates of businesses within the first 5 years of operation fall at around 50 percent (SBA Office of Advocacy, 2014). The rates in the current analysis are higher, largely

Exhibit 1

Business Retention and Displacement Rates, Citywide



Sources: National Establishment Time-Series Database; author's calculations

¹⁵ To test whether these patterns vary across space, I replicate the same rates by borough (not shown here but available on request from the author). New York City consists of five rather distinct boroughs: Bronx, Brooklyn, Manhattan, Queens, and Staten Island. The five boroughs largely show similar retention, displacement, and replacement rates, which provides assurance that the results should not be driven by one borough in particular.

because the sample comprises both older and newly opened establishments; when rates are calculated for newer establishments only (that is, less than 5 years old) the rates are closer to the national rates (ranging between 50 and 60 percent) and the relative trends remain the same.

Does Gentrification Matter for Business Retention and Displacement?

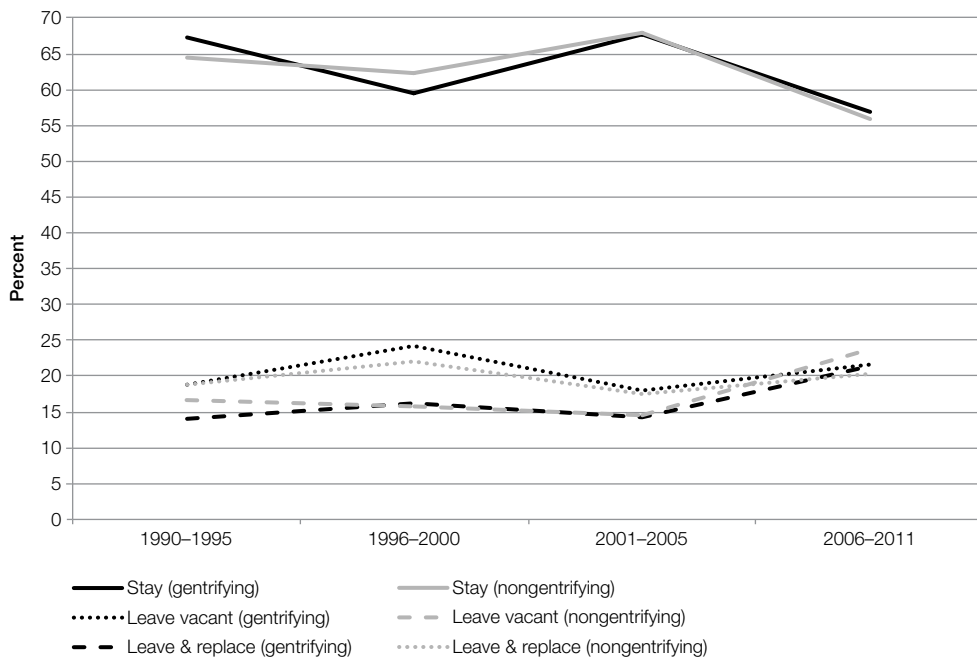
I now replicate the same set of statistics but stratified across three groups: low-income and gentrifying, low-income and nongentrifying, and the balance of tracts, where incomes range from moderate to high. Single- and multiple-business properties are combined, and I display here statistics that are contemporaneous with the decade of gentrification.¹⁶

Retention and Displacement Trends

Exhibit 2 displays retention and displacement rates across time for both gentrifying and nongentrifying neighborhoods (the underlying statistics are shown in exhibit 3). I first note that, although the magnitude of retention and displacement rates vary somewhat across time, the relative positioning of their shares persists. That is, most businesses stay in place, and the smallest share leaves with replacement. Second, the overall patterns indicate consistency in retention and displacement rates

Exhibit 2

Business Retention and Displacement Rates, by Gentrifying Neighborhoods



Sources: National Establishment Time-Series Database; author's calculations

¹⁶ For brevity of exposition, the displayed statistics are weighted averages of the single- and multiple-business property subsamples. When the analyses are conducted on the subsamples separately, the same patterns emerge. Where the data allowed, I also lagged the decade of gentrification and the results are substantively the same to those displayed.

Exhibit 3**Difference in Business Retention/Displacement Rates, by Gentrifying Neighborhoods**

| | 1990–1995 | | 1996–2000 | | 2001–2005 | | 2006–2011 | |
|--|------------|------|------------|------|------------|------|------------|------|
| | Difference | Sig. | Difference | Sig. | Difference | Sig. | Difference | Sig. |
| Gentrifying and nongentrifying tracts | | | | | | | | |
| Stay entire period | 0.027 | | – 0.027* | | – 0.003 | | 0.010*** | |
| Leave without replacement | – 0.001 | | 0.023* | | 0.006 | | 0.013*** | |
| Leave with replacement | – 0.027 | | 0.004* | | – 0.003 | | – 0.023*** | |
| Gentrifying and moderate- to high-income tracts | | | | | | | | |
| Stay entire period | 0.037*** | | – 0.033*** | | – 0.002*** | | – 0.012*** | |
| Leave without replacement | 0.036*** | | 0.056*** | | 0.021*** | | 0.026*** | |
| Leave with replacement | – 0.073*** | | – 0.023*** | | – 0.020*** | | – 0.014*** | |

* $p < 0.05$. ** $p < 0.01$. *** $p < 0.001$.

Notes: Values shown are the differences in retention/displacement rates. Statistics are based off of weighted averages of single- and multiple-business samples.

across gentrifying and nongentrifying neighborhoods. The most significant differences in retention rates exist during the second half of the 2000s, when businesses in gentrifying neighborhoods actually exhibit higher retention rates (in substantive terms, however, this rate is only a 1-percentage point difference). In addition, businesses that stay in place in gentrifying neighborhoods during the 2000s tend to be older than those in nongentrifying areas; the opposite is true for the 1990s.¹⁷ Therefore, it is not the case that longstanding businesses are more vulnerable to gentrification-induced displacement. Separate analyses on only gentrifying neighborhoods, however, show that those with faster commercial assessed values (AV; that is, rent) appreciation do display slightly lower rates of retention and higher rates of displacement without replacement, suggesting that rising rents could affect business displacement under conditions of gentrification.¹⁸

What happens to the commercial spaces after businesses leave? Although the rate of displacement without replacement universally goes up during the latter part of both decades, this increase is more pronounced for gentrifying neighborhoods; the lowest rates tend to be in the moderate- to high-income neighborhoods. Again, these differences manifest themselves in fewer than a few percentage points.¹⁹ Additional analyses (not shown here) indicate that most (that is, upward of 80 percent) vacancies are filled immediately. For those spaces left vacant, however, the duration of vacancy is often longer in gentrifying neighborhoods than in nongentrifying ones (and vacancies are always more prolonged in gentrifying neighborhoods compared with those in moderate- to high-income areas).²⁰ To check

¹⁷ These differences are all significant at $p < .05$. When I look at only retention/displacement rates for new businesses (that is, those operating less than 5 years), there is still no meaningful difference between gentrifying and nongentrifying neighborhoods (one exception is the early 1990s, during which retention rates are higher in gentrifying neighborhoods for newer businesses).

¹⁸ These results are not displayed here but are available on request from the author.

¹⁹ Most (that is, 85 to 90 percent) businesses shut down rather than relocate to another space within New York City (or outside the city). In addition, Meltzer and Capperis (forthcoming) found that when businesses relocate within the city, they tend to move to neighborhoods with new housing investment and growing retail, suggesting more (and perhaps cheaper) spaces for commercial activity.

²⁰ These results are not displayed but are available on request from the author. The disproportionate vacancy duration in gentrifying neighborhoods is most pronounced in the later 2000s and least evident in the early 1990s. Spaces can sit vacant for as little as 1 year and for more than 10 years.

the robustness of these results, I also conduct multivariate regression analyses, estimating the likelihood that a business stays in place conditional on its neighborhood gentrifying (see exhibit 4). As I did previously, I pool the single- and multiple-business property samples, but I control for business- and property-level characteristics (including the number of other businesses in the same building) and also for time (that is, interval) and geographic (that is, borough and smaller neighborhood) trends.²¹ In the most parsimonious model, the coefficients on the gentrification dummies (both

Exhibit 4

Logit Regressions

| | Pr(Stay=1) (1) | Pr(Stay=1) (2) | Pr(Stay=1) (3) | Pr(Stay=1) (4) |
|--------------------------------------|-------------------------|-------------------------|-------------------------|-------------------------|
| Gentrifying | - 0.080*** (- 4.71) | 0.019 (0.86) | 0.023 (1.04) | 0.004 (0.15) |
| Nongentrifying | - 0.053*** (- 5.56) | 0.053*** (4.25) | 0.048*** (3.81) | 0.005 (0.34) |
| Number of establishments in building | - 0.009*** (- 22.11) | - 0.009*** (- 18.78) | - 0.002*** (- 4.21) | 0.0004 (0.83) |
| Number of employees | | - 0.001** (- 3.04) | - 0.001*** (- 3.56) | - 0.001** (- 2.95) |
| Year start | | - 0.005*** (- 15.13) | - 0.005*** (- 14.48) | - 0.006*** (- 16.03) |
| Lot frontage | | - 0.001*** (- 7.80) | - 0.0004*** (- 4.52) | - 0.001*** (- 6.92) |
| Corner location | | 0.046*** (3.68) | 0.060*** (4.65) | 0.036** (2.77) |
| Chain | | - 0.407*** (- 14.95) | - 0.323*** (- 11.72) | - 0.304*** (- 10.93) |
| Property NAICS index | | | 0.521*** (24.78) | 0.509*** (23.01) |
| Constant | 0.584*** (86.89) | 11.780*** | 11.690*** (15.27) | 13.180*** (16.23) |
| Industry classification dummies | No | No | Yes | Yes |
| Time dummies | No | Yes | No | Yes |
| Geography dummies | No | Yes | No | Yes |
| N | 211,279 | 156,465 | 156,465 | 156,465 |

NAICS = North American Industry Classification System.

* p < 0.05. ** p < 0.01. *** p < 0.001.

Notes: t statistics in parentheses. Sample includes the full sample of tracts and "moderate- to high-income" is omitted. North American Industry Classification System index is a Herfindahl-type index that ranges between 0 and 1, where values closer to 1 represent more homogeneous industry mixes (single-business properties are assigned an index of 1).

²¹ I run regressions on the more restricted low-income tract sample and also the full sample, including moderate- and high-income tracts (the latter version is shown). I also run regressions disaggregated into single- and multiple-business property subsamples. The results are consistent across all the specifications. I also run the regressions wherein the dependent variable is specified as the probability of leaving; the results are consistent with those discussed in the previous sentence. Finally, I run a number of parsimonious specifications (omitting, for example, the time and geographic controls), and the direction of the gentrification coefficients are consistent; the coefficients tend to be larger in magnitude (and more significant) in the more parsimonious models, but they are consistently attenuated as more controls are added to the model. For purposes of brevity, these results are not displayed here but are available on request from the author.

relative to the moderate- to high-income neighborhoods) are negative and significant, which is consistent with what the bivariate tables showed. In addition, the difference between the two gentrification dummies is statistically zero. As more controls are added to the model, the coefficients on the gentrification dummies universally become insignificant, which shows that, after controlling for other property, business, and temporal-spatial variation, the retention rates do not vary significantly across any of the neighborhoods. These results, in general, are consistent with those from the bivariate analyses and reinforce the null gentrification effect.

Replacement Businesses

I turn now to exhibit 5, which displays statistics on the businesses that leave and those that replace them, to get a sense of how the service and commercial environment changes for local residents.²² Across the board, new businesses tend to be smaller than those that leave (that is, have a higher ratio between the number of employees in the business that leaves and the number of employees in the business that replaces); although these ratios are higher in gentrifying neighborhoods, they are not significantly different from those in nongentrifying neighborhoods. So, any job loss resulting from displacement is no bigger in the gentrifying areas. I also look at the correspondence between the industry classifications of the outgoing and incoming establishments to get a sense of how services

Exhibit 5

Business Replacement, by Gentrifying Neighborhoods

| | Number of Establishments That Leave w/ Replacement | Ratio of emp_leave: emp_replace | Is the 6-Digit NAICS the Same? (%) | Is the 2-Digit NAICS the Same? (%) | Is the Replacer a Chain? (%) |
|-------------------------------|--|---------------------------------|------------------------------------|------------------------------------|------------------------------|
| 1990–1995 | | | | | |
| Low income and gentrifying | 93 | 0.70 | 9.7 | 26.9 | 10.2 |
| Low income and nongentrifying | 2,850 | 1.36 | 13.7 | 27.3 | 9.4 |
| Moderate to high income | 4,595 | 1.46 | 12.8 | 21.7 | 11.0 |
| 1996–2000 | | | | | |
| Low income and gentrifying | 226 | 1.43 | 11.1 | 27.9 | 4.0 |
| Low income and nongentrifying | 5,142 | 1.00 | 9.9 | 20.6 | 8.6 |
| Moderate to high income | 6,820 | 0.96 | 9.0 | 17.2 | 10.8 |
| 2001–2005 | | | | | |
| Low income and gentrifying | 940 | 1.69 | 10.0 | 23.0 | 4.2 |
| Low income and nongentrifying | 2,069 | 1.77 | 12.2 | 24.3 | 3.3 |
| Moderate to high income | 4,026 | 1.69 | 10.1 | 19.1 | 6.0 |
| 2006–2011 | | | | | |
| Low income and gentrifying | 1,805 | 1.56 | 6.8 | 14.7 | 1.8 |
| Low income and nongentrifying | 4,444 | 1.49 | 8.2 | 17.9 | 1.4 |
| Moderate to high income | 6,472 | 1.76 | 7.2 | 16.2 | 2.0 |

NAICS = North American Industry Classification System.

Sources: National Establishment Time-Series Database; author's calculations

²² I focus primarily on the statistics for the single-business properties, because the correspondence between businesses that leave and that replace is cleaner (the one-to-one replacement match is less reliable in the multiple-business properties because of the fact that the number of businesses that leave can differ from the number of replacers).

turn over. I consider the narrowest 6-digit classification (for example, full-service restaurants) and also the broad 2-digit classification (for example, accommodation and food services). Although the pattern is less consistent across the 1990s, displaced and incoming businesses are less likely to have the same NAICS classification in gentrifying neighborhoods compared with nongentrifying neighborhoods in the 2000s.²³ A higher correspondence exists regarding 2-digit NAICS codes, indicating that the spaces retain broader service consistency (for example, a food establishment can return, but it may serve very different kinds of food and in a different setting). This finding makes sense if the commercial space is built out for a particular activity (like a restaurant, food store, or office). Overall, a slightly larger shift exists toward new services in gentrifying neighborhoods compared with nongentrifying neighborhoods.²⁴

Finally, the likelihood that the new business is a chain varies as well by neighborhood classification and decade. In the 1990s, replacement businesses are less likely to be chains in gentrifying neighborhoods; in the 2000s, this trend reverses, and replacement businesses are more likely to be chains in gentrifying neighborhoods compared with those in nongentrifying areas. The highest replacement rate for chains, though, is in the moderate- to high-income neighborhoods.

In sum, regardless of the neighborhood's gentrification status, businesses are more likely to stay in place during 5-year intervals than not; this likelihood is particularly true for those businesses that have been operating for a longer time. Gentrification does not induce disproportionately more displacement among businesses than what typically takes place in low-income neighborhoods. In addition, when a business leaves a gentrifying neighborhood, its commercial space is more likely to stay vacant for a longer period of time; this trend not only means that those services are gone but that the physical space is inactive and not contributing to street vitality. It is most notable that replacement businesses in gentrifying neighborhoods are more likely than those in nongentrifying neighborhoods to offer new types of services and are more likely to be chains (during the 2000s).

Case Neighborhoods

The statistics presented thus far capture average effects across the entire sample of neighborhoods. It is possible, however, that these broader patterns are obscuring important variation on a finer level. I identify three case neighborhoods that, within their broadly defined boundaries, contain (1) both gentrifying and nongentrifying census tracts and (2) a commercial presence that also crosses the gentrifying and nongentrifying tracts.²⁵ This design not only allows for a cleaner identification across gentrifying and nongentrifying tracts (because they all exist in the same macroneighborhood, with similar infrastructure and localized trends), but it is realistic in how gentrification can play out at the street level. It is not unusual to traverse a single neighborhood and cross street blocks that are

²³ This association is significant ($p < .01$) only in the second half of the 2000s.

²⁴ This shift is on a property-by-property basis; it could be the case that, as a neighborhood, a reshuffling of similar services occurs across properties.

²⁵ I use Neighborhood Tabulation Areas (NTAs), which were created by the New York City Department of City Planning to project populations at small geographies from 2000 to 2030. NTAs are compilations of census tracts, and, therefore, their boundaries are coterminous. They span multiple census tracts, but are smaller than Public Use Microdata Areas and Sub-Borough Areas. For all of the case areas, except Astoria, I combine two NTAs (that is, East Harlem South and East Harlem North) to constitute a larger, single neighborhood definition.

starkly different in their degree of development and their general character. I focus on gentrification classifications from the 2000s because a larger pool of tracts exists for this time period. I look at neighborhoods in three of New York City's five boroughs: East Harlem in Manhattan, Sunset Park in Brooklyn, and Astoria in Queens (see exhibit 6). Together, they illustrate the variation in change within and across macroneighborhoods.

For the discussion of the three case neighborhoods, I show an abbreviated set of statistics on retention and displacement. In addition to comparing these rates across tract classification (that is, low-income

Exhibit 6

Case Neighborhoods



Source: Underlying shapefiles from the New York City Department of City Planning

gentrifying and low-income nongentrifying, both within the same macroneighborhood), I also calculate the difference in rates across two decades—the 1990s and 2000s.²⁶ Therefore, the final column in each table represents a “difference-in-difference” of sorts, in which I first compare retention and displacement rates in the 2000s (the decade of gentrification designation) to those in the 1990s (to capture historical rates) for gentrifying and nongentrifying tracts. I then take this difference and compare it across the two neighborhood classifications. This approach controls somewhat for historical trends and baseline characteristics that could drive different outcomes above and beyond what is associated with the presence or absence of gentrification.

Case 1: East Harlem

East Harlem, located in the northeast section of Manhattan, historically has been an enclave for Hispanic residents. Public transit is moderately accessible and will improve even more after the new Second Avenue subway is complete (presumably, by 2017). Of the three case neighborhoods, East Harlem has the oldest housing stock, is the poorest, and houses the highest share of Black residents. More than one-half of the 22 census tracts that make up this macroneighborhood were designated as being low income in 2000, and, of those tracts, nearly one-half were classified as gentrifying in the decade that followed. The gentrifying tracts underwent significant economic and demographic changes during both the 1990s and 2000s compared with changes in the nongentrifying tracts. To be specific, population surged in the gentrifying tracts, as did the construction of new housing. The share of Hispanic households declined about 5 percentage points in the gentrifying tracts compared with increasing in the nearby nongentrifying tracts; the White population increased about the same throughout the macroneighborhood. The number of college-educated residents grew at a faster rate and the poverty rate declined more dramatically in the gentrifying tracts. It is not surprising that residential rents and prices also grew more acutely in the gentrifying tracts; the 2000s also brought increases in commercial prices and AVs compared with price declines and very modest AV increases in the nongentrifying tracts. Still, the gentrifying tracts saw a growth in retail establishments almost double that in nongentrifying tracts.

Business retention rates in the gentrifying tracts of East Harlem were slightly lower than the citywide average during the 1990s: about 65 percent of establishments in single-business properties (compared with 72 percent for the city overall) stayed in place (retention rates in multiple-business properties were slightly higher, at 68 percent, compared with 59 percent for the city overall).²⁷ In East Harlem, gentrification during the 2000s was associated with reduced business retention (see exhibit 7) compared with nearby tracts that did not gentrify. To be specific, the share of businesses that stayed in place decreased in the 2000s compared with the share in the 1990s for both gentrifying and nongentrifying tracts, but the decline was more pronounced for the properties in the gentrifying tracts (by about 5 percentage points, a meaningful drop that brings the neighborhood even further below the citywide mean). In addition, gentrifying tracts saw a larger decrease in the share of businesses that leave without any replacement and by a magnitude that makes a meaningful difference (almost 4 percentage points for single-business properties off of a base of 28 percent). A relative increase also occurred in the number of businesses that leave with replacement (based on the

²⁶ I do not include moderate- to high-income tracts as a comparison because very few or no tracts are in this income range in the case neighborhoods.

²⁷ These shares amount to 58 and 54 establishments for single- and multiple-business properties, respectively.

Exhibit 7**East Harlem, Retention and Displacement Rates**

| | Difference: Gentrifying and Nongentrifying | | Difference: 2000s and 1990s |
|-------------------------------------|---|--------------|--|
| | 1990s | 2000s | |
| Single-business properties | | | |
| Stay entire period | - 0.031 | - 0.087 | - 0.056 |
| Leave without replacement | 0.038 | 0.003 | - 0.035 |
| Leave with replacement | 0.022 | 0.032 | 0.010 |
| Multiple-business properties | | | |
| Stay entire period | 0.036 | 0.040 | 0.004 |
| Leave without replacement | 0.032 | 0.023 | - 0.010 |
| Leave with replacement | - 0.051 | - 0.076 | - 0.025 |

Sources: National Establishment Time-Series Database; author's calculations

single-business properties) in gentrifying tracts, albeit smaller in magnitude. During the course of the 1990s and 2000s, the gentrifying tracts also witnessed a larger growth in the number of chains (although the nongentrifying tracts still have a higher absolute number of chains).²⁸ Older businesses were actually less likely to leave in the gentrifying areas than the in the nongentrifying ones (even though the average business age is the same across the two types of tracts).

To understand how the types of businesses and their services change over time, I compile statistics on the neighborhood's composition of NAICS codes for gentrifying and nongentrifying tracts (see exhibit 8a). The first column of each panel shows the average concentration of the industry groupings²⁹ during the two decades and the remaining columns show the percentage change in the number of establishments during three different time periods for each industry grouping. The composition of services is very similar across gentrifying and nongentrifying tracts, with the exception of manufacturing and other industrial activity. The group with the largest growth during the 2000s is manufacturing and industrial, which is largely driven by wholesale establishments (which started with a very small base). Otherwise, the largest gains for gentrifying tracts are seen in personal services and in educational, health, and social services, both of which exceed the gains in the nongentrifying tracts. It is also worth noting that these services are the very ones that were relatively less prevalent compared with those in nongentrifying tracts at the start of the 2000s. General retail and food establishments, on the other hand, started out with relatively larger shares of the commercial activity in the gentrifying tracts (compared with shares in nongentrifying tracts) and saw smaller gains.

The question remains, however, are residents seeing a qualitative change in services? To test this question, I consider five discrete types of businesses: (1) grocery stores, (2) drug stores, (3) doctors' offices, (4) full-service restaurants, and (5) exercise facilities (gyms). The first three

²⁸ The chain business results are not shown.

²⁹ I combine related two-digit NAICS categories into broader groupings to reflect the general services/goods provided. The groupings are created as follows: retail = NAICS44+NAICS45; service = NAICS51+NAICS52+NAICS53+NAICS54+NAICS55+NAICS56; entertainment and food = NAICS71+NAICS72; personal services = NAICS81; education, health, and social services = NAICS61+NAICS62; manufacturing and industrial = NAICS31+NAICS32+NAICS33+NAICS42+NAICS48+NAICS49.

Exhibit 8

East Harlem, Change in Services

a. Broad Industries

| NAICS Grouping | Gentrifying | | | | Nongentrifying | | | |
|---------------------------|-------------|-----------|----------------|-----------|----------------|-----------|----------------|-----------|
| | Avg. Share | | Percent Change | | Avg. Share | | Percent Change | |
| | 1990-2011 | 1990-2011 | 1990-2000 | 2000-2011 | 1990-2011 | 1990-2011 | 1990-2000 | 2000-2011 |
| Retail | 0.37 | 51.7 | -7.6 | 64.2 | 0.31 | 133.3 | 34.1 | 73.9 |
| Service | 0.24 | 251.5 | 71.2 | 105.3 | 0.25 | 364.7 | 80.9 | 156.9 |
| Food, entertainment | 0.07 | 285.7 | 185.7 | 35.0 | 0.08 | 285.0 | 120.0 | 75.0 |
| Personal services | 0.16 | 352.9 | 88.2 | 140.6 | 0.17 | 287.5 | 95.8 | 97.9 |
| Education, health, social | 0.08 | 120.6 | 0.0 | 120.6 | 0.08 | 147.1 | 29.4 | 90.9 |
| Manufacturing, etc. | 0.07 | 127.6 | -24.1 | 200.0 | 0.11 | 122.0 | 2.0 | 117.6 |

b. Discrete Services

| Discrete Service | Gentrifying | | | | Nongentrifying | | | | | | | |
|--------------------------|--------------------------|------|----------------|-----------|--------------------------|-----------|----------------|-----------|----|-------|-------|-------|
| | Number of Establishments | | Percent Change | | Number of Establishments | | Percent Change | | | | | |
| | 1990 | 2000 | 2011 | 1990-2011 | 1990-2000 | 2000-2011 | 1990-2011 | 1990-2011 | | | | |
| Grocery stores | 17 | 39 | 87 | 411.8 | 129.4 | 123.1 | 26 | 38 | 83 | 219.2 | 46.2 | 118.4 |
| Drug stores | 12 | 11 | 22 | 83.3 | -8.3 | 100.0 | 10 | 9 | 16 | 60.0 | -10.0 | 77.8 |
| Full-service restaurants | 7 | 26 | 37 | 428.6 | 271.4 | 42.3 | 8 | 23 | 20 | 150.0 | 187.5 | -13.0 |
| Gyms | 0 | 0 | 4 | | | | 0 | 0 | 3 | | | |
| Doctors' offices | 21 | 26 | 56 | 166.7 | 23.8 | 115.4 | 18 | 17 | 33 | 83.3 | -5.6 | 94.1 |

NAICS = North American Industry Classification System.

Note: Percent Change refers to the percent change in the number of establishments between the indicated end points; for example, Percent Change 1990-2011 (for Retail) = $(\#_Retail_{2011} - \#_Retail_{1990}) / \#_Retail_{1990}$.

Sources: National Establishment Time-Series Database; author's calculations

represent more necessity services (that is, those that are more critical to have nearby for regular consumption), and the last two represent more discretionary services (that is, those that are not necessary but convenient to have nearby nonetheless). Exhibit 8b shows how the availability of these services changes over time in gentrifying and nongentrifying tracts. In all cases, the gentrifying tracts exhibit much larger gains in these services than do the nongentrifying tracts, suggesting that economic changes in the neighborhood are associated with increases in both necessity and discretionary services. Physical access to grocery stores increases most significantly, and it is important to note that most of these establishments are classified as general grocery stores (not convenience stores).³⁰

Case 2: Sunset Park

Sunset Park, a neighborhood in southwest Brooklyn, has been home to mostly Hispanic and Asian immigrants. It also includes large swaths of land zoned for manufacturing and has attracted increased investment in those areas. Of all the case neighborhoods, it has the highest share of Hispanic and Asian residents and, economically, falls in the middle. Like East Harlem, most of the census tracts in the Sunset Park macroneighborhood were designated as being low income as of 2000; slightly less than one-half of Sunset Park's 20 neighborhoods were designated as gentrifying. Even though poverty rates declined in the gentrifying tracts compared with increases in nearby nongentrifying tracts, population growth was comparatively slower. The share of White households declined, but less dramatically, than in the nongentrifying tracts, and the share of residents with a college degree increased more in the gentrifying tracts. The rate of housing construction was slightly higher in the gentrifying tracts, and housing costs were modestly higher only during the 2000s. Although relative commercial prices went down more in gentrifying tracts during the 2000s, commercial AVs went up. Although gentrifying tracts got more chains than did nongentrifying ones, their growth in general retail establishments was slower. Some of the biggest chains, like Home Depot and Costco, were attracted into the manufacturing section of the neighborhood.

The business retention and displacement patterns (see exhibit 9) are slightly different from those experienced in East Harlem, which has starker demographic shifts. Like the gentrifying tracts in East Harlem, those in Sunset Park also exhibit lower retention rates in the 1990s compared with rates in the city overall (65 percent for single-business properties; rates for multiple-business properties are on par with the citywide rate).³¹ It is most notable that, on net, business retention rates went down in gentrifying tracts compared with those in nongentrifying tracts. Furthermore, the magnitude of the shift was larger in Sunset Park than in East Harlem. Although displacement rates went down overall, displacement without replacement went up significantly among multiple-business properties (about 8 percentage points off of a 13 to 15 percent base). Although the gentrifying areas lost a substantial share of their older businesses, it was a smaller loss than that experienced by the nongentrifying parts of Sunset Park. Personal services were also relatively less

³⁰ It is still possible that bodegas and other establishments that carry a range, but not a comprehensive supply, of food and produce self-classify as general grocery stores. It is unfortunate that there is no way to distinguish these establishments in the data. Regardless, an observed increase in food-carrying establishments occurs, which makes a qualitative difference in the neighborhood.

³¹ These shares amount to 77 and 66 establishments for single- and multiple-business properties, respectively.

Exhibit 9**Sunset Park, Retention and Displacement Rates**

| | Difference: Gentrifying and Nongentrifying | | Difference: 2000s and 1990s |
|-------------------------------------|---|--------------|--|
| | 1990s | 2000s | |
| Single-business properties | | | |
| Stay entire period | - 0.068 | - 0.005 | 0.063 |
| Leave without replacement | 0.064 | - 0.002 | - 0.067 |
| Leave with replacement | 0.000 | - 0.032 | - 0.032 |
| Multiple-business properties | | | |
| Stay entire period | 0.034 | - 0.051 | - 0.084 |
| Leave without replacement | - 0.010 | 0.065 | 0.076 |
| Leave with replacement | 0.028 | - 0.010 | - 0.038 |

Sources: National Establishment Time-Series Database; author's calculations

prevalent in the gentrifying sections of Sunset Park (see exhibit 10a), but they experienced about the same degree of growth as in the nongentrifying tracts during the 2000s.³² Food and entertainment establishments, however, grew at a faster rate in the gentrifying tracts. Any gains in discrete necessity services, like grocery stores or doctors' offices, similarly are substantially bigger in the nongentrifying tracts (see exhibit 10b). In fact, the gentrifying tracts have a relatively large loss in certain services, like drug stores and restaurants. These patterns could be a result of the combination of rising commercial rents and relatively slower population growth in the gentrifying areas.

Case 3: Astoria

Finally, Astoria is a neighborhood in the western part of Queens across the river from Manhattan. Astoria, which is quite diverse ethnically, includes large groups of residents from Europe, South America, and the Middle East. It is considered more of a middle-class neighborhood and has a smaller share of low-income tracts than the other two case neighborhoods (about two-thirds, as of 2000). Astoria consists of a population that is substantially more White, but, of all of the case neighborhoods, it has the highest share of foreign-born residents. Of the 17 low-income tracts, nearly one-half were designated as gentrifying during the 2000s. Even though its population increased during the 1990s, the gentrifying tracts actually saw a greater population decline during the 2000s (however, it was a smaller decline than that in the higher-income tracts nearby); this decline appears to have been driven by losses in the White population (both Black and Hispanic residents increased their population shares). At the same time, poverty rates were declining more substantially in the gentrifying tracts and the share of college-educated residents was increasing. The gentrifying neighborhoods had a higher rate of new residential construction and marginally larger increases in rents. Residential prices were appreciating in the 2000s, albeit less than in the nongentrifying low-income tracts. Commercial prices were dropping more dramatically in the gentrifying tracts, but commercial AVs were increasing compared with declines in the rest of Astoria. Growth in the retail market was marginally higher in the gentrifying tracts than in the nongentrifying tracts (but was more than double that in the higher-income tracts).

³² Compared with the 1990s, the growth in gentrifying tracts was only marginally smaller than the substantial decline in growth in the nongentrifying neighborhoods.

Exhibit 10

Sunset Park, Change in Services

a. Broad Industries

| NAICS Grouping | Gentrifying | | | | Nongentrifying | | | |
|---------------------------|-------------|----------------|-----------|------------|----------------|-----------|----------------|-------|
| | Avg. Share | Percent Change | | Avg. Share | Percent Change | | Percent Change | |
| | 1990–2011 | 1990–2011 | 1990–2000 | 2000–2011 | 1990–2011 | 1990–2000 | 2000–2011 | |
| Retail | 0.26 | 115.9 | 49.2 | 44.7 | 0.35 | 135.9 | 42.3 | 65.8 |
| Service | 0.21 | 361.1 | 50.0 | 207.4 | 0.22 | 553.9 | 75.5 | 272.6 |
| Food, entertainment | 0.08 | 142.1 | 73.7 | 39.4 | 0.08 | 140.4 | 100.0 | 20.2 |
| Personal services | 0.23 | 208.9 | 77.8 | 73.8 | 0.15 | 288.1 | 122.6 | 74.3 |
| Education, health, social | 0.03 | 160.0 | 60.0 | 62.5 | 0.06 | 158.0 | 52.0 | 69.7 |
| Manufacturing, etc. | 0.20 | 67.2 | 14.8 | 45.7 | 0.13 | 241.3 | 50.0 | 127.5 |

b. Discrete Services

| Discrete Service | Gentrifying | | | | Nongentrifying | | | | | | | |
|--------------------------|--------------------------|------|----------------|-----------|--------------------------|-----------|----------------|-----------|-----|-------|-------|-------|
| | Number of Establishments | | Percent Change | | Number of Establishments | | Percent Change | | | | | |
| | 1990 | 2000 | 2011 | 1990–2011 | 1990–2000 | 2000–2011 | 1990–2011 | 1990–2000 | | | | |
| Grocery stores | 21 | 33 | 44 | 109.5 | 57.1 | 33.3 | 50 | 101 | 203 | 306.0 | 102.0 | 101.0 |
| Drug stores | 1 | 4 | 3 | 200.0 | 300.0 | –25.0 | 15 | 18 | 31 | 106.7 | 20.0 | 72.2 |
| Full-service restaurants | 9 | 23 | 17 | 88.9 | 155.6 | –26.1 | 32 | 78 | 65 | 103.1 | 143.8 | –16.7 |
| Gyms | 0 | 0 | 2 | | | | 0 | 1 | 7 | | | 600.0 |
| Doctors' offices | 4 | 5 | 7 | 75.0 | 25.0 | 40.0 | 38 | 52 | 90 | 136.8 | 36.8 | 73.1 |

NAICS = North American Industry Classification System.

Note: Percent Change refers to the percent change in the number of establishments between the indicated end points; for example, Percent Change 1990–2011 (for Retail) = $(\#_Retail_{2011} - \#_Retail_{1990}) / \#_Retail_{1990}$.

Sources: National Establishment Time-Series Database; author's calculations

Like broader citywide trends, most establishments stayed in place during both the 1990s and 2000s. For single-business properties, retention rates in gentrifying tracts were at 73 percent during the 1990s; for multiple-business properties, this number was lower, at 66 percent.³³ During the 2000s (relative to the 1990s), gentrifying tracts in Astoria, on net, had lower business retention rates and a higher likelihood of businesses leaving without getting replaced (see exhibit 11). The magnitudes of these shifts were small relative to what was observed in the other neighborhoods; for example, less than a 5-percentage-point decline off of a 73 percent share of stayers is not dramatic for a decade’s worth of change. Any decrease in the likelihood of displacement (with replacement) was small—less than 1 percentage point off of a 6 to 17 percent base. In addition, gentrifying tracts were no more likely to lose their older businesses (even though the businesses were older, on average, in the gentrifying tracts) than were nongentrifying tracts.

The growth in chains was also lower in gentrifying tracts than in the nearby nongentrifying tracts (in fact, the number went down during the 2000s). Otherwise, industry-specific gains were more prevalent in the nongentrifying tracts, although retail services grew slightly more in the gentrifying tracts (see exhibit 12a). Patterns for the discrete services tell a slightly different story: all these businesses grew relatively more in the gentrifying tracts, especially the necessity businesses, like grocery stores, drug stores, and doctors’ offices (see exhibit 12b).

Exhibit 11

Astoria, Retention and Displacement Rates

| | Difference: Gentrifying and Nongentrifying | | Difference: 2000s and 1990s |
|-------------------------------------|---|--------------|------------------------------------|
| | 1990s | 2000s | |
| Single-business properties | | | |
| Stay entire period | 0.025 | 0.030 | 0.005 |
| Leave without replacement | - 0.014 | - 0.022 | - 0.008 |
| Leave with replacement | - 0.023 | - 0.038 | - 0.015 |
| Multiple-business properties | | | |
| Stay entire period | 0.025 | - 0.013 | - 0.039 |
| Leave without replacement | - 0.046 | 0.007 | 0.054 |
| Leave with replacement | 0.032 | 0.035 | 0.003 |

Sources: National Establishment Time-Series Database; author’s calculations

Conclusions and Policy Implications

Local, small businesses are very much tied to their surrounding communities: physically, economically, and culturally (Deener, 2007; Hyra, 2008; Meltzer and Schuetz, 2012; Zukin et al., 2009). Therefore, when neighborhoods undergo meaningful economic and social changes, such as those that take place under gentrification, one would expect local businesses to feel the effects. Is gentrification, however, a threat or a boon to existing businesses? What are the implications for the residents who patronize these services?

³³ These shares amount to about 76 establishments in single-business buildings and 144 establishments in multiple-business properties.

Exhibit 12

Astoria, Change in Services

a. Broad Industries

| NAICS Grouping | Gentrifying | | | | Nongentrifying | | | |
|---------------------------|-------------|-----------|----------------|-----------|----------------|-----------|----------------|-----------|
| | Avg. Share | | Percent Change | | Avg. Share | | Percent Change | |
| | 1990-2011 | 1990-2011 | 1990-2000 | 2000-2011 | 1990-2011 | 1990-2011 | 1990-2000 | 2000-2011 |
| Retail | 0.27 | 60.0 | 24.2 | 28.8 | 0.32 | 40.8 | 10.2 | 27.8 |
| Service | 0.28 | 253.3 | 48.3 | 138.2 | 0.23 | 243.7 | 25.2 | 174.5 |
| Food, entertainment | 0.10 | 120.0 | 70.0 | 29.4 | 0.10 | 152.8 | 77.4 | 42.6 |
| Personal services | 0.14 | 114.7 | 64.7 | 30.4 | 0.14 | 161.6 | 78.1 | 46.9 |
| Education, health, social | 0.08 | 73.3 | 51.1 | 14.7 | 0.07 | 87.8 | 38.8 | 35.3 |
| Manufacturing, etc. | 0.13 | 151.7 | 60.0 | 57.3 | 0.13 | 121.2 | - 8.2 | 141.0 |

b. Discrete Services

| Discrete Service | Gentrifying | | | | Nongentrifying | | | | | | | |
|--------------------------|--------------------------|------|----------------|-----------|--------------------------|-----------|----------------|-----------|----|--------|--------|------|
| | Number of Establishments | | Percent Change | | Number of Establishments | | Percent Change | | | | | |
| | 1990 | 2000 | 2011 | 1990-2011 | 1990-2011 | 2000-2011 | 1990-2011 | 2000-2011 | | | | |
| Grocery stores | 29 | 47 | 74 | 155.2 | 62.1 | 57.4 | 30 | 46 | 70 | 133.3 | 53.3 | 52.2 |
| Drug stores | 9 | 10 | 16 | 77.8 | 11.1 | 60.0 | 10 | 8 | 12 | 20.0 | -20.0 | 50.0 |
| Full-service restaurants | 21 | 46 | 46 | 119.0 | 119.0 | 0.0 | 28 | 60 | 58 | 107.1 | 114.3 | -3.3 |
| Gyms | 0 | 1 | 8 | | | 700.0 | 1 | 0 | 13 | 1200.0 | -100.0 | |
| Doctors' offices | 34 | 50 | 59 | 73.5 | 47.1 | 18.0 | 37 | 54 | 63 | 70.3 | 45.9 | 16.7 |

NAICS = North American Industry Classification System.

Note: Percent Change refers to the percent change in the number of establishments between the indicated end points; for example, Percent Change 1990-2011 (for Retail) = $(\#_Retail_{2011} - \#_Retail_{1990}) / \#_Retail_{1990}$.

Sources: National Establishment Time-Series Database; author's calculations

The results are mixed and show that the nuances of gentrification cannot necessarily be observed in broader citywide trends. I find that the typical gentrifying neighborhood in New York City does not experience elevated rates of business displacement compared with a comparable nongentrifying neighborhood. This finding is in line with the evidence on residential displacement, which does not show systematic displacement of low-income residents in the context of gentrification (Ellen and O'Regan, 2011; Freeman, 2005; Freeman and Braconi, 2004; Freeman, Cassola, and Cai, forthcoming; McKinnish, Walsh, and White, 2010; Vigdor et al., 2002). It is also consistent with other research (Meltzer and Capperis, forthcoming) on neighborhood retail churn, a process that tends to be driven by new business entries (rather than business closures). When businesses vacate a space, however, it tends to sit vacant for longer in gentrifying than in nongentrifying neighborhoods. Therefore, implications apply not only for the displaced businesses but also for the communities left with empty storefronts. Businesses that replace the displaced establishments are more likely to introduce new types of services in gentrifying neighborhoods compared with both nongentrifying and higher-income neighborhoods. Although gentrifying neighborhoods have relatively more chains that replace displaced businesses, chains constitute a very small share of activity overall (less than 5 percent of all the replacement businesses).

The case studies illustrate how idiosyncratic the process can be. Together, the neighborhood drill-downs show that tracts undergoing gentrification in the 2000s had relatively larger, but varied, declines in retention rates than did nongentrifying tracts. In addition, the tracts' socioeconomic changes attracted new businesses and increases in both necessity and discretionary services. This shift was particularly true in East Harlem, which experienced larger population and income surges. On the other hand, gentrifying tracts in Sunset Park experienced increased displacement without replacement relative to nongentrifying tracts and smaller growth in necessity services from the businesses that moved in. So, here, the neighborhood experienced the disruption of business turnover but without the upside of more services.

Nonetheless, the results should be interpreted in the context of a large, dense city, which has experienced intense gentrification (especially during the 2000s); therefore, although the pressures from gentrification are particularly acute in New York City, the commercial markets are also relatively robust. The fact that displacement is not systematically higher in New York City's gentrifying neighborhoods bodes well for cities experiencing less aggressive gentrification; however, cities with less vibrant neighborhood retail markets could be more vulnerable to gentrification-induced displacement. Although the drill-down analyses attempt to shed light on some of this variation, the reality is that neighborhoods in less dense or walkable cities might have a harder time supporting local retail markets, even in the absence of gentrification.

In conclusion, opportunity appears to exist for the neighborhoods that gain quality-of-life services and that retain more businesses under conditions of gentrification—perhaps because of new and increased spending power locally. The threats are also palpable: the displacement that does occur can leave gentrifying neighborhoods with disproportionately more vacant spaces and without the promise of new amenities. Even in the neighborhoods where services grow and/or change, the new products, price points, or cultural orientation could be more alienating than useful for incumbent residents. Therefore, even in the absence of systematic business displacement, gentrification can present challenges around the management of changing neighborhood services.

Here, neighborhood-based organizations, like business improvement districts and Community Development Corporations, and real estate brokers can play a role in coordinating input from the community and conveying it to property owners. Moreover, new investment, which tends to happen in gentrifying neighborhoods, provides a critical opportunity for local government to negotiate the terms of development, including where commercial space is created and how it is used. This approach increasingly has been used with housing, where permitting or zoning allowances are contingent on affordable housing provision; a similar approach can be applied to the provision of commercial space and services.

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Linking Residents to Opportunity: Gentrification and Public Housing

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Abstract

This article documents that most public housing in New York City, which was originally built decades ago in low-income areas, is now surrounded by neighborhoods with relatively high average household incomes. Higher neighborhood income is associated with improved neighborhood indicators—developments surrounded by increasing- and high-income neighborhoods have lower violent crime rates and are zoned for public elementary schools with higher standardized test scores than developments surrounded by low-income neighborhoods. In addition, New York City Housing Authority residents in developments with increasing- and high-income surrounding neighborhoods are more often employed, earn \$1,675 and \$3,500 more annually, respectively, after controlling for observable characteristics, and have higher adult educational attainment. To be sure, the benefits are not unqualified; our qualitative research shows that, although public housing residents appreciate improvements in the surrounding neighborhoods (especially improved safety), they can also feel alienated when the neighborhoods around them change and face challenges as day-to-day living expenses increase, even if rents are held steady.

Introduction

In recent decades, partly in response to the perceived failures of the public housing program in many cities around the country, affordable housing programs in the United States increasingly have embraced the goal of deconcentrating poverty or at least have aimed to avoid deepening existing concentrations of poverty. These efforts have taken on renewed urgency with the emergence of new research demonstrating the long-run benefits that children glean from moving to low-poverty neighborhoods when young (Chetty, Hendren, and Katz, 2016). Federal housing programs have aimed both to improve high-poverty neighborhoods and to increase access to neighborhoods

with lower poverty rates and better indicators of opportunity. Beginning in the early 1990s, for example, the U.S. Department of Housing and Urban Development's (HUD's) HOPE VI Program and Choice Neighborhoods program have sought to reshape public housing by tearing down the most physically distressed traditional public housing projects, many of which were isolated, extremely high-poverty complexes, and replacing them with mixed-income developments (Schwartz, 2014). In selected metropolitan areas, HUD more recently has begun calculating the Fair Market Rents (FMRs) used to determine the amount of rental assistance provided through the Housing Choice Voucher (HCV) program for each ZIP Code instead of the much larger metropolitan area. The new FMRs "are designed to enable HCVP tenants to access more units in neighborhoods of opportunity...[and] discourage HCVP tenants from locating in neighborhoods of concentrated poverty" (Kahn and Newton, 2013: 326).

Few observers have considered how these efforts may be shaped by the current wave of gentrification, which is bringing higher-income, college-educated households into many high-poverty, central city neighborhoods. As a result, some of the subsidized housing developments that were created in racially concentrated areas of high poverty are now seeing increases in incomes, educational levels, and White population shares in their surroundings. This article examines the degree to which residents of public housing, the most permanent form of subsidized housing, are able to benefit from rising household incomes in the areas surrounding their developments.

This article explores this question in New York City. We show that, after the recent wave of neighborhood changes, two-thirds of New York City Housing Authority (NYCHA) public housing units were located in developments surrounded by census block groups with an average household income that was more than the citywide median income in 2010. Further, we find that higher surrounding neighborhood average household income is associated with improved indicators—developments surrounded by increasing- and high-income neighborhoods have lower violent crime rates and are zoned for public elementary schools with higher standardized test scores than developments surrounded by low-income neighborhoods. Examining NYCHA resident outcomes using novel administrative data sources, we find that, when compared with NYCHA residents in developments surrounded by low-income neighborhoods, NYCHA residents in developments with increasing- and high-income surrounding neighborhoods are more often employed, earn \$1,675 and \$3,500 more annually, respectively, after controlling for observable characteristics, and have higher adult educational attainment. In companion qualitative work, we find a more mixed story, however, with residents expressing not only appreciation for some of the changes around them but also concerns.

Our findings contribute to an ongoing literature exploring the relationship between the characteristics of neighborhoods in which low-income households live and their subsequent life outcomes. Unlike previous work, we study these effects in the context of gentrification, offering suggestive evidence that income gains in central city neighborhoods can bring benefits to low-income residents living in subsidized housing. The companion qualitative research suggests that the benefits of this change are not unqualified, however, and that efforts to help connect residents to growing opportunities may be critical.

To be sure, New York City may not be fully representative of the experience of other cities, but its large stock of public housing and the income gains that many of its low-income neighborhoods

have seen (NYU Furman Center, 2015) offer a large sample size and a window into what residents of many public housing developments around the country may experience in the future as their cities see an influx of young, college-educated workers in neighborhoods around public housing.

We proceed by briefly reviewing relevant literature in the Literature Review section and then by introducing our approach to classifying NYCHA developments based on surrounding neighborhood income and for comparing resident outcomes across surrounding neighborhood types in the next section, *The Neighborhoods Surrounding NYCHA Public Housing Developments*. We present our empirical findings and various robustness analyses in the section titled *Resident Outcomes Within the NYCHA Core* and summarize the companion qualitative analysis findings in the next section. We conclude with a discussion of the implications of our findings for both housing policy and future research.

Literature Review

Most of the research on the consequences of gentrification examines the question of residential displacement—whether low-income renters are displaced as a result of neighborhood changes. The research generally finds little evidence of direct displacement, suggesting that many low-income residents are managing to stay in neighborhoods as incomes and rents rise (Ding, Hwang, and Divringi, 2015; Ellen and O'Regan, 2011; Freeman and Braconi, 2004; Vigdor, Massey, and Rivlin, 2002). To be sure, qualitative research highlights some of the tensions that can occur as neighborhoods change (Freeman, 2006; Howell, 2016; Hyra, 2015), and it remains unclear whether gentrification can lead to economically integrated neighborhoods in the longer term. The research on gentrification, however, suggests that many low-income households are at least staying for a while as their neighborhoods change, raising the question of whether they can benefit from the rising fortunes around them.

Much of the best research on neighborhood effects examines data from the Moving to Opportunity (MTO) demonstration program. MTO was a large experiment that provided housing vouchers to a randomly selected group of individual families living in distressed public housing. One-half of the families receiving vouchers were randomly assigned to the treatment group, which could use their vouchers only in low-poverty neighborhoods. The evaluation of the demonstration tracked an array of outcomes for both household heads and children. The early work on the effects of this experimental demonstration program found large effects on adult physical and mental health; little effects on labor market outcomes; and mixed effects on children, depending on their gender (Ludwig et al., 2013). Chetty, Hendren, and Katz (2016) more recently examined longer-term outcomes for MTO participants, using administrative data sets and show that, for younger children, exposure to lower-poverty neighborhoods increases earnings in adulthood, increases college attendance, and decreases the likelihood of teenage births.

Research growing out of the MTO demonstration has become the benchmark for research about neighborhood effects on low-income families. Yet, as others have noted, the MTO treatment necessarily involved both a change in neighborhood and a potentially disruptive move, such that “the disruption of labor market referral networks could be an important explanation for why MTO participants did not experience labor market gains” (Ross, 2012: 10).

Our research complements this earlier research, but our interest lies instead in whether families who remain in public housing can benefit from reductions in poverty and increases in incomes in the neighborhoods surrounding their developments. In other words, rather than examining the effects of moving families to lower-poverty neighborhoods, we ask what happens as *neighborhoods* evolve, with residents remaining in place. In this sense, our article is related to the literature on gentrification that traces how neighborhoods change and evolve over time. Our article also connects to the literature on neighborhood effects because we study how otherwise similar public housing residents fare in neighborhoods that have experienced different economic trajectories.

This article builds most directly on Oreopoulos (2003), which examined outcomes of adults whose childhood families were assigned to public housing projects in Canada through a quasi-random waiting list process. The resulting variation in surrounding neighborhood characteristics and project characteristics to which residents are exposed enabled Oreopoulos to examine how neighborhood context affects a variety of long-term outcomes. He found that 10 to 20 years later, adult earnings, employment, and welfare participation outcomes do not differ based on surrounding neighborhood characteristics of the public housing projects to which families were assigned.

This article differs from the Oreopoulos (2003) paper in a number of important ways. First, we explore a context with much more dynamic neighborhood environments. Many of the neighborhoods surrounding public housing in New York City underwent substantial changes in average household incomes between 1990 and 2010. By contrast, in Oreopoulos's setting in Canada, "neighborhood variation by socioeconomic characteristics by census tract and enumeration area changes very little across the 1981, 1986, 1991, and 1996 censuses income levels" (Oreopoulos, 2003: 1544). Second, we observe much more variation in the conditions of neighborhoods surrounding public housing. In Oreopoulos's sample, "the largest contrast in neighborhood quality obtainable within the public housing program is between youths who grew up in the poorest areas in the city and those who grew up in moderately low- to middle-income neighborhoods" (Oreopoulos, 2003: 1546). By contrast, some public housing developments in our sample are surrounded by neighborhoods that transitioned to the higher end of the neighborhood income distribution decades ago (for example, Chelsea, one of the representative neighborhoods in a companion qualitative study [Jefferson, 2015]). Third, the architecture and size of the public housing we study are similar across all types of neighborhoods. In Oreopoulos's sample, by contrast, the public housing developments in moderately low- to middle-income neighborhoods are much smaller in size than the typically large developments found in low-income neighborhoods. Finally, our quantitative work is accompanied by companion qualitative research in New York City that adds nuance to our understanding of how changes in the conditions and population of surrounding neighborhoods affect public housing residents.

The Neighborhoods Surrounding NYCHA Public Housing Developments

New York City has far more public housing than any city in the country. NYCHA currently owns approximately 180,000 units of public housing, which amounts to about 15 percent of all public

housing units in the country. New York City has more public housing, in part, because more traditional public housing units were originally built in the city but also because virtually no units have been demolished.¹ Today, these units are located in a diversity of neighborhoods.

To assess the conditions and changes in neighborhoods surrounding public housing developments, we use census block groups to construct two key geographies: *NYCHA core areas* and the *surrounding neighborhood*. We define a NYCHA core area to be any block group in New York City in which at least 70 percent of the housing units are in a NYCHA public housing development.² Each NYCHA core area is paired with its surrounding neighborhood, defined as all census block groups that border the NYCHA core area.³ Exhibit 1 depicts two NYCHA core areas, which happen to be adjacent. As such, each is included in the other's surrounding neighborhood. NYCHA core areas contain, on average, 1,162 households, with 80 percent containing between 485 and 1,950 households. The paired surrounding neighborhoods are composed of an average of seven block groups, housing an average of 3,513 households.

Exhibit 1

Illustration of NYCHA Core Area and Surrounding Neighborhood Geography Definition



NYCHA = New York City Housing Authority.

Notes: Dark solid shapes depict the footprint of NYCHA buildings. Darker blue shaded areas are NYCHA core areas that are the study's analysis units. The surrounding lighter blue shaded areas are the surrounding neighborhoods for each core area (each composed of multiple block groups). The geography depicted is of the Ravenswood Houses, a public housing development in Astoria, Queens.

Source: Furman Center analysis

¹ See Bloom (2008) for a thorough history of public housing in New York City.

² In many instances, block group geographical boundaries differ in 1990, 2000, and 2010. As necessary, we combine multiple adjacent block groups in one decade to align with the boundaries of a block group in a different decade. As a result, our NYCHA core areas are geographically consistent over time and contain, on average, slightly less than two 2010 block groups.

³ Note that the surrounding neighborhood can include other public housing units.

We characterize NYCHA core areas on the basis of income levels and trends in the surrounding neighborhood during recent decades. We classify surrounding neighborhoods into three categories based on neighborhood average household income.⁴

1. *High-income* neighborhoods are those with an average household income that is more than the New York City median in each of 1990, 2000, and 2010.⁵
2. *Increasing-income* neighborhoods are those that have an average household income that is more than the city median in 2010 but that is less than the New York City median in either 1990 or 2000.⁶
3. *Low-income* neighborhoods are those with an average household income that is less than the city median in each of 1990, 2000, and 2010.⁷

Average household incomes for 1990 and 2000 are combined at the census block from the respective decennial censuses. We use the 2008–2012 American Community Survey to generate income estimates for 2010. The New York City median income (in 2012 dollars) is \$51,898, \$52,427, and \$50,256 in 1990, 2000, and 2010, respectively.

Exhibit 2 reports our sample size of NYCHA core areas and the number of NYCHA residents and households living in developments in each classified type. In total, we analyze 137 NYCHA core areas, with more than 125,000 households living in public housing. Of those NYCHA core areas, 49 are classified as being surrounded by low-income neighborhoods. The median of our average household income measure for these low-income surrounding neighborhoods was just under \$39,500 in 2010. It is perhaps surprising that 88 NYCHA core areas, or nearly two-thirds, were surrounded by block groups that had average household incomes that were more than the city median in 2010. Of the NYCHA core areas, 34 were classified as being surrounded by increasing-income neighborhoods. The median average household income in these increasing-income surrounding neighborhoods was slightly more than \$58,000 in 2010. Of those same NYCHA core areas, 54 were classified as being surrounded by high-income neighborhoods. The median average household income in these high-income surrounding neighborhoods was just under \$75,500 in 2010. Some public housing developments were surrounded by neighborhoods with far higher

⁴ We use average household incomes for the classifications because the surrounding neighborhood average can be calculated by combining data from the multiple census block groups that constitute a surrounding neighborhood. The New York City-wide median income is used for comparison as an intuitive reference amount that results in comparably sized groups of surrounding neighborhood types.

⁵ Of the 54 surrounding neighborhoods that we classify as high income, 3 actually had average household incomes in 2010 that were slightly less than our threshold, while meeting the criteria that 1990 and 2000 average household incomes were more than the threshold. Our results are qualitatively the same when dropping the three NYCHA core areas with these surrounding neighborhoods.

⁶ The 34 surrounding neighborhoods in the increasing-income classification all had average household incomes that were more than the median income in 2010 but had average household incomes that were less than the median income in at least one earlier year.

⁷ In 7 of the 49 surrounding neighborhoods that we classify as low income, the average surrounding neighborhood income is slightly more than our threshold in either 1990 or 2000 but is much less than our threshold in 2010. Our results are qualitatively the same when dropping the NYCHA core areas with these surrounding neighborhoods. The remaining 42 surrounding neighborhoods had average household incomes that were less than our threshold in all three decades.

incomes. Consider that the block groups adjacent to the Chelsea-Elliot development had a mean income of more than \$129,000 from 2008 to 2012. Exhibit 3 maps the location of surrounding neighborhood types across New York City. Although the Bronx has a concentration of developments with low-income surrounding neighborhoods, all three classification types are spread across the city.

Exhibit 2

NYCHA Core Areas Sample and Surrounding Neighborhood Income by Classification

| | Classification Based on Surrounding Neighborhood Income | | | |
|---|---|------------|---------|---------|
| | Low | Increasing | High | Total |
| Count | | | | |
| NYCHA core areas | 49 | 34 | 54 | 137 |
| NYCHA residents (2013) | 97,010 | 76,724 | 118,254 | 291,988 |
| NYCHA households (2013) | 40,879 | 32,999 | 52,027 | 125,905 |
| Income in surrounding neighborhoods in 2010 (\$) | | | | |
| 25th percentile | 34,370 | 52,114 | 62,068 | |
| Median | 39,452 | 58,153 | 75,465 | |
| 75th percentile | 43,830 | 66,778 | 92,272 | |

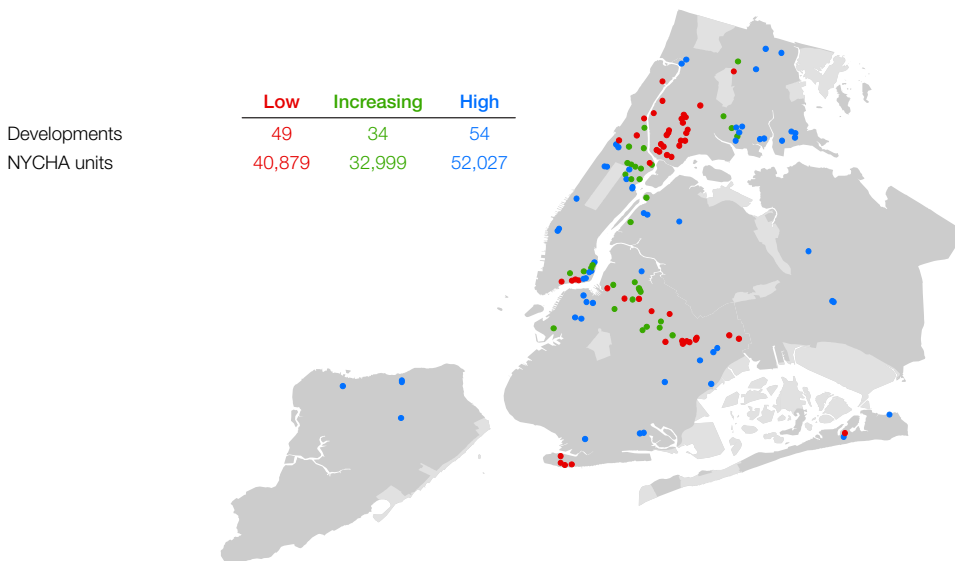
NYCHA = New York City Housing Authority.

Note: Income percentiles are of the respective surrounding neighborhood average income over all block groups adjacent to the NYCHA core areas of each type, weighted by the number of housing units in each adjacent block group.

Sources: Furman Center analysis; NYCHA administrative records; calculations from 2008–2012 American Community Survey 5-year data

Exhibit 3

Map of Neighborhood Classifications in New York City



NYCHA = New York City Housing Authority.

Note: "Low," "Increasing," and "High" refer to the low-income, increasing-income, and high-income neighborhood classifications used in this article.

Source: Furman Center analysis

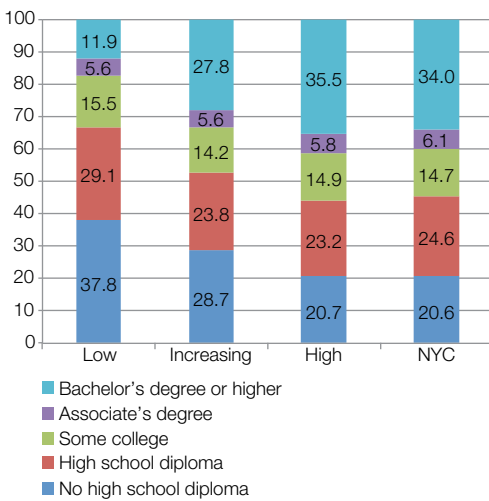
Variation in Surrounding Neighborhoods

To gain a richer understanding of the variation in the neighborhoods surrounding public housing, we compare several additional indicators. Panel A of exhibit 4 compares the educational attainment of adults living in the neighborhoods surrounding the NYCHA core areas during the period from 2008 through 2012 by income classification and shows that educational attainment was greatest for adults living in surrounding neighborhoods classified as high income: 36 percent of adults living in high-income surrounding block groups had a bachelor's degree during the period from 2008

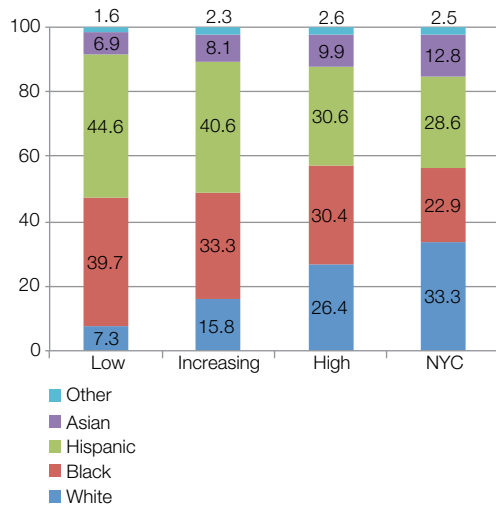
Exhibit 4

Characteristics of the Residents and Housing Stock of Neighborhoods Surrounding NYCHA Developments From 2008 Through 2012

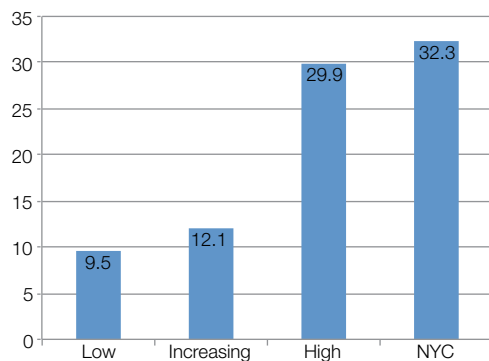
Panel A: Adult Educational Attainment



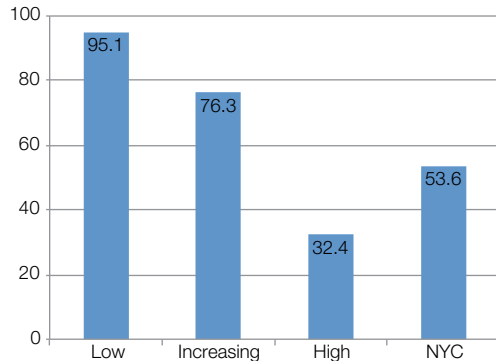
Panel B: Racial and Ethnic Composition



Panel C: Homeownership Rate



Panel D: Serious Housing Code Violations per 1,000 Rental Units



NYC = New York City. NYCHA = New York City Housing Authority.

Note: "Low," "Increasing," and "High" refer to the low-income, increasing-income, and high-income neighborhood classifications used in this article.

Sources: Panels A, B, C, and D—2008–2012 American Community Survey 5-year data; Panel D—New York City Department of Housing Preservation and Development, Furman Center

through 2012 compared with 28 percent of adults living in increasing-income neighborhoods and just 12 percent of adults living in low-income neighborhoods surrounding NYCHA developments. Panel B shows the racial and ethnic composition of the residents of neighborhoods surrounding NYCHA developments, by income classification. The surrounding neighborhoods classified as low income had a greater Black and Hispanic share (40 and 45 percent, respectively) than those counted as high income (30 and 31 percent). As shown in panel C, about 30 percent of the housing units in high-income neighborhoods were owner occupied, compared with slightly less than 10 percent in low-income neighborhoods. Finally, panel D shows that surrounding neighborhoods classified as low income had a serious housing code violation rate nearly three times as high as the rate in high-income neighborhoods: 95 serious housing code violations per 1,000 rental units compared with 32 per 1,000 rental units.

We also note that the poverty rate in surrounding neighborhoods varies with surrounding neighborhood classification. Those surrounding neighborhoods classified as low income had an average poverty rate of 40 percent, but those classified as high income had an average poverty rate of 21 percent. As a frame of reference, Chetty, Hendren, and Katz (2016) reported that children whose families used the experimental voucher in the MTO experiment lived in census tracts with poverty rates 22 percentage points lower than the census tracts lived in by those in the control group on average.

Overall, the surrounding neighborhoods classified as high income have characteristics very similar to citywide averages. They are clearly advantaged communities and have significantly more educated and higher-income residents and a far better maintained housing stock than the other neighborhoods surrounding public housing, but they are typically not among the highest income and most privileged neighborhoods in the city.

Variation in Neighborhood Context, Services, and Amenities

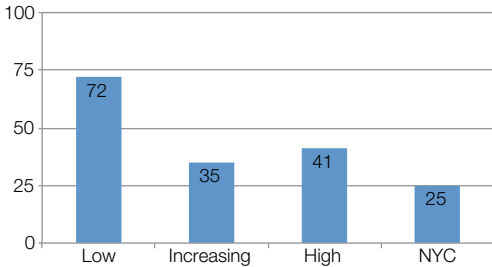
Higher-income neighborhoods tend to offer a richer set of amenities and opportunities. This tendency is generally true for the neighborhoods surrounding public housing in New York City. In exhibit 5, we present four indicators of neighborhood context, services, and amenities available to NYCHA residents. Panel A shows the share of NYCHA units whose residents are zoned to attend a public school in the bottom quartile of math proficiency, as classified by the income level of the surrounding neighborhood. Of households in NYCHA developments surrounded by low-income neighborhoods, 72 percent were zoned to attend public schools in the bottom quartile of proficiency in 2012. By contrast, only a minority of households in increasing- and high-income neighborhoods were zoned for schools with such low proficiency rates. This stark contrast suggests that children growing up in public housing surrounded by higher-income neighborhoods reach a much more enriching set of schools.

Public housing developments in higher-income neighborhoods also offer significantly safer environments. To capture the level of violence to which NYCHA residents are exposed daily, we measured the violent crime rate in NYCHA core areas and their surrounding neighborhoods together. Panel B shows the number of violent crimes reported in 2010 per 1,000 residents. Although residents living in developments surrounded by all three types of neighborhoods faced a higher violent crime rate than the average New York City resident, the violent crime rate for developments surrounded by low-income neighborhoods (8.3 violent crimes per 1,000 residents) was substantially higher

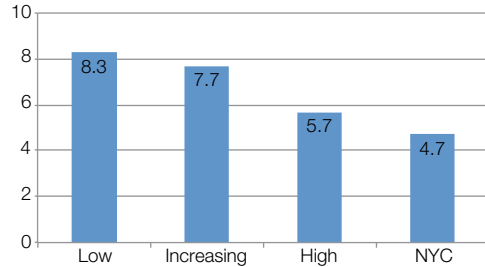
Exhibit 5

Neighborhood Context, Services, and Amenities Available to NYCHA Residents

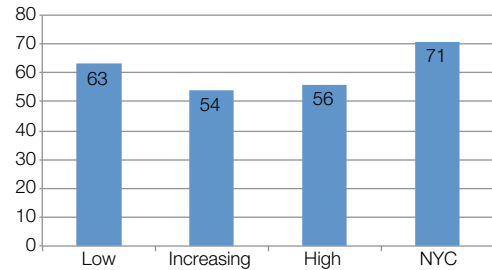
Panel A: Share of NYCHA Units Zoned for Attendance at a Public School With Low Math Proficiency Rates, 2012



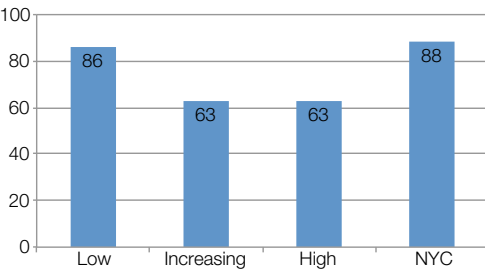
Panel B: Violent Crime Rate per 1,000 Residents, NYCHA Campus and Surrounding Neighborhood, 2010



Panel C: Share of NYCHA Units Within One-Half Mile of a Subway Entrance, 2011



Panel D: Share of NYCHA Units Within One-Fourth Mile of a Park, 2011



NYC = New York City. NYCHA = New York City Housing Authority.

Notes: “Low,” “Increasing,” and “High” refer to the low-income, increasing-income, and high-income neighborhood classifications used in this article. Panel A—Low proficiency defined as being in the bottom quartile of all NYC schools. Panels C and D—NYC includes all residential units.

Sources: Panel A—NYC Department of Education, NYCHA, Furman Center; Panel B—NYC Police Department, 2008–2012 American Community Survey 5-year data, Furman Center; Panel C—NYC Department of Transportation, NYCHA, NYC Department of Planning, Furman Center; Panel D—NYC Department of Parks and Recreation, NYC Housing Authority, Furman Center

than the rate for developments surrounded by high-income neighborhoods (5.7 violent crimes per 1,000 residents). Other research shows that such variations in exposure to violent crime can powerfully affect children’s test scores and cognitive functioning (Sharkey, 2010; Sharkey et al., 2014).

It is perhaps surprising that panels C and D suggest that public housing residents living in developments surrounded by lower-income neighborhoods have somewhat greater access to parks and transit. Panel C shows that 63 percent of units in NYCHA developments surrounded by low-income neighborhoods are within one-half mile of a subway station entrance (about a 10-minute walk) compared with 56 percent of units surrounded by high-income neighborhoods. This finding echoes a pattern across the city as a whole, where many lower-income neighborhoods in the city have better access to subway stations than do higher-income neighborhoods (NYU Furman Center, 2012).

Panel D similarly shows that more units in NYCHA developments surrounded by low-income neighborhoods are within one-fourth of a mile of a park (about a 5-minute walk) than those in high-income neighborhoods. This finding is again consistent with the overall pattern of park access throughout the city: one-half of neighborhoods in the top quartile of park access are in the bottom quartile

of the income distribution (NYU Furman Center, 2012). Of course, these statistics reveal nothing about the relative quality of the parks accessible to residents in different types of neighborhoods.

In sum, public housing residents living in developments surrounded by higher-income neighborhoods are likely to live somewhat farther away from parks and transit, but a high percentage of all residents live close to both. More important to note is that public housing residents in higher-income neighborhoods enjoy higher-performing local schools and safer streets, arguably the two most critical measures of a neighborhood's environment.

Resident Outcomes Within the NYCHA Core Areas

Our key interest lies in whether public housing residents fare better when living in a development surrounded by a higher-income community. In this section, we explore this question, examining how resident economic outcomes vary across our surrounding neighborhood classifications.

NYCHA Resident Economic Outcomes

We analyze labor market outcomes of public housing residents using a unique administrative data set that contains information from NYCHA's annual income verifications. This data set includes individual-level income, earnings, and disability status reported annually for each year from 2008 through 2013, along with some additional information, including length of tenure and basic demographic characteristics for all household members included on the lease. In analyzing labor market outcomes, we limit our sample to households with a nondisabled head of household between 25 and 61 years old and to nondisabled individuals between 25 and 61 years old.⁸ This sample includes slightly fewer than 68,000 households and approximately 100,000 individuals each year for the 6 years in our sample. We adjust all incomes to 2013 dollars.

Exhibit 6 reports results of our analysis of income by source and shows substantial differences in employment outcomes among NYCHA residents based on surrounding neighborhood type. Median household income in developments surrounded by high-income neighborhoods was \$2,100 higher (nearly 11 percent) during our 6-year sample period than in developments surrounded by low-income neighborhoods and was \$950 higher (nearly 5 percent) than in developments surrounded by increasing-income neighborhoods.⁹ To be sure, public housing residents have low incomes and employment rates relative to New York City as a whole, but these differences are substantial.¹⁰

⁸ Not all residents in the NYCHA core are included in NYCHA administrative data. Because we observed only individual-level income data as reported to NYCHA, our findings should be interpreted as relevant to individuals registered as residents with NYCHA.

Disability status is self-reported in the NYCHA data. This limit is imposed so that assessed employment status and earnings are not confounded with residents' retirement decisions or capability or eligibility for employment.

⁹ Total income reported to NYCHA during annual income reviews is comprehensive and includes income from employment, self-employment, owned businesses, unemployment, public assistance, Social Security benefits, Supplemental Security Income benefits, veterans assistance, pensions, child support, or other sources.

¹⁰ As reported in the Furman Center's *State of New York City's Housing & Neighborhoods—2013 Report* (NYU Furman Center, 2014), median household earnings in New York City in 2012 was \$51,750. As additional context, \$2,100 approximates the difference between the 52nd and 48th percentiles of the resident income distribution. For comparison, Chetty, Hendren, and Katz (2016) found intent-to-treat gains of \$1,624 on a control group mean of \$11,270 for adults in their mid-20s who were children younger than 13 years of age in MTO treatment families.

Exhibit 6

NYCHA Resident Economic Outcomes by Surrounding Neighborhood Income Classification

| NYCHA Resident Outcome | Classification Based on Surrounding Neighborhood Income | | |
|--|---|------------|----------|
| | Low | Increasing | High |
| Median household annual income | \$19,500 | \$20,698 | \$21,648 |
| <i>Household/year observations</i> | 129,620 | 105,736 | 169,079 |
| Median household annual earnings (when > \$0) | \$25,199 | \$28,167 | \$29,702 |
| <i>Household/year observations</i> | 84,456 | 68,785 | 111,233 |
| Residents with any earned income | 54.6% | 55.2% | 56.5% |
| Residents receiving SSI (disability) | 6.9% | 6.8% | 6.2% |
| Residents receiving SSI among residents reporting a disability | 73.6% | 70.9% | 67.6% |
| Median net rent | \$434 | \$452 | \$464 |

NYCHA = New York City Housing Authority. SSI = Supplemental Security Income.

Notes: Calculated over annual household or individual observations from 2008 through 2013, with all years adjusted to 2013 dollars. Median annual income calculated for households with a nondisabled, working-age (25 to 61) member.

Source: NYCHA administrative records

When limiting the comparison to earnings (employment, self-employment, and business earnings), the disparity increases, with a \$4,500 difference (18 percent) in median earnings among households in developments surrounded by high- and low-income neighborhoods. In addition to enjoying higher earnings, nondisabled, working-age adults in developments surrounded by increasing- and high-income neighborhoods were more likely to be working and earning income. These findings on differences in earnings and income are consistent whether the analysis is done at the household or individual level. The gaps are also apparent at the medians by neighborhood type. Exhibit A-1 in appendix A reports distribution percentiles by each neighborhood type that show that this finding is robust, particularly above the 25th percentile.

The differences in income and earnings are robust to the inclusion of a variety of controls for observable resident and household characteristics. Exhibit 7 presents regression results for our primary indicator of household economic outcomes—the level of household earned income. The sample for this regression is nondisabled adults ages 25 to 61 with some positive earnings in a year.¹¹ The first “no controls” specification simply regresses average earnings on dummies for surrounding neighborhood type (low-income surrounding neighborhood type is the omitted category). Average earnings in the low-income surrounding neighborhood reference category are slightly more than \$30,300. Households in developments surrounded by increasing-income and high-income neighborhoods earn \$2,200 and \$3,700 more, respectively, than their counterparts in low-income neighborhoods.

¹¹ Unpublished results, available from the authors on request, find similar patterns for total household income from all sources, individual income, and individual earnings. We note that whether a household has some positive earnings varies across neighborhood types as reported in exhibit 6. Differences in the presence of any positive earnings, however, do not appear to be driving the observed differences in earned income. The distribution of earnings in exhibit A-1 (appendix A) shows that the increase in average earnings occurs at the 25th percentile of earnings and above, rather than being driven by some smaller subset of the population. In addition, the section titled “Are These Results Causal?” reports that we see only small differences in observable characteristics across our sample, suggesting that selection into neighborhood type based on unobservable earning power of differing individuals is also not likely to be driving the observed earnings differences.

Exhibit 7

Regression Results: NYCHA Resident Household Earnings

| Outcome: Household Earned Income (when > \$0) | Model | | | |
|---|-------------|----------------|---------------|----------------|
| | No Controls | | Full Controls | |
| | Coefficient | Standard Error | Coefficient | Standard Error |
| Surrounding neighborhood type | | | | |
| Low income | — | — | — | — |
| Increasing income | 2,194** | 115 | 1,678** | 112 |
| High income | 3,709** | 105 | 3,479** | 99 |
| Demographics | | | | |
| Age | | | 1,755** | 38 |
| Age squared | | | -20** | 0.45 |
| Household years in NYCHA | | | 385** | 12 |
| Household years in NYCHA squared | | | -3.2** | 0.25 |
| Household size > four | | | -2,177** | 155 |
| Single (grand)parent | | | -2,113** | 185 |
| Children at home | | | -658** | 193 |
| Number of adults | | | 11,235** | 128 |
| Hispanic | | | — | |
| Black | | | 3,754** | 90 |
| White | | | -3,299** | 284 |
| Asian/other | | | -6,398** | 171 |
| Bronx/Queens/Staten Island | | | -929** | 90 |
| Year indicators | | | | Included |
| Constant | 30,304** | 76 | -23,792** | 816 |
| N | | 264,474 | | 264,474 |
| R ² | | 0.005 | | 0.13 |

NYCHA = New York City Housing Authority.

** p < 0.01. * p < 0.05.

Notes: Analysis was restricted to households with a head of household ages 25 to 61 with no reported disability and some positive earned income. Low income and Hispanic are reference categories.

Source: NYCHA administrative records

The second specification includes a full set of household-level controls. The coefficients on the household characteristics mostly conform to expectations. The head of household’s age and an age quadratic have coefficients of \$1,755 and -\$20, which are consistent with standard earnings regressions. The coefficients on the variables describing household composition (large household with more than four members; single parent or grandparent, minor children in home, and the number of working-age adults) have large and statistically significant coefficients. The coefficients on the self-reported race and ethnicity indicator variables are large and statistically significant as well. A Black head of household is associated with higher income than the reference category of Hispanic, but a White or Asian/other head of household is associated with significantly lower earned income than the reference category of Hispanic.

Most relevant for our purposes, the coefficients on our key surrounding neighborhood variables are robust to these additional controls. Households in developments surrounded by

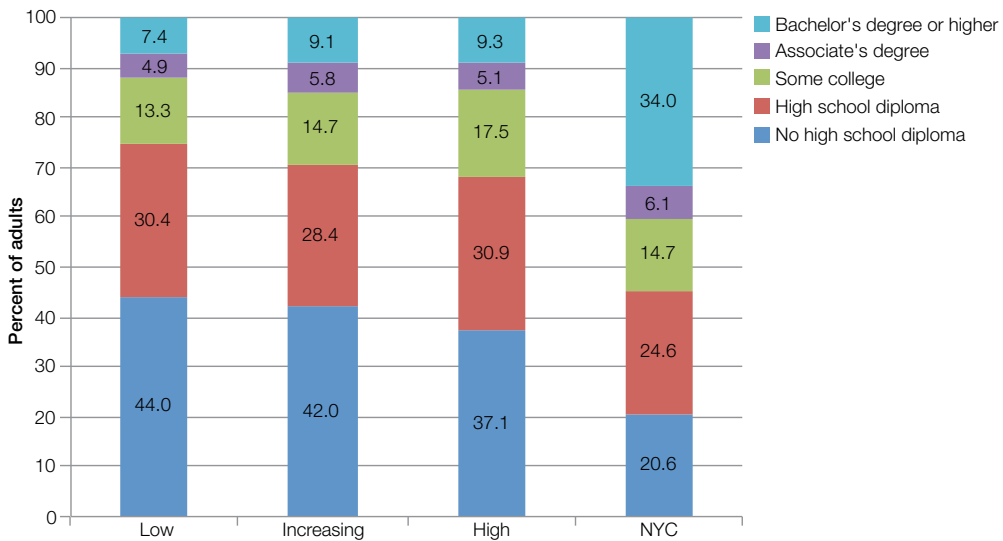
increasing-income and high-income neighborhoods have earned incomes that are \$1,678 and \$3,479 higher, respectively, than their counterparts in developments surrounded by low-income neighborhoods, after controlling for a variety of observable household characteristics.

Educational Outcomes in the NYCHA Core Areas

Although the NYCHA administrative data set does not include educational attainment, we are able to use census data to observe educational outcomes for the NYCHA resident population for cases in which the NYCHA core areas are composed entirely of public housing units.¹² Of the NYCHA units in our analysis in developments surrounded by low-, increasing-, and high-income neighborhoods, 62, 82, and 68 percent, respectively, are in NYCHA core areas that include only NYCHA developments. Exhibit 8 presents the distribution of educational attainment for adult residents living in census block groups composed entirely of NYCHA residents, averaged for each surrounding neighborhood type, and shows that adult educational attainment is greater for NYCHA residents surrounded by increasing- and high-income neighbors. Whereas 30 and 32 percent of residents in increasing- and high-income surrounding neighborhood types, respectively, have completed some education beyond high school, only 26 percent of adults have completed any education beyond high school in developments surrounded by low-income neighborhoods.

Exhibit 8

Adult Educational Attainment in NYCHA Core Areas That Are 100 Percent NYCHA Units



NYC = New York City. NYCHA = New York City Housing Authority.

Note: NYCHA core areas made up entirely of NYCHA units represent 62, 82, and 68 percent of the NYCHA units in our analysis surrounded by low-, increasing-, and high-income neighborhoods, respectively.

Source: 2008–2012 American Community Survey 5-year data, adults ages 25 years and older

¹² We include all census block groups with at least 70 percent NYCHA share of units in our analysis. This figure is limited to census block groups with 100 percent NYCHA share. Results are similar but with more pronounced differences (greater share with higher education in developments surrounded by increasing- and high-income neighborhoods) when the analysis includes NYCHA core geographies that include up to 30 percent non-NYCHA housing units.

These differences in educational attainment are likely the result of a variety of factors, including differences across surrounding neighborhood types in the quality of local public schools and in the range of youth services available, which may mean fewer young adults are prepared for college in developments surrounded by low-income neighborhoods. Exhibit 5 shows that units in developments surrounded by low-income neighborhoods are more often zoned to public schools with lower standardized test scores than units in developments surrounded by increasing- and high-income neighborhoods. Dastrup et al. (2015) also reported that individual students in developments surrounded by increasing- and high-income neighborhoods scored, on average, 2 to 4 percent of a standard deviation higher in reading and 1 to 3 percent of a standard deviation higher in math, after controlling for observable student characteristics. Although these differences are relatively small in magnitude, they suggest a link between surrounding neighborhood characteristics and student performance.

It is also possible that neighborhoods differ in access to post-secondary educational opportunities. Another possible mechanism, of course, is increased sorting—with residents more apt to pursue education finding their way into developments surrounded by higher-income neighbors. We address this possibility next.

Are These Results Causal?

A key question is whether the environments cause these differences in income or whether selection causes the differences. The key assumption needed for our regression estimates to be interpreted as causal is that residents in developments surrounded by different neighborhood types do not differ on unobservable characteristics related to their economic outcomes. Threats to this assumption arise if more motivated public housing residents with higher earnings potential seek out and sort into developments surrounded by higher-income neighborhoods, or if more economically successful public housing residents are more likely to stay in public housing when it is located in higher-income areas. We cannot claim that households are randomly assigned to different neighborhoods, but we do not see evidence of extensive sorting or selection.

The NYCHA application and transfer processes allow some room for sorting. Applicants accepted based on “working family” criteria have somewhat more choice in selecting a development—they select a development from a list of developments projected to have available units—than do applicants accepted based on emergency need who simply choose a borough and are then offered the next available unit in that borough. That said, the turnover rate in NYCHA buildings is extremely low (less than 5 percent of households exit the NYCHA data from one year to the next, indicating a turnover rate of more than 20 years), so the households that are accepted into public housing based on the working family criteria have limited room for choice.

As for transfers, the official process for a household to transfer from one development to another requires a documented need for a transfer but often allows for a specific development to be requested. Individuals may also transfer developments informally by leaving one household and joining another.¹³ The ability of residents to gain access to specific developments through transfers is again limited by the low turnover rate, and transfers are relatively rare (less than 2 percent of

¹³ Details on the application and transfer process are described at <https://www1.nyc.gov/assets/nycha/downloads/pdf/TSAPlan.pdf>.

individuals per year move from one development to another). Further, we see little to no difference in household length of residency in NYCHA across development types (see exhibit 9 discussion in the next paragraph). Still, transfers could contribute to sorting of households with more earnings potential into higher-income neighborhoods.

Although we cannot definitively test for such sorting, we can examine the degree to which the observable characteristics of households living in public housing developments vary across surrounding neighborhood types. Exhibit 9 reports on a series of simple regressions that characterize the population means of observed head-of-household characteristics for the sample of households used

Exhibit 9

Comparison of NYCHA Household Characteristics by Surrounding Neighborhood Type

| NYCHA Head-of-Household Characteristic (left-hand-side variable in regression) | Surrounding Neighborhood Classification | | |
|---|--|---|---|
| | Low Income Intercept (Standard error) | Increasing Income Coefficient (Standard error) | High Income Coefficient (Standard error) |
| Age | 43.44 (0.07) | 0.14 (0.10) | 0.34** (0.09) |
| Years in NYCHA | 13.60 (0.09) | 0.33* (0.13) | 0.30* (0.12) |
| Household size > four | 0.16 (0.003) | - 0.030** (0.004) | - 0.043** (0.003) ++ |
| Single (grand)parent | 0.47 (0.004) | - 0.023** (0.005) | - 0.024** (0.005) |
| Minor children at home | 0.64 (0.003) | - 0.036** (0.005) | - 0.054** (0.005) ++ |
| Working-age adults | 1.36 (0.004) | 0.002 (0.006) | - 0.006 (0.006) |
| Race | | | |
| Hispanic | 0.48 (0.003) | - 0.035** (0.005) | - 0.088** (0.005) ++ |
| Black | 0.42 (0.004) | 0.018** (0.005) | 0.057** (0.005) ++ |
| White | 0.030 (0.001) | - 0.002 (0.002) | 0.005** (0.002) ++ |
| Asian/other | 0.066 (0.002) | 0.019** (0.003) | 0.026** (0.003) + |
| Number of households (all models) = 59,030 | 18,979 | 15,310 | 24,741 |

NYCHA = New York City Housing Authority.

Notes: Each row of the table reports coefficients from a regression of the form $Char = \beta_L + \beta_I \text{Increasing} + \beta_H \text{High} + \epsilon$. The estimated β_L coefficient is then the mean of the characteristics for NYCHA household heads living in core areas with surrounding areas classified as low-income areas. The β_I and β_H coefficients then measure the difference in mean characteristics for household heads in developments with surrounding areas classified as increasing- and high-income areas. Analysis was restricted to households with a head of household ages 25 to 61 with no reported disability and some positive earned income. Statistical significance for β_I and β_H is denoted with ** $p < 0.01$, * $p < 0.05$ and indicates a difference in the means of each of the increasing- and high-income groups relative to the low-income group. Note that reported p-values are not adjusted for multiple comparisons. Results of an F-test of $\beta_I = \beta_H$ are reported in the high-income column, with ++ $p < 0.01$, + $p < 0.05$.

Source: NYCHA administrative records

in our earnings regressions previously. Each row represents a separate regression. For example, the first row reports on the intercept and coefficients on increasing- and high-income neighborhood indicator variables in a regression of household age on neighborhood type. It suggests that the average head of household for a household with a nondisabled, working-age adult is 43 years old in public housing developments surrounded by low-income neighborhoods (omitted category). The average age is 0.3 years older in developments surrounded by high-income neighborhoods.

Across the full set of characteristics, we see some statistically significant difference between household heads in developments surrounded by different types of neighborhoods, but, in general, they are small, and the statistical significance is not surprising in light of our large sample size. Households in increasing- and high-income neighborhoods are 3 and 4 percentage points less likely to have more than four people in the household, 2 percentage points less likely to be headed by a single parent, and 4 to 5 percentage points more likely to have minor children at home, and household heads in developments with low-income surrounding neighborhoods are more often Hispanic and less often Black and slightly less often White and Asian/other. It is important to note that the earnings differences we note previously persist after we control for these observable characteristics. Still, the difference in observable characteristics that we observe, although mostly small in magnitude, suggest there may also be unobservable characteristics of the residents living in developments in different types of neighborhoods. Future work is needed to determine the degree to which these differences we find in economic outcomes are due to sorting or are, in fact, caused by the variation in opportunities provided by surrounding neighborhoods.

Companion Qualitative Analysis Findings

To accompany our quantitative analysis, we also conducted qualitative research in three public housing developments in New York City. It is worth briefly summarizing the findings here. (For a more in-depth discussion, see Dastrup et al. [2015]). We selected one neighborhood with low incomes, Morris Heights in the Bronx (Sedgwick Houses), one with rapidly increasing incomes, Long Island City in Queens (Queensbridge North and South Houses), and one with high incomes, Chelsea in Manhattan (Elliott-Chelsea and Fulton Houses). Our team conducted stakeholder interviews in each community, and we partnered with a community-based organization in each development to hire public housing residents as community ethnographers. The community ethnographers observed interactions in the public spaces in their neighborhoods, conducted resident interviews, and helped conduct focus groups and interviews with residents and other community stakeholders, all of which helped us gain a richer sense of how residents were actually experiencing the neighborhoods around them.

Our research suggests that the residents of Chelsea and Long Island City described fairly dramatic changes in the communities around them. They generally appreciated the new amenities and improved conditions (particularly the reduction in crime and the improvement in local parks), but they felt somewhat alienated from the new amenities, believing that they were designed to serve the higher-income residents that lived in the community. Residents reported that they felt a divide between their public housing campuses and the broader neighborhood outside. When asked about their community, residents pointed to their public housing campus, not the broader neighborhood.

Although the quantitative evidence pointed to greater labor market success, residents did not perceive growing job opportunities arising from the new businesses opening up nearby. Even in Chelsea, NYCHA residents reported frustration with the lack of local job opportunities. Residents in Long Island City also expressed concern with the lack of enrichment and skill-building programs for young people; in Chelsea, many participated in the youth programs run by the Hudson Guild, a community-based nonprofit organization that serves low- and moderate-income residents of the neighborhood. Finally, many residents in both Chelsea and Long Island City expressed concern about the rising cost of living in their neighborhood. Even though their rents were fixed, they said that they struggled with day-to-day living expenses like groceries and laundry.

Policy Implications

The most important take-away from this work may be simply the fact that public housing residents in New York City experience a wide variety of neighborhood environments. Indeed, most public housing campuses in New York City are surrounded by neighborhoods with incomes that are more than the citywide median. In many cases, these neighborhoods have seen significant increases in income in recent years, belying the common belief that higher-income residents avoid living near public housing. This work shows that public housing can provide a way for residents to remain in neighborhoods as they gentrify.

The public housing residents living in developments surrounded by neighborhoods classified as increasing and high income also enjoy neighborhoods with significantly more educated neighbors, a far better-maintained housing stock, higher-performing schools, and lower crime than public housing residents surrounded by lower-income areas. Our work cannot prove that these environmental factors make a difference in families' lives, but it shows that public housing residents living in higher-income neighborhoods enjoy better labor market and educational outcomes than do other public housing residents, and at least some of this association may be causal. Further, the lesson from the recent research on the MTO demonstration program suggests that we might see far larger impacts on the long-run outcome of children who grow up in public housing surrounded by higher-opportunity areas.

Although this work is limited to New York City, the articles in the Symposium portion of this issue of *Cityscape* highlight a growing gentrification trend in cities around the country. This broader trend suggests that public housing developments in other cities might also be situated in neighborhoods undergoing similar gains in income, improvements in schools, and reductions in crime. Further research is needed to investigate the patterns. Our research, however, at least challenges the widely accepted view that public housing isolates poor families in distressed areas that offer limited opportunities for advancement. Although this isolation may remain true in many cities, in areas seeing gentrification, public housing, and place-based subsidized housing in a more general sense, can potentially be a critical tool to enable residents to remain in high-opportunity neighborhoods that they would not otherwise be able to afford and to lock in some economic diversity over the longer run.

To be sure, the benefits are not unqualified; our qualitative research shows that, although public housing residents appreciate improvements in the surrounding neighborhoods (especially

improved safety), they can also feel alienated when the neighborhoods around them change, and they face challenges as day-to-day living expenses increase, even if rents are held steady. Note that public housing residents typically described their neighborhood as being their public housing campus, and many reported that they felt a divide between their developments and the surrounding neighborhood. Community organizations can potentially play an important role in helping to break down those divisions and to build bridges between public housing campuses and the surrounding neighborhoods, which can enable public housing residents to take full advantage of any growing opportunities.

Appendix A

Exhibit A-1

NYCHA Household Income and Earning Percentiles, 2013

| Indicator | Percentile | Low (\$) | Increasing (\$) | High (\$) | Unclassified (\$) |
|-------------------------------------|------------|----------|-----------------|-----------|-------------------|
| Household annual income (2013) | 10th | 6,888 | 6,888 | 6,916 | 6,888 |
| | 25th | 10,113 | 10,400 | 10,608 | 10,524 |
| | 50th | 18,385 | 19,500 | 20,165 | 19,815 |
| | 75th | 33,157 | 36,016 | 37,090 | 36,248 |
| | 90th | 49,603 | 52,475 | 54,842 | 54,436 |
| Household earnings (when > 0, 2013) | 10th | 8,418 | 8,986 | 8,834 | 8,759 |
| | 25th | 13,462 | 14,711 | 14,869 | 14,706 |
| | 50th | 22,880 | 25,833 | 26,843 | 26,180 |
| | 75th | 37,420 | 40,606 | 41,890 | 40,870 |
| | 90th | 52,991 | 56,093 | 59,212 | 58,425 |

Source: NYCHA administrative records

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Forewarned: The Use of Neighborhood Early Warning Systems for Gentrification and Displacement

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Abstract

The 1980s saw the emergence of neighborhood early warning systems that use indicators to assess patterns of neighborhood change. In more recent years, new systems and analyses are measuring the risk of gentrification and displacement. Using information from a dozen interviews with developers and users and from a survey conducted in one region, we show that policymakers, community residents, and other stakeholders are actively using these early warning systems strategically, tactically, and for empowerment. Although the extent to which the analyses have actually caused policy shifts is unknown, the early warning systems clearly have influenced the urban debate about housing and neighborhood change. The durability of these efforts, however, remains an outstanding question. Cities have not yet sought to develop these tools and strategies for more equitable, inclusive neighborhood change, yet city government is a logical home for early warning systems, especially given new technological capabilities.

Introduction

Neighborhoods change continually because of the movement of people and capital, both private and public. Change is often visible, as newcomers walk the streets or buildings and infrastructure are built and demolished. At the same time, change may be hard to discern, as property transfers and even the arrival of new tenants are not publicized. The process may take decades to unfold and may be nonlinear; change can stall or reverse, and the neighborhood may never fully transform.

As local residents and policymakers struggle to discern the nature and extent of changes, researchers have devised “neighborhood early warning systems” to describe change processes and even

predict future transformation. These toolkits, which take the form of either reports or online guides, tend to focus on economic and racial/ethnic change at the neighborhood scale via demographic and property data. The idea of early warning is that, by tracking investment, disinvestment, and population flows at the local level, policymakers can design cost-effective interventions before the pace of change accelerates and patterns become entrenched (Snow, Pettit, and Turner, 2003). In the case of neighborhood decline, early warning might mean identifying crime hotspots or abandoned properties. For neighborhoods that are revitalizing, toolkits tend to focus on areas of housing sales, racial transition, and new amenities, among other factors.

The first generation of toolkits from the 1980s and 1990s has now disappeared,¹ but both the overheating of the housing market and the planning of new transit systems have led to new interest in understanding neighborhood change, specifically in the form of gentrification and displacement. New early warning systems with an online presence have emerged in Portland, Oregon; the San Francisco Bay Area in California; Chicago, Illinois; and Minneapolis-St. Paul, Minnesota. Many other regions also have conducted analyses. This new generation of toolkits has the potential to transform policies to stabilize and/or revitalize neighborhoods, especially if, this time around, they find more permanent homes. One pathway might be to expand the “smart cities” movement beyond its current focus on efficiency to proactive policymaking around inclusion (Pettit and Greene, 2016).

Little is understood, however, about precisely how stakeholders are using the systems and what impact those systems have on policy. Early warning systems have complex and multiple goals in contrast with smart cities systems, which primarily attempt to make city systems more responsive to constituents. To make the case for integrating early warning systems into city operations, it is important to understand their value. This article describes the intent and use of these toolkits, assessing their ability to make policy more effective, their potential sustainability, and, for a few, their predictive capability.

The following section discusses the evolution of urban data capabilities and then describes the first generation of early warning toolkits. The next section presents a survey of the landscape of current toolkits, including the Urban Displacement Project tool in the San Francisco Bay Area, which the authors developed. The next section, using information from a dozen interviews with developers and users and also from a survey conducted in one region, explores the different ways that toolkits have been used. The final section lays out next steps for system development, suggesting ways to increase the relevance of toolkits to the planning and development decisions that elected officials and communities face.

¹ Snow, Pettit, and Turner (2003) profiled four early warning systems: the Chicago Neighborhood Early Warning System, by the Center for Neighborhood Technology; Neighborhood Knowledge Los Angeles, at the University of California, Los Angeles Center for Neighborhood Knowledge; the Philadelphia Neighborhood Information System, at the University of Pennsylvania; and the Minneapolis Neighborhood Information System, at the University of Minnesota. Each has either disappeared or not been updated in many years.

Perspectives on Smart Cities, Neighborhood Change, and Early Warning Toolkits

The current generation of neighborhood early warning systems dates from the emergence of Geographic Information Systems (GISs). A movement to democratize data resulted in broad experimentation with data portals that characterize neighborhood change. Most recently, the movement has shifted focus to making cities smarter.

The Use of Data and Maps in Cities and Neighborhoods

Shortly after GISs became widely available on personal computers in the early 1990s, a set of intermediaries emerged to create more democratic access to data; many of these intermediaries were part of the Urban Institute's National Neighborhood Indicators Partnership (NNIP; Treuhaft, 2006).² These intermediaries, often community-based organizations working in partnership with universities, gather neighborhood-level data, organize them into a database, and help community actors map and analyze the data by themselves. The focus thus was on *empowerment*, building trust and capacity in communities that historically had been on the wrong side of the map (for example, through practices such as redlining) (Treuhaft, 2006).

The movement to democratize data has recently morphed into interest in smart cities, which optimize urban systems and service delivery through real-time monitoring and control. The promise of smart cities is that new digital tools that aid in the collection, analysis, and dissemination of data will help cities shift from a compliance mode to a problem-solving mode (Goldsmith and Crawford, 2014). At the same time, it is believed, technology will strengthen civil society as constituents coproduce solutions with government (Goldsmith and Crawford, 2014). Absent, however, from smart cities experiments is the application of technology to more equitable outcomes, particularly in neighborhoods, and also the input from community organizations (Baud et al., 2014; Pettit and Greene, 2016).

Despite the enthusiasm about moving toward smarter cities and more democratic data, questions remain about how the data and maps produced are actually used. Data analysis and maps either remain for internal use in decisionmaking, whether by government agency or community organization, or they are made available to external audiences to garner attention or generate new ideas. Users, particularly community groups, may use maps in a *strategic* way (for example, to identify needs or target resources), as a *tactic* to raise awareness or implement solutions, for *administration* (for example, for service delivery), for *organizing* or building the capacity of a constituency, or simply for *exploration* to see if spatial knowledge legitimizes local experience or raises questions about city policy (Craig and Elwood, 1998; Ghose, 2011). Over the long term, GIS analysis and maps are thought to have the potential to transform planning, policy, and programs (Ramasubramanian, 2011)—yet, little systematic evidence supports this thinking.

² NNIP, founded in 1996, consists of a loose network of data intermediaries in 30 cities.

The Rise of Neighborhood Early Warning Systems

Scientists and social scientists alike have long coveted the ability to predict the future. As the availability of new data has made it possible to identify the factors predicting or simply has correlated with different phenomena, researchers have tried to use these indicators to predict future change. Thus, early warning systems are now available for crime hotspots and gang homicides (Gorr and Lee, 2015; Sampson, 2011), housing abandonment and foreclosure (Hillier et al., 2003; Williams, Galster, and Verma, 2013), housing price appreciation (Galster and Tatian, 2009), land use change (Waddell, 2002), and even tornados (Oleske, 2009).

The first neighborhood-level early warning system was pioneered beginning in 1984 by the Center for Neighborhood Technology in Chicago. The idea was to create a portal of property data, such as information on tax delinquencies, code violations, and utility shutoffs, which could then be used to monitor neighborhood housing conditions (and thus spur intervention). Because many forms of financial disinvestment are invisible, identifying patterns in a timely manner can be preventative. An early Urban Institute report describing four such systems (in Los Angeles, California; Minneapolis; and Philadelphia, Pennsylvania—in addition to Chicago) found that they all provided indicators of financial disinvestment based on parcel-based data—aggregated in different ways, depending on the issue—obtained from the local government (Snow, Pettit, and Turner, 2003). With an audience of government agencies and community-based organizations, the systems were disseminated on the web and housed at academic or research institutions.

Cities and other stakeholders are interested in monitoring neighborhood decline for immediate reasons—the potential that families will lose their shelter—and for long-term issues—particularly the spiral of decline that can result in a variety of costly impacts for families and cities alike (Wilson, 1987). By contrast, the rationale for monitoring neighborhood revitalization or gentrification is murkier.

Gentrification is a simultaneously spatial and social practice that results in “the transformation of a working-class or vacant area of the central city into middle-class residential or commercial use” (Lees, Slater, and Wyly, 2008: xv)—meaning the influx of both capital (real estate investment) and higher-income or higher-educated residents. Displacement—when households are forced to move out of their neighborhood—can be a negative outcome of gentrification but may also precede it (Marcuse, 1986). Real estate investors, including prospective homebuyers, certainly take an interest in gentrification. For cities, it is important to understand neighborhood upgrading not only to stabilize communities but also to intervene proactively before intervention (for example, mitigating displacement) becomes costly and difficult (Pettit and Greene, 2016).

In one earlier iteration of work predicting gentrification—a presentation by researchers from the Urban Institute (Turner and Snow, 2001)—the researchers characterized the process of gentrification by (1) shift in tenure, (2) increase in downpayment and decrease in FHA financing, (3) influx of households interested in urban living, and (4) increase in high-income-serving amenities such as coffee shops or galleries. Analyzing data for the DC area, they identified the following five predictors of future gentrification (defined as sales prices that are above the DC average) in low-priced areas: (1) adjacency to higher-priced areas, (2) good access to the Metro subway system,

(3) historic architecture, (4) large housing units, and (5) more than 50 percent appreciation in sales prices between 1994 and 2000. Census tracts were scored for each indicator and then ranked according to the sum of indicators, with a maximum value of 5.

In 2009, the Association of Bay Area Governments sponsored an analysis of neighborhood change in the San Francisco Bay Area from 1990 to 2000, which predicted neighborhood susceptibility to gentrification, with a disclaimer that it was not possible to measure resident displacement via this method (Chapple, 2009). Chapple adopted Freeman’s (2005) definition of gentrifying neighborhoods as low-income census tracts in central city locations in 1990 that, by 2000, had experienced housing appreciation and increased educational attainment that were higher than the nine-county regional average and then constructed a multivariate statistical model that had gentrification as the dependent variable and a set of 19 socioeconomic, locational, and built environment factors for 1990 as independent variables. When census tracts scored above the regional average for each variable, they received a value of 1; the susceptibility index summed the scores across the variables.

In 2011, Atkinson et al. characterized household vulnerability to displacement from neighborhoods that gentrified between 2001 and 2006 in the Melbourne and Sydney, Australia, greater metropolitan areas. A vulnerability score (from 1 to 13) was measured based on tenure, number of employed people per household, and occupation. Displacement rates were calculated by dividing the number of out-migrants with vulnerability characteristics by the number of households with these characteristics exposed to the likelihood of moving in 2001. Neighborhoods that had higher-than-projected numbers of high-income, owner-occupant, and professional populations were designated gentrified.

Researchers have used myriad indicators and sources of data for characterizing residential gentrification displacement, each with its own set of advantages and disadvantages (exhibit 1). The table in exhibit 1 summarizes quantitative data sources only; however, data on many of the drivers and impacts of gentrification and displacement are not regularly gathered or are difficult to quantify.

Exhibit 1

Indicators and Data Sources for Analyzing Gentrification and Displacement (1 of 2)

| Indicator Type | Indicators | Data Sources |
|-------------------------------------|--|--|
| Change in property values and rents | Sales value, property value | County tax assessors’ offices, finance departments, data aggregators |
| | Rent | Data aggregators, apartment operating licenses, craigslist |
| | Changes in availability of restricted affordable housing | HUD, housing departments |

Exhibit 1

Indicators and Data Sources for Analyzing Gentrification and Displacement (2 of 2)

| Indicator Type | Indicators | Data Sources |
|--|--|---|
| Investment in the neighborhood | Building permits, housing starts, renovation permits, absentee ownership | Jurisdictions' building or planning departments |
| | Mortgage lending and characteristics | HMDA and assessors' data |
| | Sales (volume and price) | County assessors' offices, data aggregators |
| | Condominium conversions | Assessors' offices, housing departments, public works departments |
| | Change in community and business organizations (for example, number, membership, nature of activities) | Chambers of Commerce, Dun & Bradstreet, neighborhood or local business associations, and so on |
| | Public investments (for example, transit, streets, parks) | Public works departments, transit agencies, parks and recreation departments, and so on. |
| Disinvestment | Building conditions, tenant complaints, vacancies, fires, building condemnation | Surveys, censuses, maps, building departments, utility shut-off data, fire departments |
| | School quality, crime, employment rates, neighborhood opportunity | Departments of education, police departments/crime maps, censuses, Bureau of Labor Statistics |
| | Neighborhood quality | Local surveys |
| Change in tenure and demographic changes | Tenure type, change in tenancy | Building departments, assessors' offices, censuses |
| | Evictions | Rent boards, superior courts |
| | Foreclosure | HUD, proprietary data sources |
| | Demographics data on in- vs. out-movers (for example, race, ethnicity, age, income, employment, educational achievement, marital status) | Censuses, voter registration data, real estate directories, surveys, American Housing Survey, departments of motor vehicles |
| Investment potential | Neighborhood and building characteristics (for example, age and square footage, improvement-to-land ratio) | Tax assessors, censuses, deeds, and so on |
| | Neighborhood perceptions | Surveys of residents, realtors, lenders, neighborhood businesses, newspapers, television, blogs, and so on |
| Reasons that people move in or out of neighborhood | Reason for move | Surveys of in-movers and out-movers, state housing discrimination complaints database |
| Coping strategies and displacement impacts | Crowding or doubling up | Censuses, utility bills, building footprints |
| | Increased travel distance and time | Censuses |

HMDA = Home Mortgage Disclosure Act. HUD = U.S. Department of Housing and Urban Development.

The Future of Neighborhood Early Warning Systems

More than 30 years after the first neighborhood early warning system emerged, those systems arguably have failed to meet their potential. In fact, the first early warning systems for neighborhood decline have not survived the test of time. Although more research would be necessary to determine why, three explanations seem likely: (1) all the systems were housed at nonprofit organizations or universities, where changes in personnel and leadership can change institutional focus (as opposed, for example, to a city, which has a more constant mission); (2) all the systems relied primarily on funding from philanthropy, which changes its focus frequently, and/or the U.S. Department of Housing and Urban Development (HUD), which has experienced repeated budget cuts in the past few decades; and (3) none of the systems developed a broad base of users (beyond community-based organizations).

The first generation of early warning systems innovated new uses of local data and offered considerable promise to shape policymaking (Snow, Pettit, and Turner, 2003). The lack of sustainability in these systems, however, suggests that they failed to convince potential users about the importance of early warning and preventive approaches to neighborhood change. Moreover, three decades after the first research on gentrification and displacement, we continue to struggle to predict which neighborhoods will gentrify and who will benefit (and suffer). Most of the debate about gentrification and displacement has remained in academic spheres, outside of the policy realm—until the recent arrival of warning systems for gentrification and displacement.

The emergence of the smart cities movement suggests the potential of these tools. Research suggests that data on gentrification and displacement underrepresents the most disadvantaged populations and presents a mismatch between data and lived experience (Zuk et al., 2015). This underrepresentation might be overcome by user-generated geographic content, volunteered by residents and posted via interfaces like Flickr (Goodchild, 2007). With better data, prediction might improve, and, with more accessible portals, different stakeholders may coproduce more effective policies. Pettit and Greene (2016) envision the following—

But what if city leaders and community groups could get ahead of these changes and act early to direct neighborhood changes toward more inclusive outcomes? Using big data and predictive analytics, they could develop early warning systems that track key indicators of neighborhood change and predict future trajectories (Pettit and Greene, 2016: 2).

The next section presents an overview of how the next generation of early warning systems is faring.

Neighborhood Early Warning Systems: Surveying the Landscape

To examine further the use of early warning systems for neighborhood change—and gentrification and displacement in particular—we next establish the universe of systems via a web scan. Two starting points were the Urban Institute’s NNIP and the Obama administration’s open data portal, The Opportunity Project. We also searched the web on terms such as “neighborhood,” “gentrification,” and “displacement” and asked our interviewees for systems we had missed.

We identified three types of websites that explore neighborhood issues: (1) neighborhood indicator maps (typically of development, such as local educational attainment or housing construction, or quality of life, often represented by amenities), (2) opportunity maps, and (3) racial/economic change maps (including gentrification).³ To narrow our focus, we chose just the sites focusing on gentrification within this last category, which included projects in Chicago, Minneapolis-St. Paul (two projects), Portland, San Francisco, and Washington, DC. We excluded several sites that depict neighborhood change without an explicit focus on gentrification or assessment of risk.⁴ We then added projects from several cities—Charlotte, North Carolina; Houston, Texas; Los Angeles; Seattle/Puget Sound, Washington; and St. Louis, Missouri—that had produced recent assessments of gentrification or displacement risk with a report, rather than a web interface, as the final product. Again, we excluded recent gentrification reports that were not framed as risk assessments.⁵

From the 11 projects, we interviewed 9 of the system creators and attended a presentation of 1; the last site is our own. Most of the interviews occurred via telephone and lasted 45 to 60 minutes, using a semistructured format; one interview was by e-mail. The analysis also draws from a survey of users ($n = 33$) of the University of California, Berkeley's Urban Displacement Project toolkit.⁶

The projects generally fall into two broad categories: (1) those developed by universities, with online map interfaces, and (2) those developed by cities as reports for internal use (exhibit 2). Perhaps because of the role of city government in many of the projects, most of the analyses examine neighborhood change within city, rather than regional, limits. The most common audience, both intended and actual, is city government and community organizations; others specified regional agencies, community members, and elected officials as their target audience. All the sites rely primarily on U.S. census data at the tract level, typically using the data with standardized census tract boundaries provided by GeoLytics, Inc., or Brown University. Most of the projects span at least two decades (1990 to 2010 or 1990 to 2014), and two projects (Chicago and St. Louis) use 1970 as the starting year. Two sites (Portland and San Francisco) also add parcel-based data on recent home sales, and two (San Francisco and Washington, DC) add data from the U.S. Census Bureau's Longitudinal Employer-Household Dynamics program on job accessibility and also add a rail transit station layer. One site (San Francisco) also uses data about amenities (parks, transit, walkability), property characteristics (from the tax assessor), and nonprofit organizations.

³ Our scan identified 24 of these websites, but we suspect that many more exist.

⁴ These sites include HUD's Affirmatively Furthering Fair Housing Assessment Tools (huduser.gov/portal/affht_pt.html#affhassess-tab); Code for Boston's Ungentry (<http://codeforboston.github.io/ungentry/>); and sociologist Michael Bader's racial/ethnic change maps for New York, Los Angeles, Chicago, and Houston (<http://mikebader.net/media/neighborhoodtrajectories/map.html?city=newyork>).

⁵ These reports include the 2016 New York University Furman Center for Real Estate and Urban Policy annual report on New York City housing (<http://furmancenter.org/research/sonychan>) and two reports on Philadelphia by the Federal Reserve Bank (Ding, Hwang, and Divringi, 2015) and the Pew Charitable Trusts (2016).

⁶ The Urban Displacement Project solicited survey responses from a list of 395 stakeholders in the nine-county Bay Area, including housing policy advocates, planning directors, and elected officials. After two e-mail solicitations, the project received 33 responses (a response rate of 8 percent). The survey asked users 10 questions about how they used the site (maps, case studies, and policy inventory) and also asked how the site could be improved.

Exhibit 2

Neighborhood Early Warning Systems for Gentrification and Displacement (1 of 2)

| City/Region | Type of Project | Host | Geography | Goal | Users | Format | Policy Influence? |
|---|--|---|-------------|--|--|-------------------------------------|-------------------|
| Charlotte, North Carolina | Neighborhood change analysis | City of Charlotte | City | Tactical: Understand how to do equitable and inclusive development | City, some community organizations | Internal report | NA |
| Chicago, Illinois | Gentrification index | University of Illinois at Chicago | City | Tactical and empowering: Measure change and provide tools | Community organizations | Report and maps on line | Yes |
| Houston, Texas | Gentrification index and at-risk indicator | Local Initiatives Support Corporation | City | Strategic, tactical, empowering: Use as advocacy tool for LISC | LISC, community organizations | Internal report | Yes |
| Los Angeles, California | Gentrification index | City of Los Angeles | City | Strategic: Help city target initiatives within a large grant program | Mayor's office | Internal report | NA |
| Minneapolis, Minnesota | Housing market index | University of Minnesota Twin Cities | Twin Cities | Strategic, tactical, empowering: Start a conversation, inform policymakers and residents | Community organizations, city | Report and maps on line | Yes |
| Minneapolis-St. Paul metropolitan area, Minnesota | Gentrification index and at-risk indicator | Minnesota Center for Environmental Advocacy | Region | Strategic, tactical: Spark conversation, implement mitigations, obtain funding | Community organizations | Report and interactive maps on line | No |
| Portland, Oregon | Gentrification index and at-risk indicator | Portland State University (hosted by <i>The Oregonian</i>) | City | Tactical, empowering: Show where gentrification is happening in Portland | City, community organizations | Report and maps on line | Yes |
| St. Louis, Missouri | Index of "neighborhood vitality" | University of Missouri-St. Louis | City | Tactical and empowering: Show which neighborhoods are "rebounding" | Community organizations | Report on line | Yes |
| San Francisco Bay Area, California | Gentrification index and at-risk indicator | University of California, Berkeley | Region | Tactical and empowering: Describe current patterns of neighborhood change and city policies | Local government, community organizations, elected officials | Report and interactive maps on line | Yes |

Exhibit 2

Neighborhood Early Warning Systems for Gentrification and Displacement (2 of 2)

| City/Region | Type of Project | Host | Geography | Goal | Users | Format | Policy Influence? |
|---------------------------------|---|--------------------------------------|-----------|---|-------------------------------------|----------------|-------------------|
| Seattle-Puget Sound, Washington | Neighborhood typology and at-risk indicator | Puget Sound Regional Council | Region | Strategic and tactical: Provide jurisdictions a tool for station-area plans | Local government, community members | Report on line | Yes |
| Washington, DC | Gentrification index and at-risk indicator (not yet released) | University of Maryland, College Park | Region | Tactical: Understand change primarily around transit (Purple Line on the Metrorail system) | Local government | Maps on line | NA |

LISC = Local Initiatives Support Corporation. NA = not applicable.

Analyzing Risk

The first generation of reports analyzing gentrification and displacement risk generally all followed the same methodology; that is, run correlations or regressions to identify predictors of gentrification and/or displacement and then assign each factor a value to come up with a susceptibility score (Atkinson et al., 2011; Chapple, 2009; Turner and Snow, 2001). The analyses behind the current set of early warning systems—in Chicago, Houston, Portland, the San Francisco Bay Area, and Seattle/Puget Sound, as described further below—have improved on this methodology by looking at the dimension of time (that is, past and present neighborhood change dynamics in addition to the extent of vulnerability). Many analyses also make a useful analytic distinction between gentrification and displacement, while still analyzing both.

The Chicago gentrification index (Nathalie P. Voorhees Center, 2014) determined relevant factors based on a literature review. It provided a “score” for each “community area” in 1970, 1980, 1990, 2000, and 2010, based on a composite index that compares the community area to the city at large for 13 indicators. Then, a neighborhood change typology (displayed in maps) was constructed not just from these scores but also from their change between 1970 and 2010. A separate toolkit identified housing, land use, and other tools appropriate for each of three stages: (1) before gentrification, (2) midstage gentrification, and (3) late-stage gentrification (Nathalie P. Voorhees Center, 2015).

Building off the same methodology as Chapple (2009), Local Initiatives Support Corporation (LISC) researchers constructed a model predicting gentrification in neighborhoods of Houston, using a slightly narrower definition of gentrifying neighborhoods (Winston and Walker, n.d.). The LISC researchers used the regression coefficients and continuous independent variables in predicting susceptibility to gentrification.

In Portland, Bates (2013) predicted market changes based on vulnerability to displacement, demographic changes, and housing market conditions, a method that was replicated in the Twin Cities gentrification risk assessment performed by the Minnesota Center for Environmental Advocacy. Tracts were vulnerable to displacement in 2010 when they had higher-than-average populations

of renters and communities of color, few college degrees, and lower incomes. For housing market conditions, Bates defined neighborhood market typologies as (1) adjacent tracts (low/moderate 2010 value, low/moderate appreciation, next to high-value/appreciation tract); (2) accelerating tracts (low/moderate in 2010 with high-appreciation rates); and (3) appreciated tracts (low/moderate 1990 value, high 2010 value, high 1990 to 2010 appreciation). Combining this information with demographic shifts for vulnerability factors between 2000 and 2010, the study identified six neighborhood types ranging from early to mid- to late-stage gentrification. Bates then used these typologies to recommend how to tailor policy approaches to the specific characteristics and needs of neighborhoods.

In the San Francisco Bay Area, the Urban Displacement Project provided a typology analysis that characterizes Bay Area neighborhoods (census tracts) according to their experience of gentrification and risk of displacement.⁷ This early warning system was based on a gentrification index that adapts the methodologies of various researchers (for example, Bates, 2013; Freeman, 2005; Maciag, 2015) to characterize places that historically housed vulnerable populations but have since experienced significant demographic shifts and real estate investment.

The loss of low-income households between 2000 and 2013 was used as a proxy for displacement. On average, Bay Area census tracts' low-income population grew by 59 households between 2000 and 2013. The typology therefore assumes that any neighborhood that experienced a net loss of low-income households while stable in overall population is a result of displacement pressures.⁸ After constructing regression models to estimate the predictors of both gentrification and loss of low-income households/displacement, the project developed place typologies for risk of either gentrification-related displacement or exclusion-related displacement (which occurs in higher-income neighborhoods). Unlike the other studies, results were vetted via several workshops with a project advisory committee and also via community forums. Based on these interactions, tracts were divided into low-income and moderate- to high-income tracts to capture the displacement pressures occurring in nongentrifying neighborhoods that are also losing low-income households. Exhibit 3 presents the resulting typology. The Urban Displacement Project's website also includes an inventory of policies available in each jurisdiction (exhibit 4).

The Puget Sound Regional Council project, conducted with the Center for Transit-Oriented Development, used descriptive methods to construct a typology of neighborhoods based on risk factors (the "people profile") and market strength (the "place profile"), which then formed the basis for suggesting policy responses (PSRC, 2013). For the people profile, one axis consisted of social

⁷ This project was a side product of a larger study funded by the California Air Resources Board and the Metropolitan Transportation Commission (via HUD's Sustainable Communities Initiative) that involved extensive qualitative and quantitative regional analysis to better understand the nature of neighborhood change and displacement in the Bay Area and their relationship to transit.

⁸ We assume that a tract that lost low-income households during this period underwent some process of displacement when combined with other indicators such as a loss of market-rate affordable units or a decline of the in-migration of low-income population into that tract beyond the regional median. Although the change in low-income households could be because of income mobility (for example, low-income households moving into middle- or upper-income categories, or vice versa), from our analysis of data from the Panel Study of Income Dynamics, we estimate that there would have been a net increase in low-income households in most places likely because of the Great Recession (December 2007 to June 2009); therefore, our estimates of displacement are likely an underestimate.

Exhibit 3

Displacement/Gentrification Typologies^a

| Lower-Income Tracts (> 39% of households are considered low income) | Moderate- to High-Income Tracts (< 39% of households are considered low income) |
|---|---|
| <p>Not losing low-income households or very early stages</p> <ul style="list-style-type: none"> Does not fall within any of the following categories | <p>Not losing low-income households or very early stages</p> <ul style="list-style-type: none"> Does not fall within any of the following categories |
| <p>At risk of gentrification or displacement</p> <ul style="list-style-type: none"> Strong market In TOD Historic housing stock Losing market-rate affordable units Employment center | <p>At risk of displacement</p> <ul style="list-style-type: none"> Strong market In TOD Historic housing stock Losing market-rate affordable units Employment center |
| <p>Undergoing displacement</p> <ul style="list-style-type: none"> Already losing low-income households and naturally affordable units In-migration of low-income residents has declined Stable or growing in size | <p>Undergoing displacement</p> <ul style="list-style-type: none"> Already losing low-income households Either naturally affordable units or in-migration of low-income residents has declined Stable or growing in size |
| <p>Advanced gentrification</p> <ul style="list-style-type: none"> Gentrified between 1990 and 2000 or between 2000 and 2013 based on— Neighborhood vulnerability Demographic change Real estate investment | <p>Advanced exclusion</p> <ul style="list-style-type: none"> Very low proportion of low-income households Very low in-migration of low-income households |

TOD = transit-oriented development.

^a Tracts with 0 population in 2010 were excluded from the analysis (8 tracts). In addition, tracts where more than 50 percent of the population in 2010 was in college were excluded from the analysis (11 tracts).

Exhibit 4

Policy Inventory on Urban Displacement Project Website



Source: <http://www.urbandisplacement.org>

infrastructure and access to opportunity. The second axis—change/displacement—measured risk of displacement resulting from recent neighborhood change, current community risk factors, and current and future market pressure. The place profile also consisted of two dimensions: (1) urban form that supports a dense and walkable transit community and (2) the likelihood that the community will change in response to real estate market strength. Combining the people and place typologies, they identified eight general typologies; for each typology, they identified implementation and policy approaches.

Thus, in an attempt to predict change more accurately, early warning systems and related projects are gradually improving in methodology. Notable methodological shifts include the analysis of multiple stages of both gentrification and displacement, building on the approach of Bates (2013); the shift to a regional, rather than municipal, framework; and the mixing of quantitative and qualitative approaches. Conceptualizing gentrification and displacement as a long-term, multistage process, rather than a binary state or on/off switch, has helped build local buy-in into the early warning systems. Looking at many different cities within a region helps localities understand regional housing market dynamics and learn about different policies. Checking results with local residents and key informants helps ensure that the maps represent conditions on the ground.

Methodological problems remain, however, particularly in terms of the predictive ability of the models. Methods are still far from transparent: models are not readily replicable, and the scores can be hard to understand. The next section describes how stakeholders are using the models in practice and also the effectiveness of the new approaches.

The Use and Impact of Neighborhood Early Warning Systems

This section examines the use and impact of these projects, looking at those that assess gentrification and/or risk (in Chicago, Houston, Minneapolis-St. Paul, Portland, San Francisco, St. Louis) and also examines the other neighborhood change reports (in Charlotte, Los Angeles, Minneapolis, and Seattle/Puget Sound).⁹ We assess first how internal actors, and then external stakeholders, use early warning systems. We then examine what impact the projects have had on policymaking and how accurate they are at predicting change.

Internal Use

One obvious use for early warning analyses is in strategic planning for housing and neighborhoods. Maps that show how neighborhoods are changing and that anticipate future change can help stakeholders bring attention to imminent problems and target resources. If the map suggests that change is in very early stages, the neighborhood can strategize about actions to take during the long term; for example, the Houston systems architect said, “. . . in Houston, we are a few years or a decade behind other metropolitan areas in terms of the waves of gentrification and things coming. So what we realized is that by doing research now, we could get ahead of that.” The gentrification analysis showed where change was anticipated yet land was still cheap, so that intermediaries could target land acquisition funds strategically.

⁹ Because the Washington, DC site has not yet been launched, it is too early to assess its use and impact.

The Houston project was strategic, not just in terms of timing but also in policy approach and ownership. Before the analysis, stakeholders had expressed some disagreement about how to spend disaster recovery money. Having the data helped advocates to say, "...if we're doing this investment, let's also create and preserve affordable housing opportunities in places at risk of gentrification"—but without making enemies by specifically endorsing certain policies within the report itself.

The Houston system creator said—

We had a strategically placed piece of analysis that could help community stakeholders on our side make a point about what policy ought to be. Not a distraction, not something that came out of Washington, DC, saying this is what y'all ought to do. Because that would have been suicidal.

Another strategic, internal use of maps is targeting resources, as with the Housing Market Index (HMI) in Minneapolis, which helps determine the blocks where funds to fix vacant property can be most effectively spent. One developer on the Minneapolis project said, "It has been very, very, very useful.... When you're involved in politics, and competition for scarce resources, the more facts you can provide, the better you are. The HMI are facts. And that speaks much louder than any political will."

In Charlotte, where the use of the report remained internal to the city government, the analysis became a tactic to broaden the framework and discussion of neighborhood change. The initial referral from the city council had been to look at gentrification, but instead the city "looked more broadly at neighborhood change and the challenges that can arise in the context of gentrification across all neighborhoods, plus the close ties that this issue has with economic opportunity and the historic patterns of economic and racial segregation in Charlotte—consequently, we looked at a broad range of indicators."

The analysis in Charlotte ultimately supported the development of a much broader housing strategy than anticipated, with a wide array of tools and strategies to manage neighborhood change.

Once the analysis is in place, it can create its own momentum. In Seattle, the Puget Sound Regional Council analysis established—after considerable debate with advocates—that four neighborhoods in southeast Seattle were at high risk. Years later, planners working on the update to the Seattle Comprehensive Plan used the analysis as a background document to show that the community was at risk. Developers of the gentrification typology in Minneapolis-St. Paul have a similar intent—to create the momentum to fund and implement the mitigations for neighborhood preservation and equitable development in St. Paul's Central Corridor Development Strategy.

External Use

The most common use of early warning indicators and maps is as a *tactic* to spark a conversation, generate new ideas, or show how to implement solutions. The survey of users of the Urban Displacement Project in the San Francisco Bay Area suggested that this was the primary use of that warning system. Users volunteered that it was a tool to start dialogue: "I've used the maps to show policymakers that my neighborhood is at risk of displacement."

In the Bay Area, the tool also serves to legitimize other work—

My organization provides legal research, advice, education, and advocacy to support communities in developing community-owned economic structures. This data has been useful in better understanding the dynamics of displacement internally, as well as in communicating about the importance of our work to the public.

It also lets advocates know where cities lack antidisplacement policies, so they can push for implementation. A user of the Urban Displacement Project in the Bay Area reported using the site “to assess which areas have been most impacted in order to identify mitigation strategies for nonprofits that lease in those areas.” Users reported using it “to check on what policies have been implemented by Bay Area jurisdictions to produce more housing” and “assessing opportunity for preservation strategies and making the case for funding.” Because the maps are regional, advocates use them to advocate at the regional level: “[We] identify which cities are performing well and which are not. [We] advocate for MTC [Metropolitan Transportation Commission] to use this info to guide funding through OBAG [a regional grant program to encourage density] to incentivize better local policies.”

In St. Louis, the release of the index of “neighborhood vitality” also brought new attention to “rebounding” neighborhoods, helping to spark a conversation about how reinvestment occurs. Researchers at the University of Missouri–St. Louis sponsor a morning panel that highlights “come back” neighborhoods, with a panel of people from the neighborhood that tell the story of what was done to strengthen the community.

Maps of neighborhood change at a regional scale can help bring perspective to communities that had considered themselves immune to affordable housing need. In Seattle, the conversation took a new turn—

Roosevelt community...is ‘Improve Access’ [type]...[it is one of the] station areas that were predominantly white, affluent station areas in a wealthier city. When having conversations about what to do with surplus lands the transit agency will have, I was able to go in and talk about the typology exercise, which highlighted that adopting tools to ensure affordable housing was a central need for places like Roosevelt... [which] helps counter some of the community members who want to use those for parks and open space.

The Twin Cities gentrification typology is also meant to educate the suburbs, developers, and others who do not comprehend the extent of housing pressure on the urban core. The developer said, “It’s like driving down the road using your rearview mirror, and all of this demographic change is in front of you. You’re going to end up in the ditch.”

The maps often serve to validate disenfranchised perspectives. One place where such validation occurred was Portland, where many planners did not understand the issues—

And then there was this big explosion around a bike lane project...historically black part of Portland. That was the first wave of displacement. So it’s on the bike boulevards plan...they were not going to do any of the pedestrian safety stuff that black folks had asked for. Huge conflicts between bike lanes and buses. So all the transportation planners were like, ‘Wait what is this gentrification thing people are talking about?’ so that was one of the first goals was to get people on the same page of what are we talking about.

The maps made the issues more real: “So for the [National] Urban League, and some other black [organizations, it was like]: ‘See this thing we told you was happening, has happened, is real. It’s in the data.’”

When the city sponsors the project, as in Portland, it can help legitimize the entire conversation. The system creator in Portland said, “One of my first conversations with them in talking was, ‘you should all stop saying that you’re trying to gentrify stuff. It’s not going over well.’ They would routinely say that. ‘Oh this area needs gentrification...’ with no comprehension of what they were saying... I think it was really important that there was an acknowledgment on the part of the city that this was not a purely market accident. So that started happening more in the popular conversation.”

Likewise, a creator of the Chicago maps argues that depicting how neighborhoods are changing, even where the gentrification process is just barely starting, is effective because users can recognize themselves—and their own economic struggles—in the maps.

Inequality perpetuates this narrative of gentrification, the fear of gentrification, even if it’s not really happening. When you can’t get into the middle, when you’re middle income and you can’t buy a house, then there are structural forces at work. But you want something to blame, and so the narrative about how gentrification is occurring feels right.

In Chicago, the active dissemination of the index into communities by the University of Illinois at Chicago researchers helped locals shift into action and policy design. As communities looked at the new index, they wanted to deconstruct it and shift into figuring out strategies: “Communities are looking for that sweet spot, where they can prevent excessive development but still get enough to have resources.” Part of this conversation was spurred by media attention, a radio reporter who became interested in the issue because of her own neighborhood, Bronzeville. The interest led the university to add the policy toolkit, which then spurred many new conversations in different communities.

Another way to use data analysis and maps is to organize or empower a constituency. In Portland, the housing advocates formed a new coalition and reframed it around displacement, broadly defined—an umbrella that could include those fighting gentrification, or for renter protections, or to stabilize communities. For the projects being used by community organizations, all the interviewees reported empowerment and capacity building as outcomes. From Minneapolis-St. Paul to the San Francisco Bay Area, community organizations use the maps to organize their constituencies. The data do not show only that “it’s real”; the data provide evidence that advocates point to in meetings with and letters to policymakers.

In St. Louis, the analysis revealed that every rebounding neighborhood had strong civic engagement—

My main surprise is that when we go out to the neighborhoods that we identified as these rebound neighborhoods, that there really is a—groups on the ground that are talking about this. About what they can do to help the neighborhood. And it’s sort of, they find it extremely gratifying to be identified as a neighborhood that’s coming back. There seems to be a very upbeat conversation about these neighborhoods.

Interacting with communities about the early warning maps helped creators realize that locals needed to be equipped to deal with different stages of gentrification. In Chicago: “We quickly realized that we needed to show people how different tools are appropriate for different stages of gentrification.” For instance, when gentrification is late stage, as in East Pilsen, the strategy should be to preserve the diversity and stabilize the community by building coalitions across different groups.

Policy Impact

Many of these early warning systems and reports are in the public domain and have become established resources in the ongoing civic conversation about housing. This social context may have aided the process of policy learning, as policy communities construct shared definitions and debate ideas (Bennett and Howlett, 1992). Most of the interviewees can point out different ways that the analyses have shaped the policy conversation, though it is hard to know how pivotal a role they played in the passage of specific policies. Even the cities using their new neighborhood change tools internally, such as Los Angeles and Charlotte, reported shifts in how their governments thought about housing needs and targeting resources.

In St. Louis, the report influenced conversations by the Ferguson Commission about the siting of Low-income Housing Tax Credit housing in poor areas. Also, the report found that no rebounding neighborhoods were in the north of the Delmar area, which helped spur a new conversation about using tax increment financing to fund infrastructure. In Houston, the analysis of gentrification risk “kept the drumbeat going” at city hall and also helped convince Houston Endowment Inc. to provide \$1 million for a loan fund in a transitioning neighborhood. In Chicago, the maps likely contributed to the passage of the Single-Room Occupancy Preservation Ordinance. Portland has a new focus on housing policy throughout the civic arena, with the declaration of a housing emergency and many different new policies, such as the redistribution of tax increment finance revenues to affordable housing.

The evidence of policy influence is clearer in the Bay Area, where displacement and gentrification pressures are particularly acute and the Urban Displacement Project has garnered considerable media attention (more than 50 articles). Several policymakers responded to the user survey and said that they use the early warning system to design policy. One local councilmember said, “[I use the site] to assist in writing public policy for the city I represent as a public official. It is very valuable and useful.” Another official said, “For my work with the City of Oakland, I used these to understand how our existing anti-displacement policies could be improved.” San Francisco’s Mission 2016 Interim Zoning Controls requires developers of new projects in the Mission District to write a report on their project’s displacement potential, drawing from the early warning system. City councilmembers in several cities, including San Mateo and San Rafael, California, have referenced the project during council meetings to confirm the city’s displacement risk, show what policies neighboring municipalities have adopted, and justify passing new antidisplacement policies. The Berkeley, California mayor used the policy inventory to identify new policies to incorporate into his comprehensive housing plan. The Metropolitan Transportation Commission is considering incorporating more stringent antidisplacement targets in its next long-range plan. Affordable housing producers have used the maps to target sites for subsidized housing development. Unintended audiences also are using the tools; for example, real estate brokers have reported using the assessment of gentrification risk to identify profitable areas for investment.

It is clear that many users point to the early warning systems to validate their claims that the neighborhood is gentrifying. The tools also seem to be spurring policy changes (though it is impossible to know whether the new policies would have appeared in the absence of the maps). The methodological improvements in the new generation of toolkits have likely helped make policy more effective. By identifying neighborhoods in early stages of gentrification and displacement, they put the issue on the radar of local stakeholders; by extending the analysis to the region, the systems clarify that housing markets operate regionally, affecting peripheral and core areas; and, by incorporating users into the development of the tools, early warning systems have become more accurate—but with limitations, as the next section discusses.

Using Early Warning Systems for Prediction

In general, the system developers interviewed did not encourage the use of systems for prediction but found that policymakers and residents were eager to do so. One expert explained, “Either the analysis is not very helpful—it is not revolutionary, like predicting change near the metro—or it is very weak. We can’t predict the [new stadium].” Another pointed to the challenge of accounting for “sites of reserve,” or property that landlords hold for decades in anticipation of future profit. As they lay fallow for decades, warning systems may suggest disinvestment, but locals know better.

One interviewee said that developers would generally prefer that the maps be used as a “wake-up call”—

I did not expect that people—especially people in the city—the planning people—to view it as a predictive model. Or try to keep using it as a predictive model, given that the whole point was to have very minimal data and simple concepts. So that surprised me. Was their interest in doing that more so than creating and developing the policy part? Like, how much more studying of data do you need?

Likewise, in Los Angeles, policymakers describe their tool as a first step. Once they identify areas that have the potential to change, they can add more qualitative knowledge of the neighborhood in order to do “prediction”—

We use it as a way to say ‘we can choose between these neighborhoods for the first [project], and between these for the second one; and then within it, we can focus on a sub-area, block, commercial corridor, and then we pull in a lot more information. So it’s definitely not something where you can just enter in some basic search parameter and then it’ll tell you exactly where to do it... every policy item will have different things to consider, different political ramifications, and other factors that go well beyond just describing what’s happened.... And once you have a few good candidates, you have to take in all these additional considerations. Where are different community groups working in this particular space that you could partner with?

Even if the developers advise caution, users are eager for more explicit prediction. One expert explained:

The precise numbers would be valuable in influencing the city. We are now to the point where we’re hearing the city is ready to have a comprehensive housing plan, and cohesive housing policy. So precision in numbers would be useful for that. In terms of how we’re allocating resources.

Few developers have systematically assessed the validity of their gentrification and displacement predictions. The exceptions are Houston and the San Francisco Bay Area. Validating their Houston model using 2007 (2005–2009) American Community Survey data, LISC researchers found 86 percent accuracy for highly susceptible tracts (that is, those that the model predicted were 75 percent likely to gentrify) and 60 percent accuracy for moderate susceptibility (that is, between 50 and 75 percent likelihood). The Urban Displacement Project found that its analysis from 1990 to 2000 correctly predicted 86 percent of the 85 tracts that gentrified from 2000 to 2013 (Chapple et al., 2016). The rate of false positives, however, was extremely high: of the 512 tracts that did not gentrify, the model predicted that 79 percent of the tracts would experience moderate or high gentrification. The analysis of household displacement risk revealed the same pattern: a high degree of accuracy in predicting displacement, but also a high rate of false positives (Chapple et al., 2016).

Both the Chicago and Portland projects used 2010 as the end date for the analysis, so it is possible to validate those models by checking their results against neighborhood change from 2010 to 2014. Looking at Portland, we found that the extent of vulnerability had changed very little, but the number of gentrifying or gentrified tracts doubled, from 15 to 30; the model seems to have underpredicted gentrification, which is occurring very rapidly. In Chicago, we found a near-perfect correlation (0.94) between the risk score from 2000 to 2010 and that from 2010 to 2014. If anything, the extent of gentrification has slowed in Chicago; the original analysis found that 11.7 percent of neighborhoods were gentrifying by 2010, but the 2014 update (using tracts rather than the original neighborhoods) finds just 8.8 percent.

Given that most developers are skeptical of the accuracy of their own risk assessments, the call of Pettit and Greene (2016) for better predictive analytics seems warranted. A disinvested neighborhood that receives a false positive “at risk” categorization may resist new market-rate development or even other forms of revitalization. To the extent that they offer a wake-up call, early warning systems are helpful for community organizing. Without more precision, however, systems may actually hinder efforts to develop appropriate policy responses.

Next Steps

Although the first generation of online neighborhood early warning systems has disappeared, a new set has emerged, now measuring the risk of gentrification and displacement. Policymakers, community residents, and other stakeholders are actively using these early warning systems strategically, tactically, and for empowerment. Although it is unknown the extent to which the analyses have actually caused policy shifts, they clearly have influenced the urban debate about housing and neighborhood change.

The state of predictive analytics is poor, however. Despite methodological advances in the new generation, the systems are not yet reliable enough to use to design for specific policies. For instance, they are not able to predict the displacement impacts of specific developments or to identify which of the many antidisplacement policies is useful in different contexts.

For the most part, the early warning systems studied are not well integrated into the smart cities movement, potentially missing an opportunity for analytic improvement and long-term sustainability.

None incorporate real-time data on neighborhood change or crowd-sourced data. Unlike the smart systems that are improving the efficiency of city operations, neighborhood systems have a potential that is not yet clear—apart from raising awareness and building momentum for policy change. The smart cities movement has not yet fully grappled with issues of inclusion, instead focusing primarily on efficiency (Pettit and Greene, 2016). One expert said, “Getting the open data movement to address equity is like moving a big boat.”

The durability of these efforts remains an outstanding question. Of the projects profiled in this article, a few are planning minor updates, but none have long-term plans to institutionalize this work. The nonprofit organizations and universities that sponsor much of the work have little capacity to continue it without a significant influx of resources, and foundation funders come and go. Although city government is a logical home for early warning systems, especially given new technological capabilities, the case has yet to be made for why cities should pursue tools and strategies for more equitable, inclusive neighborhood change. Likewise, the private sector has not yet engaged in neighborhood change debates. Absent such intervention, these early warning systems will most likely vanish, just as the first generation disappeared.

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Preserving and Expanding Affordability in Neighborhoods Experiencing Rising Rents and Property Values

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Abstract

To ensure that low- and moderate-income households can continue to afford to live in neighborhoods experiencing rising rents and property values, local governments will need to adopt comprehensive strategies that make use of multiple policy levers. This article outlines a framework for thinking about the necessary local policies organized into six components: (1) preservation, (2) protection, (3) inclusion, (4) revenue generation, (5) incentives, and (6) property acquisition.

Introduction

Many urban neighborhoods are experiencing increases in rents and property values associated with an influx of higher-income households. This phenomenon (sometimes referred to as “gentrification”) can be a double-edged sword. On the one hand, it may contribute to the revitalization of older deteriorated buildings; generate increased property taxes for cities, helping to shore up city finances; and contribute to greater diversity in terms of income, race, and ethnicity. On the other hand, many critics are concerned that the rent and property value increases may push out long-time residents of these neighborhoods, undermining the full potential of these changes to enhance community diversity, disrupting longstanding cultural traditions, and depriving long-term residents of the health, educational, and quality-of-life benefits of living in revitalized neighborhoods.

The ideal solution to the challenge of rapidly rising rents would preserve opportunities for low- and moderate-income households to continue to afford to live in these neighborhoods even as higher-income households move in, increasing income, expanding racial and ethnic diversity. To achieve this outcome, cities and counties will need to be proactive in adopting local housing strategies designed to preserve and expand the availability of affordable housing in these neighborhoods. A

successful strategy generally will require the adoption of multiple policies or programs to address different aspects of the challenge and achieve a larger cumulative impact as well as advance planning to anticipate areas where rising rents and home prices are likely so the needed policies can be adopted early in the trajectory of neighborhood change. Communities will need to coordinate the actions of multiple local government agencies and build close working partnerships with many nongovernmental actors, including nonprofit organizations and for-profit developers, community development corporations, advocates, and others.

To address this challenge, local governments need to focus on six housing strategy components—

1. **Preservation.** Preserve existing affordable rental units.
2. **Protection.** Help long-time residents who wish to stay in the neighborhood.
3. **Inclusion.** Ensure that a share of new development is affordable.
4. **Revenue generation.** Harness growth to expand financial resources for affordable housing.
5. **Incentives.** Create incentives for developers of affordable housing.
6. **Property acquisition.** Facilitate the acquisition of sites for affordable housing.

In general, these policies will be most useful in cities and counties where strong regional economies are creating an increased demand for housing in urban areas that is driving up rents and home prices. Many of these high-cost communities are experiencing rent and home price increases throughout (or in large parts of) the city or county. These policies also may be useful, however, to address rising rents and home prices in particular neighborhoods within cities or counties that are otherwise considered to have a weak or stable housing market.

This article provides a broad overview of housing policies and programs that address each of these housing strategy components, followed by a brief discussion of cross-cutting issues that will need to be addressed as part of a comprehensive strategy for preserving and expanding affordability in these neighborhoods.

Housing Strategy Components

1. Preservation: Preserve Existing Affordable Rental Units

The first component of an overall strategy in this area aims to preserve the affordability of existing affordable rental units despite increases in surrounding property values and rents. These units fall into two main categories: (1) rent-restricted rental units and (2) unsubsidized but affordable units. Federal and state public housing units may also need preservation, although the challenges are somewhat different and so are addressed in the “Preserving Public Housing” section as a third category.

Preserving Rent-Restricted Rental Units

Most rental housing preservation efforts focus on units for which rents are legally restricted to affordable levels (rent-restricted units), usually because the owner receives one or more government housing subsidies. Federal rental subsidy programs include the Low-Income Housing Tax Credit (LIHTC) Program; a number of programs from the U.S. Department of Housing and Urban Development (HUD)—including the project-based Section 8 Program, the Section 202 Supportive

Housing for the Elderly Program, the Section 811 Supportive Housing for Persons with Disabilities program, and the Section 236 Mortgage Program—and programs from the U.S. Department of Agriculture (USDA) such as the Section 521 Rural Rental Assistance program. Two HUD block grant programs—the HOME Investments Partnership Program and the Community Development Block Grant (CDBG) program—also provide funding for housing subsidies. Some states and localities also have housing subsidy programs.

Preservation efforts tend to focus on units for which rents are restricted due to the receipt of government funding, in part, because these units are often easier to preserve than unsubsidized units and, in part, because some (though not all) of these housing units provide “deep” subsidies that base rents on 30 percent of household income. These deep subsidies are especially important for ensuring that poor households—including those living entirely on Social Security and the working poor—can afford to live in the community. The deep subsidy programs include project-based Section 8, project-based vouchers, Section 202, Section 811, and USDA’s Section 521.

Preserving rent-restricted units presents three main challenges. The first challenge is that the subsidies giving rise to rent restrictions usually have a specific duration, after which the subsidy expires and the owner may choose to raise rents to market levels. In some programs, owners also have the choice of “opting out” during the normal term of the subsidy at various trigger points or time intervals. In neighborhoods that are experiencing or expecting to experience increases in market rents, owners usually have a financial incentive to exercise their rights to raise rents to market levels rather than agreeing to keep rents below market levels. Counteracting financial incentives will thus be needed in many cases to convince owners to keep rents below market.

The second challenge is that some subsidized developments have accrued sizable capital needs that need to be addressed, such as roofs or furnaces that need to be replaced and kitchens and bathrooms that need to be updated. One way to address these needs is to seek residents capable of paying higher rents, enabling the development to borrow money against the higher rental stream to pay for capital improvements. This approach, of course, defeats the goal of long-term affordability. To address this issue, owners will often need a grant or below-market-rate loan to pay for the needed improvements, which can itself be a quid pro quo for extending affordability periods.

The third and final challenge is that, in some cases, properties are no longer being managed actively by owners but rather are more in caretaker mode. This occurs, in particular, for older properties developed as tax shelters under pre-1986 tax law, in which the owners are at points in their lives or careers where they are mostly waiting for the subsidy to end so they can sell the property rather than actively managing the property as an ongoing endeavor. In these cases, it may be important to bring in new owners who are more mission driven and focused on actively managing the developments as affordable rental properties.

Approaches used to preserve the affordability of rent-restricted units include the following—

- **Creating preservation catalogs.** An important first step is to identify the units one is trying to preserve along with information about the type of subsidies and rent restrictions present in each development and the timing of when those subsidies are going to expire. Some of this information is already available through the National Housing Preservation Database (<http://www.preservationdatabase.org>), but other information—notably, regarding state and local

subsidies—will need to be added to complete the picture. A policy brief by the Center for Housing Policy (n.d.) provides information on how preservation catalogs work, based on examples from Chicago, Illinois; Florida; New Jersey; New York City, New York; and Washington, D.C.

- **Prioritizing properties.** After the full range of potential properties has been identified, communities can determine their priority targets for preservation by reaching out to owners to learn more about their intentions and the physical and capital needs of the property and determining the likelihood that any given property will leave the subsidized housing inventory. In general, the properties at greatest risk are (1) located in neighborhoods with the highest market rents and (2) not owned by a mission-driven owner, such as a nonprofit organization; properties with high levels of accrued capital needs are also vulnerable. Where practicable, it is best to do a site-by-site analysis, because circumstances can vary from property to property. This analysis, in turn, can facilitate a determination of how properties' needs can be met in ways that encourage the preservation of long-term affordability.
- **Targeting resources.** Communities may elect to prioritize the highest priority preservation projects for the limited resources available for housing and community development activities, including HOME and CDBG funds, LIHTC, tax-exempt multifamily bonds, and 501(c)(3) bonds. The goal of such efforts generally is to develop a package of financial supports that can help properties meet any accrued capital needs and be in a position to continue to do so for as long of a period as possible. The quid pro quo for these efforts usually is a long-term extension of affordability.
- **Expanding resources for preservation.** In many cases, additional funding—above and beyond the amount normally available through federal funding streams—will be needed to preserve properties. The policies discussed later under the “revenue generation” component generate flexible funding that can be used to meet a wide range of affordable-housing needs, including preservation.
- **Facilitating transfers to new owners.** As noted previously, the preservation challenge sometimes extends beyond providing financial assistance to ensuring that properties are owned by mission-driven owners committed to actively managing the property and preserving long-term affordability. To achieve this objective, communities will often need to cultivate mission-driven owners (often nonprofit organizations) and to facilitate and finance their purchase of the properties.
- **Adopting other preservation-friendly policies.** Other policies that can help facilitate preservation of subsidized properties include (1) tax abatements to lower property taxes for owners that agree to preserve their properties as affordable, such as in the Class S incentive program in Chicago; (2) advance notice policies that give subsidized renters advance notice when an owner seeks to leave a subsidized housing program; and (3) right of first refusal policies that give either all renters or just subsidized renters (depending on the policy) a right of first refusal to match any offer to purchase a rental property that an owner seeks to convert to condominiums.¹

Galen Terrace Apartments in Washington, D.C., provides an example of preservation policies at work. A troubled project-based Section 8 property facing physical deterioration and criminal activity, Galen Terrace came under new ownership as a result of Washington, D.C.'s policy that gave

¹ Condominium conversion protections are discussed in greater depth in the “Protection” strategy.

residents a right of first refusal in the event that a rental property was put up for sale. Members of the tenant association exercised this right in 2006 and worked with the National Housing Trust-Enterprise Preservation Corporation and Somerset Development Company to make long-needed renovations and preserve the property as affordable, using a mix of low-income housing tax credits, private activity bonds, a 20-year renewal of the property's Section 8 contract, and other financing sources (National Housing Trust, n.d.).

Preserving Unsubsidized but Affordable Housing

A large share of the nation's affordable rental housing stock consists of privately owned unsubsidized units—usually older units in which rents have filtered down over time as newer units with more amenities have come on line. Many of these rental units are single-family homes or homes that provide two or three units. Others are in small, midsize or larger multifamily buildings. In many neighborhoods with rents that are low compared with those in the city or metropolitan area as a whole, these units—sometimes called “market-rate affordable” units—significantly outnumber the number of subsidized rental units.

Given the large number of these unsubsidized but affordable units, it makes sense to at least consider efforts to preserve them as affordable as neighborhoods change. Doing so, however, is easier said than done. Absent the “hook” provided by a government housing subsidy or ownership by nonprofits or mission-driven for-profit organizations, few reasons exist for owners of these buildings to forgo the profit associated with higher rents or conversion to condominiums when the market conditions allow for these higher returns.

Options to consider for preserving strategically important unsubsidized properties include the following:

- **Facilitate the purchase by mission-driven owners committed to preserving the properties as affordable.** The pioneering Housing Partnership Equity Trust offers a model for preserving the affordability of market-rate rental housing that could be put to use in target neighborhoods. Organized as a real estate investment trust (REIT), the REIT raises funds to enable participating nonprofit organizations to purchase decent-quality, market-rate affordable properties for the purposes of maintaining them as affordable over time. Tenant protection laws represent another mechanism for facilitating the purchase of properties by mission-driven owners. In Washington, D.C., for example, owners of a rental property who wish to sell it or discontinue its use as a residential property must provide residents with the first opportunity to purchase the property and a right to match any legitimate offer. This policy helped to facilitate the preservation of Galen Terrace Apartments, noted previously.
- **Provide incentives for properties to stay affordable.** In Chicago, the Class 9 program provides a tax abatement for owners of market-rate properties that undergo substantial rehabilitation so long as they agree to maintain a certain percentage as affordable. Such programs can be helpful in maintaining market-rate units as affordable but, in general, have a limited duration—such as 10 or 15 years. In the context of changing neighborhoods, such policies might best be considered as a bridge to maintain affordability for a 10- or 15-year period to provide the community with time to develop and implement longer-term options for affordability, such as the construction of LIHTC developments paired with long-term affordability covenants.

- **Bring properties into a subsidy program.** Owners of market-rate properties with substantial capital needs may find it attractive to use the LIHTC Program as a vehicle for recapitalizing and upgrading the development. Because LIHTC units may be rented only to households with incomes that are less than 60 percent of the Area Median Income (AMI)—and many target even lower-income households—this process effectively preserves the affordability of these units and also improves their quality through the investment of additional equity. The project-based Housing Choice Voucher program is another option that has the added advantage of creating units affordable to households with extremely low incomes.

Preserving Public Housing

Although most discussions of rental housing preservation focus on either privately owned rent-restricted housing or unsubsidized but affordable housing, it is also important to focus on the preservation of any public housing units that may be located within the target neighborhoods. The preservation challenge for these units generally does not refer to the preservation of affordability but rather to maintenance of the units in good physical quality. Although, in some cases, these units may be in good condition, in other cases, they may have substantial accrued capital needs and will require new financing to bring them up to current standards.

The legal framework for public housing can make it difficult to use the LIHTC Program to recapitalize these properties. A new program called the Rental Assistance Demonstration (RAD), however, offers a solution that converts public housing subsidies into a form that can be married more easily with the LIHTC Program and other subsidy mechanisms. Congress currently caps the number of public housing units eligible to convert to RAD. See Costigan (2016) for an overview of the RAD program and its initial accomplishments.

2. Protection: Help Long-Time Residents Who Wish To Stay in the Neighborhood

In addition to taking steps to preserve affordable housing in target neighborhoods, communities can adopt a variety of policies to protect low-income households from being displaced by rising rents and home values and help them manage the relocation process. Because many of these policies involve providing legal protections to renters, legal services and marketing campaigns often will be needed in conjunction with these policies to ensure residents are aware of and have the ability to exercise their rights.

Policies to protect residents from displacement include—

- **Condominium conversion protections.** These policies protect residents of multifamily rental properties in a variety of ways from adverse impacts when the properties in which they live are converted to condominium ownership. In addition to rights of first refusal for the building as a whole—discussed previously as a preservation tool—some policies require that residents be offered the right to purchase individual units in the building before they are offered to new residents. Other policies provide residents with advance notice of the conversion (so they can plan for an orderly move) and provide relocation assistance to displaced households.
- **Rent stabilization.** These policies specify that, after an initial rent is set, it can rise by only a specified amount each year. Although these policies often allow for rents to float to market each time a new resident is admitted—and thus do not guarantee the housing is initially affordable

to any particular income level—they do promote housing stability for existing residents by limiting rent increases. Most policies allow owners to raise rents to cover investments in capital improvements, so the policies cannot offer full protection from large rent increases in areas experiencing an influx of higher-income residents. They also often apply only to older buildings.

- **Good-cause eviction protections.** In some states, renters can be evicted for any reason whatsoever or no reason at all. Often, communities have the power to adopt laws that provide increased protection, providing, for example, that owners demonstrate “good cause” for eviction, such as nonpayment of rent or intentional damage to the unit. Although these protections will not help residents who simply can no longer afford the rents, they can reduce the incidence of indiscriminate evictions, giving residents more time to adjust to higher rents and, if needed, look for alternative housing arrangements. When paired with rent stabilization policies, they can promote stability for existing residents for many years.
- **Property tax protections.** Renters are not the only ones affected by higher housing costs in areas experiencing influxes of higher-income households. Homeowners with low or moderate incomes may also face higher housing costs—even if they own their homes outright—in the form of higher property taxes due to increases in assessed home values. To help protect existing owners from displacement, communities can cap the amount by which property taxes increase in a given year, set a maximum property tax level based on income, exempt a certain amount of assessed value from tax, or defer collection of increased property taxes until a property is transferred or the owner becomes deceased. By applying these policies to residents who have been in the homes for a certain period of time (for example, 5 years), these benefits can be targeted to existing residents. Some states adopt similar policies in the form of a credit against state taxes. (See Lincoln Institute of Land Policy [2012] for a compilation of residential property tax relief policies.)
- **Shared equity homeownership.** This term encompasses a range of affordable ownership policies—including community land trusts, limited equity cooperatives, and deed-restricted homeownership—that are designed to provide both initial and lasting affordability. The basic approach is to use a subsidy (or inclusionary zoning) to bring homes down to a level affordable to the target income group and then to limit resale prices according to a formula designed to balance long-term affordability to the target group with an opportunity for owners to build assets. (See Davis [2006] and Lubell [2014].) Done well, this approach can ensure that a single subsidy provides affordable-housing opportunities for one generation of homebuyers after another due to the long-term affordability of the subsidized homes. For this reason, it is well suited to changing neighborhoods that are experiencing an influx of higher-income households and can be used either as a protective mechanism to help residents continue to afford to live in a neighborhood or as a vehicle for expanding the stock of permanently affordable housing.
- **Housing Choice Voucher homeownership.** In the Housing Choice Voucher Homeownership Program, tenants with housing choice vouchers use them to pay for homeownership costs, such as mortgage payments and property taxes, rather than for rent. The family pays 30 percent of its adjusted income for housing costs and the public housing authority pays the difference between the family contribution and a locally determined voucher payment standard (Brennan and Lubell, 2012). Communities interested in using voucher homeownership as a protective

strategy for existing residents in a changing neighborhood could work with their local housing authority to ensure the option is available in the community and encourage its use in the target neighborhoods.

3. Inclusion: Ensure That a Share of New Development Is Affordable

In addition to preserving existing affordable housing within changing neighborhoods, local governments will also want to take steps to ensure that a share of new development is affordable. The most common mechanism for doing so is “inclusionary zoning,” a land use policy that either requires or creates incentives for developers to make a share of newly developed units affordable. The related term “inclusionary housing strategy” or “inclusionary housing policies” encompasses inclusionary zoning and most of the other policies covered by this article that help ensure that affordable housing is available in areas experiencing new development.

Mandatory Inclusionary Zoning

Inclusionary zoning policies can be mandatory or voluntary. The classic mandatory inclusionary zoning ordinance specifies that a share of newly developed housing units—for example, 10 or 20 percent—must be affordable to households at a specified income level. In developing a mandatory inclusionary zoning policy, communities will need to determine—

- Which developments are covered by the mandate.
- The share of units required to be affordable.
- The target income level of the affordable units.
- The duration of required affordability.
- Whether to allow owners to pay a fee in lieu of providing units on site.
- Whether to allow owners to build units off site in lieu of building on site.
- What offsets, if any, to provide developers in compensation for the lost revenue associated with the affordable units.

Allbee, Johnson, and Lubell (2015) provided a summary of the considerations involved in making these determinations. Jacobus (2015) prepared an indepth guide to designing mandatory inclusionary zoning policies. Sturtevant (2016) summarized lessons learned from research on inclusionary zoning. Levy et al. (2012) reviewed the inclusionary zoning policies of Montgomery County, Maryland, and Fairfax County, Virginia—longstanding inclusionary policies that, together, have produced more than 16,000 affordable units.

In some states—notably California, Colorado, and Wisconsin—courts have interpreted mandatory inclusionary zoning policies as a form of rent control, which is not permitted under these states’ laws, and thus restricted the ability to apply these policies to rental housing. To address this limitation, several California jurisdictions, including San Francisco, have instituted an affordable-housing fee on new rental development. Developers have the option of producing affordable housing units in lieu of paying the affordable-housing fee. (This approach is essentially the inverse of a traditional inclusionary zoning policy.) The high fee in San Francisco has made the affordable-housing development option more attractive to developers (Hickey, 2013).

Voluntary Inclusionary Policies/Density Bonuses

Although most successful inclusionary zoning policies are framed as requirements, some policies have succeeded in generating affordable units through policies that are voluntary rather than mandatory. The key to a voluntary policy is to have really strong incentives that make sense within the market context. For example, New York City rezoned formerly industrial land on the Brooklyn waterfront as residential land, providing a strong density bonus for developers that agreed to meet specified affordability targets (20 percent of units at rents affordable to households at or below 60 or 80 percent of AMI, depending on the use of other programs). Because greater density is highly valued in New York City, the program was able to generate about 2,700 permanently affordable rental units between 2005 and 2013. Some 949 affordable units were built on the Brooklyn waterfront, which accounted for about 13 percent of total units built in the area (Ullman, Freedman-Schnapp, and Lander, 2013). New York City ultimately determined, however, that it needed to produce a larger number of affordable-housing units and thus, in 2016, adopted a new mandatory inclusionary zoning policy applicable to all future upzonings that requires about 25 percent of newly developed units in covered areas to be affordable.

Some communities have policies that provide—either as a matter of formal policy or as a matter of practice—that a certain level of affordability will be required whenever an applicant seeks a variance from the standard zoning requirements. This approach has the advantage of making the nexus between the affordability requirement and the provision of a government benefit in the form of the zoning variance very clear. It is also a policy that can be adopted as a matter of practice even when insufficient political will exists to adopt a broadly applicable inclusionary zoning policy. It additionally gives policy officials a significant level of control over individual development approval decisions, which get made on a case-by-case basis. On the down side, the policy provides less predictability to developers and also increased costs associated with navigating variances or special use permits for virtually every project, which can potentially depress the overall level of supply and investment in the housing market and raise housing costs for residents living in unsubsidized rental units.

4. Revenue Generation: Harness Growth To Expand Financial Resources for Affordable Housing

The fourth component of a strategy for helping to ensure that families of all incomes can afford to live in areas experiencing an influx of higher-income households is to set up mechanisms for using the growth associated with new development or redevelopment to generate funding for affordable housing. The three principal policies within this component are (1) tax increment financing (TIF), (2) linkage fees, and (3) housing trust funds.

Tax Increment Financing and Related Tools

In general, TIF is a mechanism used for funding infrastructure and other public improvements through the future increases in property taxes expected to result from these investments. Consider, for example, a community that wanted to redevelop a distressed downtown neighborhood and needed funding for the necessary investments in roads, sidewalks, water/sewer, schools, parks, and so on. These investments would be expected to increase the value of property located in the neighborhood, generating increases in property taxes. By establishing a TIF district, with specific

geographical boundaries and a specific duration, a community can capture some or all of the increased property taxes that are collected after these investments are made (the “increment”) for the duration of the TIF. These funds can be used to reimburse the community for the original investment or to repay a loan that was made to finance the original improvements. Depending on state law, the property tax increment can be used for other purposes as well, including affordable housing within the TIF district.

The key to using a TIF for affordable housing is to enact a legally binding requirement at the time the TIF is established to use a portion of the funds for affordable housing. For many years, such a requirement was in place in California, where 20 percent of TIF revenues from TIFs established by redevelopment agencies were required to be spent on affordable housing. Several cities have similar requirements, including Madison, Wisconsin, which has a 10 percent set-aside of TIF funds for affordable or workforce housing, and Portland, Oregon, which has committed to invest a minimum of 30 percent of TIF funds in affordable-housing development. In other communities, no citywide requirement exists for an affordable-housing set-aside from all TIFs, but the requirement has been included in the authorization of a specific TIF when adopted by city council or other authorizing body.

One challenge with using TIFs in the context of areas with rising rents and home prices is that the enabling statutes often specify that TIFs be used only in blighted or distressed neighborhoods. In states that take a strict view of requiring blight or distress as a condition for establishing a TIF, it may make sense to seek statutory authorization for a new type of mechanism that works similarly to a TIF but can be applied equally to neighborhoods experiencing an influx of higher-income households, irrespective of whether the neighborhood starts out as blighted or distressed. Such a vehicle might conceivably tap only a portion of the “increment,” as traditionally defined in TIFs, to minimize concerns of diverting funds from schools and could have limited uses—perhaps focused only on affordable housing or on a narrow range of activities that include affordable housing.

The Homestead Preservation Reinvestment Zones established by the Texas legislature to address concerns with gentrification in parts of Austin and Dallas provide a precedent for this approach. The 2005 legislation (updated in 2013) authorizes TIF-like vehicles and also other housing policy options within districts designated locally within Austin and Dallas to, among other things, “provide affordable housing for low-income and moderate-income residents in the community; . . . promote resident ownership and control of housing; . . . keep housing affordable for future residents; and capture the value of public investment for long-term community benefit.”² Although the criteria for establishing the zones are still somewhat restrictive and the specific basket of policies included in the legislation may or may not make sense in every state, the legislation nevertheless provides a precedent for other states to set up specific zones designed to capture a portion of increased property tax values for purposes of helping to preserve and expand affordable housing in changing neighborhoods.

² Texas H.B. 525 (2005), relating to the creation of homestead preservation districts, reinvestment zones, and other programs to increase home ownership and provide affordable housing.

Linkage Fees

Linkage programs are another mechanism for generating funding for affordable housing in neighborhoods undergoing development or redevelopment. They generally are implemented as a fee, applied on a per-square-foot basis to new retail development.

A number of justifications exist for these fees. In areas where retail and residential developers are competing directly for land—as is often the case in changing urban neighborhoods that are characterized by mixed-use land patterns—the competition can drive up property values, aggravating affordable-housing challenges. In areas where retail and residential developers are not in *direct* competition, such as in designated retail areas, the addition of new retail can still reinforce the cycle of neighborhood change in nearby residential areas, providing amenities that attract additional higher-income households and also workers who want to live close to work, leading to increases in rents and home values.

Linkage fees are also sometimes explained as a remedy for a “jobs-housing imbalance” in a market where commercial development begins to outpace affordable-housing production. Some communities have found that commercial projects, such as the construction of offices, business parks, hotels, warehouses, and shopping centers, create a demand for housing affordable to the very low and low-income households that work there. This increased demand for a limited supply of affordable units can drive up rents and home prices that potentially jeopardize the ability of existing residents to afford to remain in the neighborhood.

In implementing a linkage program, communities need to strike a balance between raising funds for affordable housing and encouraging economic development and growth. Communities also need to meet a number of legal requirements. Local governments generally are required to show a reasonable nexus between the challenge the community is trying to address (in this case, the need for affordable housing created by commercial development) and the solution being adopted (the linkage fee). See David Paul Rosen & Associates (2001) and Local Progress and Cornerstone Partnership (2013).

Linkage fees have been used successfully in a number of communities around the country. Some localities like Fairfax County have implemented a linkage fee program in response to planned transit development. Others, like Boston, Massachusetts, apply the policy citywide.

Housing Trust Funds

Many cities, counties, and states have established housing trust funds to generate flexible revenue for affordable housing. These funds can be financed in a variety of ways, including through general revenue bonds, discretionary appropriations, document recording fees, real estate transfer taxes, linkage fees, and fees paid in lieu of providing affordable units under an inclusionary zoning policy.

Many of the funding mechanisms for housing trust funds are linked to new growth and thus represent a form of “value capture” similar to TIFs and linkage fees. In addition to linkage fees and in-lieu fees, these mechanisms include document recording fees and real estate transfer taxes. These “dedicated” fees rise and fall with the volume of new development and so represent a good way to generate funding when communities are experiencing new development. When growth slows

down, however, these funding sources start to dry up, even if the need continues to be high for affordable housing. The Center for Community Change (n.d.) provides a hub for information on state and local housing trust funds.

5. Incentives: Create Incentives for Developers of Affordable Housing

Communities can offer a range of incentives to stimulate the development of affordable housing in targeted areas. Voluntary inclusionary housing policies are essentially structured as an incentive, generally offering increases in density or relief from other provisions of the zoning code in exchange for the inclusion of affordable units within new development. This section highlights additional incentives that communities can use to stimulate the production of additional affordable housing, including—

- Tax incentives.
- Parking incentives.
- Expedited permitting.
- Reduced impact fees.
- Transfers of development rights.
- Targeting of federal, state, and local housing subsidies.

To be effective, the incentives need to make a material difference in the bottom line for developers, which can be accomplished through a single large incentive or by combining smaller incentives together to achieve a larger collective impact.

Tax Incentives

Communities have used a range of tax incentives to encourage the development and rehabilitation of affordable housing. Common tax incentives include freezing a property's taxable assessed value after construction or rehabilitation for a period of time or providing a lower property tax rate. These policies are sometimes called tax abatements or exemptions. Some states also provide a credit against state income taxes.

Tax incentives can be used to achieve a number of different housing policy goals. In neighborhoods experiencing rapidly rising rents, communities will want to focus on incentivizing long-term affordability. In weaker markets or in neighborhoods with higher levels of distress, tax incentives can be used to stimulate rehabilitation and new development of market-rate homes.

Parking Incentives

Because of local zoning codes, developers often have to meet minimum off-street parking requirements meant to reduce traffic congestion and overcrowding. These parking spaces increase land acquisition costs, which often are passed on to the homebuyer or renter. By reducing parking requirements for developments that include affordable housing, localities can decrease production costs, allowing the developments to provide more affordable housing. This tool may be particularly useful in dense, high-cost cities where land prices are very high and account for a large proportion of a development's overall costs.

For example, in Denver, Colorado, developers of rental housing who voluntarily agree to set aside at least 10 percent of the units as affordable housing receive a reduction in parking requirements, among other incentives. In King County, Washington, developers receive a 50-percent reduction in onsite parking requirements for each affordable unit.

Expedited Permitting

Another incentive for affordable housing that some communities offer is an expedited permitting process that helps reduce development costs associated with delays in permit processing. For example, in 2009, Rhode Island passed a law, Expedited Affordable Housing Permitting, which granted state agencies the ability to expedite the approval process for affordable-housing developments that address critical housing needs. In Pinellas County, Florida, affordable-housing development receives priority in the permit review process with a 2-week turnaround.

Reduced Impact Fees

Impact fees are one-time charges for new development designed to cover the costs of developing infrastructure to support that unit, such as water, sewer, and schools. Court cases have established that impact fees must have a “rational nexus” in terms of the actual impact of development on public facilities or other infrastructure. By reducing or waiving fees for affordable housing below the levels that may otherwise be required, localities can provide incentives for developers to provide affordable housing.

Transfers of Development Rights

A transfer of development rights (TDR) program is meant to transfer development potential from one site to another. The “sending site” sells its development rights (for example, the right to build at all or above a certain height) to a “receiving area,” where a developer can now build at a higher density or height than usually permitted by local zoning codes. Although often used to preserve open space, this approach has also been used to preserve affordable housing in dense, urban areas experiencing high levels of redevelopment. One approach is for existing affordable housing to serve as “sending sites” that can grant development rights to developers of other properties, raising funds to recapitalize and upgrade the units, preserving long-term affordability. This market-based tool has the ability to preserve certain areas and encourage development in other areas that can handle increased density. Rather than increasing overall density, TDR policies use the economic value of greater density to developers to generate funds for the development, rehabilitation, and preservation of affordable housing.

For example, a TDR program in Seattle has been used to preserve affordable housing since 1985. Seattle’s TDR program focuses on preserving existing low-income housing in the city. Through the program, the city can transfer development rights from low-income housing sites to downtown developments that want more density. Nonprofit organizations that need to rehabilitate or preserve affordable-housing units sell the site’s development rights to the city, which are then deposited into a TDR “bank” for developers to purchase.

Targeting of Federal, State, and Local Housing Subsidies

Other resources available to create incentives for the development of affordable housing in areas experiencing an influx of higher-income households are communities’ bread-and-butter housing

programs, funded by the HOME and CDBG funds and a diverse array of other funding sources, depending on the community, including general obligation bonds, general revenue, and state funding. In administering these programs, some communities give equal weight to applications from all parts of the community, but other communities give a preference for funding in certain priority neighborhoods. Because the resources for these programs are typically very limited, communities that wish to use their bread-and-butter programs as incentives for stimulating the preservation and expansion of affordable housing in particular neighborhoods will likely want to signal clearly in their requests for proposals and other funding plans that investments in specific target neighborhoods (or neighborhoods meeting certain criteria of need) will be prioritized for funding.

Federal funding for both HOME and CDBG has experienced cuts, leading to tight allocations that force communities to make difficult choices and reduce the scale of the impact that can be achieved directly with this funding. In considering the impact of these funding sources and decisions on how to target these funds, however, it is important to remember that these and other sources of local funding often leverage substantial additional funding through the LIHTC program. In many communities, LIHTC deals require some source of “gap funding” to cover the difference between what a project costs to develop and what the equity raised by the LIHTC and the debt supported by expected rent revenues will support. For this reason, a community’s decision to focus a substantial portion of its allocation of HOME or other funds on specific geographical areas can have an outsized impact on the production of affordable housing in those neighborhoods.

6. Property Acquisition: Facilitate the Acquisition of Sites for Affordable Housing

One of the biggest challenges associated with preserving and expanding affordable housing in an area experiencing rising rents and home prices is gaining control of desirable sites for development or redevelopment at affordable prices. These challenges differ depending on where a neighborhood is on the spectrum of neighborhood change.

Early in the trajectory of neighborhood change—when an increase in demand is not yet apparent or has not yet expressed itself in higher rents or land prices—development sites generally are easier to acquire at comparatively affordable prices. The lower prices, however, generally reflect a heightened level of risk, at least from the perspective of market-rate developers, because the potential of the site to achieve full occupancy (or sell at prices that will generate a profit) is not yet clear. Because of this uncertainty, a lengthy holding period often is required between the time a property is acquired and the time a property is developed, which can add costs (interest on any loans taken out to purchase the property plus responsibility for property taxes) and, in some cases, make it more difficult to use federal funding for the acquisition.

At this stage in the cycle, developers interested in preserving or developing affordable housing may need access to capital for land acquisition that is more patient than federal block grant funding and, in some cases, may need assistance paying for property taxes while a property is in the holding period. They also may need some backstop for the risk that a neighborhood may not be ready to absorb the planned development for some period of time. Although the challenges associated with achieving full occupancy in an affordable property are different from those of a market-rate property, they are real and need to be addressed for a development to be successful.

By contrast, late in the trajectory of neighborhood change—after rents and home prices have risen substantially—the challenge is reversed. At this point, prices tend to be high but the risk that a property will not achieve full occupancy is much lower. Easy-to-develop sites often are hard to find and property prices generally assume that renters or purchasers will have much higher incomes than the low-income households affordable-housing developers seek to serve.

At this point, developers of affordable housing do not need long-term patient capital so much as they need flexible capital that can be deployed quickly to compete effectively with private developers offering all-cash purchases. They also need financing on attractive terms. To achieve affordable, flexible financing that is easy to deploy quickly, some form of credit enhancement often will be needed from the public or nonprofit sector.

Of course, many neighborhoods fall in between these two extremes. Communities that wish to maximize the availability of affordable housing in targeted neighborhoods can facilitate its development by working closely with developers of affordable housing to understand the property acquisition challenges they face and help them overcome them.

The following two approaches have been used to help developers acquire properties for affordable housing.

Property Acquisition Funds

Some communities have set up funds to facilitate the purchase and holding of properties for development as affordable housing. The most common model is a revolving loan fund that provides low-interest-rate loans to nonprofit organizations for the acquisition of property to be developed or redeveloped as affordable housing. A second approach is a direct acquisition model in which a single entity purchases and holds land for subsequent development by outside developers.

These funds address several factors that prevent nonprofit developers from competing on an equal footing with private developers in the private market. Unlike market-rate developers, developers of affordable housing typically have few sources of available flexible funds to purchase property. In addition, public-sector funds for affordable-housing development usually require a lengthy application and competition process. These factors constrain the ability of an affordable-housing developer to successfully compete for property acquisitions in the private real estate market.

Affordable-housing developers can access low-interest capital more quickly through acquisition funds than through many other public-sector funding sources. These funds are usually made possible by the collaboration of several investors, including the local government, community development financial institutions, and private banks.

The New York City Acquisition Fund provides an example of how an acquisition fund can provide support for affordable-housing development in a highly competitive housing market. To help level the playing field with market-rate developers, the fund makes up to \$210 million in loans available for up to 3 years to developers of affordable housing for acquisition and predevelopment financing through major banks and financial institutions. These institutions are protected by a \$40 million guarantee pool consisting of \$8 million of City funding and \$32 million in funding from philanthropic foundations (New York City Global Partners, 2013).

Two other funds focus more specifically on facilitating affordable-housing development near transit—

1. The Bay Area Transit-Oriented Affordable Housing Fund is a \$50 million fund managed by the Low-Income Investment Fund, a Community Development Financial Institution. The fund focuses primarily on supporting the production and preservation of affordable housing in the San Francisco Bay Area, but 15 percent of the funds are set aside for the development of neighborhood amenities, including community facilities, health clinics, retail, and grocery stores. (Seifel Consulting Inc., 2013).
2. The Denver Transit-Oriented Development Fund is an example of the alternative model in which a single entity—the Urban Land Conservancy—purchases and holds property for subsequent development. It was established to purchase key sites for the creation and preservation of more than 1,000 affordable-housing units in “current and future transit corridors” in and around Denver (Urban Land Conservancy, n.d.)

Use of Publicly Owned Land

Another approach to addressing the challenges associated with acquiring properties for development of affordable housing in changing neighborhoods at reasonable prices is to focus on properties owned by public agencies within the city, including properties owned by public hospital corporations, police and fire departments, school boards, and a wide range of administrative entities. Some of these sites may have vacant or underutilized land that can be used for affordable housing, such as a parking lot that is rarely at capacity. In other cases, a property may have been developed at a density that is low compared with the higher densities emerging as the community changes. By redeveloping the property at a higher density, the original purpose can continue to be served while also making space available for affordable or mixed-income development.

In addition to developing affordable housing on land controlled by a range of city agencies, some communities also seek to use the inventory of tax-delinquent properties as a source of property for affordable housing. This approach works as long as an adequate number of tax-delinquent properties that are desirable development sites are within the target neighborhoods. As the market for housing in target neighborhoods begins to heat up, however, fewer tax-delinquent properties are likely to be within those neighborhoods as owners find buyers willing to purchase the properties and retire the tax debt. So this approach may work better toward the beginning of a neighborhood change cycle than toward the end.

A number of challenges are associated with using tax-delinquent properties for affordable housing or other development, including lengthy and complicated tax foreclosure processes and challenges assembling small parcels into development sites. An excellent manual about “land banks” by Frank Alexander (2011) provides a comprehensive overview of the challenges and approaches to addressing them.

Cross-Cutting Issues

In developing a comprehensive housing strategy for preserving and expanding affordable housing in target neighborhoods, it will be important for localities to address a number of cross-cutting issues.

Advance Planning

Advance planning is always a good idea, but it is particularly important in this area because of the impact of rising land prices on the overall costs of an affordable-housing strategy. The longer one waits to get serious about an affordable-housing strategy, the more difficult and expensive it will be to acquire attractive sites for development or redevelopment as affordable housing. In some cases, the higher-income households that move into a changing neighborhood also become the strongest critics of new development, again underscoring the importance of early and comprehensive planning. Finally, it often takes a period of years to put a strategy in place and begin creating affordable units, so it is best to start early.

It is not always easy to identify which neighborhoods are likely to experience influxes of higher-income households before it happens, and, as noted previously regarding land acquisition, it can be problematic to guess incorrectly. Despite the risks, it is essential to be looking ahead and paying attention to early warning signs, rather than waiting until after the change process has taken place and having to play catch-up.

Public and Private Capacity

The successful execution of a strategy to address rising rents and home prices will require a high level of capacity both within and outside government. Cities and counties can look to similar communities for models of ordinances and implementing practices, but, ultimately, policies will need to be customized to meet the needs of each locality. Members of the development community and advocates can help local government officials identify promising models and adapt these models to local market dynamics. A strong infrastructure of affordable-housing developers will also be needed to help implement many of the policies.

Long-Term Affordability

Many affordable-housing strategies aim to create housing that is affordable at the outset, and perhaps for the next 10 to 15 years, but do not focus sufficiently on what happens to housing prices or rents after that time period. This flaw can be fatal for neighborhoods where home prices and rents are rising, because the homes are unlikely to remain affordable after the initial affordability period ends.

Options for maintaining long-term affordability include shared equity homeownership (on the ownership side) and long-term covenants and nonprofit ownership (on the rental side). Well-designed policies can maintain affordability for 50 years or longer, helping to maximize and maintain the value of scarce public subsidy and ensure that efforts contribute to the overall stock of affordable homes, rather than simply replacing units exiting the affordability period. In many cases, these options will require local initiative because the affordability periods required by federal law are not long enough to preserve affordability in changing neighborhoods.

Increased Density

Rents and home prices are highly sensitive to the law of supply and demand. So long as demand for housing is low and supply is high, prices and rents will tend to be low relative to other locations, but, when demand for housing is high and supply is low, rents and home prices tend to go up, which is often the case in changing neighborhoods.

Allowing for density to increase is one way to make it easier to accommodate strong demand among incoming residents in a changing neighborhood without displacing existing residents and thus has a place as part of an overall housing strategy. In a neighborhood experiencing strong increases in demand for housing, it will seldom be possible to increase density sufficiently to keep housing prices and rents from rising at all; the best conceivable outcome is slower growth in rents and home prices. Policies to increase density can also be problematic if they accelerate the process of neighborhood change before a full-blow housing affordability strategy is in place, and, by themselves, these policies rarely produce housing in changing neighborhoods that is affordable to the very lowest incomes. If married with a comprehensive affordable-housing strategy, however, increased density can play an important role in providing ample space for both existing residents and newcomers and in generating new development that produces affordable units through an inclusionary zoning policy.

Reduction of Barriers to Development

Consistent with the discussion on density, communities may wish to consider overall reforms to their housing entitlement process that reduce barriers to new development, allowing for the supply of housing to better respond to increased demand. Density is one component of this reform process, as are the related concepts of minimum lot size and required set-backs. Parking requirements can also be a problem by increasing the amount of land needed per unit. Other barriers include lengthy permitting processes, complicated and lengthy zoning approval processes, and environmental requirements that do not effectively balance legitimate environmental goals with the need for an increased supply of housing. As with density limitations, it is unlikely that a barrier reduction strategy on its own will achieve a community's affordability goals, but it can be an important part of a broader strategy.

Targeted Versus Citywide Policies

Many of the strategies discussed in this article can be employed either in specific neighborhoods or in the city as a whole. Communities will need to decide which approach to take. Targeted policies can be more impactful than broader policies, given a limited amount of public subsidy to expend, but they may raise political issues among residents and representatives of other parts of the community. One way to avoid the appearance of singling out particular neighborhoods is to specify that policies apply wherever certain objective market conditions apply, such as median rents above a certain level or median rents increasing at a certain rate. Some of the policies, such as TIF, can be applied only to a targeted area. In practice, many communities will end up with a combination of targeted and citywide policies.

Building Community Support and Political Will

Political support will be needed both to pass the necessary public policies and to ensure that individual affordable-housing projects can be developed. Community opposition can make or break an affordable-housing project. To facilitate the necessary development and the preservation and expansion of affordable housing, communities will need to work proactively with residents and resident leaders and groups to build a trusting relationship and ensure that the city's plans for the neighborhoods respond to residents' needs and concerns.

Conclusion

The dynamic of neighborhood change brought about by increases in demand among higher-income households can be difficult to fine tune. At the outset, neighborhood change holds the possibility of increasing diversity, but, after rent and home price pressures build up, the promise of increased diversity can give way to displacement and resegregation. The local policy environment has the potential to be an important factor shaping the final outcome. A range of policy tools are available to local governments to preserve and expand housing opportunities affordable to low- and moderate-income households. Communities that wish to protect long-time residents and preserve diversity will need to act proactively to adopt a suite of complementary policy tools as early as possible in the cycle of neighborhood change.

Acknowledgments

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Commentary: A Federal Perspective on Gentrification

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Introduction

During the past 4 months, as part of the U.S. Department of Housing and Urban Development's (HUD's) "Prosperity Playbook" initiative, Secretary Julián Castro has joined local leaders in a series of convenings around the country, in cities and regions trying to address housing affordability in a way that also supports inclusive and equitable growth.

The issue of "gentrification," or community change, has been core to those conversations. What we are hearing on the ground is a widespread need for policies and tools to help areas manage the change, to harness the potential up side of renewed attraction to and investments in low-income and urban neighborhoods while minimizing the possible down sides, such as displacement, increased housing cost burdens, and the potential for long-term resegregation.

At times, these conversations have been fraught. They surfaced policy tensions and broader housing market issues that are an important backdrop for the symposium articles in this *Cityscape* issue and for policy discourse. To set that policy context, I begin by highlighting some key trends and issues noted in those conversations and by the symposium articles in this issue and connect them to the broader affordability crisis. I then draw three main policy points relevant for any policy discussion focused on gentrification. I end by describing the federal policy levers that, in combination, may be most useful for improving community outcomes in the face of affordability stressors and community change.

Key Gentrification Trends and the Broader Housing Affordability Context

Although gentrification has been written about for decades, some important trends in the current wave of neighborhood change are worth highlighting and placing in the broader context of housing market conditions and supply response.

Gentrification Trends

In their article in this Symposium, Jackelyn Hwang and Jeffrey Lin note that the revival of downtown neighborhoods has been increasing since the 1980s, but it has accelerated since 2000, affecting a much larger share of urban areas (Hwang and Lin, 2016). As documented by Ellen and Ding in their guest editors' introduction to this symposium, gentrification in this most recent period differs from in previous decades in at least two important ways: (1) unlike neighborhoods in the 1980s and 1990s, low-income city neighborhoods are now *also* experiencing much larger socioeconomic changes, namely in race and educational attainment, and (2) they are also experiencing much greater increases in rents (Ellen and Ding, 2016). Both factors, and especially the large increases in rents, are important components of local policy discussion.

Some of the biggest concerns about gentrification—potential displacement and increased rent burdens—are driven by rent (or housing cost) increases. Although researchers to date generally have not found evidence of displacement from gentrification, that finding may be because most researchers proxy displacement by turnover rates, which capture all types of moves—including households that move to live in better neighborhoods. We might expect those types of moves to actually *decrease* in gentrifying neighborhoods, even as moves related to displacement pressures increase.

Recent work from Ding, Hwang, and Divringi (2015) offers a new look, distinguishing moves by where people live after they move. They found that vulnerable households in gentrifying neighborhoods are more likely to make “downward neighborhood” moves—or moves to lower-income neighborhoods—than those in nongentrifying areas. They also found that such moves are more likely when neighborhood housing cost increases are larger. Ellen and Torrats-Espinosa (2016) similarly found that rent increases are associated with a greater probability that housing choice voucher (HCV) residents will move and increase the concentration of HCV holders in certain neighborhoods. Voucher households that do not move also experience higher rent burdens, paying more than 30 percent of their income toward rent. This collective research suggests that, regardless of the level of displacement gentrification may have caused in the past, today we are likely experiencing greater displacement of the most vulnerable.

It is worth asking why we are seeing these patterns now. One important reason raised in this symposium is the increased demand for centralized neighborhoods among younger, more educated, and White households, generating greater demographic change than in previous periods (Hwang and Lin, 2016). In terms of rent increases, it is worth considering another related factor: the overall affordability crisis and supply responsiveness.

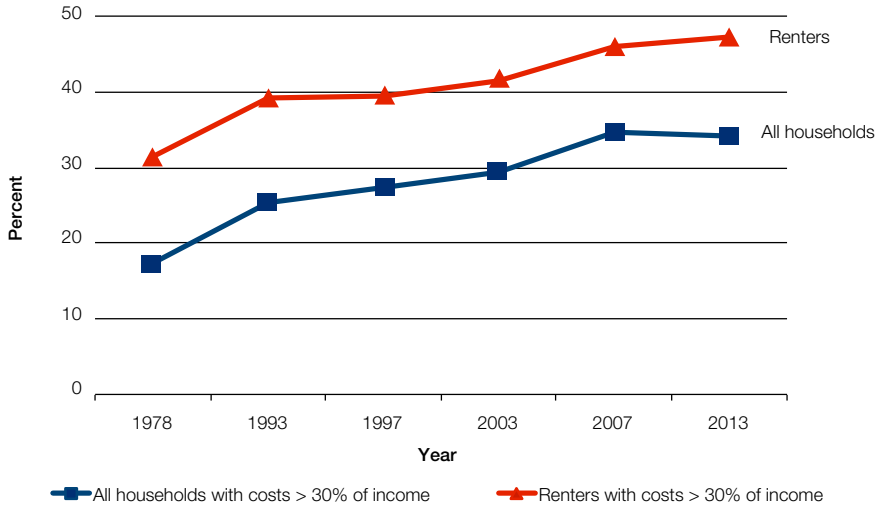
Affordability Crisis

Although considerable attention has been paid recently to the overall affordability crisis, particularly among renters, the crisis has been a long time in the making. As exhibit 1 depicts, housing costs in the United States have been increasing since the late 1970s.

Exhibit 2 shows the crisis has also expanded far beyond coastal and “hot market” cities. The Joint Center for Housing Studies of Harvard University reports that, in all but a small share of markets across the country, at least one-half of lowest-income renters have severe housing cost burdens (JCHS, 2016).

Exhibit 1

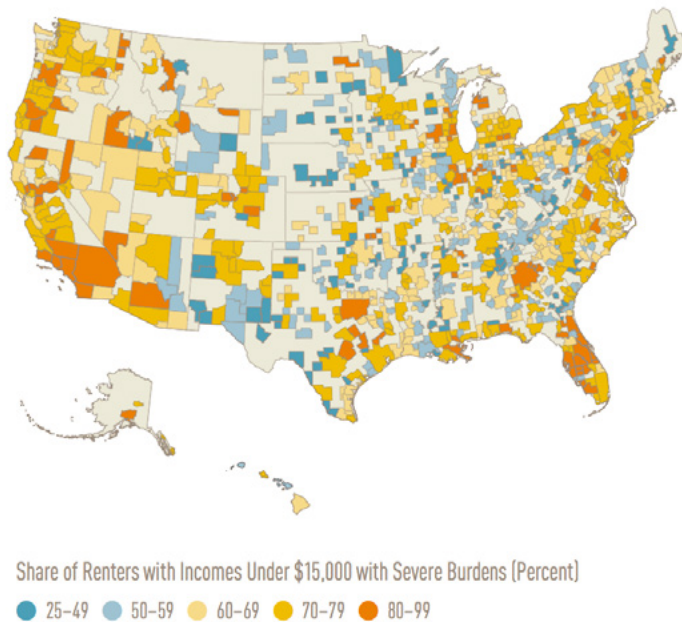
Prevalence of Housing Cost Burdens, by Severity and Housing Tenure, 1978–2013



Source: American Housing Survey

Exhibit 2

In Most of the United States, a Large Majority of Lowest-Income Renters Are Severely Cost Burdened



Notes: Severely cost-burdened households pay more than 50 percent of income for housing. Data are for Core Based Statistical Areas.

Source: Reproduced from JCHS (2016)

Cost burdens also are now reaching beyond just the lowest-income renters. Between 2010 and 2014, rent burdens among moderate-income renters increased across the board; in 2014, that increase was particularly true in the 10 metropolitan areas with the highest median housing costs (where three-fourths of renter households earning between \$30,000 and \$44,999 and one-half of those earning between \$45,000 and \$74,999 were cost burdened) (JCHS, 2016).

The overall increase in housing costs demonstrated here means that concerns about housing cost burdens and possible displacement should focus much more broadly than on neighborhoods technically undergoing gentrification. Those pressures are now far more pervasive, and the need for effective policy interventions far more urgent.

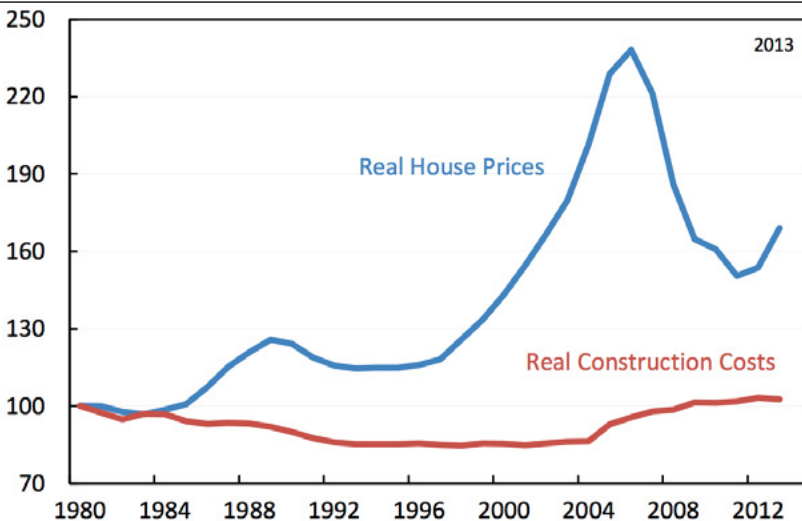
Supply Response

Why have we not seen supply responses during the recent decades to meet the demand for housing? A growing group of researchers has focused on the role of increasingly restrictive local regulation of land: zoning practices that inhibit construction and increase the cost of housing.

For example, Gyourko and Molloy (2015) indirectly examined the role of regulations by assessing the relationship between real construction costs and the price of housing (exhibit 3). Until the early 1980s, the two were closely connected, but, since then, a large and increasing gap has emerged. With competition in housing and construction markets, we expect any remaining gap to reflect the cost of land; that cost increases with tighter land use control, which they posit is driving the gap.¹ In related work, Glaeser, Gyourko, and Saks (2005a) found that, until the 1970s, housing

Exhibit 3

Real Construction Costs and House Prices Over Time



Note: Index: 1980 = 100.

Source: Reproduced from Gyourko and Molloy (2015)

¹ See Jason Furman's discussion of these issues (Furman, 2015).

price increases were driven by rising quality of both housing and construction. Since the 1970s, however, the authors concluded that price increases instead have reflected the difficulty in obtaining regulatory approval for new home construction.² In areas with increased demand, such as Manhattan, land use regulations are credited with constraining the supply of housing and leading to an increase in prices (Glaeser, Gyourko, and Saks, 2005b).

A collection of work is drawing more direct connections between local zoning restrictions and the cost of housing for specific cities and the correlation between local restrictions and overall affordability. For example, Glaeser, Schuetz, and Ward (2006) found a 1-acre increase in a Boston-area town's minimum lot size was associated with a drop of about 40 percent in housing permits, and Gyourko, Mayer, and Sinai (2013) demonstrated that the widening of real home price distributions is correlated with variation in adoption of land use restrictions by communities.

None of these patterns—the decades of increased housing costs and restrictions on supply—suggest a temporary problem or that we are waiting for the market to catch up. In fact, regulations are particularly restrictive for multifamily housing units and incentivize expensive housing development over moderately priced housing (Quigley and Raphael, 2005). This greater restriction creates additional challenges to accommodating the increased demand for downtown living and the need for affordable rental units.

Context for Policy Responses

Given these trends, I make three main points that shape how we need to think about policy responses.

The first point is that we need to be mindful of the interconnection between the larger affordability crisis and gentrification. The broad rental affordability crisis itself may drive or contribute to gentrification. As downtowns have become more desirable, the (now) high cost of many middle- and upper-income neighborhoods may push demand to low-income neighborhoods. On a broader scale, California has experienced “spillover” demand from its coastal communities to cheaper inland neighborhoods, resulting in workers living farther from their places of employment and facing longer commutes (State of California LAO, 2015).

The overall lack of affordability and inadequate response of housing supply may also be key reasons why neighborhoods that are gentrifying during recent years are experiencing much greater rent increases than in the past. The interconnection between affordability pressures at the neighborhood level and overall affordability highlights the need for increased supply and supply responsiveness. Whereas increased supply is particularly needed in and around specific neighborhoods, it is also needed beyond areas that are gentrifying.

The second point is the policy challenge of local politics. Given the increased demand in centralized locations, increasing supply may well require higher-density housing, which may not match the current stock in some neighborhoods or the preferences of current residents. This mismatch poses policy and political challenges for locally elected officials. The policy prescription that the

² Glaeser and Gyourko (2002) drew similar conclusions during an earlier period.

larger problem calls for (that is, more housing) flies in the face of residents' desire to maintain their neighborhoods as they are. In addition, many residents perceive those policies as *increasing* the risk of displacement. Proposed policy solutions that ignore the views and interests of current residents will likely fail to be adopted. It may be more popular locally to adopt approaches to prevent whole-sale gentrification from coming to a *particular* neighborhood, such as stopping new construction, yet those policies will only further constrain supply and fuel the general affordability crisis.

This policy challenge leads to the third point—the importance of considering neighborhoods within their broader housing markets and the overall web of connected places. Given the interconnections between neighborhoods and between proximate jurisdictions, we need to be looking at the entire picture when thinking about policy. We need to think of each neighborhood as being part of an “ecosystem” of neighborhoods and communities.

Looking at policy options and issues one neighborhood at a time misses these interconnections and the full implications of policy choices. In a recent *New York Times* article on segregation and neighborhood residency preferences, Xavier de Souza Briggs of the Ford Foundation made a similar point: “We need to be willing to look at the big picture and not at a neighborhood at a time” (Navarro, 2016). Margery Turner of the Urban Institute has also made this point in the context of mobility and reinvestment debates, arguing for a “portfolio approach” that moves away from considering one neighborhood and one project at a time (Turner, 2014).

The most forward-looking of the Prosperity Playbook stakeholders HUD has engaged with also make this point. They argue for a regional approach, recognizing that the neighborhoods to which their former city residents move are far flung, and the policy players they need to engage with to increase affordable housing go beyond jurisdiction lines. We at HUD agree.

HUD Policy Responses

Given that context, the federal government needs to focus on three complementary goals: (1) increase the supply of affordable rental housing; (2) preserve affordable housing; and (3) encourage localities to employ a range of tools, proactively and broadly.

Increase the Supply of Affordable Rental Housing

We need to increase the overall supply of affordable rental housing. Beyond the Obama administration's efforts to expand HUD's core programs for subsidized, affordable housing (HOME, project-based Section 8 rental assistance, public housing, and so forth), HUD has been looking for additional ways to encourage increased supply with existing levers and resources.

One good example of this approach is the **Federal Housing Administration's (FHA's) cut in multifamily mortgage insurance rates** implemented April 1, 2016, to stimulate the production and rehabilitation of affordable, mixed-income, and energy-efficient housing. The FHA estimates that rate reductions will spur the rehabilitation of an additional 12,000 units of affordable housing annually, create new units, and improve energy efficiency to help reduce utility costs for residents (Sullivan, 2016).

In brief, the FHA lowered the annual insurance rates for affordable housing of two types.

1. Affordable housing in which at least 90 percent of the units are under Section 8 contracts or covered by Low-Income Housing Tax Credit (LIHTC) affordability requirements (annual insurance rates lowered to 25 basis points, a reduction of 20 or 25 basis points from current rates).
2. Mixed-income properties that have units set aside based on affordability through LIHTC, Section 8, inclusionary zoning, or other local requirements (annual insurance rates lowered to 35 basis points, a reduction of 10 to 35 basis points from current rates).

An important component of the rate cut is that *it applies to local efforts to increase affordable housing*—inclusionary zoning or other local affordability requirements. This policy is an example of using existing federal levers to incentivize and support nonfederal policies that align with a federal priority: increasing the supply of affordable housing. The existence of federal resources that can be tapped by such local efforts can also be used by state and local actors to garner political support for local action—in essence adding an argument and some resources to the local arsenal for increasing affordable housing.

Preserve Affordable Housing

The United States loses more than 400,000 affordable-housing units each year (Schwartz et al., 2016), including 10,000 public housing units (JCHS, 2013). For public housing, the primary reason is a nearly \$26 billion backlog in unmet capital needs. The current structure and level for funding public housing—that is, through annual appropriations—is inadequate to address these needs.

In response, HUD created the **Rental Assistance Demonstration (RAD)** in 2013 (HUD, 2016a). RAD's main goal is to give public housing agencies (PHAs) a powerful tool to preserve and improve public housing properties. The core component of RAD is moving the housing to a more stable financing platform.

Developments are *removed* from the public housing program and receive a long-term project-based Section 8 contract that, by law, must be renewed, to ensure that the units remain permanently affordable to low-income households.

RAD allows PHAs to leverage public and private debt and equity—something they could not do in the public housing program—to reinvest in the public housing stock. They can obtain long-term mortgages to finance capital improvements and qualify for LIHTC, for example. Of particular note—

- To date, more than \$2 billion of private funding has been invested in about 30,000 units. HUD estimates more than \$6 billion will be leveraged for the 185,000 units already awarded RAD status, which is the current cap on RAD set by Congress.
- Residents continue to pay 30 percent of their income toward the rent and maintain the same basic rights they possessed in the public housing program.
- The RAD program is cost neutral and does not increase HUD's budget.

While more remains to be done to improve the RAD process, it is fair to say that RAD is a true innovation at HUD: a novel mechanism to stop the flood of lost units and begin leveraging private capital for badly needed improvements.

RAD links quite directly to gentrification. Given the central location of the oldest public housing stock in the country and the movement inward of higher-income households, the existing public housing stock may be an important tool for anchoring long-term affordable housing in and near gentrifying neighborhoods. In their article, Samuel Dastrup and Ingrid Gould Ellen document this phenomenon in New York City, where nearly two-thirds of public housing block groups were surrounded by block groups that had average incomes above the city median in 2010 (Dastrup and Ellen, 2016). As other forces bring investments to these neighborhoods, we need to ensure that the existing stock of public housing is maintained—and RAD is a financing source that can preserve and improve those units.

In addition, other legacy programs also covered by RAD, such as rent supplement, rental assistance payment, and Section 8 moderate rehabilitation, may exist in cities that can be preserved and improved. The Obama administration has proposed some additional expansions for such legacy-type programs in the 2017 budget.

Encourage Localities To Employ a Range of Tools, Proactively and Broadly

As well documented by Jeffrey Lubell's (2016) article, many if not most relevant policy levers are at the state and local level, including a variety of policies that affect the supply of housing and potential policies to forestall displacement. What can a federal agency do to encourage or push local action?

The Obama administration's fiscal year 2017 budget contains several policy proposals meant to incentivize local action, including a \$300 million Local Housing Policy Grant program at HUD to incentivize state and local policies aimed at increasing housing supply responsiveness. Here I focus on a policy change that is already being implemented—HUD's final rule on **Affirmatively Furthering Fair Housing (AFFH)**, issued this past summer (HUD, 2016b).

Beyond requiring that HUD and other federal agencies simply not discriminate, the 1968 Fair Housing Act requires them to “affirmatively further” fair housing in the administration of housing programs. This obligation applies to those receiving HUD funds, and the final rule sets forth the requirements and process for those grantees.

I see a promising connection between this rule and local actions in the face of gentrification. To provide a bit more context, here are the most relevant parts of the final rule:

- At the center of the rule is the requirement that jurisdictions receiving HUD funding complete an Assessment of Fair Housing, identifying fair housing issues.
- The assessment is completed using a standardized assessment tool and associated data and maps to help assess patterns of segregation, including what patterns may mean for access to important neighborhood services, for example. Practitioners and researchers, including Karen Chapple and Miriam Zuk in this issue, identify these tools as important in targeting policy responses to gentrification (Chapple and Zuk, 2016).

- Grantees then set forth their priority goals for addressing those issues and incorporate this analysis into their follow-on planning processes—such as the Con Plan for Community Development Block Grant grantees and the PHA plans for public housing agencies—which includes strategies and steps to be taken.

On the process side, grantees are required to have meaningful community participation as part of identifying issues and setting goals, and HUD is strongly encouraging joint or regional submissions so that multiple jurisdictions and entities would work together on the assessments and goals.

This obligation and planning process will be the backdrop for broader conversations on community change and gentrification, and I see the potential for it to support efforts of capturing gentrification's up side (increased investments) while minimizing its down side.

Much of the AFFH discussion focuses on two strategies: (1) increasing access to higher-opportunity/lower-poverty areas for protected classes, particularly for minority households, and (2) investing in existing minority communities so that they too have the neighborhood conditions that support a high quality of life and upward mobility. We need to pursue both. Of course, each has its own challenges: *gaining—and sustaining—*access to higher-opportunity areas for minority households and adopting *successful* strategies for revitalizing areas of minority and poverty concentration.

Neighborhoods that are currently undergoing gentrification or are likely to in the very near future could pose an opportunity for a third, highly impactful strategy. These areas frequently already contain minority households and are already experiencing increased investments such that neighborhood services and conditions are improving. Employing strategies here to minimize displacement and to secure affordable housing have the potential for securing longer-term affordability *and* diversity.

AFFH might provide the type of “enabling environment” for localities and regions to address the pressures of gentrification from a more holistic perspective and to garner the political will to make some hard policy and investment choices.

Parting Thought: Making Diverse Communities Work, and Work for All

As urban areas around the county grapple with pressures of gentrification, it is important to recognize the broader context: the overall affordability crisis, the interrelated “ecosystem” of communities affected by what happens in one place, and the constraints and goals of policy actors at different levels. The recent large increases in housing costs in urban low-income neighborhoods are of particular concern for communities and for HUD. I have argued, however, that the policy discussion needs to be broader to truly address the problem—in terms of policy substance (more than just affordable housing in a specific neighborhood) and in terms of policy actors (a role exists for regional and federal actors).

I close by touching on the large demographic and socioeconomic shifts occurring in low-income communities documented in this symposium. Those large changes pose challenges for existing residents who may not see themselves in the new services in the neighborhood or in the faces of their

new neighbors and for entire communities as change ripples through sequential neighborhoods. Meaningful integration will require more than just housing; it will require thoughtful and proactive action. Chaskin and Joseph (2015) call this challenge “activating the mix,” and their work on mixed-income developments reveals how difficult this activation can be if it is not done with intention. If this issue is not addressed, if communities are not intentionally working to ensure that the increased mixing currently occurring in cities is “real,” the integration may not be that meaningful or sustainable. Without attention to making the mix “work,” there may be less likelihood that diversity—if achieved—will remain.

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Commentary: 21st Century Gentrification

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The papers presented at the Research Symposium on Gentrification and Neighborhood Change, sponsored by the Federal Reserve Bank of Philadelphia and held in Philadelphia, Pennsylvania, on May 25, 2016, are indicative of a sea change in gentrification scholarship. In this commentary, I place the research presented at the research symposium and in the Symposium section of this issue of *Cityscape* into the context of earlier research on gentrification. In doing so, I aim to show how this scholarship complements our understanding of the process of gentrification and to also show how current efforts might be informed by understanding past scholarship.

The term *gentrification* was initially coined a half-century ago by the British sociologist Ruth Glass. She wrote, “One by one, many of the working class quarters have been invaded by the middle class—upper and lower.... Once this process of ‘gentrification’ starts in a district it goes on rapidly until all or most of the working class occupiers are displaced and the whole social character of the district is changed” (Glass, 1964: xvii).

Written at a time when central cities across much of Europe and the United States were nearing the nadir of their post-World War II decline, this apparently new type of neighborhood change caught many observers by surprise. Gentrification was perhaps all the more startling when observers across the Atlantic started to notice such changes happening in the United States. Central city decline was perhaps steeper and more troubling in the United States than anywhere else in the Western World.

This “return to the city” movement unsurprisingly captured significant scholarly attention. The first wave of gentrification scholarship attempted to document the amount of gentrification occurring in U.S. cities and its causes and consequences. Regarding the causes of gentrification, early scholarship pointed to many factors that mirror those presented in the studies presented at the research symposium. The Canadian geographer David Ley was perhaps the foremost proponent of changing tastes among the “new” middle class that led to preferences for central city living. This new middle class had tastes, born of their high levels of education and white-collar work, that drew them to authentic central city neighborhoods and the type of lifestyles they could create there (Ley, 1980).

The findings presented at the research symposium by Victor Couture and Jessie Handbury (2015), Nathaniel Baum-Snow and Daniel Hartley (2016), and Lena Edlund, Cecilia Machado, and Mi-chaela Sviatchi (2015) in many ways mirror those produced by the first generation of gentrification

scholars in the last decades of the 20th century. Like Ley, Couture and Handbury (2015) pointed to tastes, in particular, to young educated people's attraction to amenities like theaters and bars, as drivers of central city locational choices. Also echoing the "new middle class" thesis put forth by Ley (1980), Baum-Snow and Hartley (2016) found that it is young, highly educated White people who were responsible for much of the population growth near the central business district (CBD) from 2000 to 2010. Finally, Edlund, Machado, and Sviatchi (2015) identified consumption factors, specifically, being able to consume more leisure, as an important explanation for the 21st century gentrification. That these findings echo a central tenet of scholarship on gentrification during the 1970s and 1980s suggests choices and preferences of highly educated young adults were and continue to be an important explanation of gentrification.

The 21st century vintage of gentrification, however, contrasts in important ways from the gentrification that occurred decades earlier. It is perhaps most important to note that gentrification in the 1970s and 1980s appears to have happened on a much smaller scale. Indeed, Brian Berry would christen the early gentrification as "Islands of Renewal in Seas of Decay" (Berry, 1985). By contrast, Couture and Handbury (2015: 1) argued that "downtown areas experiencing urban revival are small in size, but the aggregate effects are large." Likewise, they found that the neighborhoods closest to the CBD grew the fastest from 2000 to 2010 in terms of population, White fraction, college fraction, and income of all CBD distance bands, and this pattern was not limited to a few select CBDs. Jackelyn Hwang and Jeffrey Lin (in this Symposium of *Cityscape*) draw similar conclusions: "[D]uring recent decades, an increase in SES near city centers has occurred along with an expansion of this pattern to more neighborhoods and more cities than before" (Hwang and Lin, 2016: 14). Thus, this latest wave of gentrification appears broader, affecting more cities and perhaps more neighborhoods within cities that are experiencing gentrification.

This latest wave of wave of gentrification may also be qualitatively different inasmuch as the 1970s-to-1980s gentrification was much more closely tied to the physical renovation of dilapidated housing. Indeed, news media in the late 1960s and 1970s often described young, White professionals who moved into poor inner-city neighborhoods as "brownstoners," because this movement almost always involved the renovation of older brownstones. An article published in 1971 in the *Wall Street Journal* highlighted the requisite of renovation describing gentrification as happening "... anywhere there are inner-city neighborhoods that have a stock of deteriorated but potentially fine old housing and a supply of young professional families eager to restore it" (Goldberger, 1971: 1).

The recent wave of gentrification, however, may be less attached to renovating older dilapidated housing. The studies in this *Cityscape* Symposium trace a general movement of the young and educated to the central city, without specifying whether these neighborhoods have architectural styles (for example, brownstones, old Victorian homes) that are especially attractive or offer impressive investment opportunities. It may be that after nearly a half century of gentrification there are few old distinctive houses in urban areas to be had for a steal. If this latest wave of gentrification has indeed uncoupled housing renovation from upper class movement into the inner city, this change may have implications for our understanding of gentrification. For example, the type of person drawn to renovating and restoring old, distinctive housing may be different from someone who wants to live in a highrise condominium with concierge service and proximity to his or her office job. Perhaps this is why explanations for gentrification offered in this *Cityscape* Symposium focus

more on practical concerns, such as proximity to work and availability of retail (Hwang and Lin, 2016), than older scholarship on gentrification, which often invoked explanations such as the search for “authentic” neighborhoods as being a motivation for the back-to-the-city movement.

The role of crime is also perhaps different in the 21st century wave of gentrification. In another paper presented at the research symposium, Ingrid Gould Ellen, Keren Horn, and Davin Reed (2016) found evidence that crime does matter in terms of the level of gentrification experienced by a city and where gentrification occurs. Cities experiencing greater declines in their crime rate experienced an increased probability of “high-income, college-educated, and white households choosing to move into both central city low-income and central city high-income neighborhoods” and, in select cities, “households are especially likely to move into the central city neighborhoods where crime is lowest” (Ellen, Horn, and Reed, 2016). During the first wave of gentrification, however, crime seemed to play a smaller role. Indeed, the gentrifiers, or brownstoners, seemed to embrace the risk and grit associated with inner-city living. As one early gentrifier in Boston reported: “We don’t want to make the South End another Georgetown. Not at all. I wouldn’t deny that there are problems living here. It’s dirty and risky. Gordon [her husband] got mugged last fall. You almost have to expect that” (Goodman, 1969: 33).

The articles presented in this Symposium section of *Cityscape* also greatly advance our understanding of the impacts of gentrification on the communities undergoing gentrification. Although scholars long debated how gentrification impacted residents in communities undergoing this type of neighborhood change, data limitations made it difficult to resolve competing claims. In today’s era of “big data,” it is perhaps not surprising that data can also help us understand the impact of gentrification. Using a relatively novel data set based on credit scores, Lei Ding and Jackelyn Hwang (2016) show the economic impact of gentrification is mixed. Those able to stay may benefit, but those who leave gentrifying neighborhoods seem worse off. These findings represent some of the first to document the economic fortunes of those affected by gentrification. Samuel Dastrup and Ingrid Gould Ellen’s (2016) article tells a similar story. Public housing residents, who are able to stay in gentrifying neighborhoods because the rent is subsidized, are more likely to be employed and have modestly higher earnings than their counterparts living in public housing where the surrounding neighborhoods are not gentrifying.

Research presented in this *Cityscape* Symposium also sheds light on a relatively understudied aspect of the effects of gentrification—those on local businesses. Using the National Establishment Time-Series Database, Rachel Meltzer (2016) finds mixed evidence on the impacts of gentrification on small business. At a minimum, gentrification does not appear to result in the wholesale displacement of local businesses—as many fear it does. Using a qualitative approach, Nathaniel Parker’s (2016) paper presented at the research symposium showed that business owners’ reactions to gentrification are conditioned on how they perceive this type of neighborhood change.

The studies by Meltzer and Parker thus expand our understanding of gentrification’s impacts beyond those felt by individuals and households. The retail sector is an important component of a community’s fabric, and community activists, policymakers, and scholars alike have debated the rewards and risks gentrification poses for small businesses. The research presented by Meltzer and Parker will go far in helping to inform this debate.

The final important dimension of the research presented in this Symposium section of *Cityscape* is in the policy arena. The breadth and depth of the policy options discussed in this *Cityscape* Symposium also represent a sea change in the way policymakers are thinking about gentrification. This sea change appears to be driven by the increasing prevalence of gentrification, rendering the problems associated with gentrification more visible and the increasing availability of data that can inform efforts to address the negative consequences of gentrification. Jeffrey Lubell's article in this *Cityscape* Symposium thus discusses a wide range of policy tools, many of which were only beginning to be thought of in the 1970s and 1980s as possible tools to address gentrification (Lubell, 2016). Moreover, the policies and tools described in this *Cityscape* Symposium by Karen Chapple and Miriam Zuk, such as Home Mortgage Disclosure Act data, property sales data, and Geographic Information Systems were not readily available or were only in their infancy when policymakers began reacting to gentrification in the late 1970s (Chapple and Zuk, 2016). HUD Assistant Secretary for Policy Development and Research, Katherine M. O'Regan, also describes efforts by HUD to address affordability problems related to gentrification (O'Regan, 2016).

Although policymakers were cognizant of the pitfalls of gentrification when it first captured observers' attention in the 1970s, the overall policy reaction was often muted. For example, the then-Deputy Director for Community Conservation Research at HUD would write in 1979 with regard to displacement, "...given the current state of knowledge about displacement, calls for a broad and far-reaching national policy appear to be premature." Given the prevailing trends of central city depopulation, he cautioned that "[i]ndiscriminate policies to stem displacement may slow or erase the trickle of middle class movement back to the central city. Keeping in mind that these families may help restore some fiscal balance to urban economies..." (Sumka, 1979: 486). As documented in Ingrid Gould Ellen and Lei Ding's guest editors' introduction to this *Cityscape* Symposium, gentrification is indeed growing more common in low-income urban neighborhoods in the 2000s than it did in the 1980s and 1990s. Gentrifying neighborhoods experienced much larger socioeconomic changes, namely in race, educational attainment, and rents, in the 2000s.

The contrast in the comments from these two HUD officials highlights the changing nature of gentrification over the course of several decades. Whereas, in the 1970s and even 1980s, concerns about gentrification could be considered a localized matter dwarfed by the more pressing issues related to central city decline, by 2016, gentrification had become a common concern across much of the nation.

The articles presented in the Symposium section of this issue of *Cityscape* thus represent a new chapter on gentrification scholarship. Changes in patterns of gentrification make this *Cityscape* Symposium a timely contribution to our understanding of gentrification.

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Commentary: Causes and Consequences of Gentrification and the Future of Equitable Development Policy

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In American cities, gentrification—that is, an influx of upper-income people to low-income areas—became much more pervasive in the 2000s compared with the 1990s (Freeman and Cai, 2015; Maciag, 2015; Owens, 2012). This article critiques and adds to this timely *Cityscape* symposium on the causes, consequences, and needed policy responses associated with the contemporary community change wave sweeping across much of urban America. I argue that gentrification's causes and consequences are complex and multilayered. I conclude with a few remaining research puzzles and policy proscriptions to facilitate equitable gentrification, ensuring low- and moderate-income people receive maximum benefit from the revitalization of their neighborhoods.

Causes

The forces driving the current gentrification pattern stem from multiple levels, including global, national, and city dynamics (Hyra, 2012). Foremost, as research—in this symposium, by Jackelyn Hwang and Jeffrey Lin, but also elsewhere—demonstrates, the disproportionate movement of the educated Millennials, 20- to 30-somethings, to the central city, particularly in large municipalities, is a primary element of this urban renewal trend (Hwang and Lin, 2016). Articles by Baum-Snow and Hartley (2016), Couture and Handbury (2016), and Ding, Hwang, and Divringi (2015) provide clear evidence that the movement of young professionals to central business district (CBD) areas has stimulated the redevelopment of nearby low-income neighborhoods. Why, though, is this group, that once might have preferred the suburbs or other more expensive urban neighborhoods, entering low-income areas once labeled as the “no-go” zones?

Several explanations offer answers, but none alone sufficiently explicates the country's contemporary urban revitalization story. Ellen, Horn, and Reed (2016) suggest that decreasing violent crime rates have made certain low-income neighborhoods more enticing and tolerable. Reductions in crime might diminish stigmas placed on certain places; however, crime alone cannot be the sole or direct redevelopment determinate because crime rates fell in the 1990s with little corresponding gentrification. While dipping crime levels are correlated with neighborhood redevelopment, the

effects at this point are far from direct and causal (see Couture and Handbury, 2016; Papachristos et al., 2011). So, what beyond crime explains the central city “March of the Millennials” (Chang et al., 2013)?

Edlund, Machado, and Sviatchi (2016) argued that the rising number of work hours and lack of leisure time are driving the desires of the Millennials to live in close proximity to the CBD. By moving near work, Millennials commute less and can spend more time enjoying the amenities of the city. A sizable number of Millennials, however, do not work in the CBD but reverse commute out to certain job-rich suburbs. So something else, besides short commutes, attracts Millennials to inner-city neighborhoods. Couture and Handbury (2016) suggested educated Millennials prefer the central city versus the suburbs because of its density of service amenities, such as third-wave coffee shops, craft-beer gardens, and bike shares.¹

Whereas certain amenity-packed cities are drawing Millennials in the 21st century, we would be wise to better understand how previous public policies of the 1990s aimed at bringing the middle class back to the urban core relate to the current back-to-the-city movement. For instance, the Housing Opportunities for People Everywhere Program (also known as HOPE VI) deployed billions of federal dollars to demolish distressed public housing in neighborhoods on the periphery of many CBDs (Goetz, 2013; Vale, 2013). The decreased concentration of highrise public housing and the development of new market-rate housing may have helped to spur gentrification of some low-income neighborhoods near the CBD. Furthermore, many city leaders listened to and acted on the advice of certain urban scholars who espoused that amenity-rich CBDs would lure the creative class to downtown neighborhoods (Clark, 2011; Florida, 2014; Glaeser and Shapiro, 2003). Federal housing policy and city-level spending in the 1990s on things such as public housing demolition, mixed-income housing developments, parks, and bike shares should be part of our gentrification analysis (Buehler and Stowe, 2016; Hyra, 2012; Tissot, 2011).

Beyond federal and local economic development policies, might there be other important gentrification predictors? For example, Millennials are, on average, more racially tolerant than previous generations (Hochschild, Weaver, and Burch, 2012). Increased racial tolerance might be an important predictor—beyond and in addition to housing, work hours, and crime—in explaining why young professionals are flocking to low-income minority neighborhoods. Furthermore, as noted by the U.S. Department of Housing and Urban Development’s Assistant Secretary for Policy Development and Research Katherine O’Regan, the population leading the back-to-the-city movement is educated, but their average wage increases are outpaced by rising housing costs (O’Regan, 2016). Therefore, they may choose to live in less desired urban neighborhoods, where housing costs are relatively more affordable compared with other more expensive parts of the urban metropolis (Ellen, Horn, and O’Regan, 2013). Finally, many 20- and 30-somethings seem to choose their residential location, in part, based on their desire to be cool by living in what is perceived to be edgy, hip urban areas (Hyra, in press; Oejo, 2014; Parker, 2016), and we need investigations to account for these alternative gentrification causes.

¹ For an ethnographic analysis of changing Millennial preferences and their association with central city gentrification, see the soon-to-be-released book, *Race, Class, and Politics in the Cappuccino City* (Hyra, in press).

In specifying the gentrification drivers, we must also better account for supply-side explanations. For instance, credit continues to be cheap, with historically low interest rates, and these low rates are helping to facilitate the private market production of luxury apartments in low-income neighborhoods. Thus, our gentrification models must grapple with both supply- and demand-side gentrification explanations to more fully grasp the comprehensive set of factors facilitating major central city demographic shifts and neighborhood change (Brown-Saracino, 2010).

Consequences

Perhaps the most controversial gentrification topic is its residential displacement consequences (Newman and Wyly, 2006). There is near empirical consensus, however, that mobility rates among low-income people are equivalent in gentrifying versus more stable low-income neighborhoods (for example, Ding, Hwang, and Divringi, 2015; Ellen and O'Regan, 2011; Freeman, 2005; Freeman and Braconi, 2004; Freeman, Cassola, and Cai, 2015; McKinnish, Walsh, and White, 2010). This fact should not be interpreted as evidence gentrification is unrelated to a shrinking supply of affordable housing units (which it often is), but rather that low-income people tend to move at a high rate from all neighborhood types (Desmond, 2016).

Although understanding the relationship between gentrification and residential displacement is critical, other important gentrification consequences exist. Gentrification, in some places, is associated with political and cultural displacement (Hyra, 2015). Some gentrifying areas once dominated by low-income minorities demonstrate an association between the movement of upper-income people and a loss of minority political representation. Remember, it was presumed upper-income people moving to low-income neighborhoods would bolster civic society (Wilson, 1996), and it appears, in some circumstances, it has. Often, however, newcomers take over political institutions and advocate for amenities and services that fit their definition of community improvement. This process of political displacement can be linked with cultural displacement, a change in the neighborhood norms, preferences, and service amenities. In certain respects changing norms may be positive in terms of counteracting norms of violence or a lack of health-producing amenities and activities, but do the new norms and incoming amenities in gentrifying neighborhoods sufficiently cater to the preferences of low-income people or do they predominately represent newcomers' tastes and preferences?

Through my gentrification research, I have witnessed how political and cultural displacement breeds intense social tensions, limits meaningful social interactions between longtime residents and newcomers, and results in microlevel segregation (Hyra, in press). Without ample social interactions across race and class, the promise of mixed-income living environment benefits for the poor seems unlikely. I am not the only scholar to highlight the challenges of equitable development outcomes in mixed-income communities (for example, see Chaskin and Joseph, 2015; Tach, 2014), and it is clear that we must look beyond residential and small business displacement impacts (as noted by Rachel Meltzer's article in this symposium [Meltzer, 2016]) to understand how to effectively facilitate community conditions in economically transitioning neighborhoods to better support social cohesion and interaction among traditionally segregated populations.

Further Research and Policy

It is difficult methodologically to sort out all the complex causes and consequences of gentrification, but the accumulation of knowledge in this symposium and elsewhere can point toward some promising research and policy directions. The topic of gentrification still presents a variety of underresearched areas. First, how do both demand- and supply-side explanations contribute to gentrification and neighborhood change? Plenty of studies argue one side over the other, but, in reality, both are important in igniting community revitalization, and we need carefully constructed investigations that consider both policy and economic investments and changing living preferences when trying to pinpoint the causes of gentrification (Brown-Saracino, 2010; Lees, Slater, and Wyly, 2008). Second, we need to better understand the changing role of race in both supply- and demand-side gentrification explanations. To be more specific, how have changing perceptions of race contributed to gentrification processes and associated outcomes? Some gentrification studies claim persistent racial stereotypes and discrimination perpetuate neighborhood revitalization patterns that maintain urban inequality and racial segregation (for example, Hwang and Sampson, 2014; Timberlake and Johns-Wolfe, 2016). Other investigations (for example, Freeman and Cai, 2015; Owens, 2012) suggest increased racial tolerance is related to the unprecedented proliferation of gentrification in low-income minority neighborhoods, which slightly disrupts traditional racial neighborhood hierarchies and metropolitanwide patterns of segregation (Glaeser and Vigdor, 2012). We need to better understand how changing racial prejudices, biases, and inequalities drive and mediate the outcomes of America's contemporary urban gentrification wave.

We also need investigations that more precisely account for a complete and accurate set of gentrification benefits and consequences, particularly for low-income residents. Several studies claim displacement among low-income people does not occur with more frequency in gentrifying areas compared with more stable low-income neighborhoods (for example, Ding, Hwang, and Divringi, 2015; Ellen and O'Regan, 2011; Freeman, 2005; Freeman and Braconi, 2004; Freeman, Cassola, and Cai, 2015; McKinnish, Walsh, and White, 2010), but these studies only proxy for displacement through understanding and comparing mobility rates among the poor in different neighborhood contexts. Equivalent rates of mobility among the poor in different neighborhood types do not necessarily mean the drivers of mobility in different areas are equivalent. We need residential and commercial displacement investigations that better isolate the drivers of mobility in different neighborhood settings before we settle on the determination that gentrification does not drive displacement.

It is still unknown the extent to which low-income people benefit in mixed-income neighborhoods, particularly ones that experienced gentrification. A few recent studies suggest growing up in mixed-income neighborhoods compared with high-poverty places is associated with higher lifetime earnings (Chetty, Hendren, and Katz, 2015; Sharkey, 2013), but these studies do not test the mixed-income neighborhood effect for children that stay within formerly low-income neighborhoods as they gentrify. Investigations in gentrifying neighborhoods suggest that, for low-income people, gentrification is associated with increased feelings of safety and greater amenity options (Freeman, 2006) but also with a loss of political representation (Hyra, 2015), declining rates of civic engagement (Knotts and Haspel, 2006; Michener and Wong, 2015), and limited, if any,

employment gains (Meltzer and Ghorbani, 2015). To better determine the comprehensive set of gentrification benefits and drawbacks, we need further longitudinal analysis tracking low-income residents who stay in place as their neighborhood economically transitions.

Although much still remains to be learned about gentrification, policy reforms at the federal, state, and city levels could increase the chances that low- and moderate-income people benefit from the process of gentrification. The first step is to ensure affordable housing opportunities in neighborhoods as they gentrify. In these economically transitioning neighborhoods, poor people are moving out, and once they do, their housing units typically command higher prices. If we prize racial and economic integration, we must ensure that affordable housing opportunities remain in gentrifying neighborhoods. As Jeffrey Lubell's article explains, affordable housing can be built and maintained in economically transitioning areas through a variety of policy programs, such as the Low-Income Housing Tax Credit Program, New Markets Tax Credit programs, Community Development Block Grant program, HOME, project-based Section 8 programs, tax increment financing programs, inclusionary zones, and housing trust funds (Lubell, 2016). Beyond housing, however, we must ensure low-income and upper-income people interact in meaningful and productive ways in mixed-income communities. Housing alone will not address microlevel segregation or build social cohesion in these burgeoning mixed-income spaces. Federal, state, city, and private foundation funding must support community-led organizations to provide programming and events that help stimulate meaningful cross-race and cross-class connections in "third spaces" within gentrifying neighborhoods (Oldenburg, 1999). We also need to ensure that poor people maintain a certain level of political power and control when upper-income people enter their neighborhoods. To ensure a more equitable (re)distribution of political power, we should reform housing policies that allow for market-rate actors to fully control mixed-income developments supported by public subsidies. By preserving affordable housing, encouraging interactions across differences, and providing opportunities for low- and moderate-income civic engagement, we will increase the chances the gentrification wave sweeping across the country will leave behind a more sustainable, just, and equitable urban landscape that will benefit us all.

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Point of Contention: Driverless Cars

For this issue's Point of Contention, we asked scholars with substantial knowledge of the topic to argue for or against the following proposition— “Over time, driverless cars will work a huge change in the built environment of the American city. Automated vehicle guidance will so increase the safety and efficiency of the transport system that a large portion of the land and capital currently required for parking, roads, gas stations, and car repair can be released to housing, nonautomobile commerce, foot traffic, and other uses.” Please contact alastair.w.mcfarlane@hud.gov to suggest other thought-provoking areas of controversy.

Cautious Optimism About Driverless Cars and Land Use in American Metropolitan Areas

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Driverless vehicles will enhance mobility in America's metropolitan areas, connecting people to a greater set of jobs and amenities. Fleetwide autonomy will mean lighter vehicles, many of which will be electric—reducing the environmental costs associated with many of today's individual trips in private cars. Driverless vehicles also will create the potential for a big change in the spatial structure of American cities. The accessibility of land on the urban periphery will improve, as will the accessibility of urban land that currently lacks access to transportation services. In addition, land that currently is used for cars—such as surface parking lots—can be reallocated to other uses, such as parks, foot traffic, cycling, housing, or retail goods and services.

I am very optimistic about the *potential* for driverless cars to enable beneficial changes in land use. The extent to which driverless cars *actually* lead to beneficial change, however, will depend in part on the willingness of local authorities to remove regulatory barriers to the efficient reallocation of land.

Note that it may be some time before we see substantial changes in land use as a result of driverless cars. A fully autonomous fleet of vehicles would mean that every vehicle is capable of operating without a driver or driver controls. Even if regulators and firms are very close to clearing the legal and technological hurdles to full autonomy, typically a fleet takes 20 years to turn over (Poole, 2016a). Retrofitting could speed up the timeline, but only if costs come down significantly. In the interim, the introduction of semiautonomous vehicles and mixed fleets will generate improvements in safety and efficiency, but the benefits are likely to be modest compared with those from full autonomy.

For this article I assume that the entire fleet of vehicles eventually becomes fully autonomous. Better reaction times will make fully autonomous vehicles safer than the current fleet, allowing them to be smaller, follow more closely, and maintain position in narrower lanes. With fewer accidents, less rubbernecking, and each car occupying fewer square feet of roadway at any speed, congestion will decline and the throughput of existing roads will increase. This could, in principle, reduce the amount of space necessary for roads, including highways and arterials.

The potential for saving on the use of road space and road maintenance will be offset to some degree, however, by a likely increase in vehicle miles of travel (VMT). VMT is likely to rise in part because many more people will have access to door-to-door mobility, including young, elderly, and disabled people who are otherwise unable to drive a vehicle. With no need for a driver, average vehicle occupancy also would likely decline. The combination of more people using cars and lower vehicle occupancy would lead to higher VMT, offsetting some of the potential road space savings from driverless cars (Poole, 2016b).

Although predicting whether driverless cars will save on use of road space and road maintenance is difficult, such vehicles have the potential to greatly reduce the use of urban land for parking. The amount of land that driverless cars free from parking will depend in part on whether shared fleets of for-hire driverless cars (robotaxis) replace personal vehicle ownership and in part on whether land use regulations allow for the efficient reallocation of land.

Ownership decisions about driverless cars will be influenced by whether people live in high- or low-density areas. The majority of trips in American metropolitan areas take place outside dense city centers, from suburb to suburb. In the New York City metropolitan area, for example, nearly three-fourths of trips are suburb to suburb (Bertaud, Fuller, and Stewart, 2014).

Driverless cars will improve suburban mobility—both between suburbs and for trips from the suburbs to the center city—by improving first- and last-mile transportation to and from mass transit hubs. To the extent that driverless cars enable people to cover distances more quickly, such cars will—as with many transportation innovations before them—encourage the physical expansion of urban areas, as land on the urban fringe becomes more accessible.

Households in lower-density suburbs characterized by single-family detached homes may be more inclined to own driverless cars than would households living in or closer to a center city. Land for parking in lower-density suburbs is easier to come by and less expensive. Furthermore, less-dense areas may not have the market size to support fast, around-the-clock access to for-hire driverless cars. Residential land that currently is devoted to carports and garages in low-density suburbs may remain so dedicated even after driverless cars become widely available.

Although the prospect of suburban growth is unsettling for some urbanists and environmentalists, both groups have good reason to believe that driverless cars can significantly reduce the environmental costs of moving about in the suburbs. The safety of fleetwide driverless technology will enable cars to be lighter. Combined with their ability to travel in drag-reducing pods and the trend toward greater electrification of vehicles, driverless cars will improve energy efficiency and reduce pollution. (If the carbon intensity of electricity generation continues to decline, electric driverless cars also will mean fewer greenhouse gas emissions.)

In higher-density areas closer to the city center, the factors affecting decisions about whether to own a driverless car will change. What is not clear is the extent to which local authorities will establish high entry barriers to local markets for for-hire driverless car services. The track record of restrictive licensing of taxis and some of the recent hostility toward ride-hailing services such as Uber and Lyft suggest that we should anticipate at least some resistance to for-hire driverless cars. Assuming that resistance is overcome, households in neighborhoods closer to the city center

will have better access to fleets of for-hire driverless cars and less need to own a vehicle. Some of the land devoted to garages and carports in denser suburban areas, therefore, could possibly be converted from parking areas for privately owned vehicles to other uses, such as additional housing. That conversion will be even more likely if such communities relax any restrictive zoning rules or approval processes that would otherwise prevent the sort of project that would, for example, convert a garage into an accessory dwelling unit.

Households in very-densely populated urban neighborhoods—those that are in or near city centers and are characterized by a preponderance of multifamily housing—will be even more inclined to make use of robotaxis. That inclination will exist in part because parking for private vehicles in such neighborhoods can be costly and in part because a robust market for for-hire, driverless cars will ensure that they are readily available at any time of day.

The more people opt to rely on for-hire service rather than owning a driverless vehicle, the greater the potential for converting land that is currently used for parking to other uses. But even if many people end up owning driverless vehicles, the potential to reallocate land from parking to other uses will be substantial. Driverless cars can park themselves much closer together, reducing the amount of land necessary for surface lots and parking garages and reducing the need to devote street space to curbside parking. During times that they would otherwise sit idle in a parking space, driverless cars will also be able to run errands for the owner—and for other people, if regulators resist the urge to stifle peer economy applications.

Land currently devoted to off-street parking could be reallocated to residential, commercial, or recreational uses. But whether such land is located in low- or high-density areas, local authorities will have to relax land use and zoning restrictions that would otherwise prevent property owners from reallocating their land from parking to higher-value uses in the face of driverless technology. The political economy of redevelopment will prove difficult in some circumstances, particularly if incumbent owners of adjacent property can too easily block the redevelopment of a parcel—as is commonly the case in high-demand urban areas characterized by restrictive zoning codes.

The perceived necessity for on-street parking on public roads in high-density neighborhoods—already highly questionable—will disappear entirely with the advent of driverless cars. Cities routinely underprice (or give away) on-street parking in densely populated neighborhoods, effectively subsidizing the car owners who are lucky enough to find spots. Aside from misallocating valuable urban real estate, on-street parking reduces urban mobility by contributing to traffic congestion. Because driverless cars will reduce the amount of space necessary for parking, they will allow cities to put the curbside space on public roads in high-density neighborhoods to better uses, including bike lanes, expanded sidewalks, space for vendors, and green space or “pocket parks.”

Driverless cars also will make high-density urban neighborhoods more pleasant places to live and work by reducing pollution and congestion and by improving safety for motorists, pedestrians, and cyclists. By reducing the labor costs of transportation services, driverless vehicles—be they private cars, buses, or jitneys—also will improve the accessibility of low-income urban areas that currently face limited transportation options.

As driverless cars make high-density areas in American cities more attractive, demand for housing in such neighborhoods—many of which already are experiencing revivals—will increase. If local authorities continue to restrict the ability of developers to increase the quantity of housing in response to higher demand, those improvements in urban life will be captured entirely in higher housing costs. If, however, local authorities allow the redevelopment of land formerly devoted to parking and work to remove broader restrictions on the supply of housing, driverless cars will usher in a range of better choices in high- and low-density neighborhoods for American households of all income levels.

Fleetwide, fully autonomous vehicles will create the potential for tremendous efficiency gains in urban land use. Whether those gains are realized will depend on whether our land use policies coevolve with the changes in driverless technology. Good reasons for optimism abound; but, given the trend toward restrictive land use policies in America's most productive metropolitan areas and the recent instances of municipal hostility toward innovative ride-hailing services, good reasons also exist for the optimism to be somewhat restrained.

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Choice and Speculation

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Speculation about how driverless vehicle technology will transform cities appears just about everywhere. As a transportation scholar, I often am asked to join in, but I have a problem with doing so. According to most speculation, driverless technologies will “transform” things. Technology is always the actor, like some unalterable force that sets the terms by which cities and human life will unfold. Individuals, governments, and businesses have choices about how they create, sell, and use technology, however, even if that technology promises to be important. We have choices about how we distribute the benefits and burdens wrought by driverless vehicle technology. Those social, economic, and political choices can influence human life in cities just as much as, if not more than, the technology changes, and those choices will shape the technology as much as the technology will inform and influence choice.

My speculations in this article, therefore, highlight the places where I think critical changes and choices are likely to appear. I shall focus my comments on two fundamental changes the technology enables: (1) the labor savings that can result from replacing human with machine labor, and (2) the separation of vehicle from owner/operator made possible by the technology.

Many people who speculate about the labor savings tend to focus on one transport sector at a time, and by far the most attention has been paid to what machine operation can do for individual drivers by giving them back the time they currently spend operating the vehicle. Also important are the aggregate safety benefits expected from computerized operation in both passenger and freight sectors. The World Health Organization estimates that 1.25 million road fatalities occurred globally in 2013.¹ Although it will take some time before the technology becomes global, we should welcome anything that might reduce that horrendous loss of human life.

Some individuals object that they do not trust computers to be safer drivers than humans, but that strikes me as vastly overestimating human competencies. Robotic medical and surgical practices and precision manufacturing suggest that machines can have faster, more accurate reactions than human beings do, even if those machines are not perfect. Computers, even if they might be hacked, do not struggle with distraction, self-interest, or thrill seeking. Sensors do break, but they do not get bored, nor do they get drunk or upset. Sensors do not get distracted by a bee in the car, nor do they text their friends when driving. A driverless vehicle turning left at an intersection does not have to guess whether the oncoming vehicle, also driverless, is going to try to squeak through the yellow

¹ These data were compiled by the author from the World Health Organization's Global Health Observatory database. http://www.who.int/gho/road_safety/mortality/traffic_deaths_number/en/.

light; it will know whether that vehicle will stop or go; standard programming should handle that problem. I dream of a future in which I do not have to pound on anybody's car hood (an unfortunately frequent part of my day-to-day life now) because he or she is pulling forward to make a right-hand turn and not looking right for pedestrians like me. Security and hacking are concerns, as always, but fear of potential, unrealized harms seems to me a poor reason to reject technologies that could reduce the existing, unacceptable road fatality and injury numbers we have now.

Alleviating drivers of the labor required to drive their own cars has many potential consequences, again depending on personal, business, policy, and planning choices. One major question will be how driverless cars become available to people who currently own their own cars. I tend to envision a subscription service that offers different memberships based on usage, by which individuals can schedule themselves to be picked up and dropped off.² Urban residents could opt for a lower subscription rate than would subscribers in suburban areas, much as now the former use taxis for occasional trips and the latter tend to own their own vehicles. An engineer in Helsinki, Finland, has published a study to eliminate privately owned cars in the city by 2025 (Heikkilä, 2014). A new startup affiliated with the Massachusetts Institute of Technology (MIT) promises to automate taxis in Singapore (Matheson, 2016).

Perhaps some families in suburban areas will own their own autonomous vehicles, but owning a car in a metropolitan region with high land prices, however useful the car may be in providing mobility, is expensive even beyond the cost of the vehicle. If you do not *have* to pay to store a vehicle, why would you? Eliminating the need to store cars frees up space on one's property for other activities. For people living in older, inner-ring urban suburbs, the carriage houses currently housing cars could be, in the proper regulatory environment, converted to auxiliary apartments or home offices. Developers could offer more units in a new building rather than providing car storage. We have known for a long time that there are better uses for urban space than storing cars, and driverless technology might enable us to finally act on that knowledge.

Because of the opportunity costs of parking, the subscription business model makes the most sense to me. With that type of model, building parking would be a poor investment if this kind of model were to come about. Big box retailers could replace their parking lots with something useful. Cities would lose auto malls—which, although lucrative for them, are unsightly—as most individuals would not own their own cars, and the retail sector of the market would probably consolidate to niche vendors.

However the vehicles become available to the public, people freed from the task of driving will have more time to do other things, even if they are in a vehicle while they do so. This possibility has been equal parts welcomed and a source of some angst. If driving is no longer a chore, what advantage does public transit have, if any? Overall vehicle miles of travel might increase because travel would become so effortless. Active travel (walking and biking) could decrease, perhaps leading to less exercise and more health problems.

Again, however, I do not see those outcomes as foregone conclusions. As a mobility service, *public* transit might become a thing of the past, but *mass* transit might still retain a cost advantage.

² A more indepth discussion of the options can be found in Levinson and Krizek (2015).

Individual car subscriptions could wind up being very costly, and for densely populated urban areas the benefits of vehicle scale and size do not diminish. Private shuttle buses, such as those that Google, Inc., provides its employees, could easily become automated, and the individuals they currently serve would not necessarily prefer to be in individual pod cars if, as is likely, those cars came with a substantially higher price than a shared vehicle.

The equity concerns of going to a privatized mass transit system are still in play, but they are not insurmountable if mobility service providers were held to similar expectations for lifeline pricing as utility companies are. If the vehicles use clean energies from renewable feedstocks and have zero emissions, then more vehicle miles of travel overall may not become an environmental problem, particularly if the system is much safer than it is now. If people use the vehicles to make extra trips to hiking trails, gyms, paintball battles, and other forms of physical activity, then any decrease in active travel might be offset by more time and opportunities for healthy behaviors. In addition, biking and walking as modes are inherently enjoyable, and they become more so if driverless technologies change vehicles from the menaces they currently are to more predictable, congenial actors in the urban environment.

If people can do other things, such as work or read, while commuting, they might opt for housing even farther away from their jobs than they do now and thus increase sprawl. Of all the worries, this is the one I have heard most often expressed among my urban planning and design students, a group who sees urban form as an important factor in sustainability. Although mobility technologies have indeed changed urban form, urban form has become an object of concern and regulation only recently. Land use controls, growth regulations, environmental regulations, and a market preference for urban—rather than rural or suburban—life might counter sprawl even vis-a-vis mobility technologies, such as driverless cars, that make mobility even easier than it is now. Mobility does not necessarily lower development densities unless development approvals come along with that mobility, just as taxing or otherwise penalizing relatively high levels of vehicle use does not entirely eliminate suburbanization. Whether the ability to travel farther distances translates into broader metropolitan footprints strikes me as something public policy and planning can address, granted sufficient political will.

I also am not convinced that people will necessarily want to spend a lot of time in a vehicle, even if they are not providing the labor to operate it. For instance, flying from my home in Los Angeles to Washington, D.C., takes about 5 hours. I do no driving; I am usually able to fly first class; I do all sorts of productive and fun things to occupy myself during the trip; I am a sedentary person for whom sitting about is unfortunately not a unusual state of affairs; and yet I am ready to claw my way out of that plane by the end of the trip. The prospect of doing anything like that 5-hour plane trip multiple times a week hardly appeals to me. Surely people will want to limit the time they are going to be in containers. What that limit is—when people can occupy themselves and the vehicles are comfortable—is unknown. How much distance travelers might cover during the time they spend in vehicles is also unknown, if vehicle miles of travel go up and increase congestion.

One of the great promises of driverless vehicles is that centralized, real-time route optimization and car sharing would allow for much better use of existing street capacity, so that more travel would be possible with less congestion and far fewer vehicles. A team from MIT estimates that driverless vehicles could serve existing traffic levels with an 80-percent reduction in the number

of cars, simply because most vehicles in an automated fleet would be always in use rather than parked, empty, and idle, as most privately owned vehicles are (Claudel and Ratti, 2015). If such a vision pans out even partially, cities would likely encounter less political pushback when it comes to “road diets” that take away parking and vehicle lanes and use that space for protected bike lanes, extended sidewalks, and more seating and street amenities. Even if it is possible to expand mobility and eke out more capacity from existing infrastructure with route optimization, better vehicle design, and increased car sharing, congestion is still likely at high-demand times and spaces. Developers and business owners will always want to attract more people to their locations if they possibly can. Lakers games are still likely to congest downtown Los Angeles, and Pride parades are going to create some event-related congestion even with automation. If the process works as envisioned, however, congestion would last less time and create less potential for pedestrian-vehicle conflicts. As long as there are cities and desirable things to do in them, we probably are going to have at least some congestion and, as Brian Taylor of the University of California, Los Angeles, pointed out, congestion is not entirely bad from a social perspective (Taylor, 2002).

In speaking to these possibilities and problems, I should be clear: removing the labor required to operate a personal vehicle strikes me as having marvelous potential for enhancing human life—and possibly social inclusion and social justice, if the technology becomes affordable. For example, families in cars would be able to focus on each other while they travel. In my work on family mobility practices, many parents reported that they cherished their time spent driving their children to and from schools and other activities even though they complained about it, because time in the vehicle is time together, even if driving is a chore (Liu, Murray-Tuite, and Schweitzer, 2012). Automating driving so that families can be together in a vehicle—without parents having to choose between safe driving and paying attention to their children—seems to me to be unambiguously positive. Driverless technologies might tempt some parents to simply pack their kids in a vehicle and send them off alone, but I doubt that it would be common.

Young drivers are, generally speaking, the most inexperienced and demonstrably poor at judging risks (Kahan et al. 2007). Recent years have seen an increase in the number of families delaying the age at which their children obtain their driver’s licenses several years beyond the minimum age (Brown and Handy, 2015). Teenagers in places served by public transit get the chance to explore their cities much more readily than do those who are beholden to parents or friends who can drive. Driverless vehicles would be a way to provide that mobility and enable discovery to occur much more safely for teenagers—and for the rest of us.

The ability to operate a motor vehicle does not depend solely on age. Many people who have visual impairment or other barriers to driving can face social isolation in places not well served by public transit. Some barriers to driving also make using public transit impossible. Paratransit services for people with disabilities are very expensive to provide; however, they are vital to maintaining quality of life and social inclusion for those who depend on them. Being able to patronize the same driverless vehicle services that everybody else does strikes me as both practically and symbolically significant for people who otherwise would be unwilling or unable to drive. Some patrons of paratransit require physical assistance to access the vehicle even if it is automated, so paratransit will not go away entirely, but it would become much less costly to provide over the long term if many current paratransit patrons can move to general mobility services.

A driverless vehicle will not refuse to pick up passengers because of the color of their skin.

Thus, I do see some important possibilities for driverless vehicle technologies to do good for social inclusion and safety. The land use effects of expanded mobility can go any number of ways. One example concerns seniors. Urbanists have spent years conjecturing that the graying of America's population will result in older Americans' abandoning their suburban homes for high-density, mixed-use environments, where they can walk and take transit rather than drive (Nelson, 2013). It is an appealing idea, but it also assumes quite a bit about people's willingness to move and downsize. Past generations of seniors generally have aged in place, for many sensible reasons (Painter and Lee, 2009). By retirement, people may have their homes finished as they like, and leaving a house is difficult once it is finally done the way you like. Even if children have flown the nest, sometimes they fly back, as in the case of millennials coming back to live with parents because young workers face expensive urban housing markets, long job searches, and wage stagnation. Grandparents' homes may be empty much of the year, but the extra bedrooms are handy when holidays roll around. And not all of us, as we age, want to be around busy urban areas.

Driverless vehicle technologies, just like new real estate developments that serve the growing market of seniors, could change the options available to older people weighing the decision whether to leave their single-family neighborhoods. Plenty of us, as we age, feel like our vision and reactions are not what they should be and give up driving. In an automobile-dependent context, that decision to give up the car can change an individual's life considerably. Giving up driving can mean losing independence and a subsequent increase in social isolation, which can prove very damaging to health and quality of life (Cornwell and Waite, 2009). Without a car, a senior trying to stay in a suburban family home can find it harder to get to the doctor, go shopping, and access other activities to stay engaged. Driverless vehicle technologies can offer seniors the ability to stay in their longtime homes much longer if that is what they prefer, although it is not what urban density reform advocates hope they will do for the sake of better urban form.

Too much deterministic thinking about what driverless technologies will do runs into trouble because of those myriad possibilities. Just because past generations of seniors have mostly aged in place does not mean this generation will. American baby boomers, as one group, have been more numerous, affluent, and residentially mobile than were their parents and grandparents, and companies tend to flock to supply the consumer demands of this large demographic group. Many individuals in this generation may desire the urban amenities that new lifestyle developments offer them more than they want to stay in their single-family homes, even with driverless technologies to help them get around, particularly if real estate developers put together innovative developments that cater to many tastes. Driverless vehicles will expand the choices available.

The labor savings from automated driving, however, is not universally good news. For transit agencies, labor represents a major component of the cost of getting a bus or a train out to serve passengers. Transit companies in cities around the world face different cost and revenue structures but, in the United States, few public transit agencies come close to covering their operating costs with fare collections. The cost recovery ratio, which is the ratio of the revenues from fares relative to the total operating costs, provides an indication of how well fare revenues cover expenses. For some U.S. rail operators, cost recovery runs about 66 percent; for other companies that have both

rail and bus, the recovery ratio can get below 30 percent (Schweitzer, forthcoming). Eliminating drivers will be a major operating cost savings. Machines will not demand overtime, and they do not object to split or weekend shifts. Transit patrons may benefit, on the whole; lowering operating costs might be the key that unlocks greater frequencies, and service frequencies are a key component of service quality and, thus, ridership.

Driving a bus or a train, however, currently is a well-paying, often unionized, job that a person with moderate training can do. Driverless technologies promise to be what business school writers have dubbed *disruptive* technology, a term that strikes me as a euphemism. Disruption suggests that a shock occurs, people recover, and then things roll on. That may be true for some people fortunate enough to have relative security in contemporary global job markets. It might also be true in places committed to helping those who are out of work. For others, however, in places where social welfare and insurance programs have been cut, job loss can be both devastating and long term. Students from an economic or business background often tell me that displaced workers “will learn new skills, retool, and all the new economic growth will provide other opportunities.” That thinking makes sense encapsulated within the clean bubble of microeconomic theory, but it does little to help 45-year-olds with two children who have few other skills when they get a pink slip.

Bus and rail drivers also are the human face of transit companies, and the same is true for taxicab drivers. Over my nearly 20 years of riding transit in major metropolitan areas, I have a whole portfolio of stories about how drivers make a difference. Some have been grumps, but most others have been great. More times than I can count, bus drivers have thwarted harassers who wanted to follow women and LGBTQIA patrons, helped a parent with a newborn collapse a recalcitrant stroller, and provided sensible traveler information to tourists and newcomers befuddled by changeable message signs tailored to locals. If I live to see it, I shall miss leaving the airport and chatting with a cabbie, sometimes a longtime native with tips on the most wonderful things, and other times a recent arrival from another interesting part of the world.

Transit and taxi drivers are only one group facing hard times. The news is not much better for drivers in freight shipping, in which businesses tend to run on a low margin, and the labor cost savings provide an incentive to pursue new capital investments in driverless fleets. Long-haul truckers may be particularly vulnerable, as machines do not need to rest and would be exempt from hours-of-service regulations. Many long-haul over-the-road (OTR) truckers hail from rural regions, so job losses in this sector may dry up yet another steady income source for rural residents.

This problem is one area in which conventional microeconomic assumptions about *labor* as an abstract concept differ from what is likely to occur in specific places to specific people. OTR trucking is very hard work that keeps truckers away from their homes, sometimes for weeks at a time. These workers may find new work elsewhere, perhaps in warehousing, as cost savings allow for more production. The warehousing example, however, typifies the potential spatial reorganization of labor that can carry steep personal costs and that too often falls under the radar of neoclassical economics. Currently, OTR truckers can choose where they live. By contrast, warehousing and manufacturing jobs, which also are highly automated, tie workers to a specific location, often on the fringe of a major metropolitan area. A shift in occupation from OTR trucking to other types of manufacturing or distribution employment could be another push to migrate from rural areas

to cities. As somebody who migrated from a rural area to cities for economic reasons, I can attest that such migration involves many more personal and family sacrifices than people who are never subjected to “structural adjustments in the labor force” can truly understand.

About 350,000 owner operators (truck drivers who own their own rigs) currently are registered. Adding up all the workers who identify as “driver” across all professions in the United States alone accounts for 2.8 million people, however, and about two-thirds of them are male.³ As of this writing, an estimated 7.1 million people in the United States are unemployed, so the long-term shakeout could be an increase in unemployment of about 30 percent.⁴ Fleets will not change overnight, certainly, but when those jobs begin to disappear, the consequences loom large for those who have few other skills with which to obtain work. Many will join the ranks of the unemployed, even if new jobs open up in warehousing or in other segments of the manufacturing sector. The belief that new manufacturing or other segments of the freight sector will necessarily absorb unemployed workers might be wishful thinking.

Like all the other changes I have discussed, what happens with job displacement will hinge on the public policy and planning choices made, along with private-sector implementation and individual choices. The labor market effects of driverless vehicles may be far reaching, but they do not have to be devastating to individuals and places if new education, training, and income opportunities can ease the transition.

Choices abound, and although driverless vehicles are not going to be here overnight, planning and public policy should begin to prepare for the changes sooner rather than later. Nearly effortless mobility might indeed prompt people to seek housing farther away from their jobs and thus increase sprawl, but not if municipalities stick with urban growth boundaries and infill plans. If, however, local residents succeed in opposing any and all new development, including new dropoff locations and road diets, driverless vehicles will not do much to help shrink streets, either. Depending on how well transit companies manage the transition, transit service might improve so much that low-wage workers priced out of proximity to job centers could have much better access to jobs. The technology could really help people who cannot drive for various reasons enjoy much more mobility than they had before, but only if they can afford the mobility services offered. Perhaps all of us—pedestrians, cyclists, passengers, and fellow travelers—could be made far safer; it is an outcome well worth investing in. The choices are ours to make.

Author

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³ Compiled by the author from data available as of June 27, 2016, from the U.S. Bureau of Labor Statistics occupation data. <http://www.bls.gov/bls/occupation.htm>.

⁴ Compiled by the author from data available as of June 27, 2016, from the U.S. Bureau of Labor Statistics employment data. <http://www.bls.gov/news.release/empsit.nr0.htm>.

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Transitioning to Driverless Cars

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I have little doubt that driverless cars will eventually become the dominant transportation technology in our cities. They will save us time—a lot of it. Residents of American cities spend, on average, nearly 90 minutes traveling daily. Most of that time is spent driving a car or a small truck. The single largest cost of traveling for most of us is the time we waste behind the wheel. Research typically evaluates that cost at one-half an individual's wage, or more in heavy traffic. Driverless cars will reduce traveling costs by enabling us to work, play, or just enjoy the scenery, as our cars will drive themselves. The young, physically or mentally impaired, and elderly people who cannot drive a car will gain a lot more freedom. Some errands will just run themselves with no one inside the car. Most importantly, about 30,000 Americans die on the road every year. Driverless cars will dramatically reduce that number of casualties. They will also create a number of further savings. Most of us currently own cars that sit idle most of the day. Many of us will stop owning a car and instead subscribe to a car-on-demand service. That will make our use of cars much more efficient. We will no longer need an expensive system of traffic lights and signals, as we currently do. We may even be able to reduce the large proportion of prime urban real estate that we devote to the roadway and parking. Yes, we will lose the occasional fun of driving, but that seems a small price to pay given the benefits of driverless cars.

As the cost of traveling falls dramatically with the onset of driverless cars, we will travel more—perhaps a lot more. That will sound scary to some: more pollution, more congestion, and more urban sprawl. Two of those fears are overblown. The current environmental impact of electric cars is disputed, but we are at the beginning of an energy revolution. The days of the old combustion engine are numbered. Whatever the technology that ends up dominating, electric cars or fuel cells, we will stop burning fossil fuels when we travel. More importantly—because their costs are more immediate—the small particulates in the air that cause so many premature deaths will disappear. Our cities have become incredibly cleaner over the past 50 years. That trend will continue even if we significantly increase our traveling.

Turning to congestion, fears of future cities choking because of complete gridlock also are arguably exaggerated. On our main arteries, we typically maintain a time distance of about 1.5 seconds from the vehicle in front of us. Driverless cars will be able to reduce that time distance by a factor of four or more because a computer is able to react immediately, unlike a human driver. This factor implies a very large increase in the capacity of our roads. Even if this capacity increase were not enough, the technology associated with the smooth running of self-driving cars will make it possible for cities to charge travelers more at peak traffic hours and keep the flow going.

More urban sprawl is a real possibility. Commuting to work will become much cheaper because, in many cases, the workday will start as soon as we start our morning journey to work, not when we end it. Historically, cheaper and better urban transportation has been strongly associated with the physical expansion of cities. Although the demand for urban living has arguably risen in the past couple of decades, it is hard to imagine that no one will want to take advantage of easier and more convenient commutes to live in a greener setting.

Whereas it is probably safe to bet that cities will expand, it is hard to know by how much. How many people will be tempted by remote exurbia? To what extent will jobs, retailers, and personal service providers follow them there? Quantitative predictions are all the more difficult, as other changes may occur within cities. Greater freedom from the location of our workplaces may induce residents to sort by preferences in different parts of town even more than they do today. The demand for the nicest parts of our cities will arguably rise even further. On the other hand, if enough residents relocate to remote exurbia, some less desirable neighborhoods may just hollow out. Will American cities suffer from a suburban problem in 2040 just like they suffered from an urban problem in the 1960s and 1970s?

I have no doubt that some places will try to regulate away some of these changes in urban development. Ideally, regulations should curb the negative side effects of new developments. With safer and cleaner cars on hopefully less congested roads, antisprawl policies will lose some—but not all—of their justification. Uncoordinated development remains an issue when developers do not pay the full costs of the infrastructure and public goods associated with new development or when they race for isolation and virgin territories. Regulation will also become more difficult. Some of the old recipes against sprawl will become even less operative than they are now. Greenbelts are already being leapfrogged. Just imagine what may happen when it becomes even easier to do.

Despite some nuances, the future looks mostly bright. The questions are how to get there, and what the transition to a full system of driverless cars will look like. A lot of the discussion so far has focused on insurance and ethical issues. Who is responsible in case of accidents? If the computer has to choose a victim in a collision, who will it be, its own passenger or a passenger in another car? These questions are interesting, but it is hard to imagine they will be major stumbling blocks. New technologies have brought new risks for many years, and ways have been found to spread those risks and define new forms of protection and liability. The ethical question probably makes for interesting debates in an introduction to ethics class at a university, but it is unlikely to have much practical relevance. Driverless cars will be much safer than cars are now, and most of the accidents that can be predicted by the software will be avoided. We may be arguing about a tiny number of casualties; remember that about 30,000 people die on American roads every year.

A good case can be made that the key transitional problems will be instead about the political economy of the regulation of driverless cars and the cohabitation between driverless cars and cars driven by human beings. How those issues get resolved may have major implications.

Driverless cars would have difficulty functioning in existing cities. Cars with drivers are immensely more difficult to predict than are cars without drivers, especially if the latter can communicate with each other. Existing cities are full of quirks and irregularities that make them very hard to map and thus to navigate for a robot. Many of the benefits of driverless cars in terms of smoother rides and

greater capacity at intersections will be realized only when all cars are driverless. We may have cars driven by humans roaming the streets for 20 years or more after the first fully driverless cars have appeared.

For car producers or would-be car producers, two strategies are possible. The first is incremental and consists of making cars gradually less reliant on drivers. That has been the strategy of most incumbent car producers. Some high-end cars already park themselves. Autopilot and emergency braking functions are already installed on the most advanced cars. Arguably, more driverless features will come. The incremental strategy presents one major problem, however. Partially driverless cars may be safer, but the true timesaving benefits of driverless cars will occur only when cars become completely driverless. A car that is 90 percent driverless still requires a driver who is paying attention behind a wheel. With this scenario, the transition is likely to be extremely long, and how the last step about getting rid of the wheel will take place is unclear.

The alternative strategy is rupture and the direct development of cars without a steering wheel; that is the Google, Inc. strategy. It is an appealing but difficult proposition on several counts. It will require maximum software sophistication right from the start. If anything, processes will get easier with more driverless cars. Some technical issues seem extremely tricky to resolve. To take only one example, what happens when it snows? Many complications of our complex cities will become much harder to detect. Also, if successful, this strategy may completely disrupt the car industry. Incumbent car manufacturers that are betting on incremental change, not cars without wheels right from the start, will probably do everything they can to prevent fully driverless cars from being able to operate. The recent proposal to strengthen regulation of driverless cars in California is perhaps just one teaser of the regulatory battles to come.

Realizing that its radical innovation will be a hard sell, Google appears to want to make it even more radical. If Google cars cannot operate in existing cities, perhaps new cities need to be created for them. That probably sounds like a mad idea to many, but history teaches us that it may not be as crazy as it sounds. First, America has a long history of private urban development. Irvine, California, and Dearborn, Michigan (near Detroit), are only two examples of cities that were developed by a private corporation. The sole owner of the Irvine Corporation may be the richest developer in America, but his fortune of \$15 billion pales in comparison with the market capitalization of Alphabet-Google, which nears \$500 billion. Second, history also tells us that making money with transportation is hard. Instead, money often is made with the land. What was possibly the first suburb of America, the Main Line of Philadelphia, Pennsylvania, was developed by rail entrepreneurs who realized that developing suburbs was much more profitable than operating railways.

Large-scale new urban development is thus not impossible. The main challenge will be to find large tracts of land where people want to live. That will be hard. Beyond the possibility of revolutionizing personal transportation, these new developments also would be an opportunity to redefine many things about how we operate cities.

We certainly live in interesting times.

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Driverless Cars and the City: Sharing Cars, Not Rides

Wendell Cox
Demographia

A world of driverless cars seems likely to provide massively improved highway safety, better mobility—especially for those with mobility disadvantages (such as the rising elderly population)—faster travel times, better use of existing roadway infrastructure, and a reduction in traffic congestion. All this should lead to better lives and better economies.

Some people imagine a driverless car world in which a mobility service company delivers exactly the car you want (Neil, 2015) on a moment's notice. The ultimate vision may be a city with few residential garages and in which virtually every automobile trip might be in a different vehicle, often shared with strangers. Good reasons raise doubt, however, that this ambitious scenario will ever be achieved.

An Evolutionary Process

The world of driverless cars heralds revolutionary changes, but for cities (metropolitan areas) the process will be evolutionary. No “Big Bang” will occur, in which today's driver-dependent personal mobility system will quickly become driverless.

We are entering what the National Highway Transportation Safety Administration calls “Level 3 automation,” in which new cars have automated features, but some circumstances require driver intervention. Transition to driverless cars (Level 4), in which drivers *are not permitted to intervene*, would come later. That eventuality is the focus of this discussion.

The evolutionary development of the driverless future will be determined by consumer preferences. Fortunately, those preferences will be fashioned by the experience of implementation. If significant system difficulties, problems with reliability, or “hacking” concerns arise, the driverless future could be many more years away than is currently predicted.

Recently, concerns have arisen because of a well-publicized fatal accident that involved a driverless car in automatic mode (Knight, 2016). Furthermore, questions have been raised because of complex moral choices that a driverless car would need to make in some potential accident situations (Greenemeier, 2016).

If the public does not become comfortable with having no means to intervene with automobile operation in an emergency, the transition to full automation could be slower, or may not even

occur. If driverless deployment is less attractive to consumers in lower-density areas, such as suburbs and exurbs, many households could opt for conventional vehicle ownership, which may or may not include fully automated vehicles.

In short, we are about to witness the development of a new market for mobility that will succeed only by satisfying consumers. The shape of the market will be what consumers want it to be.

Consumer Cost Implications

A common assumption is that conversion of the automobile from private ownership to ownership by corporate mobility providers will result in lower costs. Mobility service companies would use vehicles more efficiently, reducing purchase costs and passing the savings on to consumers, assuming a fully competitive market.

The cost of mobility involves more than buying cars, however. Other vehicle costs, nearly all for vehicle operation, will likely be paid by the mobility service companies, which will need to *add sufficient amounts to its fees* to pay its expenses and to earn a return on investment.

Sharing Cars, Not Rides

Some forecasts of the driverless car era suggest an ultimate future in which virtually all personal mobility will be by a vast ridesharing, or carpool, system. People would travel around the city with whoever happened to get into the car. Ridesharing with strangers would become the norm. This vision presents problems. Because not all passengers would start and stop at the same place, trips would likely often be longer and include more stops, making sharing less attractive.

Lower prices from ridesharing may not be enough to entice significant numbers of travelers. The experience with carpooling in the United States may be instructive. Despite the considerable cost savings available from commuting by carpool and improved computer matching systems, carpooling is in the midst of a decades-long decline.

A much larger barrier looms. As long as personal security concerns remain (and they seem to be becoming more, not less, of a concern), broad adoption of the ridesharing model—at least with strangers—will be unlikely. Prescreening and security cameras can reduce risks; however, the potential for breaches of personal security remain. Many people may not be willing to share rides with people they do not know.

An Array of Ownership and Deployment Options

The evolutionary market development process should provide ample opportunity for a vibrant, competitive mobility services industry to develop, with product offerings that meet the differing needs of consumers.

In the competitive market, companies are likely to provide cars (mobility) to consumers, ranging from short-term rentals to long-term leases, similar to car leases today. The success of such services

in places as dense and compact as the core city of Paris, France, with its incomparable transit system (for a western city), may be surprising. However comprehensive transit is in the central core of Paris, some trips within the core of the city can be substantially shortened by automobile travel.

Long-term arrangements could be exclusive, involving no vehicle sharing for the lessee, replicating car-leasing arrangements common today. Alternatively, the long-term arrangement could include the mobility service company's using the customer's garage for storage between short-term rentals.

At the same time, individual ownership could continue, and many individual owners could take advantage of Internet-based alternatives for renting out their cars on a short-term basis. Some websites (such as turo.com and getabout.com) already facilitate such arrangements. The bottom line is that the advantages of the driverless vehicle are likely to be achieved regardless of the pattern of personal vehicle ownership.

The deployment of vehicles, ultimately, is likely to include various options, from private ownership to mobility companies that send driverless vehicles on demand. The deployment of a fully driverless vehicle fleet likely would not eliminate the residential garage or private ownership.

Size of the Vehicle Fleet

Vehicles sit idle more than they move. One estimate is that cars are parked more than 90 percent of the time (Burgess, 2012). Some projections have suggested that reducing the vehicle fleet by 80 to 90 percent is achievable. That projection may be possible in some very unique environments, such as the core of New York City (Claudel and Ratti, 2015) and the core city of Lisbon, Portugal (Martinez, 2015). Travel environments such as those, however, are the exception, not the rule.

Most people in the United States and Portugal live at far lower densities than do residents of New York City and the city of Lisbon. New York City represents less than two-fifths of the metropolitan area population (combined statistical area) but covers only one-fortieth of the land area. The city of Lisbon contains one-sixth of the metropolitan area population but covers only one-thirtieth of the land area.

Markets within metropolitan areas are different enough that the pace of implementation and the array of services could vary substantially. Exhibit 1 indicates the substantial variation in market factors between sectors within the 52 metropolitan areas with a population of more than 1,000,000, using the City Sector Model (Cox, 2014).¹ The high zero-vehicle household densities in the urban core suggest a strong market for mobility service companies. The much lower vehicle densities in suburban areas suggest that the costs of doing business there could be much higher, principally because of longer vehicle deployment trips ("deadhead" trips), in which the vehicles have no passengers.

¹ The City Sector Model (<http://www.newgeography.com/category/story-topics/city-sector-model>) classifies small areas (ZIP Codes) of major metropolitan areas by their urban function (lifestyle). The model includes five sectors (exhibit 1). The first two are labeled as "urban core," replicating the urban densities and travel patterns of pre-World War II U.S. cities—although those classifications likely fall short of densities and travel behavior changes sought by contemporary urban planning (such as Plan Bay Area; <http://www.newgeography.com/content/003899-plan-bay-area-telling-people-what-do>). The third and fourth are suburban sectors, earlier and later. The fifth sector is the exurbs, outside the built-up urban area. The principle purpose of the City Sector Model is to categorize metropolitan neighborhoods based on their intensity of urbanization, regardless of whether they are located within or outside the boundaries of the historical core municipality. City Sector Model criteria are described at <http://demographia.com/csm2015.pdf>.

Exhibit 1**Selected Market Characteristics by City Sector: 2012**

| City Sector | Car Density | Zero-Car Household Density | Cars per Household | Population Density | Share of Population (%) |
|---------------------------------------|-------------|----------------------------|--------------------|--------------------|-------------------------|
| Urban core: central business district | 5,646 | 7,015 | 0.49 | 23,280 | 1.3 |
| Urban core: ring | 4,368 | 1,316 | 1.05 | 11,155 | 13.4 |
| Earlier suburbs | 1,606 | 82 | 1.71 | 2,588 | 41.6 |
| Later suburbs | 905 | 19 | 1.89 | 1,346 | 27.3 |
| Exurbs | 109 | 3 | 1.96 | 155 | 16.4 |
| Metropolitan area | 429 | 28 | 1.68 | 700 | 100.0 |

Note: Density measured per square mile.

Sources: Derived from 2010–2014 American Community Survey 5-year data; City Sector Model

The first driverless cars that operate without driver intervention will likely be “city cars” operating in urban cores, where sufficient mapping will have been completed. Those cars will not be attractive to individual users who need to travel outside a service area that is smaller than the metropolitan area. Driverless cars will probably be available and practical within the densest parts of metropolitan areas first, with a gradual expansion of individual service areas to the suburbs and exurbs. Eventually, driverless cars would likely be able to make long-distance trips between cities.²

At this point, the size of the required fleet is not known, and the abysmal record of transport planning projections (Flyvbjerg, 2007) suggests substantial potential for error. Fortunately for consumers, mixed operations will continue for a long time, and consumers will switch to driverless vehicles only when they are satisfied with the reliability of the system.

Dispatching cars every day from parking facilities to the many workers and school-trip drivers, who have virtually the same daily need for a car, may not be feasible for mobility service companies. Using customers’ garage space may make more sense in such cases, and that would likely reduce costs and would certainly reduce unnecessary deadhead mileage.

It would also reduce traffic because, in the lower-density suburbs and exurbs where 85 percent of metropolitan residents live,³ deadheading cars the much longer distances from mobility service company facilities would increase both car mileage and traffic congestion.

A similar though lesser problem exists with respect to the mid-workday storage of work-trip vehicles. Sufficient demand for vehicles may not exist between the morning and evening work trips. Mobility service companies might find that parking those vehicles in the already existing parking facilities near work locations makes sense, rather than making an additional trip to the company facility to await dispatch.

² See “Top Misconceptions of Autonomous Cars and Self-Driving Vehicles,” Driverless Car Market Watch, http://www.driverless-future.com/?page_id=774.

³ According to the City Sector Model, in 2012, 85.2 percent of residents of the metropolitan areas with more than 1,000,000 in population lived in the suburbs and exurbs (41.6 percent in the earlier suburbs, 27.3 percent in the later suburbs, and 16.4 percent in the exurbs). See Cox (2015).

The best markets for the permanently roving car seem likely to be “one-off” trips, such as to and from airports, enabling travelers to avoid expensive parking. Shopping trips are another promising market, especially in geographic areas that have either low automobile ownership rates or less penetration of longer-term lease arrangements by mobility service companies. Unlike airport parking lots, however, shopping center parking lot sizes may not be reduced much by driverless cars because those cars will have to be immediately available for the return trip, so they would be taking up space in the parking lot.

Effects on Transit: Positive and Negative

Mass transit access is exceedingly limited in the modern metropolitan area. According to research by the University of Minnesota Access Laboratory, the average worker in large metropolitan areas can reach less than 2 percent of jobs by transit in 30 minutes and less than 10 percent of jobs by transit in 1 hour (Owen and Levinson, 2014). By comparison, more than 65 percent of jobs are within a 30-minute commute by car (Levinson, 2013), and the average travel time for driving alone is approximately 25 minutes.⁴ Transit is thus less attractive than driving in terms of travel time. Transit’s huge travel time disadvantage relative to cars is the result of transit authorities’ necessary focus on central business districts, the location of the most concentrated demand, and sparse coverage in the suburbs, which contain 80 percent of jobs. In 2014, central business districts had 65,700 jobs per square mile, more than 30 times the density of urban core rings (2,100), more than 60 times that of the earlier suburbs, more than 120 times that of the later suburbs, and approximately 1,500 times that of the exurbs (Cox, 2016; Demographia, 2016). The result is the “last mile” problem—the fact that most potential transit destinations, jobs and otherwise, are often beyond walking distance from transit stops. This practical consequence is indicated by the Owen and Levinson (2014) findings, which show the overwhelming majority of destinations in major metropolitan areas—from the largest, New York, to the smallest, such as Raleigh, North Carolina, and Salt Lake City, Utah—cannot be reached by the average resident in a time remotely competitive with the automobile.

Driverless vehicles could be both a bane and a boon to transit. Improved car travel times, combined with door-to-door access, could severely disadvantage transit’s ability to retain riders who can afford to travel by car.

On the other hand, a large share of transit riders have low incomes and generally will not have a sufficient budget to take advantage of driverless car alternatives. Transit thus will likely retain its low-income ridership market, not least because rates could be unaffordable without some form of subsidy; however, American Community Survey data indicate that most commuting by low-income workers is already by car.⁵

⁴ In 2010, the average drive-alone travel time was 24.0 minutes (American Community Survey).

⁵ More than 75 percent of commuting by low-income workers was by car, according to the 2006–2010 American Community Survey (Cox, 2012).

On the other hand, driverless cars dispatched to transit stops could lessen transit's last-mile problem by placing more destinations within practical access. Because commuter rail services, subways, and some other rail services operate faster than local bus routes, the most important driverless car potential for *increasing* transit ridership could be in rail connections.

If driverless car charges are low, however, the attractiveness of transit could be further reduced, as people opt to use driverless vehicles for the entire trip.

Assessment: Effect on the Urban Form

Reason Foundation's transportation policy director, Robert Poole, rejects the view of some people that "mobility as a service" will lead to a "world of high-density, compact urban living, where people's jobs, shopping, dining, and recreation opportunities will be much closer to their homes than they are today in suburban America." He points out that "there is zero evidence—in census data or anything else—suggesting that any significant demographic group, including millennials or the retired—wants to live in that imagined world" (Poole, 2016).

I agree. Cities evolve. They are not transformed in the short term. Truly transformational cities are rare and are designed and built from scratch. Switching to driverless cars will not be like building and opening a Brasilia, but rather more like slowly retrofitting Rio de Janeiro, from which Brazil's capital moved nearly 60 years ago.

Of course, some future neighborhoods and districts will be built to take full advantage of the driverless car, but, other than gaining intermittent coverage in real estate sections of national newspapers or architectural journals, they will do little to change the city as a whole.

New suburban employment developments beyond the current urban fringes could require less parking, depending on how many people opt for longer-term service arrangements (or ownership) as opposed to on-call arrangements. Suburban residential areas may yield little or no additional developable land. If, as seems likely, many suburban residents continue to have cars that they either own or lease on a long-term basis from mobility service companies, the need for garages will continue. Resale values for houses built without garages may be lower, which could encourage buyers to require garages, whether or not they believe when they move in that they need a garage.

Urban transport seems likely to be characterized by dispersed "many-to-many" travel patterns even more than today. The term *many-to-many travel patterns* refers to the near-random distribution of origins and destinations. The urban transport system must be able to serve trips that begin at any address and end at any other address in the metropolitan area. In the United States, automobiles serve at least 98 percent of urban travel. Indeed, replicating this service coverage and travel time with transit could require expenditures equaling the gross domestic product of any city that attempts it (Ziv and Cox, 2007).

The driverless car city of tomorrow will continue to be automobile oriented, likely more so than today. Some large central business district parking lots can be converted to other uses, and airport parking lots could well become shadows of their former selves.

Driverless cars do not seem likely to have much of an overall effect on urban form, however. Even once the “full deployment” scenario is achieved, much of the land that could be converted to other uses, such as from potentially narrower streets (which might be opposed by bicyclists), provides little potential for development.

The driverless car seems likely to achieve a mobility and safety revolution, implemented in an evolutionary fashion over decades. To directly address the issue at hand, little of “the land and capital currently required for parking, roads, gas stations, and car repair” is likely to “be released to housing, nonautomobile commerce, foot traffic, and other uses.” Nor is it likely that “driverless cars will work a huge change in the built environment of the American city.”

What the driverless car has the most potential to do is expand opportunity. That means better lives for disabled and other people who are unable to drive. Quicker transport facilitates labor market efficiency, which means more economic growth. This is important in view of concerns about the likelihood of slower economic growth in the future (Gordon, 2016). The real gains could be in the standard of living, not so much in the urban form (and that is as it should be).

A future of greater mobility, quicker door-to-door trips, and increased demand for travel seems unlikely to lead to higher densities or greater centralization. On the contrary, those are the forces that have suburbanized not only the urban periphery but also large areas of core cities. More and better personal mobility is unlikely to reverse that trend.

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Vouchers and Neighborhood Distress: The Unrealized Potential for Families With Housing Choice Vouchers To Reside in Neighborhoods With Low Levels of Distress

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Abstract

The Housing Choice Voucher (HCV) program seeks to help poor households locate in high-opportunity neighborhoods, but experts have reached little agreement on how to define high opportunity. Using low poverty as the sole criterion has proven ineffective. We offer an alternative metric to assess the level of distress in neighborhoods using multiple measures of neighborhood condition. With this new metric, we examine the extent to which female-headed families with children who have housing choice vouchers reside in census tracts with varying levels of distress by comparison with the availability of affordable rental housing. We find that HCV families are underrepresented in the least-distressed neighborhoods. The problem is especially acute among Black and Hispanic households.

Introduction

The Housing Choice Voucher (HCV) program constitutes the single largest housing subsidy program for low-income households in the United States and is among very few housing programs to increase in size over the past quarter century. More than 2.3 million households received housing choice vouchers as of 2012, accounting for nearly one-half of all recipients of “deep” federal housing subsidies—subsidies that generally ensure that recipients pay about 30 percent of their income for rent.¹ Whereas public housing and other project-based rental subsidy programs have decreased in size, the HCV program has continued to grow, if only in fits and starts (Schwartz, 2014). The program was originally conceived as a more cost-effective way of providing housing subsidies, because it costs less to help pay the rent for an apartment in an existing building than to subsidize the construction and operation of new rental housing. Advocates subsequently have also championed vouchers for their potential to help low-income families avoid the most-troubled neighborhoods and reside in neighborhoods that afford opportunities for education and employment.

Although vouchers have proven to be less expensive than project-based rental assistance (Deng, 2005; GAO, 2002), the evidence is much more mixed with regard to their locational advantages. Compared with people living in public housing, voucher holders generally live in neighborhoods with lower levels of poverty. Much less difference is evident in neighborhood characteristics when the HCV program is compared with other project-based subsidy programs. Voucher holders, along with other recipients of low-income housing subsidies, are underrepresented in neighborhoods with the lowest poverty rates. Moreover, vouchers have been ineffective in countering racial segregation. As a result, the HCV program has not lived up to expectations in helping low-income families reside in places that provide good schools and other services and that enjoy access to suburban job opportunities.

In this article, we shed more light on the ability of the HCV program to help families avoid the most-distressed neighborhoods and access neighborhoods with the greatest opportunities. Focusing on female-headed families with children under age 18, we find that voucher recipients are underrepresented in the least-distressed neighborhoods and overrepresented in neighborhoods with the highest level of distress. These patterns are especially acute among Black and Hispanic voucher holders but are also evident to some degree among White voucher holders. Our analysis is based on tract-level data for 2013 from the American Community Survey (ACS) 2013 (2009–2013 data pooled) and from administrative records for 2013 on the HCV program. The analysis covers all census tracts located in metropolitan statistical areas (MSAs); nonmetropolitan areas are excluded from the analysis.

The article is organized as follows: In the following literature review, we position our central research questions within the context of previous research on housing vouchers. The subsequent section lays out our analytic approach and data sources. In the next section, we present our findings, focusing on the representation of voucher holders in census tracts with varying levels of

¹ The HCV program permits households to pay as much as 40 percent of income toward rent plus utilities. In addition, it appears that about 17 percent of all HCV households pay more than 40 percent of income toward housing due to irregularities in measuring income and other administrative problems (McClure, 2005).

socioeconomic distress and with varying racial and ethnic composition. In the concluding section, we discuss the policy implications of the study, especially regarding the federal government's final rule, Affirmatively Furthering Fair Housing, issued in July 2015.²

Literature Review

Although the HCV program is the largest federal housing subsidy program for low-income households in the United States, it has received relatively little research—certainly less than public housing, a program that has diminished in size since the mid-1990s. As noted previously, a few studies have compared the cost of the HCV program with public housing and other project-based subsidy programs and found that vouchers are more cost effective (Deng, 2005; GAO, 2002). A larger number of studies have examined the locational outcomes of voucher holders. Most of these latter studies, however, have looked not at the HCV program as a whole but at much smaller initiatives that include vouchers (Schwartz, 2014).

Perhaps the first influential study on the failure of vouchers to reach their potential to help low-income households' access high-opportunity neighborhoods was Newman and Schnare's article in *Housing Policy Debate* (1997) on the locational outcomes of recipients of different subsidy programs. They found that, although voucher holders tended to reside in neighborhoods with lower levels of poverty and other indicators of distress than did residents of public housing, voucher holders were underrepresented in census tracts with the lowest levels of poverty and in tracts with predominantly White populations. Pendall (2000) also examined the spatial distribution of voucher holders nationwide. He found that they were more likely to concentrate in highly distressed census tracts when rental housing is concentrated in these tracts. He also found this concentration to be pronounced when voucher holders are predominantly Black and live in predominantly White metropolitan areas (Pendall, 2000). Galvez (2011) found similar patterns in her regression analysis of the residential locations of voucher holders. Devine et al. (2003) examined the geographic distribution of voucher holders in the 50 largest metropolitan areas in 2000. They found that voucher holders are widely distributed but are underrepresented in low-poverty neighborhoods. They also found that minority voucher holders were more likely than White voucher holders to reside in high-poverty areas. Another key finding was that voucher holders seldom cluster within the same census tracts—they rarely account for more than 5 percent of total households in a census tract. McClure, Schwartz, and Taghavi (2015) updated and expanded Devine et al.'s research and found that little had changed in the geography of voucher holder residence from 2000 to 2010.

In another study, McClure (2010) combined administrative data for 2010 from the U.S. Department of Housing and Urban Development (HUD) and census block group data from the 2000 census to assess the extent to which voucher recipients accessed "neighborhoods of opportunity." These neighborhoods had low rates of poverty but also low levels of assisted housing, unemployment, welfare usage, minority concentrations, and female-headed households. He found that voucher holders are currently underrepresented in these neighborhoods relative to the supply of affordable rental units, but he also found that the number of affordable units in these

² "Affirmatively Furthering Fair Housing: Final Rule," *Federal Register* 80 (116) July 16, 2015. <http://www.gpo.gov/fdsys/pkg/FR-2015-07-16/pdf/2015-17032.pdf>.

neighborhoods was much too small to absorb a large increase of voucher holders. In addition to these national studies, several studies of voucher use within particular cities and metropolitan areas have been conducted. For example, Wang and Varady (2005) employed a “hot-spot analysis” of voucher holder residence in the Cincinnati, Ohio metropolitan area and found that voucher recipients were overrepresented in the city’s poorest and predominantly minority neighborhoods.

Much, if not most, of the research to date on housing vouchers has focused on special programs that use vouchers to help former public housing residents relocate to less-distressed neighborhoods. The Moving to Opportunity for Fair Housing (MTO) demonstration program alone has probably seen more research than the HCV program as a whole. The Gautreaux decree in Chicago, Illinois, a progenitor of MTO, has also been studied extensively. Researchers have also studied the use of vouchers by households displaced by the demolition of public housing under the federal HOPE VI Program.

The MTO demonstration program was designed to study how neighborhood conditions affect a variety of socioeconomic, educational, and health outcomes for low-income families. The program took place in five cities. A total of 4,610 households from distressed public housing were assigned to three groups: (1) a control group consisting of original public housing residents who stayed in place, (2) public housing residents who were assigned regular housing vouchers and treated the same as all other voucher recipients, and (3) an experimental group of public housing residents who were also given vouchers but were allowed to use them only in census tracts with poverty rates at less than 10 percent. The members of the experimental group were also given a limited amount of assistance in finding eligible housing. Program participants were tracked for about 10 years. Researchers used a wide range of methods—quantitative and qualitative—to assess the extent of “neighborhood effects” on educational attainment, employment, health, mental health, and other outcomes. The final report on the program, published in 2011, found that MTO had no significant effect on educational attainment among the participating children or on the employment or income of the parents. The program did improve the participants’ sense of safety, however, and was shown to improve certain aspects of mental health, physical health, and overall sense of well-being (Sanbonmatsu et al. 2011; see also Briggs et al., 2010; Ludwig, Ladd, and Duncan, 2001; Ludwig et al. 2011, Ludwig et al. 2012). The educational and employment outcomes led some observers (for example, Imbroscio 2012) to view MTO as a failure and sometimes as evidence of the futility of residential mobility as a means of improving the life chances of low-income families.

Certain limitations in the design and implementation of the MTO program, however, probably contributed to the disappointing results. Most important to this discussion, by contrast with Gautreaux, MTO had no restrictions on the racial and ethnic composition of the neighborhoods to which members of the experimental group could move. As a result, most ended up in predominantly minority census tracts, often in close proximity to their original homes and usually within the same underperforming school district. In addition, many participants ended up in census tracts with poverty rates higher than the 10-percent maximum; the program began in the mid-1990s, and the 2000 census showed that many of the tracts to which participants had moved saw poverty rates increase to more than 10 percent by 2000 (Briggs et al., 2010). Moreover, many participants, after moving to low-poverty neighborhoods, ended up moving back to impoverished neighborhoods very similar to those they had originally come from (Briggs et al., 2010). As a result, many participants resided in high-poverty, racially segregated neighborhoods during much of MTO’s duration.

Although HUD's evaluation of MTO found no effect on educational or economic outcomes, some studies did detect a positive impact. Turner et al. (2012) analyzed MTO's program evaluation data, controlling for the amount of time participants resided in "high opportunity neighborhoods," defined by low poverty rates and high levels of educational attainment. They found that the longer participants lived in these high-opportunity neighborhoods, the better the outcomes in health, work, and school. For example, they found that "an adult who lived in neighborhoods with poverty rates averaging 16 percent over the demonstration period had a predicted monthly income \$233 higher at the end of the period than an adult who lived in neighborhoods with poverty rates averaging 41 percent. The corresponding differences in boys' predicted English and math test scores equate to nearly a year of instruction" (Turner et al., 2012: 5). Unlike other analyses of MTO data, however, Turner et al. did not employ an experimental design, and their findings may therefore be subject to selection bias.

Chetty, Hendren, and Katz (2015), who make direct use of the experimental design of MTO, also discerned a positive effect on education and income in MTO, but only for children who moved to low-poverty neighborhoods at a relatively early age. Drawing on administrative data from tax returns, the researchers compared the long-term outcomes for children who moved to lower-poverty areas when they were less than 13 years old with the outcomes for children who moved when they were age 13 or older. They found that, years later, the younger children were more likely to attend and complete college than were their older counterparts and that they earned significantly higher incomes as adults.

The Gautreaux settlement derived from a federal lawsuit against the Chicago Housing Authority and HUD for violations of the Fair Housing Act. The resulting consent decree required 7,100 residents of public housing and other subsidized housing projects to gain the opportunity to move to neighborhoods with low rates of poverty and low levels of racial segregation. Public housing residents applied through a lottery for the program, which ran for 22 years. Winners who passed the subsequent screening criteria were given the chance to move to the suburbs or to certain inner-city neighborhoods. Research by Rosenbaum and colleagues found that participants who moved to suburban locations saw substantial improvements in educational attainment, employment, and income (Rosenbaum, 2012). The research has been criticized because of the lack of a control group and because of potential selection bias (participants had to be motivated to enter the lottery and pass the eligibility standards; most of the Gautreaux research was retrospective, with "unsuccessful" households potentially underrepresented in the sample). Nevertheless, the research does suggest that Gautreaux's requirement that participants move to places with low levels of poverty and racial segregation led to improvements in educational and employment outcomes.

Finally, in addition to studying MTO and Gautreaux, researchers have examined how vouchers affected socioeconomic and other outcomes for low-income households who were displaced by the demolition of public housing and the conversion of other federally subsidized developments to market-rate occupancy. For example, the Urban Institute tracked the census tracts to which households displaced by the Hope VI Program for public housing redevelopment have moved. As with the MTO research, these studies found that former public housing residents use vouchers to move to neighborhoods with substantially lower levels of poverty but that remain highly segregated (Kingsley, Johnson, and Petit, 2003).

In sum, much of the research on rental vouchers has focused on relatively small programs such as MTO, Gautreaux, and HOPE VI. MTO, for example, was limited to only 5,000 households, and operated in only five cities. Its results are not necessarily reflective of the broader voucher program. The HCV program as a whole has seen relatively little research—and with nowhere near the funding allocated to the evaluation of MTO. Moreover, much of the research on the HCV program dates to the late 1990s and early 2000s (an exception is Martha Galvez’s doctoral dissertation [2011]). The research to date shows that, although voucher holders tend to reside in census tracts that are less impoverished than those of most public housing developments, they are substantially underrepresented in tracts with the lowest rates of poverty. Moreover, if vouchers enable recipients to avoid neighborhoods with the highest rates of poverty, they are much less effective in countering racial segregation.

The aim of this article is to extend our understanding of the locational outcomes of the HCV program. Rather than focus entirely on the extent to which voucher holders reside in neighborhoods with varying degrees of poverty or in neighborhoods that are more or less subject to racial segregation, this article examines the interrelationship between neighborhood distress and race and ethnicity in shaping residential opportunities for voucher holders. As discussed in the next section, we examine the distribution of voucher recipients who are female-headed families with children as compared with the distribution of those who live in affordable rental housing in census tracts with varying degrees of distress and with different racial and ethnic compositions. The article shows that, without addressing the realities of racial segregation, it is extraordinarily difficult for minority voucher holders to reside in neighborhoods that are not subject to high rates of poverty and other dimensions of neighborhood distress.

Data and Analytic Approach

The research presented here is based on ACS data for all census tracts in metropolitan areas of the United States in 2013 (5-year estimates) and tract-level data provided by HUD on female-headed families with children who have housing choice vouchers (“voucher families”), partitioned by race and Hispanic status. We look at the distribution of all voucher families and of non-Hispanic White, non-Hispanic Black, Hispanic, and other voucher families in census tracts with (1) varying levels of distress and (2) varying racial and ethnic compositions. We also examine intermetropolitan variations in the degree to which voucher families reside in tracts with low levels of distress. We limit the analysis to voucher recipients who are female-headed families with children because they would presumably benefit the most from the educational and other opportunities associated with low-distress neighborhoods (Chetty, Hendren, and Katz, 2015). They account for 36 percent of all voucher recipients in metropolitan areas. (Elderly and disabled households account for 49 percent of all voucher recipients, and other households account for 15 percent.)

Briggs and Turner (2006) suggest that we know too little about what constitutes a true high-opportunity neighborhood and that a definition of such a neighborhood must incorporate more than just poverty. One of the many lessons from the MTO demonstration is that poverty alone is not an effective measure of the level of opportunity in a neighborhood. Although poverty correlates with many aspects of neighborhood distress, it does not, by itself, fully capture every aspect of distress. The MTO program sought to improve the lives of impoverished public housing residents

by guiding them to high-opportunity neighborhoods where the households could obtain good housing with access to good schools and gainful employment. For purposes of the MTO program, high-opportunity neighborhoods were operationally defined as tracts with poverty at less than 10 percent. This definition proved to be inadequate, because households participating in the program too often moved to tracts with poverty at less than 10 percent but that remained racially segregated with poorly performing schools. If the HCV program is to succeed in guiding disadvantaged households into high-opportunity neighborhoods, it must identify those neighborhoods with more precision than can be obtained using level of poverty as the sole indicator of distress. The Gautreaux program may have found greater success because it employed more criteria than just poverty level to identify neighborhoods where participating households could locate.

Following Kasarda (1993) and Pendall (2000), we developed a neighborhood distress index. The index is based on five variables: (1) poverty rate, (2) percent female-headed households, (3) unemployment rate, (4) percent of households receiving public assistance, and (5) percent of adults not in school and without a high school diploma. These variables were found by Kasarda to correlate with distress. To create the index, we calculated Z scores for each variable, summed up the Z scores across the five variables, and divided the nation’s 72,181 census tracts into quintiles based on their summed Z scores.

Exhibit 1 compares the distribution of census tracts nationwide based on the distress index with the distribution based on the poverty rate alone. If the two distributions correlate strongly, then it would seem that the distress index would be of little value—adding extra complexity when the poverty rate alone would suffice in categorizing neighborhoods. Poverty and the distress index, however, are not perfectly aligned. Overall, a tract’s poverty rate quintile “predicts” its distress index quintile correctly only 56 percent of the time. For example, exhibit 1 shows that 69 percent of the census tracts in the lowest quintile of poverty rates are also in the lowest quintile of tracts based on the distress index; only 44 percent of the tracts in the second poverty-rate quintile are in the corresponding distress-index quintile.

In addition to developing an index for neighborhood distress, we sorted the nation’s census tracts into four categories based on the percentage of different racial and ethnic groups: (1) White, (2) Black, (3) Hispanic, and (4) integrated. Predominantly White tracts include those where non-Hispanic White residents comprise 75 percent or more of the population. In predominantly Black tracts, Black residents make up 50 percent or more of the population. Hispanic residents account for 50 percent or more of the population in predominantly Hispanic tracts. We refer to all other census

Exhibit 1

Comparison of Tracts by Distress and Poverty Categories

| Poverty Quintile | Distress Quintile | | | | | Total | Percent | |
|------------------|-------------------|--------|----------|--------|-----------|--------|---------|-----------|
| | Very Low | Low | Moderate | High | Very High | | Correct | Incorrect |
| 1st | 9,949 | 3,548 | 803 | 127 | 9 | 14,436 | 69 | 31 |
| 2nd | 3,815 | 6,336 | 3,421 | 824 | 40 | 14,436 | 44 | 56 |
| 3rd | 752 | 3,879 | 6,149 | 3,277 | 380 | 14,437 | 43 | 57 |
| 4th | 89 | 748 | 3,761 | 7,231 | 2,607 | 14,436 | 50 | 50 |
| 5th | 6 | 89 | 450 | 3,052 | 10,839 | 14,436 | 75 | 25 |
| Total | 14,611 | 14,600 | 14,584 | 14,511 | 13,875 | 72,181 | 56 | 44 |

tracts as being “integrated.” Predominantly Black or Hispanic tracts are defined as those with more than one-half of the population comprising one of these minority groups. Most tracts in the nation, however, have a majority White population. Thus, the standard for predominantly White tracts is set higher, at 75 percent, to identify those tracts with very-low levels of racial or ethnic integration.³

Findings

The following discussion focuses first on the geographic distribution of voucher families in census tracts with varying levels of distress in comparison to that of voucher-eligible housing (as defined by rents up to the prevailing fair market rents (FMR). We then compare the distribution of voucher families and voucher-eligible housing in tracts of varying racial and ethnic composition. The following analysis examines the distribution of voucher families in census tracts with varying levels of distress and with varying racial and ethnic compositions. We then look at intermetropolitan variations in the representation of voucher holders in low- and very-low levels of distress.

Neighborhood Distress

Voucher families are underrepresented relative to the availability of affordable housing in census tracts with the lowest levels of distress and are overrepresented in tracts with the very highest levels of distress. Exhibit 2 compares the average percentage of female-headed families with vouchers in each distress category with the percentage of affordable rental housing costing no more than the area’s Fair Market Rent (FMR). It also shows the distribution of White, Black, and Hispanic families with vouchers by neighborhood distress level.

Whereas 8.0 percent of all affordable rental units are located in census tracts classified as having the lowest level of distress, only 3.7 percent of all voucher families reside in these tracts. Moreover, all four groups of voucher holders—White, Black, Hispanic, and other (Asian, Native American, Pacific Islander)—are underrepresented, Black and other voucher holders by substantial margins, with less than one-half the share of voucher holders locating to these very-low-distress tracts as are White voucher holders. Voucher families are also underrepresented in the next two quintiles of neighborhood distress. Whereas 14 percent of all affordable units are in low-distress tracts, only 8 percent of all voucher families reside in those tracts. In the middle-distress group, the percentage of voucher families is 4 percentage points less than the share of all affordable units. On the other hand, tracts with very high levels of distress account for 36 percent of all affordable units but 49 percent of all voucher families.

Minority voucher holders are especially underrepresented in tracts with low levels of neighborhood distress. Although non-Hispanic White voucher holders are slightly underrepresented in the very low-distress category relative to the percentage of all affordable housing, Black and Hispanic voucher holders are significantly underrepresented, and other voucher families are

³ See the bottom panel of exhibit 4 for a breakdown of the number of census tracts, households, and voucher holders in each racial/ethnic category. It shows that nearly one-half (48 percent) of all census tracts are predominantly White, 35 percent are integrated, and 8 and 9 percent, respectively, are predominantly Black and Hispanic. On average, White voucher holders account for 88 percent of the population in predominantly White tracts; Black voucher holders 74 percent in predominantly Black tracts; and Hispanic voucher holders 71 percent in predominantly Hispanic tracts.

underrepresented to a lesser degree. Non-Hispanic White voucher holders are slightly overrepresented relative to the availability of affordable units in low-distress tracts, but all three minority groups are underrepresented, again especially Black and Hispanic voucher holders. For example, in low-distress neighborhoods, the percentage of Black and Hispanic voucher families, each at about 7 percent, is about one-half the percentage of all affordable housing (14 percent).

Exhibit 2 shows that the distribution of voucher families tracks closely with that of all affordable units in the fourth-highest distress category, at around 25 percent. Voucher families, however, are drastically overrepresented in the highest distress category. Whereas 36 percent of all affordable units are located in tracts with very high levels of distress, the same is true of 53 percent of all Black voucher families, 52 percent of all Hispanic voucher families, and 39 percent of all other voucher families; White voucher families, on the other hand, are underrepresented, at 31 percent.

Exhibit 2

Average Percent of HCV Female-Headed Families With Children in MSAs by Race/Ethnicity by Tract Level of Distress

| Distress Quintile | Affordable Units (%) | HCV Female-Headed Families With Children (%) | | | | |
|-------------------|----------------------|--|-------|-------|----------|-------|
| | | Total | White | Black | Hispanic | Other |
| Very low | 8.0 | 3.7 | 7.1 | 2.9 | 2.7 | 5.6 |
| Low | 13.8 | 8.4 | 14.6 | 6.9 | 7.3 | 11.3 |
| Moderate | 17.7 | 14.0 | 20.6 | 12.5 | 12.6 | 16.3 |
| High | 24.4 | 25.0 | 26.2 | 24.4 | 25.7 | 27.4 |
| Very high | 36.1 | 48.9 | 31.3 | 53.3 | 51.6 | 39.3 |
| Total | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |

HCV = housing choice voucher. MSA = metropolitan statistical area.

Neighborhood Racial and Ethnic Composition

Exhibit 3 shows the distribution of affordable rental housing and of voucher families in neighborhoods with varying racial and ethnic compositions. It compares the average percentage of affordable units and voucher families in census tracts where non-Hispanic White families comprise 75 percent or more of the population, where Black families comprise 50 percent or more, where Hispanic families comprise 50 percent or more and in integrated neighborhoods where none of the voucher families—White, Black, or Hispanic—are dominant by these measures.

Exhibit 3

Average Percent of HCV Female-Headed Families With Children in MSAs by Race/Ethnicity and by Racial/Ethnic Dominance of Tract

| Tracts by Racial or Ethnic Dominance | Affordable Units (%) | HCV Female-Headed Families With Children (%) | | | | |
|--------------------------------------|----------------------|--|-------|-------|----------|-------|
| | | Total | White | Black | Hispanic | Other |
| 75+ percent White | 25.0 | 15.3 | 46.3 | 8.5 | 8.3 | 15.4 |
| 50+ percent Black | 12.9 | 28.3 | 4.5 | 41.7 | 5.7 | 5.6 |
| 50+ percent Hispanic | 17.5 | 16.4 | 12.0 | 9.5 | 47.6 | 13.9 |
| Integrated | 44.6 | 40.0 | 37.3 | 40.3 | 38.4 | 65.0 |
| Total | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |

HCV = housing choice voucher. MSA = metropolitan statistical area.

Voucher holders overall are underrepresented in predominantly White neighborhoods, and White, Black, and Hispanic voucher families tend to reside in tracts dominated by their own racial or ethnic group. Whereas 25 percent of all affordable rental units are located in predominately White census tracts, only 15 percent of all voucher families reside in these neighborhoods. Of all White voucher families, however, 46 percent reside in these predominantly White tracts. Conversely, only about 8 percent of all Black and Hispanic voucher families reside in predominantly White neighborhoods.

Compared with the distribution of affordable rental housing, voucher families are overrepresented in predominantly Black census tracts but are proportionately represented in predominantly Hispanic tracts. Exhibit 3 shows that, whereas 13 percent of all affordable units are in predominantly Black tracts, 42 percent of all Black voucher families locate in these tracts. By contrast, only about 5 percent of all White voucher holders and 6 percent of all Hispanic and other voucher holders reside in these predominantly Black neighborhoods. Exhibit 3 also shows that, although the proportion of voucher families in predominantly Hispanic census tracts is only a percentage point less than the 17.5-percent share of all affordable units, these tracts account for nearly one-half of all Hispanic voucher holders but about 10 percent of all Black voucher holders and about 12 percent of all White voucher recipients.

Although voucher holders most often reside in tracts dominated by members of their racial or ethnic group, a substantial portion also live in “integrated” census tracts where no one group is dominant (at least by the definitions used here). Moreover, the proportion of voucher holders in these integrated neighborhoods tracks fairly closely with the share of all affordable housing located there. Nearly 45 percent of all affordable units are found in integrated census tracts, and these tracts are also home to 40 percent of all voucher families—ranging from 37 to 40 percent for all White, Black and Hispanic voucher families to 65 percent of all voucher families from other racial and ethnic backgrounds.

Neighborhood Distress and Racial/Ethnic Composition

In the previous sections we compared the distribution of affordable rental housing and of housing choice voucher recipients in census tracts with varying levels of distress and with varying racial and ethnic mixes. In exhibit 4, we combine the two perspectives and examine the representation of affordable units and voucher holders in tracts with varying levels of distress and with varying racial and ethnic composition. Two findings stand out.

First, voucher holders are underrepresented in White and integrated census tracts with low levels of distress. For example, tracts with very-low levels of distress account for 22 percent of all affordable units in predominantly White neighborhoods, but they account for only 15 percent of all voucher families. In a similar way, tracts in the lowest distress category account for 6 percent of all affordable housing in integrated tracts but just 3 percent of all voucher holders.

The second, and starkest, finding is the almost complete absence of affordable housing or voucher holders in low-distress tracts in predominantly Black and Hispanic neighborhoods. Less than 1 percent of all affordable units and voucher holders in Black and Hispanic neighborhoods are in low- or very low-distress census tracts. On the other hand, 78 percent of all affordable units and

Exhibit 4

Distribution of Affordable Units, HCV Female-Headed Families With Children, and Census Tracts in MSAs by Tract Level of Distress and Racial/Ethnic Composition

| Distress Quintile | Percent of... | Racial/Ethnic Composition of Tract (%) | | | | |
|-------------------|------------------|--|-------------------|----------------------|------------|------------|
| | | 75+ Percent White | 50+ Percent Black | 50+ Percent Hispanic | Integrated | Total |
| Very low | Affordable units | 21.6 | 0.1 | 0.2 | 5.7 | 8.0 |
| | HCV households | 15.2 | 0.1 | 0.2 | 3.3 | 3.7 |
| | Tracts | 39.9 | 0.4 | 1.0 | 15.3 | 22.6 |
| Low | Affordable units | 28.4 | 0.7 | 0.7 | 14.6 | 13.8 |
| | HCV households | 24.7 | 0.7 | 0.9 | 10.7 | 8.4 |
| | Tracts | 28.2 | 2.2 | 2.3 | 20.4 | 20.0 |
| Moderate | Affordable units | 25.8 | 3.1 | 4.0 | 22.7 | 17.7 |
| | HCV households | 27.4 | 4.0 | 4.2 | 20.1 | 14.0 |
| | Tracts | 19.1 | 6.3 | 7.7 | 23.5 | 18.3 |
| High | Affordable units | 17.6 | 18.5 | 21.5 | 31.1 | 24.4 |
| | HCV households | 22.6 | 18.5 | 20.8 | 32.2 | 25.0 |
| | Tracts | 9.9 | 20.0 | 26.9 | 24.2 | 18.1 |
| Very high | Affordable units | 6.7 | 77.7 | 73.6 | 25.9 | 36.1 |
| | HCV households | 10.1 | 76.7 | 74.0 | 33.6 | 48.9 |
| | Tracts | 2.9 | 71.1 | 62.1 | 16.7 | 21.0 |
| All tracts | Affordable units | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |
| | HCV households | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |
| | Tracts | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |
| All tracts | Affordable units | 4,308,418 | 2,213,256 | 3,011,865 | 7,665,890 | 17,199,429 |
| | Percent of total | 25.0 | 12.9 | 17.5 | 44.6 | 100.0 |
| | HCV households | 100,952 | 187,470 | 108,285 | 264,845 | 661,552 |
| | Percent of total | 19.5 | 25.8 | 15.6 | 39.1 | 100.0 |
| | Count of tracts | 23,862 | 5,479 | 6,117 | 21,628 | 57,086 |
| | Percent of total | 48.0 | 8.0 | 9.0 | 35.0 | 100.0 |

HCV = housing choice voucher. MSA = metropolitan statistical area.

77 percent of all voucher families in predominantly Black neighborhoods are located in tracts with the very highest levels of distress. The same is true for 74 percent of all affordable units and voucher holders in predominantly Hispanic neighborhoods.

This huge imbalance in the distribution of affordable units and voucher units across tracts with varying levels of distress in Black and Hispanic neighborhoods is not specific to affordable and subsidized housing. It reflects a much more pervasive pattern. Of the 4,479 metropolitan-area census tracts where Black residents make up 50 percent or more of the population, only 22 (0.4 percent) are in the very-low-distress category, and only 120 (2.2 percent) are in the low-distress category. On the other hand, 71 percent of all predominantly Black census tracts in metropolitan areas fall in the top distress category. Of the 6,117 predominantly Hispanic census tracts in metropolitan areas, only 61 (1.0 percent) are in the lowest distress category and 141 (2.3 percent) are in the next highest group. Conversely, 62 percent of all Hispanic tracts are in the very high-distress category and 27 percent are in the high-distress group.

In other words, if a voucher holder resides in a predominantly Black or Hispanic census tract, he or she will almost invariably face high or very high levels of neighborhood distress. Integrated tracts, on the other hand, are distributed more evenly across the five distress categories. Of all integrated census tracts, 36 percent are in the two lowest distress categories and 41 percent are in the two highest categories.

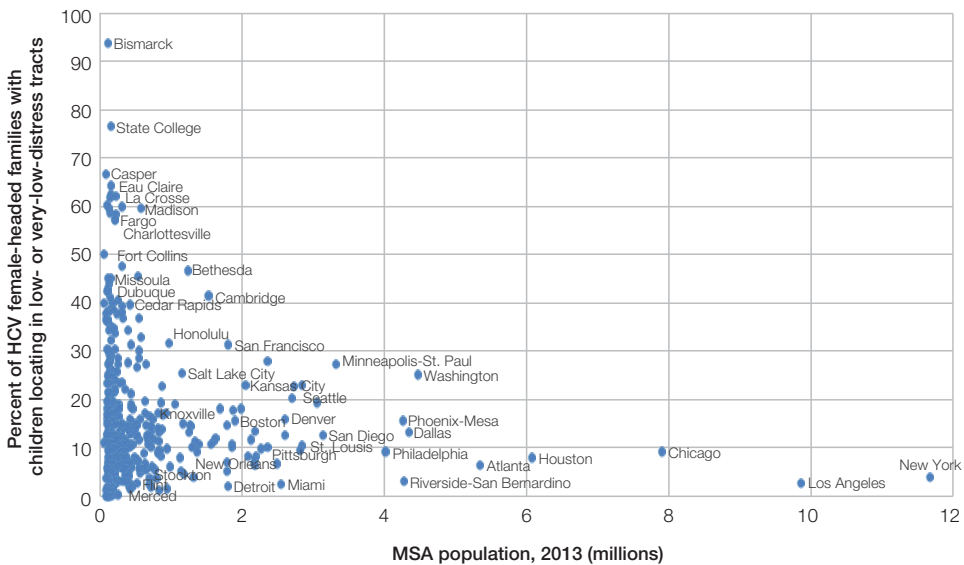
Geographic Variations

The preceding analysis has been framed at the national level; however, housing markets operate at a regional or local scale. Therefore, the finding that voucher holders are underrepresented relative to the supply of affordable housing in neighborhoods with low levels of distress and overrepresented in high-distress neighborhoods may hold up to varying degrees across the country. Voucher holders may be more likely to reside in low-distress neighborhoods in some places than in others. In this section, we examine the intermetropolitan distribution of the percentage of voucher families residing in low- and very low-distress tracts—hereafter referred to as “low distress.”

Exhibit 5 presents a scatter plot of metropolitan areas, with the Y-axis indicating the percent of voucher holders in low-distress census tracts and the X-axis population size of the metropolitan areas. The graph shows that the representation of voucher holders in low-distress tracts varies widely (from 0 to 94 percent) in metropolitan areas with populations of less than 1.5 million. The percentage of voucher holders in low-distress tracts is consistently lower within larger metropolitan areas. It varies from 2 to 42 percent in metropolitan areas of 1.5 to 4.5 million and from 3 to just 9 percent in metropolitan areas with populations of more than 4.5 million.

Exhibit 5

Percent of HCV Female-Headed Families With Children Locating in Low- or Very-Low-Distress Tracts Among MSAs by Population



HCV = housing choice voucher. MSA = metropolitan statistical area.

We developed several regression models to further understand intermetropolitan variations in the presence of voucher holders in low-distress census tracts. The dependent variables in the analysis include all voucher families and all voucher families in each racial/ethnic group. The independent variables, as shown in exhibit 6, pertain to housing market conditions, demographic conditions, FMRs, and metropolitan area population size. Note that some of the variables are expressed in comparison of the low- and very-low-distress tracts with the surrounding metropolitan areas (for example, the difference between the rental vacancy rate in low- and very-low-distress tracts

Exhibit 6

Descriptive Statistics for Components of Models Explaining Variation in Percentage of HCV Female-Headed Families With Children Into Low- and Very-Low-Distress Tracts in MSAs, 2013

| Variable | Minimum | Maximum | Mean | Standard Deviation | Expected Relationship |
|---|---------|---------|--------|--------------------|-----------------------|
| Dependent variables | | | | | |
| <i>Percent of HCV female-headed families with children locating in low- or very-low-distress tracts</i> | | | | | |
| Total | 0.0 | 93.8 | 16.7 | 14.5 | NA |
| Non-Hispanic White | 0.0 | 91.8 | 22.2 | 15.7 | NA |
| Non-Hispanic Black | 0.0 | 94.1 | 14.0 | 15.1 | NA |
| Non-Hispanic other | 0.0 | 100.0 | 19.7 | 23.6 | NA |
| Hispanic | 0.0 | 100.0 | 16.8 | 18.0 | NA |
| Independent variables | | | | | |
| <i>MSA percent for low- or very-low-distress tracts</i> | | | | | |
| Percent of total tracts | 0.0 | 91.7 | 40.2 | 16.9 | + |
| Rental vacancy rate | 0.0 | 35.6 | 7.7 | 3.7 | + |
| Difference in rental vacancy rate with MSA | - 11.4 | 23.6 | - 1.2 | 2.5 | + |
| Workers below poverty level using public transit | 0.0 | 39.5 | 2.6 | 3.9 | + |
| Difference poor workers using public transit with MSA | - 19.8 | 16.3 | - 2.1 | 3.1 | + |
| Housing units single-family | 23.8 | 95.1 | 73.7 | 9.0 | - |
| Difference single-family with MSA | - 40.9 | 32.4 | 8.4 | 5.9 | - |
| Percent of households who rent | 10.3 | 51.6 | 23.3 | 5.7 | + |
| Difference renters with MSA | - 30.7 | 6.4 | - 10.5 | 4.5 | + |
| Percent population Black | 0.1 | 28.5 | 4.9 | 5.3 | + |
| Difference percent Black from MSA | - 34.6 | 2.0 | - 5.6 | 6.3 | + |
| Percent population Hispanic | 0.5 | 89.6 | 7.7 | 10.2 | + |
| Difference percent Hispanic from MSA | - 43.8 | 1.9 | - 5.2 | 7.0 | + |
| Difference percent HCV households Black with percent Black in low- and very-low-distress tracts | - 2.0 | 90.2 | 43.9 | 28.9 | + |
| Difference percent HCV households Hispanic with percent Hispanic in low- and very-low-distress tracts | - 28.7 | 64.3 | 7.1 | 14.6 | + |
| Percent of rental units less than the FMR in low-distress tracts | 7.2 | 68.6 | 36.7 | 10.7 | + |
| Difference percent of rental units below FMR in low-distress tracts from MSA | - 51.3 | 10.1 | - 13.1 | 7.9 | + |
| MSA population, 2013 (thousands) | 55 | 11,680 | 681 | 1,187 | - |

FMR = Fair Market Rent. HCV = housing choice voucher. MSA = metropolitan statistical area. NA = not applicable.

and the rental vacancy rate in the metropolitan area); this difference is meant to reflect whether a particular characteristic is overrepresented or underrepresented in the low- and very-low-distress tracts relative to the broader region. Many of the independent variables are the same or similar to those that Pendall (2000) used in his study of voucher holder location patterns.

The most important variable in all the models is the percentage of low- and very low-distress tracts in the metropolitan area. It was not surprising to find that the higher the percentage of low- or very low-distress tracts in a metropolitan area, the higher the percentage of voucher holders in these tracts. Conversely, metropolitan areas with few low-distress tracts have fewer voucher holders located in these tracts.

Other market-related variables that were also significant in one or more models include the percentage of rental housing, the percentage of single-family homes, and the tract-MSA difference in the percentage of low-income workers using public transit. The percentage of renter households was positively associated with the percentage of voucher holders in low-distress tracts, and this variable was significant (at the 0.01 level) in two of the five models (all voucher families and Black voucher families). The percentage of single-family housing in low-distress tracts correlates negatively with the percentage of voucher holders, but this variable is significant in only one model (all voucher families). These results suggest that HCV households make greater entry into low-distress tracts where rental units, especially multi-multifamily rental, units, are more prevalent.

The only other variable in this category to show significance was the tract-MSA difference in the percentage of workers in poverty who use public transit. Tracts where the incidence of poor workers using public transit exceeded the corresponding percentage for their metropolitan area were positively correlated with the percentage of voucher families in low-distress tracts, but this variable was only significant (and weakly so) in only one model (Hispanic voucher families).

Among the demographic variables, the percentage of Black residents in the population of low-distress tracts showed the strongest effect. The higher the percentage of Black residents, the greater the percentage of voucher families in low-distress tracts. This finding was significant in three models (all, White, and Black voucher families). The coefficient is highest for Black voucher families. In addition to the percentage of Black voucher families in tract population, the difference in the percentage of voucher recipients who are Black and percentage of Black residents in low- and very-low-distress tracts was significant in four of the five models (all except other voucher families). This result aligns with the work of Pendall (2000), suggesting that Black voucher holders will gain greater entry into low-distress tracts where the racial composition of the HCV population more closely corresponds to the racial composition of the population in that market. In a similar way, the difference in the percentage of HCV households who are Hispanic with and the percentage of Hispanic residents in low- and very-low-distress tracts was also significant in the same four models, even though the percentage of Hispanics residents was not.

Metropolitan population size is significant in three models (all, White, and Black voucher families), but the coefficients are very low. Although exhibit 5 suggests that low-distress tracts in smaller metropolitan areas show the most variation in the percentage of voucher holders, it appears that much of the relationship between metropolitan area size and the presence of voucher holders in low-distress tracts is explained by other variables in the models.

Finally, exhibit 7 shows that the availability of affordable housing, as measured by percentage of units costing no more than the FMR, is not significant in any of the models. Also not significant is the *difference* between the percentage of FMR units in low-distress tracts and the percentage in the metropolitan area as whole. From a policy perspective, this finding suggests that increases in FMRs or the use of Small Area FMRs, whereby FMRs are increased in more expensive neighborhoods and reduced in less expensive ones,⁴ are not by themselves likely to help voucher families move into low-distress neighborhoods.

Conclusions and Policy Implications

This analysis of the geography of housing choice voucher recipients makes several contributions toward our understanding of the HCV program's ability to help low-income households locate in neighborhoods with low levels of distress. This study builds on previous ones that have documented that the HCV program has not delivered on its potential to help low-income families avoid neighborhoods that are racially segregated and that often have high rates of poverty (Galvez, 2011; Newman and Schnare, 1997; Pendall, 2000). Whereas previous studies group all voucher recipients together, our study examines the residential locations of White, Black and Hispanic voucher holders separately. Also, whereas most previous studies of the residential locations of voucher holders focus on neighborhood poverty rates, we use a broader index of neighborhood distress that combines poverty with four other characteristics of neighborhood residents. As shown in exhibit 1, poverty does not capture all aspects of distress, and use of a multiple-variable measure may more effectively capture differences in neighborhood quality.⁵

Two findings stand out. The first and most important finding is the almost complete absence of predominantly Black and Hispanic neighborhoods with low or very-low levels of distress. This finding means that if a voucher holder wishes to live in a low-distress neighborhood, he or she must choose one that is either predominantly White or integrated. At present, only about 8 percent of all Black and Hispanic voucher families reside in predominantly White neighborhoods, and 38 to 40 percent live in integrated neighborhoods (see exhibit 3).

It is worth pointing out that in the few instances when Black and Hispanic voucher families do reside in predominantly White neighborhoods they are *more likely* than White voucher families to live in tracts with low levels of distress. For example, although less than 13 percent of all White voucher families in predominantly White census tracts live in very-low-distress tracts, the

⁴ As of August 2016, Small Area FMRs apply in the Dallas-Fort Worth-Arlington, TX MSA and in five additional public housing authorities that participate in HUD's Small Area FMR Demonstration program (Chattanooga, Tennessee; Cook County, Illinois; Laredo, Texas; Long Beach, California; and Mamaroneck, New York). "Final Fair Market Rents for the Housing Choice Voucher Program for Small Area Fair Market Rent Demonstration Program Participants: Fiscal Year 2013," *Federal Register* 78 (192) October 3, 2013: 61668–61742. In June 2016, HUD issued a Notice of Proposed Rulemaking to allow use of Small Area FMRs in selected metropolitan areas where there is wide variance in rents and voucher holders are concentrated in high-poverty neighborhoods. See "Establishing a More Effective Fair Market Rent System; Using Small Area Fair Market Rents in Housing Choice Voucher Program Instead of the Current 50th Percentile FMRs," *Federal Register* 81 (116) June 16, 2016: 39218–39234. The Comment period for the proposed rule ended on August 15, 2016. At the time of the issuance of the proposed rule, 31 metropolitan areas met HUD's criteria for the application of Small Area FMRs.

⁵ This is not to say that our index could not be improved; it may be possible, depending on data availability, to add or substitute variables such as school quality (measured by test scores) and crime.

Exhibit 7

Ordinary Least Squares Models Explaining Variation in the Percent of HCV Families in Low- and Very-Low-Distress Tracts in MSAs, 2013

| Independent Variable | Dependent Variable: Percent of Female-Headed HCV Families Locating in Low- and Very-Low-Distress Tract | | | | | |
|---|--|----------------|----------------|---------------------|-------------------|----------------|
| | Model 1: Total | Model 2: White | Model 3: Black | Model 4: Other Race | Model 5: Hispanic | |
| | Coef- ficient | Signifi- cance | Coef- ficient | Signifi- cance | Coef- ficient | Signifi- cance |
| MSA percent of low- or very-low-distress tracts | | | | | | |
| Percent of total tracts | 0.589** | 0.693** | 0.592** | 0.429** | 0.660** | |
| Rental vacancy rate | -0.172 | -0.132 | -0.081 | -0.071 | 0.220 | |
| Difference in rental vacancy rate with MSA | 0.022 | 0.281 | -0.354 | 0.356 | -0.451 | |
| Workers below poverty level using public transit | -0.182 | 0.082 | -0.257 | -0.016 | -0.107 | |
| Difference poor workers using public transit with MSA | 0.269 | -0.177 | 0.344 | 0.504 | 0.802* | |
| Housing units single-family | -0.161* | -0.085 | -0.192 | -0.361 | -0.135 | |
| Difference single-family with MSA | -0.032 | -0.019 | -0.188 | 0.274 | 0.045 | |
| Percent of households who rent | 0.308** | 0.231 | 0.376** | -0.243 | 0.355 | |
| Difference renters with MSA | -0.053 | 0.127 | -0.282 | 0.462 | 0.153 | |
| Demographic conditions | | | | | | |
| Percent population Black in low- or very-low-distress tracts | 0.410** | 0.334* | 0.614** | 0.182 | 0.192 | |
| Difference percent Black from MSA | 0.077 | -0.182 | 0.122 | -0.151 | -0.309 | |
| Percent population Hispanic in low- or very-low-distress tracts | 0.023 | 0.007 | 0.035 | -0.115 | 0.085 | |
| Difference percent Hispanic from MSA | -0.049 | -0.115 | -0.160 | -0.208 | -0.078 | |
| Difference percent HCV households Black with percent Black in low- and very-low-distress tracts | -0.179** | -0.093** | -0.151** | -0.059 | -0.154** | |
| Difference percent HCV households Hispanic with percent Hispanic in low- and very-low-distress tracts | -0.278** | -0.179** | -0.235** | -0.080 | -0.332** | |
| Fair Market Rents | | | | | | |
| Percent of rental units less than the FMR in low-distress tracts | -0.010 | -0.019 | 0.070 | 0.209 | 0.085 | |
| Difference percent of rental units below FMR in low-distress tracts from MSA | 0.143 | 0.205 | 0.060 | -0.140 | -0.084 | |
| MSA size | | | | | | |
| MSA population (thousands), 2013 | -0.001** | -0.001* | -0.001* | -0.001 | -0.001 | |
| Constant | 10.790 | 3.827 | -0.111 | 31.662 | -5.033 | |
| R square | 0.675 | 0.614 | 0.513 | 0.093 | 0.405 | |
| Number of cases | 381 | 381 | 379 | 337 | 370 | |

FMR = Fair Market Rent. HCV = housing choice voucher. MSA = metropolitan statistical area. * = significant at 0.05. ** = significant at 0.01.

corresponding figures for Black and Hispanic voucher holders in predominantly White tracts are 18 and 16 percent, respectively. Conversely, again focusing on predominantly White census tracts, 36 percent of all White voucher holders reside in tracts with high or very-high levels of distress compared with 29 percent of all Black voucher holders and 30 percent of all Hispanic voucher holders residing in these predominantly White neighborhoods (see exhibit 8).

The second finding is that voucher families are underrepresented relative to the availability of affordable housing in low-distress neighborhoods. This finding is especially true of Black and Hispanic voucher families but also for White voucher holders. A more proportional distribution of voucher holders would enable a large number of voucher holders to move out of highly distressed neighborhoods. If, for example, the percentage of nonelderly, nondisabled Black voucher families in each distress category corresponded exactly with the percentage of affordable rental housing, the number of Black voucher holders in very-low-distress tracts in metropolitan areas would increase by 180 percent, from 15,185 to 44,508; the number in low-distress tracts would increase by 118 percent, from 38,021 to 81,579. Meanwhile, the number of Black voucher holders in very-high distress tracts would decline by 38 percent, from 317,222 to 194,634.

Although increases in the availability of affordable housing in low-distress neighborhoods may be necessary to improve residential options for voucher holders, it probably will not be sufficient, especially for Black and Hispanic voucher holders. As shown above (see exhibit 7), the availability of housing in low-distress tracts that cost less than FMR (and therefore eligible for voucher holders) had no significant effect on intermetropolitan variations in the percentage of voucher holders in these low-distress tracts; all else equal, MSAs with relatively large percentages of affordable units in low-distress tracts did no better than MSAs with small percentages of affordable units in attracting minority voucher holders to these low-distress neighborhoods. As discussed previously, this suggests that policies aimed at increasing FMRs, or adopting Small Area FMRs,⁶ are unlikely by themselves to succeed in attracting Black or Hispanic voucher holders to low-distress neighborhoods. To do so, policymakers will need to address racial barriers as well.

Exhibit 8

Average Percent of HCV Female-Headed Families With Children in MSAs by Race/Ethnicity by Tract Level of Distress in Predominantly White Tracts

| Distress Quintile | Affordable Units (%) | HCV Female-Headed Households With Children in Predominantly White Tracts (%) | | | | |
|-------------------|----------------------|--|-------|-------|----------|-------|
| | | Total | White | Black | Hispanic | Other |
| Very low | 21.6 | 15.2 | 12.8 | 18.3 | 15.7 | 17.0 |
| Low | 28.4 | 24.7 | 23.0 | 26.1 | 26.4 | 28.7 |
| Moderate | 25.8 | 27.4 | 28.1 | 26.2 | 28.3 | 27.2 |
| High | 17.6 | 22.6 | 24.7 | 20.3 | 20.7 | 19.8 |
| Very high | 6.7 | 10.1 | 11.4 | 9.1 | 8.9 | 7.2 |
| Total | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |

HCV = housing choice voucher. MSA = metropolitan statistical area.

⁶ "Final Fair Market Rents for the Housing Choice Voucher Program for Small Area Fair Market Rent Demonstration Program Participants: Fiscal Year 2013," *Federal Register* 78 (192) October 3, 2013: 61668–61742.

These findings are especially germane to HUD's Final Rule for Affirmatively Furthering Fair Housing.⁷ Issued in July 2015, the final rule replaces the government's previous requirement that housing authorities and state and local governments analyze impediments to fair housing with a new approach that requires them to state how their housing and community development programs and investments promote fair housing. To aid in this effort, HUD now provides all program participants (that is, governmental units receiving HUD funds) "with local and regional data on integrated and segregated living patterns, racially or ethnically concentrated areas of poverty, the location of certain publicly supported housing, access to opportunity afforded by key community assets, and disproportionate housing needs based on classes protected by the Fair Housing Act." In providing this data, HUD expects participants [to be]—

...better able to evaluate their present environment to assess fair housing issues such as segregation, conditions that restrict fair housing choice, and disparities in access to housing and opportunity, identify the factors that primarily contribute to the creation or perpetuation of fair housing issues, and establish fair housing priorities and goals.⁸

Some of the specific topics program participants must examine include—

- Racial and ethnic segregation.
- Racially/ethnically concentrated areas of poverty (R/ECAPs).
- Disparities in access to opportunity.

In each category, program participants must consider the location and type of affordable housing as a contributing factor. This study shows that the HCV program does very little to reduce racial and ethnic segregation or to help voucher holders avoid racially defined areas of concentrated poverty, because minority voucher holders are disproportionately located in predominantly minority neighborhoods with high levels of distress. Regarding disparities in access to opportunity, program participants must, among other things, assess how their policies affect the ability of Black and Hispanic residents and members of other protected classes to access "low poverty areas." The HCV program falls short here as well; as noted previously, the percentage of voucher holders, especially minority voucher holders, in low-distress tracts is less than the percentage of eligible rental units.

In developing plans for affirmatively furthering fair housing, administrators of the HCV program should consider policies that enable voucher recipients to secure housing in neighborhoods with low levels of distress. In doing so, governments will need to devise ways of helping voucher holders access housing in either integrated or predominantly White neighborhoods.⁹

⁷ "Affirmatively Furthering Fair Housing; Final Rule," *Federal Register* 80 (116) July 16, 2015. <http://www.gpo.gov/fdsys/pkg/FR-2015-07-16/pdf/2015-17032.pdf>.

⁸ "Affirmatively Furthering Fair Housing; Final Rule," *Federal Register* 80 (116) July 16, 2015: 42272. <http://www.gpo.gov/fdsys/pkg/FR-2015-07-16/pdf/2015-17032.pdf>.

⁹ For an excellent discussion of potential strategies and policy reforms to help voucher holders access low-distress neighborhoods, see DeLuca, Garboden, and Rosenblatt (2013).

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Affordable Rental Housing Development in the For-Profit Sector: A Review of the Literature

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Abstract

Starting with below-market interest rate loan programs in the 1960s and culminating with the creation of the Low-Income Housing Tax Credit (LIHTC) Program through the Tax Reform Act of 1986, the federal government has provided various incentives to encourage for-profit developers to build rental housing that is affordable to low- and moderate-income households. Although for-profit firms have been involved to a far greater extent than nonprofit housing organizations in the LIHTC and other affordable housing production programs at the federal, state, and local levels, these firms have garnered relatively little attention from the academic and policy communities. This article addresses part of that gap by presenting a review of the literature¹ pertaining to the affordable housing production record of private, for-profit developers and, where possible, comparing it with the records of nonprofit housing organizations. The article also explores what is known about the extent to which for-profit firms are meeting the “quadruple bottom line.” The quadruple bottom line encompasses the following four components: an affordable housing development must (1) have the financial backing necessary to preserve the development’s long-term affordability, (2) address the social and economic needs of the residents, (3) contribute positively to the neighborhood, and (4) be environmentally sustainable (Bratt, 2012, 2008a). Although the evidence is limited and some findings are contradictory, several differences emerge from this review. The article also offers suggestions for further research.

¹ This literature review is revised from a section presented in a working paper (Bratt, 2016).

Introduction

The question of how to build decent housing that is affordable to lower-income households has challenged policymakers for decades. Although it is widely acknowledged that federal housing policies have attempted to meet a number of objectives in addition to housing the poor, the challenge of how best to stimulate production has persisted. All the many efforts that have been tried assume that the private, for-profit housing sector typically is not, on its own, able to produce housing affordable to low-income households while still realizing the desired level of profit. Federal assistance in some form is essential to stimulate a large-scale production effort. This simple statement, however, raises additional questions about the type of developer that could best produce the housing. With public housing authorities losing favor by the 1960s, questions arose about whether federal housing assistance should be targeted primarily to private nonprofit or for-profit developers.

After a brief overview of the historical context of for-profit affordable housing development, the literature review first summarizes the findings of key studies concerning how for-profit and nonprofit developers navigate the development process. The article then explores how housing projects built by both types of developers have gone about trying to satisfy several, sometimes competing, pressures, which we call the “quadruple bottom line,” which is “the simultaneous need for the [affordable housing] development to be financially and economically viable while also meeting social goals” (Bratt, 2012: 443). An affordable housing development meeting the requirements of the quadruple bottom line must—

- Have the financial backing necessary to preserve the development’s long-term affordability.
- Address the social and economic needs of the residents.
- Contribute positively to the neighborhood.
- Be environmentally sustainable (Bratt, 2008a; see also Bratt, 2012).

Whenever available, information on the comparative record of for-profit and nonprofit affordable housing developers is included. Data that allow for a head-to-head comparison, however, is relatively sparse. In addition, in no studies did we find a finer grain of analysis that takes into account the significant variety in both types of organizations. More exploration is needed to develop a full typology of the world of for-profit affordable housing developers.

The types of developers vary in a number of key ways: total size of portfolios, size of individual development projects (for example, individual buildings or entire neighborhoods), focus on urban or suburban development, and type of primary construction (that is, rehab or new). In addition, at least some for-profit developers have a mission and approach that are similar to those of nonprofit developers: a commitment to providing social services and long-term affordability for their residents, while also being very conscious of the financial demands of the development (see, for example, Bratt, 2016). These developers typically “start with a mission-driven approach to create vibrant communities that give more people a safe and engaging place to call home—and then make sure that the developments also fit with their profit motivation” (Brennan, 2015).

In a similar way, considerable variation exists in the types of nonprofit organizations that are involved with affordable housing production: neighborhood-based or regional, statewide, or multistate organizations and those that focus on families rather than special subpopulations, such as people

with special needs, the elderly, veterans, formerly homeless people, and those with human immunodeficiency virus/acquired immunodeficiency syndrome, or HIV/AIDS, for example. Many of the same criteria for sorting the for-profit development community are also relevant for the nonprofit community, such as the overall size of the portfolio and the extent of the organization's commitment to a broader set of neighborhood revitalization initiatives versus being strictly housing focused. Yet, as just noted, whenever comparative information is available for for-profit and nonprofit developers, neither of these two broad groups is further delineated according to their varying characteristics.

A further confounding factor is that the literature is often not precise when discussing the exact household income limits to which the affordable rental housing is targeted. Under the Low-Income Housing Tax Credit (LIHTC) Program, households cannot have incomes higher than 60 percent of Area Median Income (AMI); many developments are targeted to households at 50 percent of AMI or lower. The latter in the terminology of the U.S. Department of Housing and Urban Development (HUD) are viewed as "very low income"; however, many affordable housing developments, particularly those that are built through local inclusionary zoning programs, are targeted to households earning 80 percent or less of AMI. Throughout this literature review, the term *affordable housing* generally refers to households earning no more than 80 percent of AMI.

The final sections of this article present conclusions from this inquiry and suggestions for further research.

Historical Context of For-Profit Affordable Housing Development

For more than 50 years, the federal government has been providing various incentives to encourage private, for-profit housing developers to develop affordable rental housing. This reliance on the private sector replaced the decades-old federal strategy of providing deep subsidies to local housing authorities to produce public housing.

In response to the various criticisms of the public housing program, and to increasing concerns about the cost of maintaining this housing stock, the federal government embraced a public-private partnership approach for affordable housing development. The thought was that by involving the private sector, the available federal funds could be strategically leveraged to create a greater impact (Iglesias, 2013) while also intensifying the "market discipline" applied to affordable housing projects. A key challenge, however, has been how to provide sufficient incentives to encourage private-sector participation, while also safeguarding the public purposes of the particular program—providing housing over the long term at prices that are affordable to lower-income residents who are unable to compete in the private housing market.

From their perspective, for-profit affordable housing developers face the potential dilemma of trying to generate the desired level of profit while providing housing for those with very limited incomes. With reference to the major current public-private housing program aimed at this group (the LIHTC Program discussed later in this section), one observer noted that it aims "to house poor people, but not ones so poor that they cannot pay rents sufficient to preserve a profit for the developers" (Ballard, 2003: 24).

In the 1960s, the federal government began providing below-market interest rate (BMIR) loans to private nonprofit and for-profit developers for the construction of housing targeted to low- and moderate-income households. Following these initiatives was the Section 8 New Construction and Substantial Rehabilitation (NC/SR) Program (1974 to 1983), another public-private initiative that continued to bolster the ranks of private, for-profit housing developers.

The contradiction between the public purpose of maintaining affordable housing over the long term and the desire for private-sector profit became a key concern as the affordability restrictions on developments built through the BMIR programs began to expire, starting in the 1980s. A series of public-sector interventions attempted to preserve these homes for lower-income occupancy. Similar problems have arisen concerning expirations on affordability restrictions on the Section 8 NC/SR portfolio (Achtenberg, 2006).

Furthermore, the erosion of federal funding and appropriations for affordable housing and community development accelerated during the Reagan administration, with its focus on a national agenda of privatization and deregulation. As a result, affordable housing development was to be accomplished with more nonfederal and private resources. Indeed, HUD's share of total federal budget authority plummeted by 80 percent from 1980 to 1989 (the largest cut of any federal department). During that period, nonprofit community-based housing organizations that typically relied on funding through federal community development programs had to grapple with cuts as steep as 70 percent (Kochinsky, 1998).

The LIHTC Program, created in 1986, cemented the role of private developers in affordable housing development and is now the major federal housing subsidy program aimed at assisting lower-income households. The program requires that states reserve at least 10 percent of their annual tax-credit allocations to projects with nonprofit sponsors. Although the nonprofit share of total LIHTC production has exceeded that number, for-profit developers have, by far, been the major sponsors of these projects, producing about 78 percent of the LIHTC projects placed in service between 1987 and 2014 (Lew, 2016a).² A 2009 evaluation of state housing finance agencies (HFAs), the entities responsible for tax-credit allocations, found that nonprofit developers tend to assume that state HFAs are influenced by “strong investor and private developer interests” and “often feel excluded from HFA programs due to their weaker capitalization and smaller-scale production capacities compared to private developers” (Sally, 2009: 207).

In 2015, a survey of about 100 for-profit and nonprofit firms involved with affordable housing development or rehabilitation³ was conducted. Among the 52 top developers, for-profit firms started 89 percent and completed construction on 86 percent of the affordable units produced that year (calculated from data in *Affordable Housing Finance* staff, 2016a).

² The 78-percent estimate excludes 9,285 projects in HUD's LIHTC database for which information on sponsor type was missing. The estimate also excludes 696 projects for which sponsor type was available but “placed in service status” or year was unconfirmed. Also excluded were some 52 properties that were placed in service in 2015. Although HUD requests data from state housing finance agencies for properties placed in service through a specific year, states do not always submit information for the specified time period. HUD excludes these properties in their published tables because they would provide an inaccurate picture of activity for those years. It is typical that some undercounting of properties occurs, because it usually takes 2 to 3 years to fully account for all the properties placed in service for a given year (Hollar, 2014).

³ The *Affordable Housing Finance* survey does not account for the types of subsidies used in these projects. The rankings are based on the number of housing units serving residents who earn no more than 60 percent of AMI.

In terms of ownership of affordable housing, as of 2015, 36 out of the 50 largest firms were for-profit firms (*Affordable Housing Finance* staff, 2016b). Indicative of for-profit firms' financial advantages and ready access to capital, 9 out of the 10 firms that acquired the most units of affordable housing that year were for-profit firms (*Affordable Housing Finance* staff, 2016c). In a similar way, for-profit companies comprised the entire list of the 10 companies that did the most substantial rehabilitation work in 2015 (*Affordable Housing Finance* staff, 2016d). In addition, looking at the data over several years, a similar pattern prevails: between 2009 and 2015 (calculated from data in exhibit 1), for-profit firms represented 80 percent of all affordable housing starts among the largest 50 developers (*Affordable Housing Finance* staff, 2016e).

Private, for-profit developers also have been key players in the HOPE VI Program, which started in 1992. This initiative supports the redevelopment of severely distressed public housing through partnerships between local public housing authorities and private, for-profit and nonprofit developers, typically using the LIHTC Program.

State and local housing programs have further encouraged and stimulated the participation of the private sector in affordable housing development. In some states, developers are allowed to produce higher-density housing beyond the amount typically allowed under local zoning laws, with the stipulation that a percentage of units in the development be set aside as affordable housing (see, for example, Bratt and Vladeck, 2014). This approach has been particularly attractive to for-profit developers that are eager to take advantage of density bonuses and other incentives that have the potential to increase profitability for a given development. Also, at the local level, in areas that have a strong demand for housing, inclusionary zoning ordinances have required that new market-rate residential developments of a certain size include a certain percentage of units affordable to lower-income households.

The private, for-profit sector's increasing dominance in the affordable housing arena was buttressed by the simultaneous and growing support for the mixed-income housing approach.

Citing the problems associated with concentrated poverty, which implicated the public housing program, Wilson (1987) and others have criticized developments devoted exclusively to very low-income residents. Already in the late 1960s and 1970s, some housing professionals began considering the benefits of mixed-income housing—housing that would be occupied by both market-rate and lower-income households. Among its purported benefits, mixed-income housing has been touted as far better than traditional public housing and other older, project-based subsidy programs, because it provides a nonstigmatizing environment and may even provide opportunities for lower-income households to network with neighbors who may offer jobs or other advantageous connections (Levy, McDade, and Bertumen, 2013).

Despite the potential strengths of the mixed-income approach, questions have been raised about the actual benefits for low-income households. A number of researchers have found that, to date, the results have not been encouraging and that factors contributing to success go beyond the mere fact of a development's being "mixed income" (see, for example, Brophy and Smith, 1997; DeFilippis and Fraser, 2010; Joseph, Chaskin, and Webber, 2007; Levy, McDade, and Bertumen, 2013; Moore and Glassman, 2007; Schwartz and Tajbakhsh, 1997). The theory and actual outcomes of the mixed-income housing approach notwithstanding, the private, for-profit sector, in particular, has found this approach to be an attractive development option.

Exhibit 1

Overview of Affordable Housing Activity by the 50 Largest Nonprofit and For-Profit Affordable Housing Firms, 2009 Through 2015

| | 2009 | | 2010 | | 2011 | | 2012 | | 2013 | | 2014 | | 2015 | |
|-----------------------------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|
| | Non-profit | For Profit | Non-profit | For Profit | Non-profit | For Profit | Non-profit | For Profit | Non-profit | For Profit | Non-profit | For Profit | Non-profit | For Profit |
| Units in portfolio | 122,814 | 326,672 | 126,075 | 392,068 | 124,671 | 411,717 | 115,150 | 424,716 | 145,398 | 417,973 | 149,289 | 410,807 | 148,331 | 442,658 |
| Percent share | 27 | 73 | 24 | 76 | 23 | 77 | 21 | 79 | 26 | 74 | 27 | 73 | 25 | 75 |
| Units started | 3,123 | 13,005 | 4,753 | 19,775 | 4,870 | 14,183 | 4,543 | 14,248 | 4,101 | 12,292 | 2,745 | 16,648 | 1,976 | 15,677 |
| Percent share | 19 | 81 | 19 | 81 | 26 | 74 | 24 | 76 | 25 | 75 | 14 | 86 | 11 | 89 |
| Units acquired | 0 | 13,867 | 2,246 | 11,858 | 1,176 | 17,414 | 0 | 18,996 | 1,529 | 30,096 | 0 | 14,497 | 1,636 | 23,227 |
| Percent share | 0 | 100 | 16 | 84 | 6 | 94 | 0 | 100 | 5 | 95 | 0 | 100 | 7 | 93 |
| Units substantially rehabilitated | NA | NA | NA | NA | 4,674 | 8,065 | 2,655 | 6,253 | 4,204 | 6,595 | 2,622 | 5,266 | 0 | 10,458 |
| Percent share | NA | NA | NA | NA | 37 | 63 | 30 | 70 | 39 | 61 | 33 | 67 | 0 | 100 |

NA = Data not available.

Notes: Two- or three-way ties often exist, so in any given year more than 50 developers/owners are listed among the "50 largest." For 2009, the percent share calculation of affordable units excludes 583 units developed by the San Antonio Housing Authority, which is a public housing agency; 2009 was the first year for which the information presented was available.

Source: Affordable Housing Finance staff (2016e)—The National Multifamily Housing Council also maintains its own rankings of the largest 50 nonprofit and for-profit owners and managers of multifamily housing dating back to 1990 and the largest 50 developers starting in 2015, but it does not separate out the number of affordable or subsidized units from the total count of apartments owned or developed in a given year.

Alongside the federal government's trend toward promoting private for-profit-sector involvement in affordable housing development have been efforts specifically geared to engaging and encouraging nonprofit-sector involvement. For example, in 1959, the federal government created the Section 202 Supportive Housing for the Elderly Program, which provided funding to nonprofit organizations to develop elderly housing. In a similar way, in 1990, the federal government created the Section 811 Supportive Housing for Persons with Disabilities program to encourage nonprofit development of housing for people with disabilities. Under the HOME program, also enacted in 1990, 15 percent of each participating jurisdiction's allocation must be spent for housing that is developed, sponsored, or owned by nonprofit Community-Based Development Organizations and an additional 5 percent of this allocation can be distributed to these organizations to cover their operating expenses. Furthermore, in 1988, 2 years after it was originally authorized, rules for the LIHTC Program were modified to require that states set aside at least 10 percent of their annual tax-credit allocations to projects sponsored by nonprofit organizations (O'Regan and Quigley, 2000). Some states also choose to set aside more than 10 percent, with allocating agencies from Virginia and Chicago reserving 15 and 30 percent, respectively, of their tax credits for eligible nonprofit developers (U.S. Government Accountability Office, 2016).

Despite the federal government's support for nonprofit affordable housing development, the for-profit sector has played a much greater role than nonprofit developers; for-profit developers are dominant in all the major public-private partnership programs: BMIR, Section 8 NC/SR, and LIHTC. Yet, for-profit firms have received relatively little attention from the academic and policy communities. This inquiry is aimed at filling a small portion of that gap by presenting a review of the literature pertaining to the affordable housing production record of private, for-profit developers.

In each of the following literature review sections, we discuss how for-profit affordable housing developers are carrying out affordable housing development tasks and meeting each of the four components of the quadruple bottom line. Where possible, this record is compared with the experiences of nonprofit housing organizations. Each section concludes with a summary of the supporting evidence. We underscore here that some of these summary statements are based on scant data—in some cases, just one study; therefore, we use terminology that suggests apparent trends rather than definitive findings.

Affordable Housing Development

A number of studies examined differences in the ways in which for-profit and nonprofit developers carry out various affordable housing development tasks. Evaluations of the LIHTC Program in the early 2000s found that for-profit developers were more likely than their nonprofit counterparts to use conventional loans to finance a larger share of their affordable housing development costs (McClure, 2000) and that they were able to secure mortgages covering a larger portion of development costs (Ballard, 2003). As a result, compared with nonprofit developers, for-profit developers have a smaller financing gap to fill between mortgage proceeds and equity generated from the sale of tax credits, and they may be more adept than nonprofit developers in raising equity for their LIHTC projects (Enterprise Community Investment, Inc., 2010).

In view of these findings, it is not surprising that for-profit developers were less likely than nonprofit developers to rely on federal funds through the HOME program for gap financing in tax-credit projects (Lew, 2016a).⁴ Of the nonprofit-sponsored LIHTC projects placed in service between 1987 and 2014, 28 percent included HOME funds, more than double the 13 percent of for-profit-sponsored projects using those funds (Lew, 2016a). In addition, nonprofit developers obtained a greater proportion of project costs through syndication than did for-profit developers (McClure, 2000).

In one of the earliest studies examining development costs⁵ of for-profit and nonprofit developers, researchers found that nonprofit developers worked with an average of 7.8 funders per development (Hebert et al., 1993). Decades later, another study analyzing LIHTC properties in five states found that the average project had four additional funding sources, on top of the LIHTCs, with the most being eight (Bolton, Bravve, and Crowley, 2014). It is unfortunate that neither of these two studies compared the number of additional funding sources used by nonprofit versus for-profit developers.

In at least one city (Chicago), for-profit developers' fees were 50 percent higher on average, than those charged by nonprofit developers (Leachman, 1997). Although development costs may vary based on the types of units produced and the local development conditions, a number of researchers found that for-profit developers typically have lower overall development costs than do nonprofit developers (California HCD et al., 2014; Cummings and DiPasquale, 1999; Fyall, 2012; Hebert et al., 1993; U.S. General Accounting Office, 1999). Yet, one study found the opposite: holding unit sizes constant, project costs (comparable to development costs) were higher among for-profit than among nonprofit projects (Leachman, 1997).

The siting of LIHTC projects can also play a role in the higher per-unit development costs of nonprofit projects. An analysis of data from a 1997 study of such developments found that nonprofit developers tend to build in higher-cost areas of the country, such as the Northeast and the west coast (U.S. General Accounting Office, 1999). Using the HUD LIHTC database, an analysis of more recent data (projects placed in service between 1987 and 2014) revealed similar findings. For-profit-developed projects comprised the majority (86 percent) of LIHTC projects placed in service in the South but represented just 66 percent of the LIHTC projects in the Northeast (Lew, 2016a).

For-profit developers' typical evaluation of a potential project is from a market-based point of view, whereas nonprofit developers operating in a "subsidy-dependent environment" are more limited by where they can build and "often first identify a municipality that is hospitable to the construction of affordable housing" that may also provide some support and then search for a location for construction (Myerson, 2005: 3). Indeed, in a survey of nonprofit housing developers in California, 80 percent cited local government as the institution most critical for their success (Christensen, 2000).

The type of housing built by nonprofit developers can also add to development costs. Compared with for-profit developers, nonprofit developers are more likely to build larger units (more than

⁴ The HOME program (the HOME Investment Partnerships Program) is an important source of funds for states and localities in the development of affordable housing and other housing programs.

⁵ Some research refers to "development costs" while other research uses the term "production costs." For consistency, we use the former throughout this discussion.

1,000 square feet) in mixed-use or highrise structures in more expensive urban settings and adopt more costly building styles. Meanwhile, for-profit developers tend to build smaller, less-expensive, garden-style apartments in rural and suburban areas (U.S. General Accounting Office, 1999).

The development costs of nonprofit developers also may be higher due, in part, to their need to rely on multiple funding sources to fill the gap between first-mortgage proceeds and tax-credit equity, noted previously. As the number of funders increases, the project's development costs rise due to the multiple transaction costs (Ballard, 2003). The patchwork of financing across federal, state, local, and private sources that is typically required for any development that includes affordable housing is challenging for all developers, but, for nonprofit developers, in particular, the difficulties in lining up the needed funding can discourage or thwart potential projects (Salsich, 1999).

Higher development costs may also reflect the willingness of nonprofit developers to “stick with a project even when things turn rocky.” This is because they are “reluctant (and in some cases, limited in their ability) to default on a deal,” compared with for-profit developers that “are prepared to walk away from a deal if it turns sour,” and are better equipped to limit their losses (Myerson, 2005: 3).

Because nonprofit developers more than for-profit developers tend to rely on federal subsidies and funding sources to cover development costs, some nonprofit developers may have to pay higher wages to construction workers due to various requirements (for example, prevailing wages) tied to federal subsidies (Ballard, 2003). Consistent with this finding, one group of researchers concluded that differentials in development costs may be attributable primarily to factors other than “systematic differences in nonprofit versus for-profit comparative efficiencies” (Hebert et al., 1993: ES–20).

A key question, only minimally addressed in the literature, relates to the quality of the housing built by for-profit and nonprofit sponsors using various federal housing subsidy programs. One recent evaluation of hundreds of affordable multifamily projects completed in California found that “nonprofit developers may build projects to a higher quality or durability standard relative to for-profit developers or may choose to take on more difficult and expensive to develop projects”⁶ (California HCD et al., 2014: 35).

Researchers invariably note that, if development by nonprofit developers is comparatively more costly, this difference in cost needs to be viewed in the context of the other benefits typically associated with this housing, such as the nonprofit developers' purportedly greater involvement with the community and their focus on resident services, as discussed in more detail in following sections (see for example, Bratt, 2008a, 2008b; O'Regan and Quigley, 2000).

Conflicting information exists regarding the extent to which each type of developer relies on rental assistance in LIHTC properties. Some earlier studies found that, in comparison with nonprofit developers, for-profit developers tend to rely more on federal subsidies, such as Section 8 vouchers, during the operation of a LIHTC project or have a higher share of residents in LIHTC developments with project-based Section 8 assistance (Ballard, 2003; Buron et al., 2000). Yet, a more recent study found that a higher percentage of nonprofit-developed properties receive project-based

⁶ In view of the intense local competition for LIHTCs, both for-profit and nonprofit developers are likely under pressure to maintain the quality of their housing because it is difficult to obtain allocations of tax credits without a good track record (Deng, 2011).

rental assistance compared with those owned by for-profit developers (CohnReznick LLP, 2015). Although comparative research on the use of tenant-based subsidies such as vouchers by developer type was limited, Buron et al. (2000) found that nonprofit-sponsored projects were more likely than for-profit-sponsored projects to have this type of assistance.

One reason why for-profit and nonprofit sponsors have different costs and funding strategies may be that each group tends to have different central goals and motivations. A study contracted by HUD, which examined 39 LIHTC properties, found that nonprofit sponsors were more likely to cite neighborhood improvement or affordable housing goals as their primary objectives. By contrast, for-profit sponsors were, overall, “more likely to identify financial benefit as the primary goal” (Buron et al., 2000: xv). Another study found that nonprofit sponsors were more likely to locate their properties in poor and problem-laden neighborhoods than the total universe of LIHTC properties, the bulk of which were developed by for-profit sponsors (Climaco et al., 2006; see also CohnReznick LLP, 2015).

At least one study, however, showed that some for-profit developers also choose to work in challenging inner-city neighborhoods, but not without considerable concern. A case study of private, for-profit developers and social service providers involved with mixed-income housing in Chicago found that one for-profit developer knew that building this type of housing was “the right thing to do”; however, the slow, costly, and highly bureaucratic development process made it difficult to remain involved in such investments when greater and quicker profits were available elsewhere: “We’ve had to carry [the project] out of our own pockets for nearly five years at a great cost. No developer in their right mind would ever do this...we ultimately think we’re going to make money or we wouldn’t be in it at all. But we can make a lot more money elsewhere doing a lot of other things” (Joseph, 2010: 115).

To take advantage of the comparative assets of each type of developer, many partnerships have formed between for-profit and nonprofit developers. A study of California’s nonprofit affordable housing sector found that, of the 19 nonprofit developers surveyed, 35 percent had established various types of joint ventures with for-profit developers (Christensen, 2000). For nonprofit developers, the motivation likely relates to the inhouse technical or financial expertise of the for-profit developers and their access to ready capital. For-profit developers typically see a partnership with nonprofit developers as being beneficial because the latter are likely to have deep knowledge of and support from neighborhood residents. In addition, nonprofit developers may have site control of a key property, improved access to potential sites through the city or local redevelopment agency, the ability to attract philanthropic funds, and easier access to public subsidies or financing such as HOME (Bratt, 2008a; Chung, 2004; Jacobus and Winning, 2006; Madden, 2012).

In summary, for-profit developers seem more likely to—

- Have a smaller financing gap to fill between mortgage proceeds and equity generated from the sale of tax credits and may be more adept than nonprofit developers in raising equity for their LIHTC projects.
- Build in lower-cost rural and suburban areas rather than in more expensive urban areas.
- Charge higher developers’ fees.
- Cite financial benefit as their primary goal.

Nonprofit developers seem more likely to—

- Rely on federal funds for gap financing.
- Obtain a greater proportion of project costs through syndication.
- Rely on multiple funding sources to fill the gap between first-mortgage proceeds and tax-credit equity.
- Pay higher wages to construction workers due to various requirements tied to federal subsidies (for example, prevailing wages).
- Build projects to a higher quality or durability standard.
- Choose to take on more difficult and expensive-to-develop projects.
- Cite the importance of neighborhood improvement or affordable housing goals as their primary objective.
- Locate their properties in poor and problem-laden neighborhoods.
- Build units larger than 1,000 square feet.

Conflicting information exists on—

- The extent to which each type of developer relies on rental assistance in LIHTC properties.
- Which type of developer has lower development costs, although most studies conclude that it is for-profit developers.

Components of the Quadruple Bottom Line

As noted at the outset of this article, the quadruple bottom line encompasses four components. An affordable housing development must (1) have the financial backing necessary to preserve the development's long-term affordability, (2) address the social and economic needs of the residents, (3) contribute positively to the neighborhood, and (4) be environmentally sustainable. Each of these components is discussed in the following sections with regard to the record of the private for-profit sector and, when information is available, by comparison with that of the nonprofit sector.

Financial Viability of Developments

The first component of the quadruple bottom line pertains to the need for developments to be financially viable while also providing a high quality of housing over the life of the project.⁷ What do we know about the long-term viability of projects developed by for-profit sponsors, and how does this compare with the experience of nonprofit sponsors? As with the other comparative findings discussed previously, research findings may point in one direction or the other, but the answers are rarely conclusive.

Very little information about the comparative long-term viability of developments that nonprofit and for-profit sponsors produced using earlier federal housing subsidy programs is available. In

⁷ Much of this section is based on Bratt (2008a).

a study of the Section 236 Mortgage Assistance Program, an interest rate subsidy program aimed at multifamily housing that was active from 1968 to 1973, 47 percent of the developments that nonprofit organizations sponsored were found to have failed, although they accounted for only 23 percent of those developments. Further, “nonprofit sponsored [Section] 236 projects failed at four times the rate of limited dividend [for-profit] sponsored projects” (U.S. General Accounting Office, 1978: 93). According to the report, the high failure rate of nonprofit-sponsored projects was because nonprofit sponsors had few resources to weather adversity and probably because they had less experience.

In another early study of FHA-insured multifamily properties, researchers found that distressed and stressed properties were less likely to have for-profit than nonprofit owners (Finkel et al., 1999: 4–11). They added, however, that these findings would be expected because for-profit owners predominate as sponsors of the less troubled, newer assisted properties, whereas nonprofit owners are more prevalent as sponsors of more troubled, older assisted properties.

With the exception of the analysis related to the higher risk of for-profit-owned properties opting out of the Section 8 NC/SR Program (discussed in the next section), and of management experiences (discussed below), we have not found data on the performance of for-profit and nonprofit developers using the Section 8 NC/SR Program, and the record under the LIHTC Program is sparse. The LIHTC industry typically uses three primary measures to evaluate the financial viability and performance of LIHTC projects: (1) occupancy rates, (2) debt-coverage ratio (DCR), and (3) per-unit cashflow (CohnReznick LLP, 2015). Although data are not available from the HUD LIHTC database on these three indicators or on default rates of LIHTC projects by owner type, the cumulative foreclosure rate of LIHTC projects placed into service from 1997 through 2010 is less than 1 percent (CohnReznick LLP, 2012). Additional data from 2013 through 2014 point out that, although for-profit and nonprofit owners have very similar experiences in terms of occupancy rates, with the latter slightly outperforming the former, for-profit developers had stronger per-unit cashflow and DCR levels (CohnReznick LLP, 2015). Nonprofit developers also tended to admit the lowest-income people eligible for the subsidy program and to serve needier families than limited-dividend sponsors. Indeed, the DCR and cashflow underperformance of nonprofit developers may reflect their willingness to take on projects that include additional operating expenses and lease-up challenges, such as supportive housing projects targeted to the formerly homeless (CohnReznick LLP, 2015).

In an earlier analysis of 2,554 LIHTC projects (between 1987 and 1996) that also compared the cashflow generated from properties developed by nonprofit and for-profit developers, Cummings and DiPasquale (1999) arrived at similar conclusions: nearly 83 percent of the developments owned by for-profit developers had positive cashflows compared with only 60 percent of those owned by nonprofit developers. They concluded: “Despite incentives to keep net income close to zero, no project can continue indefinitely with expenses exceeding revenues. Syndicators and investors indicate that as projects increasingly are structured to provide no positive cash flow, funding reserves become very important” (Cummings and DiPasquale, 1999: 278). With only 11 years of experience with the LIHTC Program at the time of the analysis, Cummings and DiPasquale observed that “...there is no evidence on how these projects will fare when they need substantial capital infusions for renovations or systems replacement. How well these projects clear such hurdles will be a major determinant of long-term viability” (Cummings and DiPasquale, 1999: 278).

It is perhaps surprising that, in view of the previously mentioned findings, one study conducted several years later found that nonprofit developers were more likely than for-profit developers to maintain higher operating reserves for their tax-credit projects as a way to support the ongoing affordability of the units and to provide tenant services (Ballard, 2003). Yet, Bratt et al. (1994) found that these reserve funds were often inadequate, revealing concerns about the long-term financial viability of housing owned by nonprofit developers. To be specific, 17 of the 23 developments examined were in a dangerous position because of inadequate capital reserves. In terms of operating reserves, the situation was even worse, with only three developments having reserves in excess of 20 percent of operating costs, the number that HUD considers the minimum for public housing authorities. In view of this shaky financial situation, it is perhaps not surprising that more than one-half of the developments in the sample reported that expenditures exceeded revenues (Bratt et al., 1994).

Although Bratt et al. (1994) did not attempt to quantify how specific conditions contributed to these types of difficulties, their study suggested a number of possible reasons. For example, the quality of the initial rehabilitation was often found to be problematic because of inadequate construction budgets or poor workmanship and dishonesty on the part of contractors. In addition, small portfolios of properties made it difficult for organizations to cover the full cost of operations from property management fees, and neighborhood factors often created adverse conditions and increased management costs (Bratt et al., 1994).

The decisionmaking process leading to some of these poor-quality and ill-advised projects was particularly noteworthy. Nonprofit developers reported that they sometimes undertook projects for which they knew funding was inadequate, primarily in response to local pressures to improve a troubled property or to provide additional housing in the neighborhood (Bratt et al., 1994).

In short, nonprofit developers' willingness to undertake projects in areas that other developers are likely to bypass appeared to be a key factor underlying differences in the viability of their developments. This observation is consistent with the earlier observation that nonprofit developers are more likely to undertake affordable housing projects in more distressed areas where development is more difficult and expensive.

The way in which a development is managed also can have major impacts on project viability; however, information on differences in management practices among nonprofit, for-profit, and government sponsors is limited. One study of public housing and project-based Section 8 housing in Virginia found that, in general, no significant differences existed. Nevertheless, on a few criteria, nonprofit owners had a stronger record than for-profit owners: lower vacancy and unit turnover rates; quicker turnaround times for routine maintenance; and, as discussed further in later sections, undertaking more initiatives to empower residents (Johnson, 1996).

In summary, for-profit developers seem more likely to—

- Have stronger per-unit cashflow and DCR levels.

Nonprofit developers seem more likely to—

- Be susceptible to local pressures to improve a troubled property or to provide additional housing in the neighborhood.
- Have a stronger record in terms of lower vacancy and unit turnover rates and quicker turnaround times for routine maintenance.

Conflicting information exists on—

- Which type of developer maintains higher operating reserves.

Further, based on studies of early federal housing subsidy programs, nonprofit-owned developments—

- Had a much higher failure rate.
- Tended to admit the lowest-income people eligible for the subsidy program and to serve needier families.
- Were more likely to be distressed and stressed.

Again, a recurrent theme is that, when nonprofit developers perform less well than for-profit developers, at least some of the reason is likely attributable to their willingness to take on more difficult projects in more distressed areas. The more complex and challenging the project is to develop and manage, the greater the likelihood that a range of problems will be encountered.

Social and Economic Needs of Residents

At the same time that developments are striving for financial viability, the quadruple bottom line also demands a focus on the social and economic needs of residents. In Bratt's early conceptualization of the quadruple bottom line framework, the category "the social and economic needs of residents" was limited to the level of services provided within the developments. Resident-focused services are provided by trained professionals whose primary responsibility is service delivery. Service personnel either act as coordinators or directly deliver the services themselves, perhaps with an onsite staff. Services typically include some mixture of financial and credit counseling; basic skill development (for example, literacy; English as a second language; preparation for a general education development, or GED, diploma); job training; social service programs for families, youth, the elderly, and special needs populations; homeownership counseling and downpayment assistance; and community and economic development activities (for example, organizing, neighborhood beautification, microenterprise development) (as cited in Bratt, 2008b).

A number of researchers have underscored the importance of service-enriched programs in affordable housing developments (see, for example, Bratt, 2008b; Kudlowitz and Pinder, 2006; Newman and Schnare, 1992; Proscio, 2006;), and some have found correlations between developments providing resident services and significant cost savings in various aspects of property management (Dunn, 2011; Galpin-Platter and Meyer, 2007).

Only limited research directly compares the extent or availability of resident services provided by for-profit-owned and nonprofit-owned developments or that focuses on just the former. One study noted that developers of mixed-income housing may perceive higher costs and risk associated with the provision of onsite social services, with some developers and property managers possibly "reluctant to offer some needed services on-site for fear of advertising the low incomes of many tenants and alienating the higher-income tenants" (Smith, 2002: 25). At least one industry trade publication noted, however, that a growing share of the nation's largest for-profit owners and developers are making an effort to include social services in their affordable projects, including after-school programs for children and onsite health programs (Kimura, 2016a).

The availability of resources and funding to cover the costs of services is, obviously, a critical issue, with nearly one-half (47 percent) of the respondents to a recent survey of 60 mixed-income developments (a group that included 23 private for-profit and nonprofit developers) reporting that this was the number one challenge to offering resident services within their developments (Gress, Joseph, and Curley, 2015). Another study found that Community Development Corporations (CDCs) are more likely than for-profit developers to provide social services such as job training programs to their tenants, especially as part of their management activities. In addition, because many of these services are provided by nonprofit developers' staff members apart from their regular duties, "the costs in terms of time and money become significant" (Leachman, 1997: 45). To bring down the cost of services, some mission-driven for-profit developers, notably Jonathan Rose Companies and McCormack Baron Salazar, often search for a "nonprofit development partner with ties to the community" that will help them identify necessary services for residents that are financially feasible and "also support the project's bottom line" (Brennan, 2015). Indeed, developments built by these for-profit developers may be mixed use and include schools and health centers, which have the additional advantage of bringing public funding with them. Some developments may also include afterschool programs run by nonprofit groups that typically pay rent, further bolstering the project's bottom line and "improving the sustainability of the neighborhood while increasing profits" (Brennan, 2015).

The social and economic needs of the residents can be expanded to encompass several components beyond direct services. Further comparative data were found for the following areas: targeting the lowest-income groups, the size of units, and the likelihood that the units produced would be preserved as affordable housing over the long term. Some of these elements admittedly could be viewed as addressing the needs of the larger community or those of future residents, not just the needs of the existing residents of a particular development. Short of adding an additional component to the quadruple bottom line, the following issues are appropriate to consider in the overall discussion of residents' needs.

Targeting Lowest-Income Groups

Developers applying for LIHTCs must agree either (1) to dedicate at least 20 percent of the rental units in their project to very low-income tenants, defined as those with incomes at or at less than 50 percent of AMI, or (2) to dedicate a larger share—40 percent—of units to somewhat higher-income tenants, with incomes at or at less than 60 percent of AMI. An early study found that most developers (88 percent) had chosen the latter option (U.S. General Accounting Office, 1997). A more recent analysis of the LIHTC database found that the same share (88 percent) of tax-credit projects placed in service between 1987 and 2014 were targeted at the income ceiling—at or below 60 percent of AMI (Lew, 2016a). Consistent with other findings, for-profit-sponsored projects were slightly more likely than nonprofit-sponsored projects—89 versus 86 percent—to be targeted to the somewhat higher income group (at or below 60 percent of AMI; Lew, 2016a).

In an earlier analysis of the LIHTC Program that included a sample of 39 properties placed in service between 1992 and 1994, the only two properties that chose to have the minimum number of units qualifying as affordable for households at or below either 50 or 60 percent of AMI were owned by for-profit developers; the other developments had 80 to 100 percent qualifying units. In addition, just 9 percent of units developed by for-profit developers had rents at less than 70 percent of the

HUD-designated local Fair Market Rent (FMR). By contrast, 45 percent of the nonprofit-built units had rents at less than this amount (Burton et al., 2000). A more recent analysis of HUD's LIHTC database revealed that less than one-half of the low-income units placed in service by for-profit sponsors between 1987 and 2014 had rents lower than the rent ceiling compared with nearly three-fourths of low-income units (73 percent) with a nonprofit sponsor (Lew, 2016a).

A comparative analysis of public funding for for-profit and nonprofit developers of subsidized housing in Chicago found that for-profit developers sought more moderate-income renters in more stable neighborhoods while nonprofit developers developed housing targeted at the lowest-income renters. For the period studied (1994 and 1995), 93 percent of the units developed by nonprofit developers were affordable to those with annual incomes of less than \$15,000, in contrast with just 18 percent of those developed by for-profit developers (Leachman, 1997).

In allocating tax credits, state HFAs are required to give preference to proposals that serve the lowest-income tenants (Ballard, 2003). Developers are also eligible to claim additional tax credits for building in areas where development costs are high relative to income. Yet, only 21 percent of the units developed by for-profit developers qualify for these additional credits compared with 49 percent of those developed by nonprofit developers (U.S. General Accounting Office, 1999). Aside from this incentive for additional credits, "there is no financial benefit to a developer with an otherwise strong tax credit proposal to serve tenants earning less than 50 percent of AMI" (Ballard, 2003: 231; see also McClure, 2000) because tax benefits will not differ for the developer.

For private, for-profit developers to serve low-income households, they "must receive a subsidy at least equal to, if not greater than, the revenue lost through the reduced rents for the low-income units" (Smith, 2002: 32). The required rate of return among for-profit developers is three times higher than the rate of return required by nonprofit developers (Smith, 2002). Consistent with the finding that for-profit developers seek a higher rate of return, a study of LIHTC developments in Richmond, Virginia, revealed that nonprofit developers are more likely to serve households with incomes at 50 percent of AMI or less, and for-profit developers are more likely to serve households at or below 60 percent of AMI (Johnson, 2012). Thus, in short, research shows that nonprofit developers are more likely than for-profit developers to target their units to lower-income households (McClure, 2000).

Several researchers have also observed that partnerships brokered between for-profit and nonprofit developers reflect a clear difference in priorities and organizational goals between these two groups. Compared with their nonprofit partners, for-profit developers may prioritize economic goals over charitable and social welfare goals. For-profit developers tend to be more concerned with the financial feasibility of deals under existing local housing market conditions and with the return that they can expect (under the programmatic guidelines of LIHTC or local affordable housing initiatives). Meanwhile, nonprofit developers may place a higher priority than their for-profit partners on meeting charitable organizational goals and fulfilling a mission to serve lower-income households (Jacobus and Winning, 2006; Lucio and Ramirez de la Cruz, 2012).

Size of Units

Developers have an incentive to produce smaller units—studios and one-bedroom apartments—because this approach increases the number of units that can be built in a given development and, therefore, increases overall revenues (Graddy and Bostic, 2010). Areas with a shortage of affordable

housing, however, typically need larger units to accommodate families with children. As noted earlier, for-profit developers appear likely to build smaller units compared with their nonprofit counterparts. One study found that only 31 percent of units created by for-profit developers had two or more bedrooms compared with 40 percent of units built by nonprofit developers (Leachman, 1997). Other research revealed that nonprofit developers were more likely than for-profit developers to sponsor less-dense developments with fewer units (Johnson, 2012).

Preserving Affordability

The public-private partnership programs of the 1960s and the Section 8 NC/SR Program all encountered the “expiring use” problem. This problem refers to publicly assisted housing developments that cease to be affordable to lower-income households when the regulatory agreements with HUD expire. Hundreds of thousands of affordable units have been lost when developments revert to market-rate housing, and hundreds of thousands of additional units are still at risk (Schwartz, 2015). Multifamily properties with project-based subsidies can also leave the assisted stock through prepayment of mortgages or through opting out of expiring contracts.

A recent study compared the characteristics of properties with project-based assistance that have left the affordable rental stock (due to mortgage prepayment or through opt-outs) with those properties that have remained in the HUD programs. Researchers found that assisted properties owned by for-profit corporations and properties located in areas where the rents charged in the assisted properties are significantly lower than market rents are more likely to opt out (Ray et al., 2015; the same trend was found by Finkel et al., 2006, for an earlier period).

In a separate analysis using data from the National Housing Preservation Database, for-profit owners were found to be less likely than their nonprofit counterparts to own assisted properties that had low rent-to-FMR ratios. Among for-profit-owned units expiring during the coming decade, only 9 percent had average rents of less than 80 percent of the local FMR. By contrast, nearly one-third (30 percent) of those units owned by nonprofit organizations had rents at less than this amount (Lew, 2016b).⁸ Ray et al. (2015) point out that for-profit ownership and average rents charged at less than FMR are two primary risk factors for opting out of project-based rental assistance contracts when they expire. Therefore, this analysis identifies a potential universe of units at risk of being removed from the affordable assisted stock during the coming decade. In a broader context, nonprofit developers tend to have a much longer time horizon than their for-profit counterparts and have a consistent presence in a community over time. As a result, they are more likely to “own and manage their rental properties for many years” while “for-profit developers tend to have a dynamic portfolio” (Myerson, 2005: 2).

⁸ This analysis is based on the data in the National Housing Preservation Database as of June 2016. The database includes units with subsidies through the project-based Section 8 Program and through Section 811, Section 202, and older initiatives, such as the Rent Supplement and Rental Assistance Payments Programs. These tabulations include units with a contract expiration date between January 1, 2016, and December 31, 2026. The methodology used here varies from the methodology used for the Joint Center for Housing Studies’ annual *State of the Nation’s Housing* report (see, for example, 2016), which tabulates the number of expiring units based on the latest expiration date of any subsidy in that property. That methodology results in higher shares of both for-profit-owned and nonprofit-owned expiring units with average rents at less than 80 percent of the local FMR (11 and 36 percent, respectively) than the ones presented here (9 and 30 percent, respectively).

One study, which involved telephone interviews with 314 owners of LIHTC developments, found that less than 40 percent of the for-profit owners of LIHTC properties envision that the properties will remain affordable to low-income housing residents beyond the end of the compliance period compared with 70 percent of the nonprofit owners (Abravanel and Johnson, 2000). Further, when compared with nonprofit owners, for-profit owners were more likely to limit the affordability of their properties to the minimum-use restriction periods, as opposed to extended affordability-use commitments (Johnson, 2012).

Because for-profit owners developed and own the great majority of LIHTC properties, it is not surprising that for-profit developers now own 81 percent of the 1.6 million LIHTC units with affordability requirements due to expire between 2016 and 2026 (Lew, 2016b).⁹ In the early years of the LIHTC Program, affordability restrictions lasted for just 15 years. Since 1990, LIHTC properties have been required to retain affordability for at least 30 years, unless they are able to get special approval. Also, most states have their own requirements for even longer restriction periods. As of 2001, affordability restrictions of more than 30 years were required (or such projects were given priority) in 41 states. For example, in Massachusetts, Michigan, and Vermont, affordability is required in perpetuity (Gustafson and Walker, 2002).

Because of these extended affordable-use requirements, properties built more recently are at a lower risk of being converted to market-rate housing (Khadduri et al., 2012). The same report also found, however, that most early LIHTC properties are not at risk of losing affordability, with the exception of properties owned by for-profit developers located in strong market areas that could support rents that are higher than LIHTC rents, a finding that supports the study by Ray (2015) cited previously. In a similar way, according to the results of a survey of eight tax-credit syndication firms conducted in 2005, the involvement of not-for-profit sponsors as part of the ownership structure of the projects is a primary determinant of risk; nonprofit sponsorship was associated with a lower risk of losing affordability (Meléndez, Schwartz, and de Montrichard, 2008). Although it is the mission of nonprofit developers to operate properties as affordable housing beyond the term of any regulatory requirements, some for-profit developers also see their work as providing high-quality affordable housing over the long term, thereby serving needy households (Khadduri et al., 2012).

In summary, for-profit developers seem more likely to—

- Build smaller units.
- Limit the affordability of their properties to the minimum-use restriction periods as opposed to extended affordability-use commitments and opt out of affordability contracts where assisted property rents charged are significantly lower than the fair market rents for that area.

Nonprofit developers seem more likely to—

- Be focused on providing social services.
- Target a higher share of their units to lower-income households.

⁹ This analysis is based on the same data described in the previous note, with the same limitations. These tabulations include 1,618,906 units with an affordability expiration date between January 1, 2016, and January 1, 2026. Once again, the methodology used by the Joint Center for Housing Studies differs from the approach used here, resulting in a lower estimate of expiring units with LIHTC allocations (1,321,088) than the 1.6 million estimate presented here.

- Sponsor less-dense developments with fewer units.
- Own assisted properties that have low rent-to-FMR ratios.
- Charge lower rents for units with use restrictions expiring during the coming decade.
- Envision that their properties will remain affordable to low-income housing residents beyond the end of the compliance period.

Neighborhood Context

The third component of the quadruple bottom line is, perhaps, the most difficult to assess, and research findings are far from robust. Potentially relevant questions about whether a given development is viewed as a positive addition to the neighborhood include—Does the development fit into the larger fabric of the neighborhood and does it contribute to neighborhood viability? If the neighborhood has been distressed and suffering from high vacancy rates and turnover rates and abandonment, what evidence, if any, shows that the new development is helping to stimulate increased investment and revitalization? Have any other public and private investments followed the new housing? What do we know about how property values in the surrounding area have been impacted? Further, from the perspective of the development’s residents, does the development’s location potentially open up opportunities in terms of access to jobs and desired schools? Is the new development located in a higher-income area that previously had been inaccessible to the lower-income tenant population?¹⁰ It is unfortunate that, even when researchers seek answers to these questions, the findings are rarely conclusive.

Regarding siting, and as pointed out previously, nonprofit developers are more likely than for-profit developers to build units in economically distressed and extremely low-income areas (Dillman, 2007; Fyall, 2012; Leachman, 1997). In one of the few studies comparing the neighborhood quality of LIHTC projects developed by for-profit developers versus nonprofit developers, Buron et al. (2000) found that, among a sample of 39 properties across five metropolitan statistical areas, those sponsored by for-profit developers were more likely than those with a nonprofit sponsor to be located in low-poverty areas with poverty rates of less than 10 percent and with lower percentages of minority residents, to be located in stable neighborhoods with lower turnover rates, and to have higher shares of owner-occupied housing. By contrast, however, another study found that for-profit developments were more likely to be located in neighborhoods with high concentrations of Black residents (Dillman, 2007).

In terms of LIHTC tenants’ satisfaction with their neighborhoods, results differed by sponsor type, with residents of for-profit-sponsored properties more likely than those in nonprofit-sponsored

¹⁰ The issue of whether affordable housing should be built in low-poverty “opportunity neighborhoods” versus lower-income areas, where much of the target population already lives, is obviously a critical issue that has attracted a great deal of academic interest. In addition, the 2015 Supreme Court case (*Texas Department of Housing and Community Affairs et al. v. Inclusive Communities Project, Inc., et al.*) and HUD’s 2015 guidelines on Affirmatively Furthering Fair Housing are an important part of the policy discussion. Although the legal basis for these actions has been in existence for decades, together they represent a reaffirmation of the importance of eliminating racial segregation, and they could stimulate an increased commitment to consider the racial impacts of a given housing project or intervention.

projects to rate their neighborhood as good or excellent. Residents in nonprofit-sponsored properties, however, were more likely than those in for-profit-sponsored developments to report living in close-knit neighborhoods and to be “somewhat or very active in [their] neighborhood” (Burton et al., 2000).

Ellen and Voicu (2006) concluded that developments built by both for-profit and nonprofit developers contributed to an increase in neighboring property values. In smaller projects, however, nonprofit developers delivered less benefit to the neighborhood than for-profit developers. On the other hand, the impact of the nonprofit developments remained stable over time, but the impact of the for-profit developments declined slightly over time.

In a similar way, in an analysis of external neighborhood effects of LIHTC projects built in Santa Clara County, California, from 1987 to 2000, researchers found that projects owned by for-profit developers delivered benefits similar to those sponsored by the area’s nonprofit developers. Projects built by large nonprofit developers that were members of the Housing Partnership Network and those built by the Housing Authority of the County of Santa Clara generated the greatest amount of positive impact on nearby single-family property values compared with properties built by for-profit developers and nonprofit developers that were not members of the Housing Partnership Network (Deng, 2011).

In contrast with the studies cited previously that note the generally positive spillover effects of affordable housing built by for-profit developers, an earlier study found that subsidized housing owned by for-profit developers was associated with negative impacts on property values, while housing developed by CDCs had a positive impact on property values (Goetz, Lam, and Heitlinger, 1996).

Thus, very little comparative information is available on this component of the quadruple bottom line, and the findings are also somewhat contradictory. For-profit and nonprofit developers seem to be delivering similar benefits, and developments built by both generally contributed to an increase in neighboring property values.

In summary, for-profit developers seem more likely to—

- Deliver more benefits to the neighborhood, where there are smaller projects.

Nonprofit developers seem more likely to—

- Build units in economically distressed/extremely low-income areas (as noted previously).
- Have developments whose impacts remain more stable over time.

Conflicting information exists on—

- Whether for-profit or nonprofit-owned developments were more likely to be located in neighborhoods with higher concentrations of minority residents.
- Whether for-profit or nonprofit-owned developments were more likely to positively or negatively impact house values.

In addition, and perhaps the only comparative information on the performance of different types of nonprofit developers, projects owned by large nonprofit developers generated larger neighborhood impacts than for-profit developers and nonprofit developers that were not members of the

Housing Partnership Network. The importance of better understanding characteristics and differences in outcomes for different types of for-profit and nonprofit developers is underscored in the section titled Suggestions for Further Research.

Environmental Issues

The final component of the quadruple bottom line concerns the environmental sustainability of the development or the incorporation of “green” building standards into the construction or rehabilitation of affordable housing projects. Despite the trend toward green design, there does not appear to be relevant literature on the extent to which for-profit and nonprofit developers take advantage of these approaches and incentives.

Investments in energy-efficiency retrofits and green building standards for affordable rental housing are critical: residential buildings account for approximately 22 percent of the nation’s total energy consumption (DOE, 2012). Furthermore, the lowest-income tenants tend to bear a disproportionate burden for energy costs, so improving the energy efficiency of affordable housing not only leads to potential energy savings but also improves the stability of low-income households. In 2014, utility costs accounted for 17 percent of the incomes of renter households earning less than \$15,000 a year compared with just 2 percent among those earning \$75,000 and more (JCHS, 2015).

During the past several years, the federal government and state-based funding agencies have emphasized the importance of green design as an important criterion in awarding subsidies. To be more specific, nearly one-half of the states in the United States (as of 2013) included incentives for developers to include green building elements in their applications for competitive LIHTCs through the Qualified Allocation Plan process (Linstroth, 2013).

It appears that developers historically may have thought that environmentally sensitive design was an “impediment, not an opportunity” (Levin, 2013: 37, based on a 1998 survey); however, attitudes toward affordable environmentally sustainable housing may be shifting. According to a recent survey, as of 2012, 86 percent of multifamily builders and developers¹¹ reported that at least some of their affordable housing projects were green; nearly one-fourth of this group reported that 31 to 60 percent of those projects were green (McGraw Hill Construction, 2014). Industry trade publications also indicate that large for-profit developers, such as Omni New York LLC, are increasingly undertaking substantial rehabilitations of affordable properties that include upgrades to energy-efficient boilers and incorporation of other sustainable features (Kimura, 2014).

Conclusions

As discussed previously, public-private partnership initiatives have been prevalent since the 1960s, and the important role of for-profit developers in affordable housing development was further solidified with the creation of the LIHTC Program in 1986. Regardless of the type of developer, the

¹¹ The survey did not ask multifamily developers to identify whether they were for-profit or nonprofit organizations. The developer sample was drawn from the membership of the National Association of Home Builders and from a list of the developers associated with multifamily projects featured in other reports released by the consultant (Dodge Data & Analytics) commissioned to conduct the study (Laquidara-Carr, 2015).

issues confronted and the tasks that need to be carried out are essentially indistinguishable. We know that for projects to be successful they need, for example, adequate upfront subsidies and gap financing; high-quality construction and design, with an emphasis on both durability and green building materials; a sensitivity to how the development fits into the surrounding neighborhood; subsidies for ongoing management and capital repairs; and support services for residents.¹²

In addition, in the absence of mandatory affordable-use restrictions, for-profit and nonprofit developers are likely to have a differing level of commitment to preserving long-term affordability. As a result, preservation requirements and goals should be addressed at the time of funding. In particular, for-profit developers of LIHTC projects can set up arrangements at the outset so that, after the 30 years, the developments can be transferred or purchased by nonprofit developers (or tenants, resident management corporations, or government agencies) as a way to retain affordability.¹³

The preceding literature review highlights several key differences between for-profit and nonprofit developers in the development and ownership of affordable rental housing. Among the many findings discussed, several are particularly important to highlight.

First, for-profit developers appear to be better able to fill the financing gap between mortgage proceeds and equity generated from the sale of tax credits, and they have greater access to ready capital. As a result, they are less in need of additional subsidies than are nonprofit developers, which tend to have to layer a great many subsidy sources to make the deals work.

Second, for-profit developers appear to charge higher developers' fees and are more likely to cite financial benefit as their primary goal. By contrast, nonprofit developers are most likely to cite neighborhood improvement or affordable housing goals as their primary objectives.

Third, although data are conflicting, the weight of the evidence suggests that for-profit developers may also be able to achieve lower development costs.

Fourth, when nonprofit developers' development costs are found to be higher, researchers invariably note that these costs need to be viewed in the context of the other benefits that are typically associated with housing produced by nonprofit developers. In particular, there appears to be a greater willingness on the part of nonprofit developers to undertake projects in areas that other developers are likely to bypass—economically distressed areas with extremely low-income households. This orientation, researchers find, seems to be a key factor underlying any differences in the viability of developments owned by nonprofit developers. In addition, the more complex and challenging the project is to develop and manage, the greater the likelihood that a range of problems will be encountered.

¹² For a more detailed discussion of the many elements needed for high-quality affordable housing development, see Bratt (2016).

¹³ To be more specific, a for-profit owner may grant a right of first refusal to a nonprofit or to an agency of state government for a statutory minimum price. The statutory minimum price (outstanding debt plus taxes) can be a below-market price. The LIHTC Program also gives owners an opportunity to operate the property, without affordability restrictions after year 15 if the state agency is unable to find a buyer at the contract price. As noted earlier, however, most states have produced regulations that require more stringent affordability standards.

In reviewing the comparative records of for-profit and nonprofit developers using the components of the quadruple bottom line, we often found only sparse information. In particular, comparative information for key measures of project financial viability, including default rates, is lacking, thereby making conclusions in these areas impossible. For-profit developers, however, seem to have stronger per-unit cashflows and DCR levels.

Nonprofit developers may be more likely than typical for-profit developers to focus on providing or coordinating social services to meet residents' needs, to target their units to lower-income households, and to sponsor less-dense developments with fewer and smaller units. A commitment to try to maintain affordability beyond the mandated use-restriction periods is also a key orientation of nonprofit organizations. By contrast, for-profit developers seem more likely to opt out of affordability contracts and limit the affordability of their properties to the minimum use-restriction periods.

In terms of neighborhood impacts of for-profit and nonprofit affordable housing developments, both seem to be delivering similar benefits and contributing to an increase in neighboring property values. Further, where nonprofit developers operate smaller projects, they seem to be delivering less benefit to the neighborhood than are for-profit developers. On the other hand, the impact of nonprofit-owned developments seems to remain more stable over time. In perhaps the only comparative information on the performance of different types of nonprofit developers, projects owned by large nonprofit developers (that is, Housing Partnership Network members) generated larger neighborhood impacts than for-profit developers and nonprofit developers that were not members of the Housing Partnership Network.

Finally, we could not find any comparative literature for the last component of the quadruple bottom line. Thus, we cannot offer any conclusions about the extent to which for-profit versus nonprofit developers are incorporating environmental considerations into their projects.

Suggestions for Further Research

Despite the longstanding importance of for-profit developers in affordable housing production, the literature review reveals key gaps in the research. Three areas for further exploration are suggested.

Develop a Typology of For-Profit and Nonprofit Affordable Housing Developers

To gain a better understanding of the comparative strengths and weaknesses of for-profit and nonprofit affordable housing developers, it would be helpful to be able to delineate the types of for-profit and nonprofit firms that are engaged in affordable housing development. In exploring the literature and in conversations with key informants,¹⁴ it is clear that an ability to more precisely differentiate the various types of for-profit affordable housing developers is needed. Indeed, as noted at the outset, for-profit developers do not constitute a single homogenous group. When comparing for-profit and nonprofit organizations, as many studies discussed in this article have

¹⁴ A conversation with Patrick Clancy, former president of the large Boston-based nonprofit, The Community Builders, was particularly helpful in understanding the diversity within the for-profit affordable housing development sector (Clancy, 2014). Some of the suggestions contained in this section are based on his observations.

done, it would be helpful to know exactly what type of for-profit or nonprofit organization is being discussed. Which exact types of entities are the most productive and efficient, while also providing a high level of services to residents in good-quality, long-term affordable housing?

A key factor for sorting groups could be along a continuum of social mission and the extent to which a strong financial outcome is a prerequisite for getting involved with a specific deal. Many nonprofit developers traditionally have launched projects that have had a shaky financial basis but an ambitious social agenda (see also Bratt, et al., 1994). This combination will significantly increase the difficulty of successful execution and compound the risk (Clancy, 2014).

In thinking further about the world of large nonprofit affordable housing developers and their for-profit counterparts, we may see a convergence between the day-to-day activities and overarching orientations of corporate-like nonprofit developers and mission-driven for-profit developers. Although the need to make a certain level of profit may still be a distinguishing feature, one would likely be hard pressed to see real differences in the operations between some of the highest-performing nonprofit developers (for example, BRIDGE Housing, The Community Builders, Mercy Housing, Preservation of Affordable Housing) and the most mission-driven for-profit developers (for example, Jonathan Rose Companies, McCormack Baron Salazar).

Additional research should be carried out comparing some of the highest-performing for-profit and nonprofit affordable housing developers to better understand the relative advantages and challenges of each. More specifically, it would be desirable to have more detailed information about a number of factors such as the operating costs, staffing, and organizational capacity of for-profit developers—using, for example, the LIHTC Program—by comparison with various types of nonprofit organizations, particularly neighborhood-based community development corporations. To make the best possible use of federal resources—whether through direct or indirect subsidy approaches—policymakers would benefit from having more and better information about the types of developers that produce and maintain the best and most cost-effective housing for lower-income households.

More and Better Comparative Research

This literature review has explored the comparative strengths and weaknesses of for-profit and nonprofit developers. Although some trends are apparent, as noted previously, it should be emphasized that many of the findings discussed in this article are based on very little evidence. Sometimes, only a single research study is cited to describe a particular observation. As the literature makes clear, uneven research interest exists in the topics discussed here. The most focus has been on the housing development process, financial viability, and social and economic benefit components. Particularly sparse are comparisons on neighborhood quality and environmental quality. In addition, we have not found any research that specifically looks at how weak versus strong market contexts may be a factor in the comparative performance of for-profit and nonprofit affordable housing developers. Much of the comparative research on for-profit and nonprofit developers has also focused on the LIHTC Program. Aside from some analyses related to the use of additional rental subsidies in LIHTC projects and preserving the affordability of properties with federal project-based rental assistance, little information is available on the role of for-profit developers involved with the project-based Section 8 Program and with federal demand-side programs, notably the Housing Choice Voucher program.

Direct comparisons are needed between for-profit and nonprofit developers, holding as many variables constant as possible. Such comparisons would provide a better understanding of how each type of developer goes about meeting its goals. In short, we need more information on the extent to which both types of developers meet the criteria of the quadruple bottom line. Additional qualitative and quantitative explorations could look at key variables through the experiences of the various subtypes of nonprofit and for-profit developers. Such exploration would promote a richer understanding of the challenges being encountered by a range of entities, preferably in diverse market settings, in the production of high-quality housing that remains affordable over the long term.

To be more specific, to what extent is each type of developer creating projects that promote greater safety, stimulate other public and private investment in the area, and provide opportunities for local residents to enhance economic security? In an ideal controlled study, a group of cities would be selected that each has at least two very similar neighborhoods, in terms of, for example, types of residential structures (for example, one-to-four-family or multifamily homes), vacancy rates, extent of vacant and abandoned buildings, racial and socioeconomic characteristic of residents, amount of open space, and access to schools and public transportation.

For each neighborhood, a nonprofit developer and a for-profit developer would be designated and two comparably sized developments would be built. Following these efforts over 15 years would provide innumerable insights into the development process, the long-term financial viability of developments, impacts on individual residents and the neighborhood, and how environmental considerations are incorporated into the projects.

To facilitate better comparative research efforts, it would be helpful for HUD, if possible, or the National Council of State Housing Agencies to collect information from state HFAs on project health and viability (that is, occupancy rates, DCRs, per-unit cashflows, and default and foreclosure rates) by type of owner. This information could then be incorporated into the LIHTC database or released publicly as a stand-alone data set or report.

Better Understanding of Productive For-Profit and Nonprofit Partnerships

As noted previously, good affordable housing development and management are essentially the same regardless of the sponsor, providing that key requirements are met. Explicit efforts for for-profit developers and nonprofit developers to share experiences, collaborate, and learn from each other are needed. We need to do a better job of learning from some of the largest producers of affordable housing in the United States—for-profit developers that use the LIHTC. At the same time, the group of high-performing nonprofit developers represents a valuable resource. What lessons can they share with all affordable housing producers and how might these lessons be translated into new public policy strategies? What models of for-profit-nonprofit partnerships appear to be providing the best-quality, long-term affordable housing? What additional legislative initiatives or technical assistance programs are needed to support these collaborations?

The national nonprofit intermediaries, NeighborWorks America, the Local Initiatives Support Corporation, and Enterprise Community Partners, along with the Housing Partnership Network and the relatively new group, Stewards of Affordable Housing for the Future, could launch a collaborative effort with the for-profit affordable housing development community to address these

questions and other issues of mutual interest and concern. The research community could play a role in encouraging such an effort and offering its assistance in compiling and analyzing the results.

Final Note

This literature review has been presented with the hope that it will help illuminate the work of private, for-profit developers in providing housing that is affordable to lower-income households. Helping to spur a new wave of research efforts among housing academics and policymakers would be a welcome outcome of this effort.

As frequently noted, the need for good affordable housing continues to be a significant challenge. Seven years after the end of the Great Recession, a record number of renters are paying more than 50 percent of their income for housing and federal interest in providing deep housing subsidies is weak (JCHS, 2016; NLIHC, 2016). Indeed, the major housing subsidy program directed to lower-income households, LIHTC, does not depend on annual federal appropriations and, instead, provides tax credits to high-income investors. The tax credits available under this program are insufficient, however, to meet the demand. Furthermore, since the LIHTC program has a higher income eligibility limit (60 percent of AMI) than many other federal housing subsidy programs, additional rental subsidies are often necessary in order to make the units affordable to extremely low-income households (O'Regan and Horn, 2013), which results in complex financing schemes. Not since the Section 8 NC/SR Program has there been a low-income-targeted deep, direct federal housing subsidy.¹⁵

Despite strong demand for tax credits, the decline in critical federal gap financing programs like HOME, coupled with tight rental markets and rising development costs, have made it more difficult for both nonprofit developers and for-profit developers to expand the supply of affordable housing. According to results from *Affordable Housing Finance* magazine's annual survey, 24 percent of the nation's 50 largest for-profit and nonprofit developers reported that they were most concerned about rising development costs in 2016, with the average per-unit development costs for new affordable construction projects at \$253,984 in 2015, up 7 percent from \$238,296 in 2014 (Kimura, 2016b). Moreover, because these are national averages, they camouflage the fact that development costs are much higher in various parts of the country, such as in the Northeast and several West Coast cities, where land costs, in particular, are especially steep.

It is clearly important to use the limited resources available as effectively as possible. To do that, a better understanding of the strengths and weaknesses of the various types of development entities is needed. At the same time, advocates, academics, and policymakers should continue to underscore the essential role of government in producing and maintaining a stock of high-quality affordable

¹⁵ One of the most encouraging mechanisms to create a funding stream for affordable housing is the new National Housing Trust Fund. Shortly after its creation in 2008, however, the major source of funding was shut down, due to the financial upheavals within Fannie Mae and Freddie Mac. As of January 1, 2015, these two agencies were directed to contribute a set amount of money each year based on their volume of business. In May 2016, HUD made its first allocation of nearly \$174 million to states through the Trust Fund. These funds will provide a reliable source of revenue that does not depend on annual congressional appropriations (Crowley, 2015; HUD, 2016).

housing. For the federal government to regain its primacy as the key driver of a low-income housing agenda, it will need to rely on high-performing nonprofit developers, mission-oriented for-profit developers, and non-mission-driven for-profit developers that are able to partner with nonprofit developers that will assure long-term affordability. Regardless of sponsorship, the overriding goal is to produce a robust and sustainable stock of high-quality affordable housing for the millions of households that are facing serious housing problems. To achieve this goal, more and deeper federal subsidies for affordable housing are needed. Our ability to meet the housing needs of the nation is within our intellectual grasp, but the issue has not risen to a level of political imperative.

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Departments

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Data Shop

Data Shop, a department of Cityscape, presents short articles or notes on the uses of data in housing and urban research. Through this department, the Office of Policy Development and Research introduces readers to new and overlooked data sources and to improved techniques in using well-known data. The emphasis is on sources and methods that analysts can use in their own work. Researchers often run into knotty data problems involving data interpretation or manipulation that must be solved before a project can proceed, but they seldom get to focus in detail on the solutions to such problems. If you have an idea for an applied, data-centric note of no more than 3,000 words, please send a one-paragraph abstract to david.a.vandenbroucke@hud.gov for consideration.

Chicago Multifamily Market Characterization: Developing a Comprehensive Picture of the Multifamily Housing Landscape

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Abstract

A data-driven description of a community's housing stock can help identify community needs and inform decisionmaking regarding energy efficiency and other types of programs. This article presents the data and methods used in an analysis characterizing the multifamily building stock in Chicago, which segmented Chicago's multifamily buildings by age, size, construction type, and energy use. Conducting this analysis presented several thorny data challenges: building-level data are not collected in any central location; in Chicago and many other cities, the local property assessor has the most complete data of this kind, but the data are compiled for the purpose of tax assessment and not for the purpose of population-level building segmentation; and many disparate data sets must be combined with assessor data into a cohesive whole, presenting difficulty in matching, cleaning, and determining the appropriate level of granularity. This article describes a multifamily market characterization study in Chicago for which different data sources were merged for the analysis; presents a general methodology that could be used by other

Abstract (continued)

cities or program implementers; and discusses insights about the Chicago multifamily market. Identifying and locating geographic concentrations of certain building types enable more precise targeting for energy, housing, and other building programs.

Motivation

The analysis described in this article is part of a series of multifamily research studies, which were created in partnership with the Energy Efficiency for All (EEFA)¹ project, which has the goal of reducing energy consumption to support the larger goal of maintaining affordable housing. EEFA's aim is to encourage electric and gas utilities to spearhead programs that capture all cost-effective energy efficiency within the affordable multifamily housing sector, significantly benefiting low-income families, building owners, and utilities.

The Natural Resources Defense Council and other organizations have indicated a need for market characterization studies to document the building types, ownership structures, housing subsidy characteristics, and energy use characteristics of multifamily buildings at a local level. They recognize that in many cases municipalities are better positioned than states, public utility commissions, or utilities to design and implement locally tailored energy efficiency programs that meet city climate and sustainability goals. Local data could be used by municipal policymakers to complement utility energy efficiency potential studies, or the methodology can serve as a guide for municipalities to identify and characterize the broad and complex multifamily market. Market segmentation is needed because a one-size-fits-all approach to energy efficiency is ineffective in a diverse multifamily sector.

The approach presented here is focused on the affordable multifamily market in Chicago; similar characterizations are being done in New York City and Los Angeles (Yancy et al., 2015). The methodology is also broadly applicable to the other building sectors. For example, Elevate Energy used this methodology, augmented by extensive data transfer processes and Python scripting, to assist the City of Chicago in the implementation of its commercial building benchmarking and disclosure ordinance, as well as a countywide single-family market characterization.

Data Sources for the Chicago Multifamily Characterization

The authors faced expected issues of data availability, completeness, consistency, and granularity. These challenges stemmed from the number of data sources that were used to develop the database of Chicago multifamily buildings and the fact that each data source was originally designed and maintained for a purpose other than developing the multifamily characterization.

¹ EEFA is a joint effort of the Natural Resources Defense Council, the National Housing Trust, the Energy Foundation, and Elevate Energy. The mission of EEFA is to make multifamily homes healthier and more affordable through energy and water efficiency and access to clean energy, benefiting millions of Americans living on limited incomes.

Exhibit 1 includes the 13 data sources leveraged, shown in order of the number of observations. The primary data source used, which was from the Cook County Assessor, provided more than 173,000 observations. Although incomplete for some properties, the data source included variables for property age, units, stories, construction material, and assessed value. Critically, each observation was associated with a unique 10-digit number called a property identification number (pin10).

Exhibit 1

Data Sources Used in the Chicago Multifamily Market Characterization

| Data Set Name | Description | Number of Buildings or Properties | Geography and Granularity | Public, Fee-Based, or Private |
|--|--|--|--|--------------------------------------|
| Cook County Property Assessor data | Residential properties that include the vintage, number of units, and other building characteristics | 173,000 | County (includes city of Chicago) parcel or building level | Public |
| Chicago Department of Buildings | Water meters in commercial, residential, and industrial buildings | 71,000 | City of Chicago building level | Private |
| Chicago Energy Use 2010 | Aggregate electricity and gas use, at the census block level, for particular building types | 67,000 | City of Chicago census block | Public |
| Chicago Department of Buildings permit | Building permits for commercial, residential, and industrial buildings | 54,000 | City of Chicago building level | Public |
| CoStar | Commercial real estate database with multifamily module | 9,000 | National building level | Fee-based |
| ComEd 2013 Smart Meter data | Electricity usage data for ComEd customers with smart meters on the multifamily rate | 3,000 | Regional Illinois building and utility meter level | Private |
| Elevate Energy All-Electric database | Multifamily all-electric buildings in Chicago | 1,600 | Chicago building level | Private |
| National Housing Preservation Database | Aggregated database of federally subsidized properties | 800 | National census block | Public |
| Elevate Energy retrofit program | Energy use and characteristics for buildings that have applied for or completed retrofits | 600 | Regional Illinois building level | Private |
| City of Chicago benchmarking | Reported energy data for multifamily buildings > 250,000 square feet | 300 | Chicago building level | Private |
| ACS | Ongoing survey that provides demographic data | NA | National census block | Public |
| RECS | National survey of 12,000 households on energy consumption | NA | National census block | Public |
| Energy Score Cards/Bright Power | Energy reporting data for owners of multifamily housing in Chicago | 166 | | Private |

*ACS = American Community Survey. NA = not applicable. RECS = Residential Energy Consumption Survey.
Note: The ACS and RECS regional and national survey data are reported in aggregate.*

To ensure that the database would be complete with respect to the number of multifamily buildings in Chicago, Elevate Energy complemented the assessor data with two sources from the Chicago Department of Buildings. These sources were complete for owner contact information but less complete for other building characteristics. CoStar, a commercial real estate database, contained about 9,000 buildings labeled as multifamily properties in the city of Chicago, many of which tended to be larger and newer properties. These buildings represent about 45 percent of the stock of multifamily buildings with at least five units.

To assess housing subsidy characteristics, Elevate Energy used the National Housing Preservation Database, which contains property-level subsidy information for the Low-Income Housing Tax Credit Program, public housing authority affiliation, and other subsidy information. Ownership structure was estimated using the most recent estimates from the American Community Survey (ACS).

Energy use information was unavailable at the population level. Instead, energy use was estimated using a variety of sources, including Elevate Energy's program data, which cover roughly 600 buildings in Chicago; the City of Chicago data portal, which published 2010 electricity and gas data for particular building types at the census block level; the Residential Energy Consumption Survey, which provides regional estimates on residential energy use; and Bright Power, which shared energy benchmarking data for approximately 150 multifamily buildings in Chicago.

Data Cleaning and Joining

The Cook County Assessor data for multifamily buildings required extensive data cleaning and manipulation. First, duplicates with the same unique pin10 were removed and any associated data fields were appended to the remaining observation. It is possible that these duplicates represented a property that had undergone significant improvements, like an added garage, added units, or renovation, which triggered a new instance in the assessor's data systems. Other causes for the extensive duplication in the pin10 were not immediately obvious.

The assessor data also presented a challenge because some single buildings were divided into multiple parcels. The City of Chicago publishes geospatial building footprint data on its data portal. These footprint data were analyzed in ArcGIS and overlaid with assessor data to identify potential duplication. An example is shown in exhibit 2, in which buildings, shown as shaded outlines, were represented as multiple observations (straight lines), according to the Cook County Assessor. Visual inspection revealed several possible explanations for the discrepancy: large buildings with multiple postal addresses or a mix of commercial and residential space could be represented as distinct assessed properties; newer development had been constructed on more than one parcel but had not been condensed to a single property; parking lots, vacant lots, and other nonbuilding objects that were subject to property tax assessment were included but were not relevant to the multifamily market study.

SQL scripts were employed to address each type of parcel or footprint discrepancy. For example, a large apartment building at a range of addresses was condensed into one observation for a given building footprint, and the associated data were aggregated for that observation. If this methodology resulted in different values for a variable—such as building age—the minimum value was always taken. Vacant or demolished buildings were removed from the data set.

Exhibit 2

Geospatial Building Footprint Data, City of Chicago



Note: Outlines of assessor parcels are overlaid onto footprints of existing buildings (shaded).
Sources: Cook County Property Assessor; city of Chicago geospatial building footprint data

Condominium units presented another duplication issue. To the property assessor, they are unique data entries with their own assessed value and other characteristics. The authors were concerned with the building level, not the property level, however, and therefore condominiums were collapsed to their respective buildings. They were identified as condos using their class code and were aggregated to the building level using the final four digits of their pin10, which were identical for units in the same building. Thus, condo units were aggregated to the building level and the number of units was included as a field.

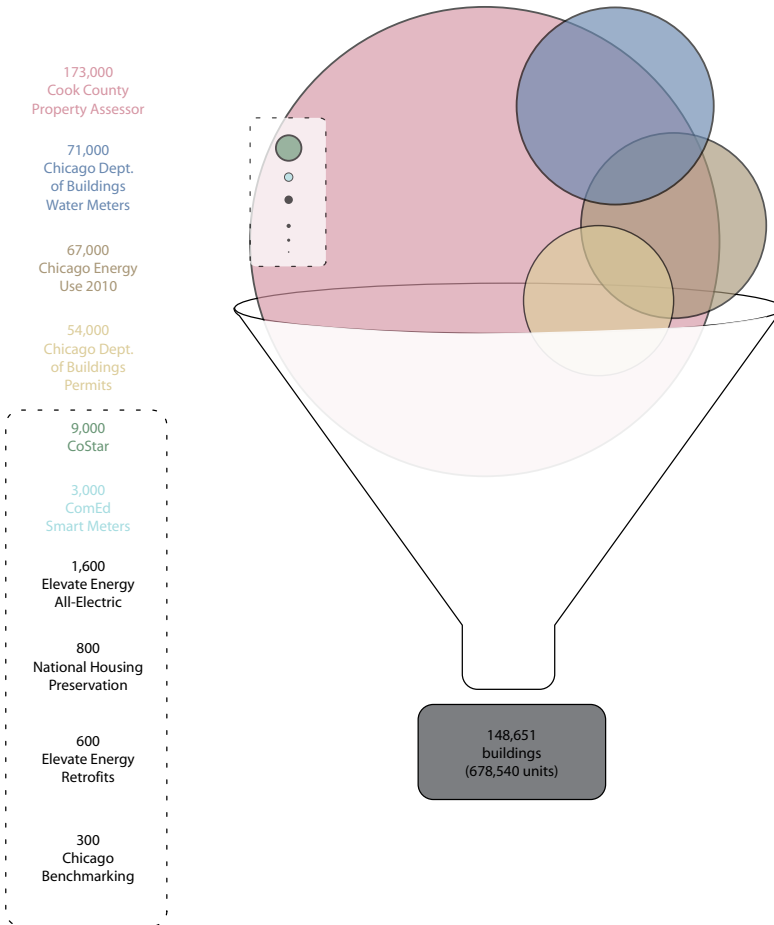
Whenever possible, the assessor data, which served as the primary data source, were joined to other sources via the pin10. For example, CoStar data were joined in this way, and the roughly 1,200 observations in the CoStar multifamily database that did not have matching pin10s in the assessor file were appended to the master data file. The slight mismatch between the assessor and CoStar files is attributed to a lack of standard methodology for classifying large apartment buildings as either residential multifamily or commercial, or as both.

Finally, each observation was geocoded with ArcGIS, using the address to assign a unique geospatial location to each building. Using this information, each building was linked to a census tract, which could be used to join the data from the National Housing Preservation Database, ACS, and other census-based survey data.

Exhibit 3 is a representation of the database.

Exhibit 3

Multiple Data Sources Combined To Build Characterization Database



How To Conduct a Multifamily Market Characterization

The authors wrote a how-to guide for cities, program implementers, and others wishing to conduct their own segmentation study: *Understanding Your Multifamily Building Stock: A Framework for Cities and Municipalities* (Corso et al., 2016a). Following is a summary of the approach, and its intended audiences are cities only starting to identify uses and data sources. This approach could be applied to answer questions about the potential for energy efficiency savings in the building stock or to create a list of covered buildings under a benchmarking ordinance, and it is generalized to facilitate many other applications.

1. Identify a Primary Data Source

To start, cities and municipalities should identify and document all the potentially useful data sets from various data sources and secure authorization to use them. After data sets are identified, it

is critical to identify the set that appears to be the most complete, comprehensive, and accurate and to consider this set as the primary data source. When the primary data set's strengths and weaknesses are well understood, identify secondary data sources to fill in any gaps. Ideally, the secondary data sets can be joined via a unique identifier, rather than an address, because addresses often require extensive cleaning.

The potential data sources include but are not limited to—

- Property tax assessors.
- Municipal open data portals.
- Housing agencies or university research centers.
- Utility energy efficiency studies.
- Energy use surveys.
- Municipal water agencies.
- Private real estate databases.
- Public surveys and data sources.

When choosing a primary data source, it is important to consider the original intended purpose of the data. A city's open data portal with information on building permits, for example, might not be intended to capture every building that exists in the city, because it tracks only those with pending or expired permits. By contrast, the purpose of a county assessor's database is to determine the tax base, and therefore it includes every property within its jurisdiction. Similarly, take note of the strengths and weaknesses of sources relative to one another; the quality and reliability of the building owners' contact information may be stronger in some data sources, because the data were used to create a contact list for a municipal agency. Another data set may lack phone numbers and addresses but include high-quality information about building construction materials and fuel mix.

Consider and document variable definitions as well and be aware that variables that appear to be identical in disparate data sets may have different data definitions, depending on the source of the information. For example, the size of a building measured in square footage might be reported as a distinct value across different data sets. A property assessor calculates square footage based on taxable area of a building, an energy program such as the U.S. Environmental Protection Agency's Portfolio Manager defines square footage as the conditioned heated and cooled areas of a building, and CoStar tracks gross leasable floor area. These different criteria for calculating square footage result in three distinct values for the same concept.

2. Consider the Granularity of Secondary Data Sources

Secondary data sources can include any data sources that are less complete, valid, or granular than the primary data source. For example, in an effort to protect the privacy of individual residents, a city might share energy or water data at the neighborhood level but not at the building level.

Because the data are at the neighborhood level, they cannot be linked to an individual building, although they are valuable to link by neighborhood. Given these constraints, it would not make sense to start a market characterization with such a secondary data source.

Many secondary data sources are less complete or available only in aggregate. Despite these constraints, these data can still complement the primary data source. A less complete source might cover only a particular neighborhood or type of housing. A conclusion can be drawn from this less complete source and extrapolated to a larger population, as long as the methods and assumptions are clearly explained.

3. Understand Privacy and Data Sharing

After primary and secondary data sources are selected, analysts must consider the privacy requirements associated with each. If the ultimate goal of a market characterization is to share a data file with a broad audience, it is paramount to ensure that subsidiary data sources can be shared more widely. Some data-sharing agreements prevent such wholesale sharing of data but enable sharing of aggregated, manipulated, or transformed data.

Building-level energy data in particular pose privacy challenges, because the industry is highly regulated. For example, a city that requires certain types of buildings to benchmark its energy data should take care to understand the data access limitations that may exist.

4. Consult Local Experts

Experts in housing, real estate, and energy policy can be invaluable partners in a market characterization study. Many of them have deep knowledge of the data sets available and the challenges associated with each. They can also assist in framing and communicating findings for various audiences. Advocates for affordable housing and experts in local housing markets are often especially helpful in providing context for working with the subset of affordable multifamily housing in a given market.

Findings

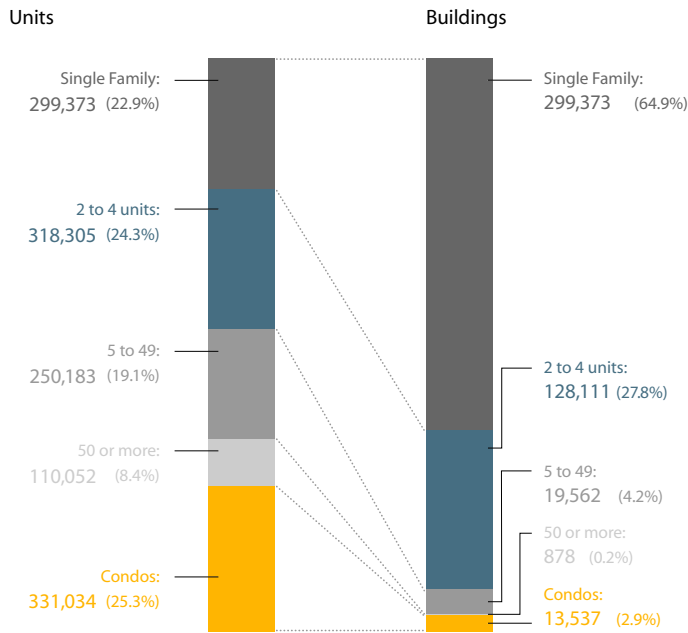
The methods presented previously, when applied to the Chicago multifamily building stock, yielded insights about the size, geographic distribution, and segmentation of residential buildings in Chicago. Previous analyses of Chicago housing, most notably by the Institute for Housing Studies at DePaul University, used assessor data to understand the building stock. This analysis built upon those studies by adding layers of other municipal data, fee-based commercial databases, and energy data.

More Chicagoans live in multifamily housing than in any other type of residence. The city of Chicago is home to an estimated 1.3 million housing units, of which roughly 23 percent are single-family homes and the remaining 77 percent are broadly defined as multifamily housing. In other words, more than three-fourths of Chicago's housing units are in some kind of multifamily structure; these structures number nearly 150,000 and occur in every neighborhood in the city. See exhibit 4 for the segmentation of Chicago housing in buildings and units.

Exhibit 4

City of Chicago Residential Housing Stock in Buildings and Units

City of Chicago Residential Stock



Source: Elevate Energy analysis of the characterization database, as illustrated in Exhibits 1 and 3

Multifamily housing forms the backbone of affordable housing in Chicago. Nearly 90 percent of rental housing in Chicago is in a multifamily building. The two- to four-flat building is a dominant building type and accounts for 38 percent of rental housing in Chicago. The multifamily building with five or more units accounts for 52 percent of all rental housing in Chicago; rental units are divided into market-rate, subsidized housing, and that which is not subsidized but affordable. As seen in exhibit 5, the number of so-called “naturally occurring affordable housing” units (184,000) is double the number of subsidized housing units (91,000). Between 60 and 70 percent of multifamily housing in Chicago exists in neighborhoods where at least one-half of households earn well below the median income for the Chicago rental market (exhibit 6).

Exhibit 5

City of Chicago Affordable Multifamily (Five or More) Housing Units

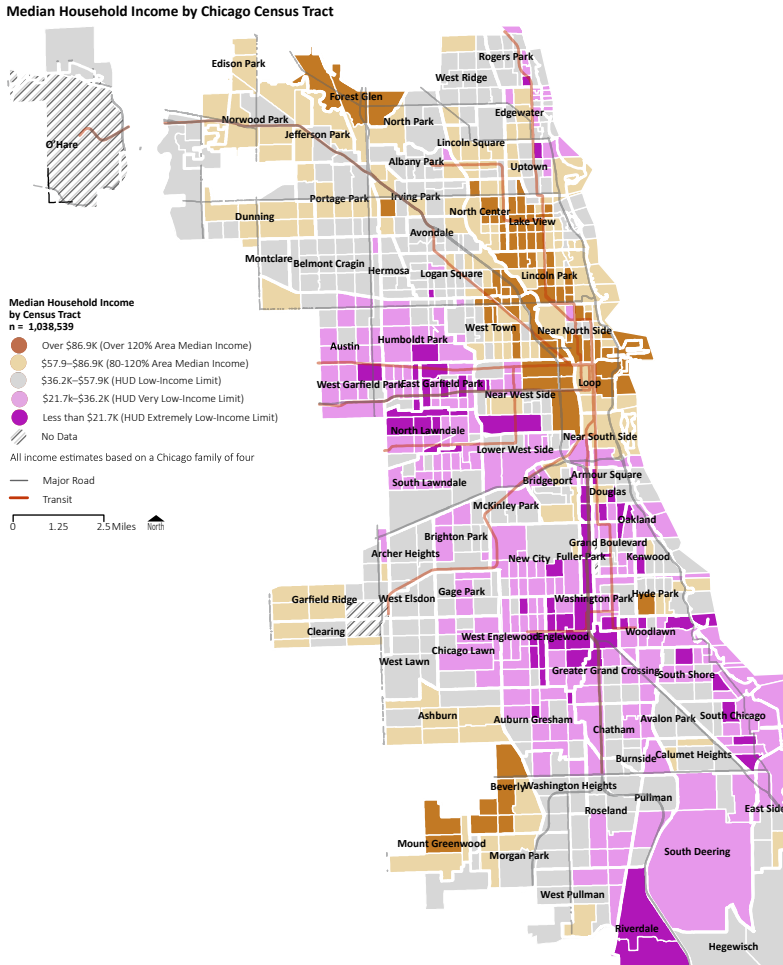
| | Two- to Four-Unit Buildings | | Multifamily (Five or More) Buildings | |
|-------------------------------|-----------------------------|---------|--------------------------------------|---------|
| | Units | Percent | Units | Percent |
| Market rate | 111,632 | 30 | 264,359 | 49 |
| Unsubsidized affordable | 261,502 | 70 | 183,860 | 34 |
| Subsidized | NA | NA | 90,747 | 17 |
| All multifamily housing units | 373,149 | | 538,966 | |

NA = data not available.

Sources: National Housing Preservation Database; American Community Survey

Exhibit 6

Chicago Median Income, by Census Tract



Last Updated: September 2015

HUD = U.S. Department of Housing and Urban Development. n = number of households.
 Source: 2013 American Community Survey 5-year estimates

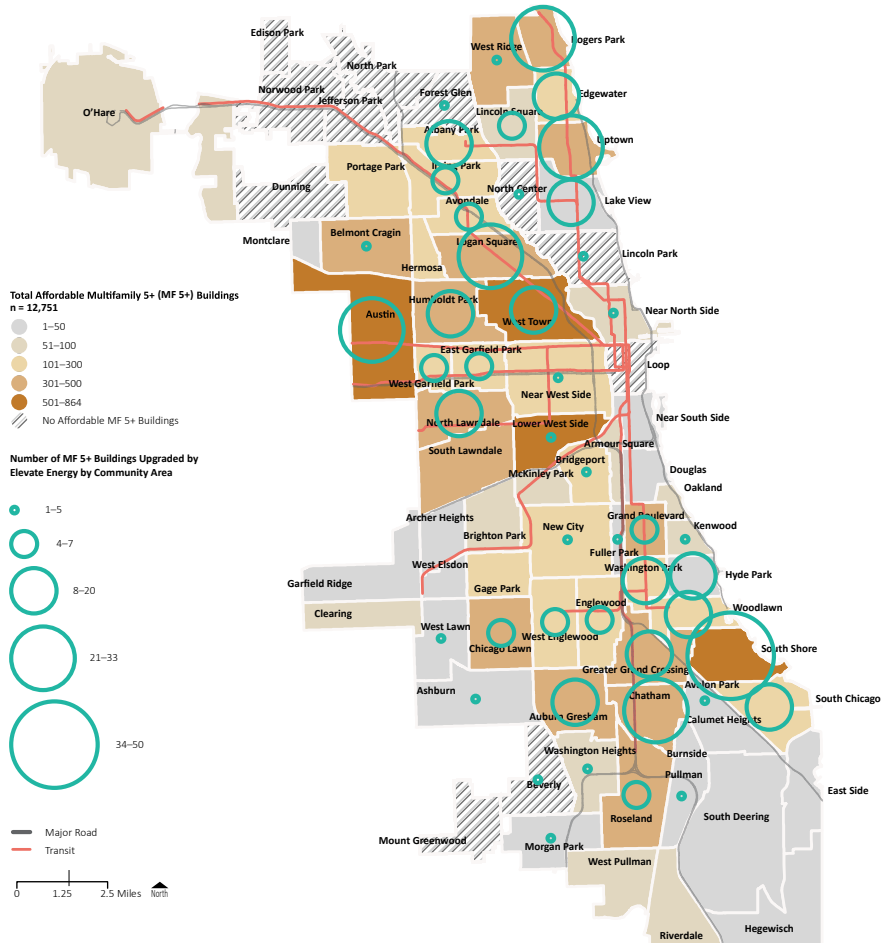
Targeting five building segments would capture 86 percent of Chicago multifamily buildings and 94 percent of multifamily units. These segments are—

1. Five-or-more-unit, lowrise, prewar buildings.
2. Five-or-more-unit, lowrise, mid-century buildings.
3. Five-or-more-unit, lowrise, post-1978 buildings.
4. Two- to four-unit, prewar, masonry buildings.
5. Two- to four-unit, prewar, frame buildings.

The largest segment consists of the lowrise prewar building with at least five units, which is also the most common type of multifamily building to undergo energy efficiency retrofit services from Elevate Energy. Exhibit 7 shows the number of multifamily retrofits completed in each Chicago neighborhood contrasted with the size of the total market.

Exhibit 7

Penetration of Elevate Energy's Multifamily Program in Chicago Neighborhoods



Conclusion

This article presented the data and methods used in an analysis characterizing the multifamily building stock in Chicago, which segmented Chicago's multifamily buildings by age, size, construction type, and energy use. The article described the 13 data sources that were merged to complete the analysis and discussed recommendations for other researchers conducting a similar market characterization. This article was adapted from the forthcoming reports *Segmenting Chicago*

Multifamily Housing to Improve Energy Efficiency Programs (Corso et al., 2016b) and *Understanding Your Multifamily Building Stock: A Framework for Cities and Municipalities* (Corso et al., 2016a), which are directed at municipal policymakers, energy-efficiency program implementers, and utility stakeholders.

These findings are a key step in designing and implementing energy efficiency programs that meet the needs of a diverse set of nearly 150,000 multifamily buildings in Chicago. As more cities and municipalities commit to energy reduction goals and pass legislation such as energy benchmarking and reporting, analysis of local data and subsets of the building stock can provide insights and identify areas of opportunity for energy efficiency programs. By using these local data sets and forming partnerships among policymakers, utilities, and program implementers, cities can continue to lead the way in making our urban areas more livable, sustainable, and economically viable.

Acknowledgments

The authors acknowledge additional contributors to the analyses at Elevate Energy: Abigail Corso, Alex Helbach, Emily Robinson, and Brittaney Ross. In addition, they thank Lindsay Robbins of the Natural Resources Defense Council, who served as advisor and co-author on the other Chicago reports, and many external reviewers and informal advisors. Energy Efficiency for All is made possible by funding from the JPB Foundation.

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Industrial Revolution

Every home makes compromises among different and often competing goals: comfort, convenience, durability, energy consumption, maintenance, construction costs, appearance, strength, community acceptance, and resale value. Often consumers and developers making the tradeoffs among these goals do so with incomplete information, increasing the risks and slowing the adoption of innovative products and processes. This slow diffusion negatively affects productivity, quality, performance, and value. This department of Cityscape presents, in graphic form, a few promising technological improvements to the U.S. housing stock. If you have an idea for a future department feature, please send your diagram or photograph, along with a few well-chosen words, to elizabeth.a.cocke@hud.gov.

Clean Heat: A Technical Response to a Policy Innovation

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Abstract

NYC Clean Heat policy was enacted to improve air quality in New York City, with emphasis on reducing exposure to pollutants—black carbon, particulate matter, and sulfur—that are linked to environmental degradation and various health risks. This policy measure called for phasing out residual oil and adopting cleaner-burning fuel sources by converting boilers in commercial and residential properties throughout the city. This article describes the process of clean heat technology adoption within the innovative NYC Clean Heat policy context, demonstrating thorough compliance on the part of building owners and managers and discussing implications for scalability in other urban settings.

Introduction

Significant changes to the U.S. housing stock are often stimulated by market demands or policy changes. Both conditions exist in New York City (NYC). Market forces have created an increased demand for new housing developments at all levels of affordability (Kadi and Ronald, 2014). Policy

advancements simultaneously have served to improve the functional capacity of existing buildings (Tan et al., 2015). A recent policy measure issued by the NYC Department of Environmental Protection mandated that boilers providing heat and hot water in (mostly older) residential and commercial buildings phase out the use of No. 6 oil, a heavy-burning fuel source (NYC Department of Environmental Protection, 2011). The policy required conversion to cleaner-burning fuel sources including lower-sulfur No. 2 fuel, biodiesel or natural gas, and No. 4, a blend of No. 2 and No. 6 oils (exhibit 1), until 2030, when a stricter regulation goes into effect. This environmental and public health law was intended to address widespread air pollution by reducing fine particulate matter emissions that produce soot and black carbon in NYC (Seamonds et al., 2009). Because NYC is the most populated city in the United States, this regulation is one of the most consequential pieces of environmental, energy, and public health policy in the nation in the past decade.

Exhibit 1

Heating Fuels Implicated in NYC Clean Heat Policy



Source: NYC Clean Heat, <https://www.nycleanheat.org/content/problem>

This article reviews key tenets of the NYC Clean Heat policy regulations and describes the technical responses available to building operators for achieving compliance. Acceptable changes ranged from minor retrofitting of boilers to the installation of modern, more efficient mechanical systems coupled with energy-efficiency upgrades. The discussion section highlights the benefits, drawbacks, and information gaps associated with the policy as other jurisdictions consider adopting similar measures.

Rationale for Clean Heat Policy

Previous research has demonstrated that residual oil represents a significant environmental and public health threat (Cromar and Schwartz, 2010; Seamonds et al., 2009). In addition to polluting the air, residual oil is linked to such health problems as cardiovascular disease, respiratory illness, and impaired cognitive function (Brook et al., 2010; Cornell et al., 2012; Suglia et al., 2008). Buildings that burn residual heating oils (exhibit 2), including No. 6 and No. 4, significantly contribute to the city's current emissions of black carbon, particulate matter 2.5, and sulfur (Cromar and Schwartz, 2010; Seamonds et al., 2009).

NYC Clean Heat policy was a measure enacted in 2012 to address the hazards associated with heating oil emissions. The conversion regulation called for more than 6,000 buildings to convert from No. 6 oil to a cleaner fuel by 2015 and has achieved a nearly perfect level of compliance (exhibit 3), with a mere 20 buildings still running No. 6 in NYC as of this writing (NYC Clean Heat, n.d.a.). It is estimated that this initiative has decreased related emissions by as much as 65 percent, resulting in cleaner air and reduced health risks (NYC Clean Heat, n.d.b.). A multipronged technical response was instrumental in achieving these important results.

Exhibit 2

Emissions Stemming From Residual Oil Use in a Large Residential Building in New York City, 2013



Photo credit: Tomás Guilarte (2013)

Exhibit 3

New York City Building That Transitioned From No. 6 to No. 4 Oil During the Clean Heat Policy Implementation Period



Photo credits: Diana Hernández (2013, 2016)

Clean Heat Technical Responses

Building operators affected by this policy measure were required to install new boilers or burners using, at a minimum, No. 4 oil or cleaner options such as ultra-low-sulfur No. 2 oil, natural gas,

biodiesel, or steam. Of these options, most boilers were converted to No. 4, followed by No. 2, and natural gas. Many operators also took the opportunity to install dual-burner boilers running No. 2 and natural gas (similar to the boiler in exhibit 4) to contain costs and ensure reliability of building heat. Building operators who opted to make the minimal shift to No. 4 oil will be required to adopt one of the cleaner options by January 2030 to complete the phaseout of heavy heating oil and comply with NYC Clean Heat regulations and other city plans. Building operators were given administrative support and financing help to ensure compliance. Enforcement was tied to the renewal of boiler permits; violations and fines were issued for noncompliance.

Building operators also were encouraged to implement energy-efficiency measures for improved performance and increased cost savings. Furthermore, most buildings mandated to transition to cleaner fuel were also required to comply with the 2009 Greener, Greater Buildings Plan laws,¹ which called for energy benchmarking and better energy performance in large commercial and residential buildings. The energy-efficiency measures that were coupled with fuel conversion included installing heat management systems with indoor temperature sensors, installing burner and draft controls to increase boiler efficiency, and implementing weatherization techniques to reduce heat loss and increase comfort. Many building operators took advantage of the opportunity to upgrade building efficiency and applied for related financial incentives.

Exhibit 4

New Dual Burning Boiler (No. 2 Oil and Natural Gas) in Residential Building Formerly Using No. 6 Oil To Provide Heat and Hot Water



Photo credit: Diana Hernández (2013)

Discussion

By phasing out the use of residual oil for heating purposes, the NYC Clean Heat policy initiatives were successful in reducing a prominent source of air pollution in New York City. Spanning only four heating seasons from 2012 to 2015, the conversion timeframe was short, but 99.8 percent conversion compliance was achieved. The conversion initiative confers several benefits. First, building operating costs and procedures were improved by incorporating cleaner, more reliable

¹ http://www.nyc.gov/html/planyc2030/downloads/pdf/greener_greater_buildings_final.pdf.

fuel sources; participating buildings achieved significant cost savings (NYC Clean Heat, n.d.c.). Second, air quality has improved dramatically. Compared with air quality measures from 2008 to 2011, recent estimates of air quality demonstrate a significant decrease in particulate matter and sulfur oxide, in large measure attributable to NYC Clean Heat regulations (NYC Community Air Survey, 2016). Third, health risks related to black carbon emissions—including cardiovascular, respiratory, and neurological disorders—are expected to decline significantly with improvements in air quality spurred by the NYC Clean Heat policy, albeit the public health effect for local residents may not be fully documented for some time.

Although NYC Clean Heat initiatives are promising, they leave unanswered questions about the geographic distribution of the cleanest (or dirtiest) heating sources, the incorporation of renewable energy, and the economic consequences to fuel providers and others whose incomes were negatively affected by the changes. A major shortfall of the policy reform is the extended time allotted to complete the phaseout of heavy fuel sources. As indicated previously, most buildings opted to transition to No. 4 oil—which, although cleaner than No. 6, is still considered a dirty fuel. Policymakers, advocates, and public health officials should consider shortening the time frame to phase out No. 4 so the benefits of cleaner air can be secured long before 2030. Systematic evaluation of the effect of such policy is critical as other cities weigh the benefits of transitioning to cleaner fuel sources.

Conclusion

Long recognized as a dirty city, NYC has made significant strides in sanitizing its air quality by implementing a comprehensive Clean Heat policy. The technical responses to the policy ranged from simply shifting to a slightly cleaner fuel source to conducting a major overhaul of heating systems, which included incorporating energy-efficiency measures to improve the overall performance of buildings. In light of NYC's aging housing stock, NYC Clean Heat policy offered a promising approach for modernizing building functions and addressing environmental and public health concerns one boiler at a time.

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A Rocky Path to Homeownership: Why Germany Eliminated Large- Scale Subsidies for Homeowners

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For most Germans, renting a home is nothing unusual. Germany has developed an affordable, well-functioning rental market and a longstanding reputation as a nation of renters. The rate of homeownership has remained correspondingly low (43 percent in 2013) when compared with the rate in the United States (65 percent in 2013).¹ The story often told is that generous housing subsidies for the rental market and the absence of homeownership subsidies helped produce such an outcome (Voigtländer, 2009). Contrary to this popular belief, however, homeowners in Germany *did* receive sizable tax breaks and subsidies as part of social housing programs from the 1950s until the first decade of the 21st century. For decades, policymakers across the political spectrum have tried to create a nation of homeowners—but have struggled to do so.

After the destruction of World War II (WWII), Germany faced severe housing shortages. To stimulate housing, the German state adopted far-reaching subsidies through the tax code and social housing programs for both renters and homeowners. The subsidies for homeowners even outlived the nation's housing recovery well into the 21st century. The limited success of the subsidies, however, in creating more homeowners or raising the country's homeownership rate to levels seen in other advanced economies made these subsidies politically vulnerable. In the middle of the first decade of the 21st century, the grand coalition of the Christian Democratic Union (CDU) and the Social Democratic Party (SPD) under Chancellor Angela Merkel eliminated most federal subsidies for homeowners.

¹ Data retrieved from the U.S. Census Bureau and Federal Statistics Office Germany. The 2011 census in Germany estimated the homeownership rate to be 46 percent that year.

The key to understanding why the country eliminated its large-scale subsidies for homeowners lies in the power of Germany's federal states (*Länder*). In pursuit of their interests, the *Länder* both influenced housing legislation at the federal level and implemented federal laws in ways preferable to them at the state level.² The *Länder* undermined the objectives of federal homeownership policies by distributing more social housing funds to the rental sector than to homeowners and by successfully supporting the elimination of tax breaks for homeowners. They did so in part because they wanted to be in control of steering housing policy and distributing funds with sensitivity to the housing needs of their regions and local communities. The influence of the *Länder* in Germany is all the more remarkable when compared with the situation in the United States, a country also known for its decentralized government, where federal housing policies put federal agencies in charge of the most important homeownership policies.

U.S. policymakers and housing experts may be interested in these findings for a number of reasons. The differences between the German toolkit of home finance policies and that of the United States provide opportunities for comparison that may help us better understand and advance housing policies in the United States. Moreover, contrasting the political economies of housing in the United States and Germany reveals that the degree to which the housing sector plays a key role in the larger economy creates different policy options and opportunities for home finance reform in the two countries. This discussion sheds some light on why the United States is seemingly stuck in a “socialized” homeownership market,³ a so-called third rail of U.S. politics that is unlikely to be touched by political leaders, whereas German policymakers managed to scale down subsidies for homeowners.

Subsidizing Homeowners Through the German Tax Code, 1949–2006

When roughly one-half of the German housing stock was destroyed or severely damaged as a result of WWII—producing a shortage of 4.5 million homes—the German government under Chancellor Konrad Adenauer (CDU) decided to stimulate both rental and owner-occupied housing. Included in this larger effort to stimulate housing were tax breaks for homeowners dating back to the early years of the Federal Republic, in 1949. Over time, these tax subsidies not only have outlived their original purpose of rebuilding the country but also have become the largest subsidies in the German tax code, amounting to roughly €11.4 billion in 2004.

The nature of tax breaks for homeowners in Germany differed decidedly from those in the United States. Homeowners in the United States have mainly benefited from the mortgage interest deduction, the property tax deduction, the capital gains exclusion, and the foregone tax on imputed rent (a tax on the rental income one generates by living in one's own home). By contrast, U.S.-style tax

² Also see Katzenstein (1987) and Scharpf (1988). For an example in a different policy area—that is, old-age care—see Campbell and Morgan (2005).

³ I adopt this characterization from Mervyn King, the former head of the Bank of England, quoted in McLean (2015). For instance, the U.S. government currently guarantees more than 5 trillion U.S. dollars in mortgage debt and provides sizable tax breaks for homeowners.

subsidies for homeowners were never the most important tax subsidies in Germany—most notably not the mortgage-interest deduction.⁴ Instead, homeowners were able to deduct from their income a certain percentage of the construction and financing costs of their homes through the so-called *Eigenheimzulage* (homeownership allowance).⁵ The tax break was limited to certain income groups, was co-financed by the *Länder* and the federal government, was offered as a tax deduction (before 1996) and a direct tax subsidy (after 1996),⁶ could be used only once by each taxpayer for a limited time, and for the most part privileged those building new homes over those purchasing older homes. Thus, German policies had a number of key differences when compared with U.S. policies. Technicalities aside, however, both countries—albeit in different ways—subsidized homeowners through tax breaks deviating from the economic principle of tax neutrality.

A distinctive feature of German homeownership tax breaks was their connection to other policy areas, such as family and environmental policy. In 1981, for instance, homeowners with children could deduct a higher amount from their income as part of the tax subsidy. This added a family policy component to the subsidy. In 1996, homeowners building environmentally friendly homes were permitted to deduct higher amounts from their income, which appended an environmental element to the subsidy. Tax breaks for homeowners thereby served multiple policy objectives.

The political story behind these subsidies is intriguing. Largely sustained by strong center-right parties, the German tax subsidies were relatively uncontested until the 1980s—but the political climate changed dramatically in the 1990s. The reunification of the country was especially important in bringing about changes in housing taxes. First, reunification reinforced an existing trend of growing deficits and, with it, fiscal consolidation efforts in the late 1990s and 2000s. Second, it led to some housing market imbalances, with large-scale housing vacancies in eastern Germany and housing shortages in the western parts of the country. Third, given income and wealth differences between the old and new federal states, it elevated the issue of inequality to the political agenda, bringing attention to, among other concerns, the regressive nature of tax breaks for homeowners. This led several *Länder*, including conservative-led states, to join SPD in launching a series of attacks to eliminate the tax subsidy. The *Länder* opposed the subsidy because, among other things, they co-financed the subsidy in times of growing deficits and viewed it as an imprecise instrument to manage unbalanced regional housing markets (the vacancies in some regions and shortages in others). In 2006, the grand coalition of CDU and SPD removed the tax break for homeowners, a reform that was supported by the *Länder* in the country's upper house.

⁴ Before 1986, German homeowners could use the mortgage-interest deduction, but they also had to pay a tax on imputed rental income. After 1986, they could no longer use the mortgage-interest deduction, but they were also no longer taxed on imputed rental income. Note also that German homeowners are exempt from paying taxes on the capital gains of home sales if they have owned their home for at least 3 years. Also, from 1950 until 1989, some German homeowners could claim a property tax deduction for 10 years as part of the large-scale social housing programs.

⁵ The tax break was renamed and tweaked multiple times: it was called “7b tax break” from 1949 until 1986, “10e tax break” from 1986 until 1996, and *Eigenheimzulage* from 1996 until 2006. It nevertheless retained its core function of subsidizing homeownership through the tax code until 2006.

⁶ Before 1996, high-income households benefited disproportionately from the tax break, because they could reduce their taxable income (and the taxes they owed) more effectively than low-income earners. After 1996, homeowners received a subsidy, rather than a tax break, in an amount independent of their incomes.

How Germany's Social Housing Programs Failed To Promote Homeownership, 1950–2006

The large-scale social housing programs (the *Sozialer Wohnungsbau*) provided significant government subsidies to German homeowners. To most observers, the focus on homeownership as part of social housing programs is counterintuitive, because social housing programs are often associated with public housing projects or the rental sector. Yet, social housing funds (that is, subsidized loans or interest-rate subsidies on loans) in Germany were offered both to homeowners and to the rental sector. The regionalized character of these subsidies is distinctive when compared with the national character of subsidies in the U.S. mortgage market, where federal agencies—Fannie Mae and Freddie Mac, for example—tend to harmonize mortgage rates across regions with different risk levels through federal subsidies and government guarantees (Hurst et al., 2015).

Much like tax breaks for homeowners, social housing subsidies for homeowners date back to the early years of the Federal Republic, when the Adenauer government introduced the First and Second Housing Laws, in 1950 and 1956. The Second Housing Law specified that homeowners should be given priority when it comes to the allocation of these funds, because the Christian Democrats, in particular, tried to create a nation of homeowners in the early postwar years. This effort reflected their strong preference for family life in single-family homes, especially for uprooted families, and an anticollectivist ownership ideology (Diefendorf, 1993; Moeller, 1996).

Despite the federal law's goal of supporting homeowners, most funds were given to the rental sector, because the *Länder*—responsible for distributing federal housing funds and their own social housing funds—decided to support that sector. With appropriate caveats about some differences between federal states, during only two brief periods from 1950 until 2000 were more social housing funds distributed to homeowners than to renters (from 1976 to 1981 and from 1984 to 1988); in these periods, the share of subsidized owner-occupied housing briefly climbed above 50 percent, peaking at 68.7 percent in 1987.⁷ This situation, of course, stands in stark contrast with that in the United States, where the mortgage giants Fannie Mae and Freddie Mac and the Federal Housing Administration supported multifamily rental housing only marginally.

The German *Länder* favored the rental sector on multiple grounds. Funding single-family homes was often not feasible for states and local communities, especially in metropolitan areas where land is scarce and expensive. In addition, states did not want to encourage urban sprawl and suburbanization, which would have put them on the hook for financing new infrastructure, such as schools and hospitals.⁸ It was more efficient administratively to approve funding applications from experienced public or private companies that specialized in building multifamily homes than from thousands of inexperienced homeowners. In sum, many states viewed distributing funds to the rental sector as being more pragmatic and providing affordable housing for more people, and as showing sensitivity to the housing needs of local communities.

⁷ Some notable regional variation exists, in that states such as Baden-Württemberg (the so-called land of home builders) and Rhineland-Palatinate offered more subsidies to homeowners than did other states.

⁸ Also see Kohl (2016).

The funding of social housing units for renters and for homeowners corresponded closely with developments in the larger housing market. In times of balanced housing markets—a perceived equilibrium between housing demand and supply—federal and state policymakers decreased the number of subsidized units; and, in times of housing shortages, the number of supported units increased. For instance, construction was booming in the early postwar years, with 3.5 million newly built housing units from 1950 until 1956, roughly 70 percent of which received social housing subsidies. Because of strong population and economic growth, construction levels remained high until the mid-1970s (roughly 500,000 to 700,000 units per year), but the share of subsidized units declined steadily to about one-third of the total new units, in part because the housing crisis was over, the private capital market had recovered, and policymakers started celebrating a balanced housing market. Although the federal government had provided the lion's share of social housing funding in the 1950s, the Länder's funding share started to match and exceed federal funds beginning in the 1960s.

The reunification of the country, including the integration of two very different housing markets, upset the equilibrium. While reunification led to an initial increase of housing activity in the country to modernize the eastern German housing market and to stimulate western German housing to cope with newcomers from the eastern parts, it also contributed to an overheated eastern German housing market fueled by short-term tax incentives and other subsidies. The result was large-scale housing vacancy of about 1 million units, followed by federally funded demolitions in eastern Germany. As a result, housing activity in the country leveled off at the turn of the century. In 2003, the social housing programs subsidized a mere 32,000 units (down from 162,000 units in 1994). Still, between 1950 and 2004, the social housing programs subsidized 36 percent of 25.3 million newly built housing units in the country in a government program that most analysts consider a success.

In the new century, the German Länder received even more autonomy in formulating social housing policy. In light of low demographic projections and rebalancing housing markets, the first major reform of 2001 included a notable shift from supporting affordable housing for large segments of the population—the signature theme of the older social housing programs—to supporting those in need of affordable housing.⁹ In 2006, as part of Merkel's federalism reform, the Länder received the full authority to distribute social housing funds, effectively sidelining the federal government. This was because for many years the Länder had provided most of the social housing funds and had pushed for more autonomy in social housing policy (Scharpf, 2008). In ceding its authority in this way, the federal government lost its ability to react swiftly to housing shocks caused by demographic and economic developments, including any influx of immigrants or refugees.

⁹ Another reason for this reform was that many people lived in subsidized units after no longer fulfilling the income criteria for such units.

Larger Implications

Today, there are relatively few homeownership subsidies left at the federal level in Germany.¹⁰ The few programs that still exist are for the most part administered by the Länder.¹¹ Despite the country's low rate of homeownership, Germany has developed a relatively balanced and well-functioning housing market, which offers homeownership for some and high-quality and affordable rental housing to others—with a few exceptions in major cities.

How did the German state reduce its footprint in the country's home finance market whereas the United States is struggling to do the same? Comparing the political economies of housing in both countries sheds some light on this issue. Housing is an essential part of the U.S. growth model, based on consumption and credit, with important transmission effects into the larger economy (Leamer, 2007; Mishkin, 2007). The German growth model is much less dependent on housing and instead relies on exports and savings. While rising house prices stimulate credit growth, housing demand, and consumption in the United States, this relationship is less pronounced in Germany, in part because of conservative lending practices and the absence of equity withdrawal (Geiger, Muellbauer, and Rupprecht, 2016). Housing debates in the United States are often centered on a number of sensitive issues that truncate the policy space for comprehensive housing finance reform: the macroeconomic effects of reform on housing demand, mortgage rates, house prices, and consumption. These considerations are all the more important as many Americans use their homes as a form of private social insurance. As noted, home finance policies in Germany have not been tied in closely with the country's economic growth model and have produced fewer homeowners. German policymakers as a result have faced fewer macroeconomic and political constraints, allowing them to tweak and reform housing finance policies in pursuit of a wide array of policy objectives, including family, pension, affordability, or regional priorities. The differing political economies of housing in the United States and Germany thus present different policy options and opportunities for reform in the housing area.

Finally, homeownership is not all we should talk about when it comes to housing. The German experience shows that, although the country's homeownership project struggled, Germany managed to develop a well-functioning, affordable, and high-quality rental market. In contrast to the United States, the German state provided generous subsidies to both forms of tenure (that is, renters and homeowners), often empowering regional governments to decide how to distribute funds. In times of stagnant wages, rising student debt, tight credit conditions, and a slowly resolving financial crisis, many people in the United States are in need of affordable housing. U.S. policymakers could respond to these concerns by shifting some housing subsidies from homeownership toward rental markets, they could expand voucher programs (Desmond, 2016; Green, 2011), and they could distribute federal housing grants with more sensitivity to the rental housing needs of their local communities. These changes might provide affordable housing for larger parts of the population.

¹⁰ For instance, the Kreditanstalt für Wiederaufbau (KfW), a government-owned development bank, extends small subsidized loans to homeowners. Other government programs, such as pension-related contributions (*Wohnriester*) and savings-related contributions (*Bausparen*), do not directly subsidize homeownership.

¹¹ Some Länder continue to offer programs for homeowners, including small-scale subsidized loans, but these programs differ significantly across the federal states.

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Housing Policies in the United Kingdom, Switzerland, and the United States: Lessons Learned

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Abstract

We provide an analysis of the housing market and current housing policies in three developed countries: the United Kingdom, Switzerland, and the United States. We focus on these three countries mainly because of the marked differences in their institutional settings. The United Kingdom is characterized by fiscal centralization and an extraordinarily rigid planning system. The consequences of this setting, which make housing supply extremely unresponsive to changes in house prices, are a high degree of urban containment, a severe housing affordability crisis, and a housing shortage, particularly for the young. The key UK policy, Help-to-Buy, which focuses on stimulating housing demand, fails to address the affordability crisis, because increasing demand only pushes up house prices further without expanding housing supply. Fiscal decentralization and a lax zoning system—both are encouraging residential development—and an extraordinarily low homeownership rate explain why Switzerland’s main political concerns are sprawl and rent stabilization. The country’s key policies aim to tackle these two concerns, but those same policies have some important unintended consequences. The United States is characterized by fiscal federalism and an enormous variation in the tightness of land use restrictiveness across metropolitan areas. The key policy concern across the country is homeownership attainment and the key policy to tackle this issue is the mortgage interest deduction (MID). This policy backfires in metropolitan areas that are prosperous and where land use is tightly regulated—“superstar cities”—because, in these places, the policy-induced demand increase mainly pushes up house prices. The MID increases homeownership attainment of only higher-income households in metropolitan areas with lax land use regulation. The net effect of the policy on homeownership

Abstract (continued)

attainment across the country is essentially zero. We conclude that the assessment of housing policies crucially depends on the fiscal and regulatory environment in local housing markets. Policies that stimulate housing demand, such as the MID or Help-to-Buy, are doomed to fail in markets with tight regulation or otherwise tight supply.

Introduction

In this article, we provide an analysis of the housing market and current housing policies in three developed countries: the United Kingdom, Switzerland, and the United States. All three countries are founding members of the Organisation for Economic Co-operation and Development (OECD). They are all high-income economies with a high Human Development Index and all three are highly urbanized today: 82 percent of residents in England and Wales (2011), 77 percent in Switzerland (2010), and 84 percent in the United States (2010) lived in urban areas, according to their respective censuses.

We did not select these three countries at random. We chose the United Kingdom and Switzerland because they represent two opposite ends of the spectrum regarding their fiscal and land use planning policies, making them interesting cases from the point of view of a comparative analysis. The United States falls between these two extremes; although it has a decentralized fiscal system (with local, state, and federal taxes) similar to the Swiss one, the country is characterized by an enormous spatial heterogeneity in land use planning restrictiveness, ranging from very relaxed (in places such as Houston or much of the Midwest) to highly restrictive (in cities such as Los Angeles, New York, and San Francisco), thus providing useful variation that can be exploited in a comparative analysis.

The three countries differ not only in their institutional settings but also in their housing policies. These policies have evolved over time within the institutional, political, economic, and cultural contexts of the respective country. In this article, we illustrate how the institutional setting—in particular a country's land use planning and fiscal systems—influences urban form, the built environment, housing market conditions, and the perceived challenges and risks (for example, housing affordability, housing shortage, and homeownership attainment). The current housing policies attempt to tackle these challenges, but, as we document, many of these policies have severe unintended consequences and are ineffective and costly at best and harmful at worst.

Trying to identify the origins of the key policies of the three countries and analyzing their merits and demerits provides a broader and clearer picture of the consequences of specific housing policies for given institutional settings. It may thus help governments of emerging economies in Asia (and elsewhere) to learn some lessons for the implementation of their own respective housing policies.

To begin, the United Kingdom is a highly politically and fiscally centralized country with a rigid planning system focused on urban containment. It is a country of homeowners, although homeownership has been in decline recently, falling from 69.3 percent in 2002 to 63.5 percent in 2013. The country's main political concern is the housing shortage and its corresponding lack of affordable

dwellings. We document that the housing shortage and lack of affordability are a direct consequence of the planning system—implemented more than 70 years ago—and of the extreme form of fiscal and political centralization. We outline the key policies (for example, Help-to-Buy) that attempt to address the housing shortage and affordability crisis. These policies have the effect of propping up demand and, because supply is severely constrained, of increasing house prices. Thus, they fail to resolve the housing affordability crisis. Homeownership attainment is another closely related political concern. We find it intriguing that the evidence from recent empirical research suggests that key policies that aim to increase homeownership attainment (for example, the Mortgage Interest Deduction [MID] in the United States or Help-to-Buy in the United Kingdom) may not, in fact, positively affect aggregate homeownership rates and may even lower them in supply-constrained locations.¹

Switzerland, in many respects, is the counterpart to the United Kingdom. It is one of the most politically and fiscally decentralized countries in the world, with a flexible zoning system and a unique political setting with direct democracy at all levels of government: federal, regional (cantons), and local (municipalities). Although housing affordability is a concern among a fraction of lower-income households, the main housing-related policy issue in the recent past has arguably been sprawl—not so much urban sprawl in the larger cities of the country as a phenomenon that could be described as “rural sprawl” in the more touristic mountainous areas. We argue that the housing policies enacted are, to a large extent, a direct consequence of the degree of fiscal decentralization and the implemented land use planning system. The key policy for “rural sprawl containment” is a ban on second (investment) homes in tourist areas in place since 2013. We discuss the intended and unintended consequences of this policy.

Another unique characteristic of Switzerland’s housing market is its extremely low homeownership rate, still less than 40 percent, despite a slow but steady increase during the past few decades and a steeper increase since the early 1990s. Because the median voter in Switzerland is still a renter, the implemented policies are unsurprisingly tilted toward favoring renters. The key policy in place, aimed at helping renters, is a mild form of rent stabilization that allows landlords to raise rents if a tenant changes or if some specific conditions are met, such as the mortgage interest rate increases or a major renovation is carried out. We discuss the various merits and demerits of this policy.

Finally, the United States is interesting because parts of the country—mainly the large coastal “superstar” cities such as Boston, Los Angeles, New York, and San Francisco—are confronted with strong demand pressures and rigid land use controls. Other parts of the country—including the Midwest and Texas—have lax land use regulations. This unique setting allows us to test the hypothesis that supply constraints imposed by rigid planning make the housing supply curve inelastic and, thus, housing subsidies—such as the MID—are capitalized into higher house prices, offsetting the intended effects of the policy. We summarize evidence in support of this hypothesis.

¹ On the one hand, subsidies to existing or prospective homeowners (such as the MID or Help-to-Buy) lower the cost of owner-occupied housing. On the other hand, the subsidy-induced demand increase is likely to raise prices of owner-occupied housing in supply-constrained locations, thus increasing the cost of homeownership. One might expect that the net effect may be positive or neutral depending on supply conditions (that is, depending on whether the subsidy is fully capitalized into prices or not). In fact, Hilber and Turner (2014) outline a number of theoretical mechanisms that explain why the net effect may even be negative in places with inelastic housing supply. They also provide evidence for the United States consistent with the proposition that, in supply-constrained locations, the impact of the subsidies on homeownership attainment is negative.

We proceed as follows. For each of the three countries, we (1) review the current status of the housing market and describe the main challenges and risks facing policymakers, (2) describe the key housing policies currently implemented, (3) discuss the policies' intended distributional effects and other objectives, (4) provide an analysis of the merits and demerits—often unintended consequences not considered by policymakers—of the key policies, and (5) discuss the lessons learned from our analysis of the key policies. In a final step, we bring together the evidence from all three countries and provide a synthesis.

Housing Policies in the United Kingdom

The institutional setting in the United Kingdom² is characterized by two key features. First, by contrast with continental European countries and the United States, which implemented rule-based planning systems, the United Kingdom regulates its land use via a rigid so-called “development control” system. In this system, each change of use of any parcel of land triggers a public consultation process and, in the end, has to be approved on a case-by-case basis by a local planning authority. The main aim of the system is urban containment.

Second, the United Kingdom has a high degree of fiscal centralization—giving very little weight to local taxes—with the consequence that local authorities have virtually no positive fiscal incentives to permit new development. (That is, local authorities that permit development face significant local infrastructure-related costs and strain to local public services, but they reap few benefits in the form of local tax revenue.) This situation is made worse because, in the medium term, a government grant equalization system effectively eliminates any revenue gain for the less-restrictive local authorities. In conjunction with the idiosyncratic development control system that assigns strong political power to local “not-in-my-backyard” (NIMBY) residents, the ultimate outcome is that housing supply is extremely price inelastic, particularly in major urban agglomerations such as the Greater London Area. In these urban agglomerations, positive demand shocks have the main effect of rising land and house prices, leading to a severe housing affordability crisis in large parts of the country. This affordability crisis has triggered a swath of mainly demand-focused housing policies that, as we illustrate in this section, have had major unintended consequences; rather than stimulating new housing supply, they have further exacerbated the affordability crisis.

Current Status of the Housing Market

Housing in the United Kingdom—particularly in London and Southeast England—is some of the most expensive and cramped³ in the world. According to a ranking by the Global Property Guide (2015) of the buying price per square meter of a “comparable apartment” in a prime inner-city area

² The discussion of UK housing policies in this section builds on a recent analysis in Hilber (2015a).

³ New houses in the United Kingdom are 38 percent smaller than in densely populated Germany and 40 percent smaller than in more densely populated The Netherlands (Statistics Sweden, 2005). Not only are new housing units small in an international comparison but also, allegedly, within the existing housing stock. Moreover, the existing stock in the United Kingdom tends to be substantially older and, partly as a consequence of its age, of poorer quality compared with housing in other OECD countries with similar standards of living, such as the United States or Switzerland.

of a country's prime city—in the United Kingdom, this is London—the United Kingdom comes second. It is topped only by the tiny city-state and tax haven, Monaco. Not only UK house prices, but also UK rents, are extraordinarily high. The same comparable apartment in London is also the second-most expensive in the world, again topped only by Monaco.

Exhibit 1 provides the relative housing costs by country (city), with the United Kingdom (London) being the benchmark (100 percent). We find it astonishing that housing costs in the United Kingdom are almost twice as high as those in the United States (New York, 53.6 percent), and they are significantly more than twice as high as those in Switzerland (Geneva, 44.2 percent), despite the fact that Switzerland is one of the wealthiest countries in the world and that Geneva typically is one of the cities at or near the top of life-quality rankings.

Housing costs in the United Kingdom are not only high in absolute terms but also relative to incomes. Conventionally measured “housing affordability”—median house price to median income—in the Greater London Area is currently at its worst since data became available. The price-to-income multiple in the Greater London Area in 2014 was 8.5. The United Kingdom, as a whole, was somewhat less unaffordable with a multiple of 5.0 (Demographia, 2015).

UK house prices are not only extraordinarily high but also exceptionally volatile. Real house price swings in the United Kingdom (exhibit 2) were substantially larger during the last full real estate cycle (that is, the upswing of the 1980s and the downturn of the 1990s) than those in the single-most-volatile metropolitan area in the United States (Hilber and Vermeulen, 2016).

Exhibit 1

International Comparison of Housing Costs, 2014

| Country (City) | Price/m ² in Percent Relative to UK (London) | (Rank) | Rent/m ² in Percent Relative to UK (London) | (Rank) |
|--------------------------------|--|------------|---|------------|
| Monaco | 174.1 | (1) | 101.8 | (1) |
| United Kingdom (London) | 100.0 | (2) | 100.0 | (2) |
| Hong Kong, China | 66.1 | (3) | 58.5 | (4) |
| United States (New York) | 53.6 | (4) | 63.9 | (3) |
| France (Paris) | 53.3 | (5) | 47.2 | (6) |
| Russia (Moscow) | 46.4 | (6) | 46.4 | (7) |
| Switzerland (Geneva) | 44.2 | (7) | 42.8 | (8) |
| Singapore | 44.2 | (8) | 39.1 | (9) |
| India (Mumbai) | 33.2 | (9) | 24.5 | (16) |
| Japan (Tokyo) | 31.2 | (10) | 48.4 | (5) |
| Israel (Tel Aviv) | 27.5 | (11) | 29.4 | (11) |
| Sweden (Stockholm) | 27.3 | (12) | NA | |
| Finland (Helsinki) | 24.3 | (13) | 26.9 | (14) |
| Canada (Toronto) | 23.9 | (14) | 27.4 | (13) |
| Italy (Rome) | 23.2 | (15) | 27.6 | (12) |
| Luxembourg | 22.2 | (16) | 26.4 | (15) |
| Australia (Sydney) | 22.1 | (17) | 31.1 | (10) |

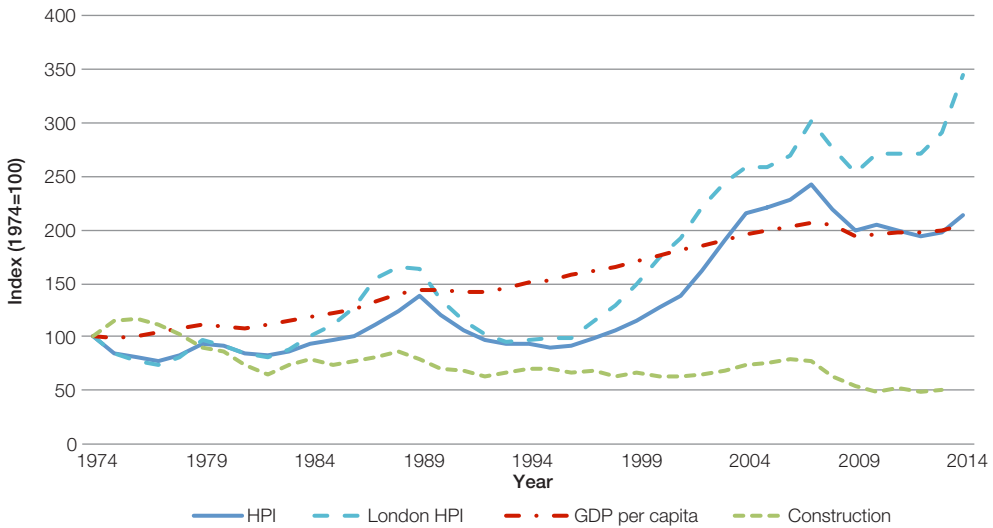
m² = square meter. NA = data not available. UK = United Kingdom.

Notes: All data are derived from <http://www.globalpropertyguide.com/most-expensive-cities>. Relative prices and rents are based on own calculations.

Source: Hilber (2015a)

Exhibit 2

UK HPI (real), UK GDP per Capita Index (real), and Construction Index



GDP = gross domestic product. HPI = house price index. UK = United Kingdom.

Sources: Authors' calculations based on Nationwide, www.nationwide.co.uk/about/house-price-index/download-data#xtab:uk-series; Office for National Statistics, www.ons.gov.uk/ons/datasets-and-tables/data-selector.html?ccid=IHXW&dataset=uk-ea&table-id=X11; Department for Communities and Local Government, www.gov.uk/government/statistical-data-sets/live-tables-on-house-building

The current housing affordability crisis has been developing slowly during the past 40 years. House price growth in the United Kingdom has been faster than in any other OECD country during this period. Exhibit 2 illustrates the country's real house price index (HPI) and real gross domestic product (GDP) between 1974 and 2014. UK house prices are today more than twice as high, in real terms, as they were in 1974. The United Kingdom's HPI, which rose 113 percent (from 100 to 213 percent), slightly exceeds the real GDP growth per capita, which grew 105 percent. Within the United Kingdom, the price growth has been most pronounced in London: the ratio of London house prices to average UK house prices has increased substantially since the mid-1990s. London housing prices have displayed a staggering increase in the past few years. In 2014, the London HPI reached an all-time high value of 344 percent with respect to the 1974 base year, far outstripping the real GDP growth per capita of about 140 percent. This increase explains why housing is most unaffordable in London and Southeast England, even when holding earnings constant.

Despite rising real incomes and significant population growth driven by net immigration and despite strongly growing nominal and real housing prices, construction of new permanent dwellings has been decreasing dramatically since the late 1960s, leading to a substantial housing shortfall. According to the Department for Communities and Local Government (DCLG, 2015a), the United Kingdom built nearly 380,000 new homes in fiscal year 1969, when statistics began. Housing construction subsequently declined until it fell markedly to fewer than 200,000 homes from 1990–91 onward. Residential construction reached a record low in 2012, when fewer than 135,510 new homes were constructed. In 2013, figures were only slightly higher, at 140,930

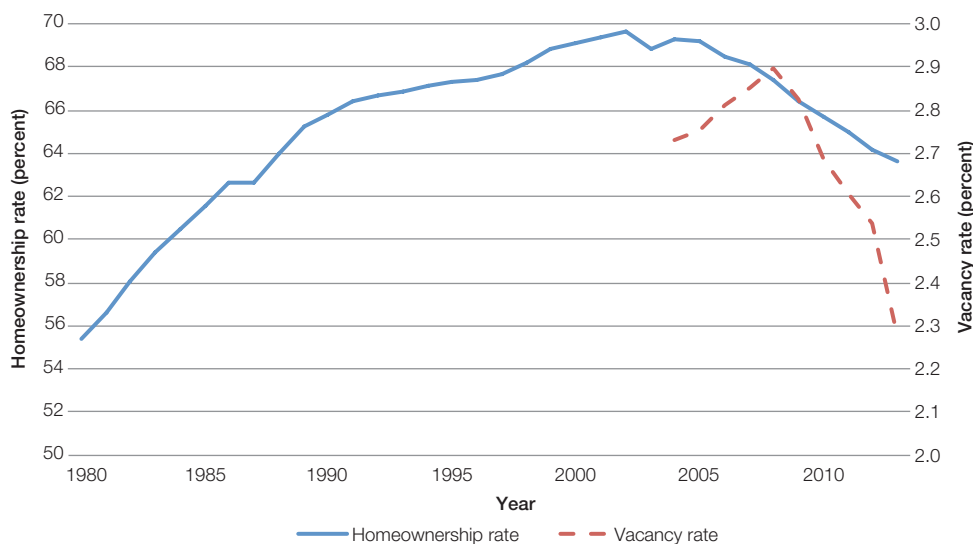
homes constructed, reflecting the typical increase in housing construction associated with an economic recovery. As illustrated in exhibit 2, between 1974 and 2013, housing construction fell 50 percent, despite strongly rising real house prices.

The extremely high UK house prices, particularly in London and Southeast England, have also affected homeownership attainment. Homeownership has been on the rise since World War II. As exhibit 3 illustrates, homeownership also increased markedly during the 1980s. This increase can be attributed mainly to the so-called “Right-to-Buy” scheme introduced by Margaret Thatcher’s Conservative government in 1980. At that point, merely 55.4 percent of UK households were homeowners, 33.1 percent were social renters, and 11.4 percent rented privately. The share of social renters has been falling significantly since then, but the homeownership rate has taken the opposite direction. The homeownership rate continued to grow during the 1990s and reached its peak in 2002 with 69.6 percent. At that point, 20.9 percent and 9.8 percent of dwellings were socially and privately rented, respectively. Since 2002, the homeownership rate has been in decline, reaching a tentative low point of 63.6 percent in 2013, the latest year with available numbers (DCLG, 2015b). At the same time, the private rental rate has increased very substantially to 18.6 percent, but the social rental rate fell to 18 percent.

We find it interesting that, given the massive housing shortage in the United Kingdom, which can perhaps most accurately be described as a “construction drought” (exhibit 2), the residential vacancy rate has been stable during the past decade, ranging between 2.3 and 2.9 percent from 2004 to 2013 (exhibit 3). The UK vacancy rate is lower than that of the United States. This difference is not surprising given the massive overbuilding and subsequent foreclosure crisis in the United States during

Exhibit 3

UK Homeownership and Vacancy Rates



UK = United Kingdom.

Source: Department for Communities and Local Government, <https://www.gov.uk/government/statistical-data-sets/live-tables-on-dwelling-stock-including-vacants>

the 2007-to-2009 global financial crisis. What is perhaps more surprising is the fact that the residential vacancy rate is currently substantially higher in the United Kingdom than in Switzerland, despite a massive housing shortfall in the United Kingdom and a minor housing construction boom in Switzerland in recent years. This disparity could, in part, be driven by the fact that the United Kingdom, in contrast with Switzerland, contains numerous struggling and declining cities (such as Blackpool, Liverpool, and Sunderland) with stagnating or declining populations and, thus, comparably weak housing demand, likely causing some houses to be empty. In part, the disparity could also be driven by the strict local planning constraints in the United Kingdom: in places with strict regulatory constraints, the supply of new housing, and the characteristics of the existing stock are less well adapted to the structure of demand for housing characteristics and, thus, may be more likely to stay empty. See Cheshire, Hilber, and Koster (2015) for evidence on the latter.

Explaining the Current Status of the Housing Market: The Role of the UK Land Use Planning System

Longstanding empirical research points clearly to the United Kingdom's land use planning system—in conjunction with strong demand for housing in some regions, notably the Greater London Area and Southeast England—as the main cause of the United Kingdom's housing affordability crisis (Ball, Allmendinger, and Hughes, 2009; Barker, 2006, 2004, 2003; Cheshire, 2014, 2009; Cheshire, Nathan, and Overman, 2014; Hilber, 2015a; Hilber and Vermeulen, 2016, 2010; Overman, 2012).⁴

The UK planning system,⁵ which dates back to the Town and Country Planning Act of 1947,⁶ is extraordinarily rigid by world standards. This rigidity is a consequence of urban containment through so-called “greenbelts” (introduced during the middle and late 1950s), strict controls on height, and lack of fiscal incentives to develop at the local level. The system's rigidity is exacerbated

⁴ The negative effects of the UK planning system are not confined to housing. Cheshire and Hilber (2008) provided evidence that firmly links regulatory constraints to the extraordinarily expensive price of UK office space. Cheshire, Hilber, and Kaplanis (2015) demonstrated that “Town Centre First” policies in England imposed a loss of output of 32 percent on a typical store opening after the rigorous implementation of the policy in 1996. Cheshire, Hilber, and Sanchis-Guarner (2014) provided evidence that Town Centre First policies paradoxically made shopping trips less “sustainable” by nudging suburban residents to shop in congested town centers rather than in big-box retailers out of town. Moreover, tight planning constraints in the United Kingdom also may have increased commuting times (for example, because commuters have to “jump” the greenbelt) or may have discouraged new buildings and renovations, thus generating older housing of poorer quality relative to other comparable countries. Of course land use planning can also generate benefits by correcting for various market failures (internalizing negative and positive externalities and providing local public goods such as public parks or the preservation of historically important buildings). The net welfare effect of the existing planning regime is not in itself clear but the scarce evidence for the United Kingdom is indicative that the net welfare impact is, in fact, negative (Cheshire and Sheppard, 2002; Hilber and Vermeulen, 2016).

⁵ We somewhat casually refer here to the “UK planning system” even though notable differences exist between the planning systems of the four UK countries: England, Northern Ireland, Scotland, and Wales. Although the planning systems in the four countries all follow the same guiding principles, some significant differences occur in how rigorously these principles are applied; for example, Town Centre First policies are applied much more rigorously in England than in Scotland and Northern Ireland.

⁶ To be more precise, the Town and Country Planning Act of 1947 was an Act of Parliament in the United Kingdom passed by the postwar Labour government. It came into effect on July 1, 1948, along with the Town and Country Planning (Scotland) Act of 1947. It is the foundation of modern town and country planning in the United Kingdom.

by the use of development control, which makes all decisions about whether development can go ahead subject to local political calculations and, therefore, makes them more uncertain. Development control also facilitates NIMBY behavior.

Early empirical evidence by Hall et al. (1973) suggests that the UK planning system may have already imposed binding constraints on construction as early as the beginning of the 1970s. Although rigorous empirical evidence on this point is lacking, it is highly plausible that the greenbelt constraints—which affect all major UK cities—started to become binding around 1970, when growing demand for housing hit the greenbelt boundaries. When this change happened, NIMBY homeowners (and private landlords) residing near greenbelts started to oppose new construction in their local authorities, effectively imposing gradually more severe “horizontal” constraints on construction. These constraints, in conjunction with various “vertical” constraints (that is, building height restrictions or so-called “view corridors”⁷), gradually made housing supply less and less price elastic. Thus, as the demand for housing continued to grow, especially in the Greater London Area (the United Kingdom’s economic powerhouse), real house prices started to rise drastically, and commuters, desperate for affordable housing, started to “jump” the greenbelts.

Increasingly binding planning constraints are the likely explanation for why housing construction numbers have been in continued decline since the late 1960s. In 1970, the United Kingdom built nearly 380,000 new homes, almost three times as many as are being built today. In those days, fewer constraints existed regarding where new housing could be built. Price signals still provided important information to developers, architects, and builders regarding where and how much to build. Today, the planning system completely ignores price signals and effectively tries to prevent residential development nearly anywhere, particularly where it would be attractive to build. If price signals were taken into account, more housing would be built in attractive areas, with more highrise buildings in town centers and more single-family homes farther out (Hilber, 2015c).

Hilber and Vermeulen (2016) provided the arguably most rigorous econometric evidence to date for England on the impact of local land use planning restrictiveness and other types of supply constraints on local house prices. The study found that local-earnings shocks lead to much greater local house price increases in severely planning-constrained locations. The study provided evidence that can be interpreted in a causal sense: regulatory restrictiveness causally affects house prices. Although regulatory constraints appear to be binding everywhere, the effects are starkest in London and Southeast England, where refusal rates (that is, the proportion of planning applications that are refused by local planning authorities) are highest and land use planning restrictions

⁷ View corridors, by means of limiting the height of nearby buildings, aim to preserve an unobstructed view to places deemed of particular value. London’s St. Paul’s Cathedral, for example, is protected by six view corridors imposing constraints on construction in large parts of Central London. One such view corridor—created in 1710—imposes a view from King Henry VIII’s Mound in Richmond Park to St. Paul’s Cathedral at a distance of more than 10 miles (16 kilometers). The view frames the cathedral through a special gap in a hedge, down a specially maintained clear avenue and then all the way across London. This particular view, still enforced today, has severely limited development around Liverpool Street Station—the third most frequented train station in the United Kingdom and one of the most central and busy areas in London.

most binding.⁸ Housing is not being built in the most desirable areas, where demand pressure is greatest, but instead in those local authorities where it is still feasible to get the green light for development. Often these are local authorities with high unemployment rates, which have economic incentives to permit local development: construction creates local jobs, if only temporarily.

To give a sense of the economic magnitude of the effects, according to the estimates in Hilber and Vermeulen (2016), house prices would have risen about 100 percent less in real terms between 1974 and 2008 if, hypothetically, all regulatory constraints were removed. Removing all regulatory constraints, of course, is neither realistic nor desirable. To be more pragmatic, if Southeast England (United Kingdom's regions with the most severe planning constraints) had the regulatory restrictiveness of Northeast England (the least restrictive UK region, but still highly restrictive in an international comparison), its house prices would have been roughly 25 percent lower in 2008 and—based on forecasted trends—about 30 percent lower in 2015.

Hilber and Vermeulen (2016) also found that regulatory constraints are not the only constraints that are binding. Constraints also exist because of scarcity of developable land. These constraints are confined to highly urbanized areas (mainly the Greater London Area, Greater Manchester, and the West Midlands conurbation that includes Birmingham); however, in these areas the effect is large in the sense that, because of scarcity constraints, house prices increase more strongly in response to given positive demand shocks. To put it a different way, house prices in London would still be high by world standards if the various regulatory constraints were relaxed. Topographical constraints were also found to be binding, but the effect of those constraints was quantitatively less meaningful, perhaps because England is largely a flat country with few slopes that really hinder construction severely.

The UK planning system also has important distributional effects. The groups of the young, and not so young, would-be buyers are the obvious losers of the constraints imposed by the UK planning system. Young home-owning families, however, are also losers of the broken system, although they often do not realize it. They lose out because they (1) live in artificially cramped housing and (2) are increasingly priced out from moving to a larger home that would be more adequate for their growing family. Trading up becomes increasingly difficult, and the problem is made worse by the UK Stamp Duty Land Tax (SDLT) that heavily taxes housing transactions (Hilber, 2015c; Hilber and Lyytikäinen, 2015).

Elderly homeowners could be argued to be the winners of the system, because their houses have experienced tremendous (untaxed) capital gains since the late 1960s and early 1970s and they

⁸ Hilber and Robert-Nicoud (2013) provided a theoretical argument for why not all regions and local authorities are equally restrictive. They argue that land use restrictions benefit owners of developed land via increasing prices but hurt owners of undeveloped land via increasing development costs. In such a setting, more desirable locations are more developed and, as a consequence of political economy forces, more regulated. Translating this theoretical argument to the institutional setting of the United Kingdom, the authors' argument implies that, in the wealthiest and most desirable local authorities with the strongest demand pressures (mainly in the Greater London Area), homeowners and private landlords have the most assets to protect, so they have the strongest incentives to restrict local development either via voting and NIMBYism-objections (homeowners) or lobbying (private landlords). Struggling places with weak demand and high unemployment (mainly in the north of England) may be more prone to permit commercial, or even residential, development in an attempt to create local retail or office jobs, or, temporarily, local construction jobs.

typically no longer live in cramped housing since their children have moved out. If anything, given the reduced household size, they may well now overconsume housing and may well have gardens too big to maintain.

The trouble from the perspective of elderly homeowners is that they cannot really access their housing wealth unless they sell their home—a costly and burdensome endeavor, especially for the elderly—and either downsize or move to a cheaper location, thereby often having to give up their local social ties. Equity release (in U.S. parlance: reverse mortgages) may represent an alternative option for elderly homeowners to monetize their housing wealth. According to Burgess, Monk, and Williams (2013), however, equity release represented only about 2.1 percent of mortgage sales in the first half of 2011 in the United Kingdom. This low percentage may be related to several factors, such as a perceived lack of transparency of the instruments, concerns about the quality of the financial advice, drawbacks linked to concerns about having to move out of the property, and absence of long-term planning for old age. Private renting is not a better option for elderly homeowners because it is similarly costly (to owning) and legal protection of renters in the United Kingdom is poor.

Hence, the only real winners of the broken UK planning system are arguably those elderly homeowners who are prepared to sell their house, pocket the proceeds, and move to a country with cheaper housing. For those who stay put, it is the children who will eventually benefit. The children of renters lose out. The planning system, thus, cements wealth inequality (Hilber, 2015c).

Key Housing Policies and Their Objectives, Merits, and Demerits

As the previous section documented, the United Kingdom’s affordability crisis has been developing slowly during the past 40 years. In contrast with real incomes, real house prices and, presumably, real private rents⁹ have grown faster in the United Kingdom than in any other OECD country (Hilber and Vermeulen, 2016). Especially younger and lower-income households struggle to get their feet on the housing ladder.

The key housing policies that were adopted in the past and, especially those that were implemented in recent years, not surprisingly, thus reflect the stylized fact that housing affordability has been the key concern of voters and politicians of all stripes. In the next subsections, we briefly discuss the United Kingdom’s key policies that have been implemented with the intent to address the affordability crisis. We discuss their objectives and their merits and demerits.

Social Housing

The birth year of social housing in the United Kingdom goes back to 1919—the year when local authorities (councils) had been required by law to provide the so-called “council housing” (also called “council estates”) (Wheeler, 2015). Local authorities had been the main provider of social housing in the United Kingdom until 2007. In 2008, housing associations¹⁰ outstripped local councils for the first time to provide the majority of social homes in the United Kingdom.

⁹ A good time-series on rents is not publicly available.

¹⁰ Housing associations are private, nonprofit making organizations that provide low-cost housing for households in need of a home. They have been operating an increasing share of social housing properties in the United Kingdom since the 1970s. Although formally independent of the government, housing associations are regulated by the state and receive public funding.

The original aim of council housing was to provide decent housing for army recruits; however, the age of social housing only truly arrived after World War II, when the Labour government built more than 1 million homes, 80 percent of which were council homes, largely to replace those destroyed during the war. The house-building boom continued throughout the 1950s, but, near the end of the decade, the emphasis shifted toward slum clearance (Wheeler, 2015). By the early 1970s, the downsides of social housing became more visible. In the words of Wheeler—

By the early 1970s, the concrete walkways and “streets in the sky” that had once seemed so pristine and futuristic, were becoming grim havens of decay and lawlessness. And there was a powerful smell of corruption emanating from some town halls as the cosy relationship between local politicians and their friends in building and architecture was laid bare, along with the shoddy standard of many of the “system-built” homes they had created. It was against this backdrop that “right to buy” (discussed in a later section) began to take off, with the number of council houses sold in England going up from 7,000 in 1970 to nearly 46,000 in 1972. (Wheeler, 2015)

The provision of social housing has certainly helped the lowest-income households and the most vulnerable people to obtain more adequate housing than they could have in the absence of such intervention. Whether public spending on social housing in certain areas (“helping places”) was more effective as a policy than giving the same amount of funding directly to low-income households and vulnerable people (“helping people”) is a difficult question to answer. Normally the answer would be that helping people directly is a more effective means of achieving the desired outcome; however, because the planning system has increasingly not been responding to price signals nearly everywhere in the country, market forces are muted and subsidies to people that raise demand may not actually lead to much additional private construction of housing. Hence, what would normally be a good policy when market forces work properly may become a policy doomed to fail.

Still, even when we abstract from this general argument that makes assumptions about a counterfactual outcome, the track record of social housing is mixed. One concern associated with social housing estates is that, through the concentration of low-income households, social housing may be associated with negative peer effects (for example, adversely affecting student performance). Weinhardt (2014) estimated the effect of living in a deprived neighborhood—as identified by a high density of social housing—on the educational attainment of 14-year-olds in England. He first points out that neighborhoods with markedly high concentrations of social housing have very high unemployment rates and extremely low qualification rates and also have high building density (social housing is typically midrise or highrise buildings). To identify the causal impact of neighborhood deprivation on pupil attainments, Weinhardt (2014) then exploits the timing of moving into these neighborhoods. He argues that the timing of a move can be taken as exogenous because of long waiting lists for social housing in high-demand areas. Using this approach, the study found no evidence of negative effects of social housing neighborhoods on student attainment.

Another obvious concern with social housing is the fact that, when the price of rental housing is kept below the market price, a shortage of rental housing will inevitably occur: given below-market prices, more households demand social housing than there is supply (and given below-market prices, developers will not have sufficient incentives to provide additional social rental housing). We consider this phenomenon in more depth when we analyze the rent control system in

Switzerland that also arguably generates below-market prices. Because the subsidy associated with social housing in the United Kingdom is substantial, the waiting list is long. Such a long waiting list is obviously inefficient and associated with a deadweight loss. Social housing waiting lists also tend to favor the “clever” and “persistent” among low-income households rather than those most vulnerable (for example, clinically depressed people).

A policy related to social housing is the so-called “Section 106 agreements,” which require private-sector developers to offer “affordable housing” as a condition of obtaining planning permission. This policy has similar adverse effects to social housing in the sense that the demand for such subsidized housing far outstrips supply.

Right-to-Buy

The downturn of social housing began in 1980, when Margaret Thatcher introduced “Right-to-Buy.” In brief, the policy allows social tenants to purchase their homes at a significantly subsidized price, with the effect that some of the best social housing stock moved from socially rented to privately owned. Right-to-Buy is a crucial factor helping to explain the significant rise in homeownership from 1980 until 2002, as illustrated in exhibit 3.

In their recent election manifesto, the Conservative Party proposed to extend the Right-to-Buy to tenants of housing associations. What are the merits and demerits of this new policy?

First, consider the likely effect on homeownership attainment. To the extent that the discount granted to tenants is substantial, it will have the effect of incentivizing many housing association tenants to become homeowners, perhaps reversing the decline in the homeownership rate observed since 2002.

Increasing homeownership attainment may be desirable. Some evidence for the United States indicates that homeownership is associated with social benefits (DiPasquale and Glaeser, 1999), particularly in places with tight supply constraints (Hilber, 2010; Hilber and Mayer, 2009). Other evidence suggests, however, that (leveraged) homeownership also has social costs. Homeownership impairs the labor market (for example, Blanchflower and Oswald, 2013) or adversely affects entrepreneurship (Bracke, Hilber, and Silva, 2015). Therefore, it is not clear whether the Right-to-Buy subsidy to housing association tenants, which essentially randomly benefits some lower-income households, is justifiable from a social welfare point of view.

Second, the policy imposes significant costs on the taxpayer because housing associations receive public funding; therefore, they presumably must be compensated for their losses. Otherwise, Right-to-Buy would significantly harm housing associations and endanger their ability to finance new homes, which would effectively decrease housing supply.

Finally, although extending Right-to-Buy will help the selective group of tenants of housing associations, the policy will not solve the affordability crisis for the rest of the population. If anything, extending Right-to-Buy is likely to make the crisis worse, even if the ability of housing associations to finance new homes is unaffected. This is for two reasons. First, a transition from housing association tenant to homeowner neither affects total housing demand nor total housing supply, so does not create any new homes; second, the incentive of a converted homeowner to oppose new

construction is likely much larger than that of the identical person as a tenant. In aggregate, this latter reason will make building new homes even more difficult (Hilber and Robert-Nicoud, 2013) and will, thus, if anything, accelerate the housing affordability crisis.

Help-to-Buy

The so-called “Help-to-Buy” policy was introduced in 2013. The aim of the scheme—arguably the flagship housing policy of the previous coalition government—has been to stimulate housing demand (Gov.uk, 2015). The Help-to-Buy scheme consists of four instruments: (1) equity loans, (2) mortgage guarantees, (3) shared ownership, and (4) a “new buy” scheme that allows buyers to purchase a newly built home with a deposit of only 5 percent of the purchase price. The promoters of the policy hoped that the increase in demand would translate into new housing being supplied and higher homeownership attainment.

Some simple stylized facts, however, cast serious doubt on this optimistic view. Help-to-Buy appears to have hindered people to buy: In the year following the announcement of Help-to-Buy, between the second quarter of 2013 and the second quarter of 2014, according to Nationwide,¹¹ the price of the average dwelling in London increased 25.8 percent from £318,200 to £400,400 and a building boom failed to emerge.

The stylized fact that mortgage subsidies may create a house-price boom, thus discouraging homeownership attainment rather than stimulating it, is consistent with evidence from the United States. Hilber and Turner (2014) suggested that only a very weak link at best exists between mortgage subsidies and homeownership attainment across the United States. They documented that, in tightly regulated metropolitan areas (which may be most comparable with tightly contained UK cities), the subsidies have a negative effect on homeownership attainment because the price effect—through increased demand—more than offsets the income effect from the tax deduction. They also found that, in less-regulated metropolitan areas (more comparable to sprawling Swiss cities), subsidies do have a positive effect on homeownership attainment, but only for higher-income groups.

As outlined in the previous section, longstanding evidence documents that housing supply in the United Kingdom is incredibly unresponsive to demand shocks, in large part, because of an extraordinarily inflexible planning system. Consistent with unresponsive supply, a related study found that central government grants in the United Kingdom are roughly fully capitalized into house prices; that is, the present value of the change in the grant allocation roughly equals the change in house price (Hilber, Lyytikäinen, and Vermeulen, 2011). The effect of Help-to-Buy, which also works through stimulating the demand side, can thus be expected also to become fully capitalized, consistent with the observed extraordinary price increase in London after the introduction of the policy.

Apart from not achieving its main intended objective, the policy has a number of additional drawbacks. First, taxes are needed to finance the Help-to-Buy schemes and these have a deadweight loss—a pure welfare loss to society. Second, the scheme has created a systemic risk in that the government (or perhaps more accurately, the taxpayer) assumes most of the risks associated with the guarantee schemes. The remaining risk is assumed by the “marginal homebuyers,” those who

¹¹ <http://www.nationwide.co.uk/about/house-price-index/download-data#tab:Downloaddata>.

could not obtain loans in the absence of the scheme. Third, the policy may have undesirable distributional consequences. The beneficiaries of the scheme are existing homeowners, who benefit from the capital gains. First-time buyers who take up the scheme may not be better off, because the price increase, quite plausibly, offsets the present value of the subsidy they receive. Moreover, they increase their financial leverage beyond what they could do without Help-to-Buy; they thus expose themselves to a greater risk of defaulting. Would-be buyers who are discouraged to purchase a home as a consequence of the policy-induced price increases also lose out because they still finance the policy as taxpayers. Fourth, introducing the scheme is fairly straightforward. Withdrawing it, however, may pose a threat to the macroeconomy, because a withdrawal will create some obvious (perceived) losers and will likely also have an adverse effect on house prices, especially if the withdrawal coincides with an economic downturn that forces the government to review its costly spending programs. Help-to-Buy and related schemes designed to stimulate housing demand have some further drawbacks. These drawbacks are discussed in Hilber (forthcoming, 2015b, 2013).

Housing-Related Tax Policies

Housing-related taxes can have important effects on housing affordability, especially in a setting with a rigid planning regime, because, in supply-constrained areas, higher (lower) taxes likely have the effect of being capitalized into lower (higher) property prices. Any tax-related policy reforms ought to be considered in this light. In the next subsection, we briefly discuss the key housing-related taxes in the United Kingdom and also address their merits and demerits.

Central Government Grants to Local Authorities and the Council Tax. Most local expenditures in the United Kingdom are financed via central government grants, not via local taxes. These grants are distributed to local authorities on a “needs” basis according to some complicated formulas that take into account numerous characteristics of the local authorities and their residents. The distribution mechanism amounts to an “equalization system.” One significant shortcoming of this system is that only a very weak link, at best, exists between permitting new residential development on the one hand and permanent grant revenue on the other.

In brief, local authorities face most of the cost of providing the infrastructure and local public services for the newly built residential development. At the same time, the central government grants provide virtually no fiscal incentives to local authorities to permit development. This lack of incentives is even more so because NIMBY homeowners and private landlords will try to put additional pressure on local authorities to resist new development. Local authority politicians interested in re-election have strong incentives not to permit residential development in their council.

Linking local tax revenue to the amount of local residential development could provide the necessary incentives to local authorities to permit such development in the first place, even under a “development control” system. In the United Kingdom, however, such tax incentives are lacking almost entirely. The only local tax in the United Kingdom is the council tax, which is a tax based on property value. The tax has little weight in the tax system, however, compared with tax systems in other countries (and compared with what it would be under an efficient tax system [Mirrlees et al., 2011]). It thus is not substantial enough to provide any meaningful incentives to local authorities to permit residential development. Moreover, because all local revenue is subject to the equalization system, this redistribution mechanism will largely eliminate any council tax revenue gain in

the medium term for local authorities that permit comparably more development. The council tax has one important additional flaw: a revaluation of the tax base has not occurred since 1992. This flaw has had the consequence that the tax now bears little relation to current underlying property values and has become increasingly regressive over time.

Stamp Duty Land Tax. Stamp duty, which is a tax on real estate transactions (that is, on land and property), was introduced in the United Kingdom during the 1950s. It is formally paid by the buyer and is a percentage share of the purchase price of the house. The economic incidence, however, may be at least partially on the seller. The stamp duty effectively drives a wedge between the price obtained by the seller and the price paid by the buyer. Basic economic intuition suggests that the stamp-duty-induced transaction costs result in fewer housing transactions and fewer moves, *all else equal*.¹²

Until early December 2014, the progressive schedule was a defining feature of the UK stamp duty system. The latest reform—announced in the government’s 2014 Autumn Statement—eliminated this longstanding anomaly of the tax: Under the old rules, homebuyers had to pay the tax at a single rate on the entire property price. For example, a tax rate of 1 percent levied on a house worth £250,000 resulted in a tax payment of £2,500. A tax of 3 percent was imposed on a house worth £250,001, leading to a tax payment of £7,500—a difference of £5,000. Thus, the old rules led to large discontinuous jumps in the tax paid at the threshold prices (in our example, £250,000). Under the new rules, homebuyers have to pay the rate of tax only on the part of the property price within each tax band. This reform has been a small step in the right direction in that it has eliminated the large discontinuous jumps in the tax and corresponding distortions. It did not address, however, the fundamental flaw of the SDLT, which is that the tax creates a disincentive to move to a new or different house. This tax-induced lack of mobility potentially has adverse consequences for the functioning of housing and labor markets.

Empirical research strongly suggests that the adverse effects of the SDLT on housing transactions and household mobility are substantial. Besley, Meads, and Surico (2014) and Best and Kleven (2015) both examined the effect of the 2008–09 stamp duty “holiday” (that is, in September 2008 the UK government implemented an increase of the threshold for paying the SDLT from £125,000 to £175,000 for 1 year to stimulate the housing market). Although Besley, Meads, and Surico (2014) found that the tax holiday temporarily increased transactions by 8 percent, Best and Kleven (2015) estimated the effect on the transaction volume to be 20 percent in the short run. Hilber and Lyytikäinen (2015) found that the increase in stamp duty from 1 to 3 percent at the cut-off of £250,000—before the 2014 stamp-duty reform—reduced the annual rate of mobility by 2 to 3 percentage points (a large effect given that the average rate of mobility is 4.6 percent). This adverse effect is confined to short-distance and non-job-related moves, suggesting a distortion in the housing market rather than in the labor market. The key conclusion of this research is that the SDLT is a highly inefficient tax. It discourages downsizing of the elderly and expansion of young families.

¹² Of course, many other factors, such as labor market conditions, prevalence of rent control, and homeownership rates, affect household mobility. Moreover, we note that many other countries also impose taxes on land and property transfers—especially Southern European and less-developed countries—often exceeding those of the United Kingdom.

A revenue-neutral replacement of the SDLT and the council tax with an annual local tax on the true value of property should be a strongly preferred outcome for at least two reasons. First, such a tax does not affect the decision to move house and, thus, does not distort housing and, possibly, labor markets. Second, annual local taxes on the true value of property (with the revenue not to be equalized) provide greater incentives to local authorities to permit residential development.

Lessons Learned

Our analysis of the UK housing market and its policies suggests that the United Kingdom's rigid planning system is the main culprit of the housing affordability crisis. The planning and fiscal systems are incredibly inflexible and provide insufficient incentives to permit residential development, respectively, making the local housing supply curves inelastic. In such a setting, the main effect of policies that stimulate housing demand—such as Help-to-Buy—is to push up house prices rather than increase supply. These demand-focused policies may, thus, be a waste of taxpayer resources at best. They may even be counterproductive in that they may effectively price out young would-be buyers from the market.

If policymakers are serious about addressing the housing affordability crisis, then they need to fix the planning system, rather than introduce yet more demand-focused policies that push up house prices to even higher stratospheres. It is important to stress here that fixing the planning system does not mean abandoning it. Planning is necessary and it can generate important benefits to society. The planning system, however, should not be focused merely on constraining residential (and other) development to often unattractive brownfield sites in unattractive locations. Instead, the basic principle should be that reforms reflect issues of market failure so as to ensure that land-based public goods (for example, urban open spaces, wildlife habitats, national parks, areas of outstanding natural beauty, historical districts, or heritage buildings) are adequately supplied and that positive and negative externalities arising from the proximity of different land uses are internalized. Positive externalities can be internalized, for example, through mixed land use zones (which spur mutually beneficial activities arising from proximity of land uses). Negative externalities can be internalized through separation of incompatible land uses. In brief, the planning system ought to be focused on addressing market failures.

Hilber (2015a) discussed various reforms on the supply side, distinguishing between short-term reforms and more fundamental longer-term reforms. In the particular case of the United Kingdom, in the short term, the boundaries of greenbelts could be revised to release some accessible land with low or negative environmental value and low amenity value (Cheshire, 2014).

In the longer term, one could revert to protecting all land only on the basis of its environmental or amenity value, taking account of other cost factors (infrastructure, carbon footprint, among others). This land use allocation could be done in a way to retain all areas of outstanding natural beauty and all national parks but using observed land-price differentials as price signals to inform planners where or when land would be more usefully released for residential use. If the land-price differentials cannot be justified by environmental or amenity benefits, then there would be a presumption in favor of development (Cheshire and Sheppard, 2005).

Other supply-side reforms could work via altering tax incentives at the local level. In an ideal world, the existing council tax and the SDLT—two highly distortive taxes (Hilber, 2015a; Hilber and Lyytikäinen, 2015)—are replaced with a proper annual local property tax with automatic annual revaluation based on neighborhood-specific price changes. Such a tax reform could be designed to be revenue neutral in the aggregate.

An alternative and less radical proposal would be to provide incentives to local authorities through the central government's grant allocation system, which could be done by tweaking the grant allocation formula and taking account of the amount of housing development granted. Local authorities that facilitate residential development could be compensated with permanent and generous "development grants" that exceed the cost they have to bear. Local authorities alternatively could be allowed to tax developers so they are compensated for any extra infrastructure or any other expenses that are required to accommodate additional development. Lastly, planning laws could be altered to allow developers (potential winners) to compensate NIMBYs (potential losers) in an attempt to reach a mutually beneficial (that is, Pareto-superior) outcome.

Housing Policies in Switzerland

Switzerland has one of the most decentralized governments in the world. The jurisdictional decentralization is reflected in the political autonomy of regional (cantons) and local (municipalities) administrative units. This autonomy provides two main instruments to municipalities to attract new taxpayers, both of which have a significant impact on the housing market. The first instrument is the fiscal package offered by the local municipality. The fiscal package consists of the local income tax rate (a lower tax rate will attract more and higher-income taxpayers, all else equal) and the nature and level of local public services provided. Households will sort into the respective municipalities that provide their preferred local public goods package; better local public services, all else equal, are more desirable. This autonomy is the central idea of "fiscal competition": cantons and municipalities compete against each other to attract (wealthy) taxpayers.

In principle, municipalities could compete on both the tax rate and the local public services offered. In practice, however, competition is mainly one of tax rates, because both the federal government and the cantons require high minimum standards of local public good provision. For example, primary and secondary school class sizes must not exceed 23 to 25 students in any of the cantons. Thus, local public services offered in Switzerland end up being relatively homogenous across municipalities within a canton. As a consequence, relatively little evidence of capitalization of local public services exists, all else equal. Strong evidence indicates, however, that local income tax rates are capitalized, at least partially, into house prices.

In an early paper, Hilber (1998) found that an annual tax increase of SFr1,000 for an average taxpayer reduces rents in the Canton of Zurich by roughly SFr720. The present value of a tax increase of SFr1,000 reduces house values by roughly SFr940 and land values between SFr560 and SFr1,620, depending on the specification estimated, which suggests, roughly, full capitalization.

In a more recent and econometrically rigorous analysis, Basten, von Ehrlich, and Lassmann (2014) looked at all of Switzerland and employed a boundary-discontinuity design approach that corrects

for unobservable location characteristics. They estimated the income tax elasticity of rents to be about 0.26 (compared with 0.54 based on a conventional estimating approach). That is, a tax increase of 10 percent reduces rents by about 2.6 percent. Basten, von Ehrlich, and Lassmann (2014) estimated that about two-thirds of the tax elasticity is the result of direct capitalization effects. About one-third can be traced back to the sorting of high-income households into low-tax municipalities. This study suggests that the extent of house-price capitalization may be only very partial in Switzerland, consistent with a more elastic housing supply curve compared with the United Kingdom.

The second, less well documented, instrument is land use controls. Municipalities may implement lax or tight land use controls to attract households with particular housing needs. One instrument is the so-called “Ausnützungsziffer,” a utilization intensity factor that determines what fraction of land on a given plot may be physically developed. It is a type of exclusionary zoning, similar in nature to the “minimum lot size restriction” in the United States. By setting a low Ausnützungsziffer, municipalities may attract better-off taxpayers who can afford a less-intensive use of land.

Municipalities also have to comply with mandatory land use regulations emanated at the federal level, such as the sectorial plan for cropland protection. The plan aims to guarantee a sufficient supply of food for the country during times of crisis and war, protect the soil, and preserve good agricultural land in the long term. Because of the heterogeneous geographic features of the Swiss territory, about 77 percent of the land protected by the plan is concentrated in only seven cantons possessing large agricultural areas, thus making the plan more binding for some municipalities than others. With the possible exception of Geneva, however, the impact of the plan on local housing prices seems to be weak for most of the cantons. In the case of Geneva, protected cropland effectively amounts to a greenbelt similar to the ones surrounding UK cities. The surrounding mountains, the Geneva Lake, the Swiss boundary with France, and other fairly tight local land use controls (including height restrictions)—all making property supply inelastic—jointly explain the fact that Geneva has the most volatile property prices in Switzerland—in fact resembling the price volatility in the United Kingdom.

The fact that a local municipality’s tax revenue is directly determined by the number and nature of taxpayers provides strong incentives to (1) permit local development and (2) set local tax rates to attract high-income households. This setting, by contrast with the setting in the United Kingdom, suggests that local housing supply curves in Switzerland may be elastic.

Besides affecting local housing markets by encouraging tax competition among local authorities, the Swiss tax system also potentially affects the country’s homeownership rate. In fact, the Swiss tax system is fairly neutral with respect to homeownership at all levels. It is possible to deduct mortgage interest from taxable income in a similar fashion as under the U.S. tax system. It is important that the deductibility applies to both homeowners and landlords, so no differential tax treatment occurs between the two. In a similar fashion, homeowners have to pay taxes on “imputed rents,” whereas landlords have to pay taxes on their rental income. Tax treatment is again neutral between the two groups. Thus, in contrast with most other countries, Switzerland’s tax and housing policies have little (or no) bias in favor of homeownership.

In contrast with banking policies adopted in other European countries, Swiss banks do not require households to fully pay back their mortgage loans over a given period. Coupled with the mortgage

interest deduction, this policy creates a strong tax incentive for households—even wealthy ones—to never fully repay their mortgage debts. This setting explains why Switzerland has one of the highest outstanding mortgage debt-to-GDP ratios in the world—exceeding 140 percent in 2012—despite the low homeownership rate of the country and despite the fact that initial loan-to-value (LTV) ratios are low in an international comparison.

In addition to the consequences arising from a decentralized government, Switzerland has to cope with another specific factor strongly influencing its housing market; that is, the particular geographic features of its territory. In contrast with the United Kingdom, which has a fairly homogeneous flat landscape, Switzerland's geographic features affect both local housing supply and demand. On the one hand, lakes, mountains, and country borders strongly impede the development of major urban areas like Geneva and Zurich, thus reducing the elasticity of the housing supply in these places. On the other hand, the country's geographic attributes increase the demand for investment homes (called “second homes” in Switzerland) by attracting wealthy foreigners in prestigious locations where ski resorts are located.

Foreign second-home investments are affected by the Swiss franc exchange rate. Many foreign investors consider the Swiss housing market as a “safe bet,” providing significant returns after real estate capital gains are converted into home currencies.¹³ The pressure of foreign buyers on the Swiss housing markets is the result of not only second-home investors but also a significant immigration inflow of people who—for tax and quality-of-life purposes—transfer their primary residence to Switzerland. According to the Federal Statistical Office, in 2013, 23.8 percent of Swiss residents were foreigners, one of the highest rates of all European Union countries.

Current Status of the Housing Market

Switzerland regularly appears in world rankings as one of the countries with the highest per capita incomes,¹⁴ one of the most competitive economies,¹⁵ and the highest quality of life (Kekic, 2012). Given the state of the country's economy and the high standard of living, one might expect that most households own their home. The reality, however, is different. Switzerland displays one of the lowest—if not the lowest—homeownership rate among all developed countries (exhibit 4) (missing years have been computed by linear interpolation). In 2013, it was 37.5 percent, increasing 2.9 percent from 2000. The increase in the homeownership rate is arguably due to the negative trend in mortgage interest rates. In particular, from mid-2008, fixed mortgage interest rates have shown a strong negative trend and are presently at less than 2 percent.¹⁶ Bourassa and Hoesli (2010) suggested that high house prices and imputed rent taxation may represent two factors

¹³ In contrast with what is observed in Japan, where the yen devaluation has arguably led to an increase of foreign investment into the residential sector, the Swiss franc appreciation of the past few years—and the corresponding price increase faced by foreign real estate investors—did not negatively affect their investments. In fact, the Swiss franc traditionally represents a safe-store currency, preserving capital gains from exchange-rate fluctuations, thus being particularly attractive to foreign investors in times of economic and political instability. It is particularly desirable for foreign investors with large financial assets in Swiss banks.

¹⁴ See <http://data.worldbank.org/indicator/NY.GDP.PCAP.CD>.

¹⁵ See <http://reports.weforum.org/global-competitiveness-report-2014-2015/rankings/>.

¹⁶ See <https://en.comparis.ch/hypotheken/zinssatz/zinsentwicklung.aspx>.

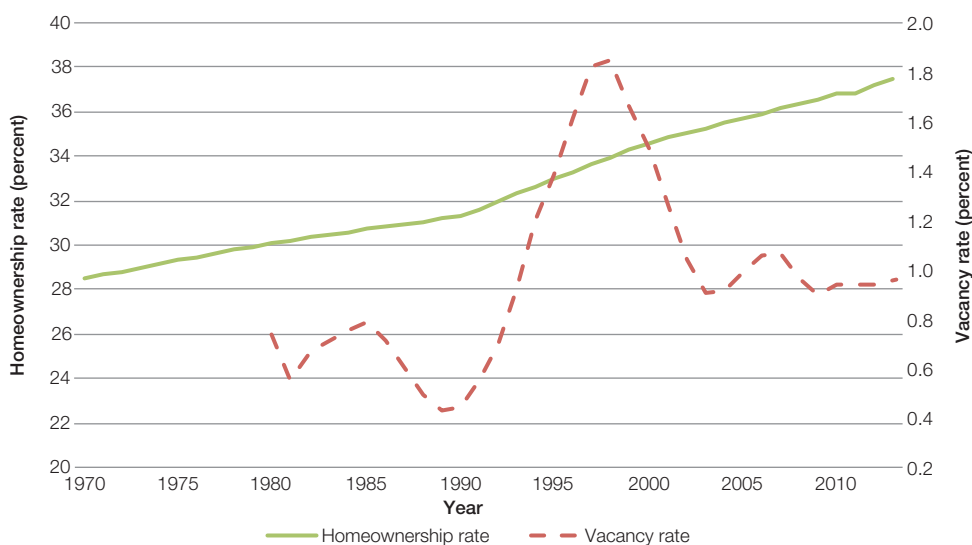
partially explaining Switzerland's exceptionally low homeownership rate. Shiller (2013) pointed out that the taxation of imputed rents distinguishes Switzerland from most other developed countries: in the United States, imputed rent taxation was abolished by the Supreme Court in 1934, and the United Kingdom tried to adopt it, but the proposal was relinquished in 1963.

Exhibit 4 also depicts the incredibly low vacancy rates of the Swiss housing market, which ranged from 0.43 percent in 1989 to 1.85 percent in 1998. In the past 10 years, vacancy rates appear to have stabilized around 1 percent. This low number may be, in part, driven by the Swiss rent-control system, explained in the following subsection. We note that vacancy rates are particularly low in major urban areas. For example, the vacancy rates in the cities of Geneva and Basel are only 0.36 and 0.24 percent, respectively. These exceptionally low rates may be explained by two factors. First, rent control is particularly important in urban areas because they have extremely low homeownership rates, typically in the range of 10 percent. Second, a spatial shift of housing demand toward the major Swiss agglomerations can explain why few housing units remain empty in these places. According to the Swiss Federal Statistical Office, in 2012, major agglomeration centers accounted for 59 percent of the total population, covered only 12 percent of the country's surface, and provided 70 percent of the employment.¹⁷

In contrast with the United Kingdom, where construction numbers have been falling dramatically since the late 1970s, construction numbers in Switzerland since 1980 are cyclical, but the long-run trend is roughly stable. Exhibit 5 shows construction indices for *all* and for *single-family*

Exhibit 4

Swiss Homeownership and Vacancy Rates

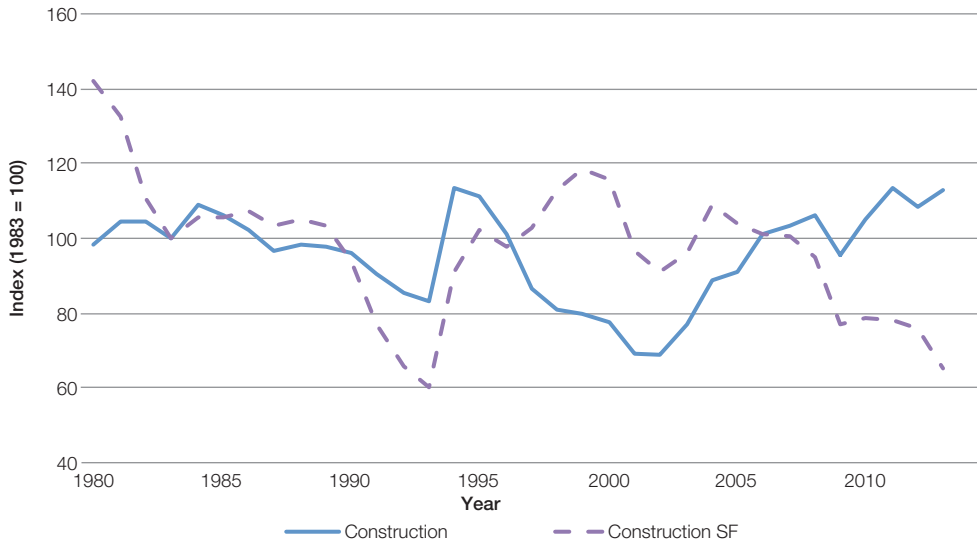


Sources: Swiss Federal Statistical Office, <http://www.bfs.admin.ch/bfs/portal/de/index/themen/09/01/new.html> and <http://www.bfs.admin.ch/bfs/portal/de/index/themen/09/02/blank/key/leerwohnungen/entwicklung.html>; authors' calculations

¹⁷ See http://www.bfs.admin.ch/bfs/portal/de/index/regionen/11/geo/raeumliche_typologien/00.html.

Exhibit 5

Swiss Construction Indices: Total and Single-Family Houses



SF = single-family.

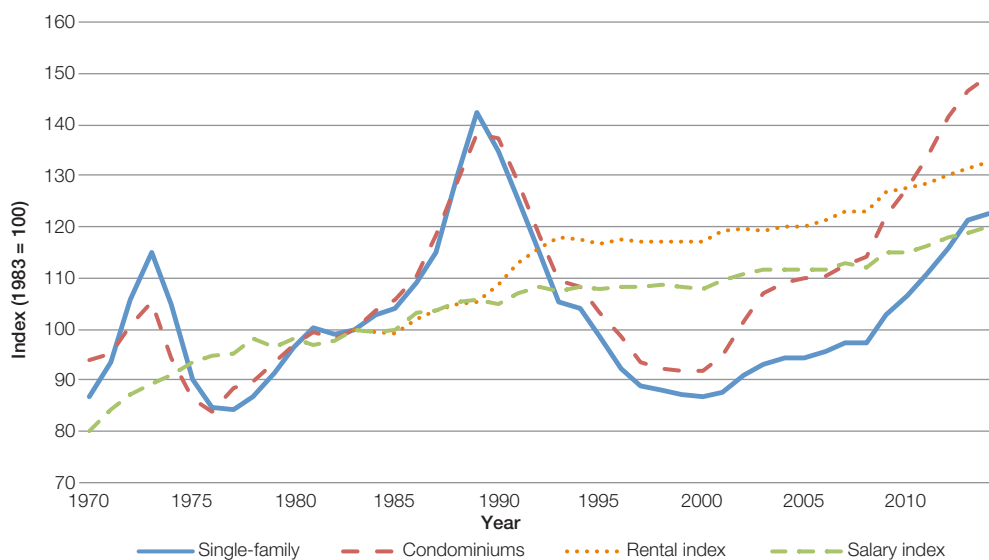
Sources: Swiss Federal Statistical Office, <http://www.bfs.admin.ch/bfs/portal/de/index/themen/09.html>; authors' calculations

construction. One interesting trend since about 2005 has been that more flats (apartments) and fewer single-family houses were constructed. Between 2002 and 2011, the construction of new flats increased markedly. The yearly construction of new flats during this period increased from 28,644 units to 47,174. In 2012 and 2013, however, the number of newly constructed dwellings remained stable at around 45,000 to 46,000 units. In 2014, according to Credit Suisse and the Swiss Association of Contractors and Builders, a general reduction of the residential construction sector could be observed and is expected to continue through 2015. Waltert and Müggler (2014) pointed out that, in part, this reduction may be related to both the implementation of the Second Home Initiative (SHI) (discussed in a later section) and the decision of the Swiss National Bank to no longer support the minimum exchange rate against the euro (causing a significant appreciation of the Swiss franc).

Price dynamics also show major differences compared with the UK housing market (exhibit 6). Three stylized facts are worth highlighting. First, real house prices in Switzerland are cyclical; three boom periods can be observed since 1970 (early 1970s, middle to late 1980s, and the period since 2000). Second, in contrast with the United Kingdom, where real house prices more than doubled since the early 1980s, in Switzerland, real house prices merely increased 23 percent (single-family prices) and 50 percent (condominiums), respectively. The difference in the growth rate between these two categories reflects the fact that the housing demand has shifted toward major urban areas, as suggested by the vacancy rate differentials observed between rural and urban areas. This hypothesis is further supported by the drop in vacancy rates observed from 2000 onward, which

Exhibit 6

Swiss Single-Family and Condominium Price Indices (both real), Rental Index (CPI Sub-Index) (real), and Salary Index (real)



CPI = consumer price index.

Sources: Swiss National Bank, www.snb.ch/en/i/about/stat/statpub/statmon/stats/statmon/statmon_O4_3; Wüest and Partner, www.wuestundpartner.com/en/online-services/immobilienindizes.html; Swiss Federal Statistical Office, www.bfs.admin.ch/bfs/portal/de/index/themen/05/06/blank/key/index.html; authors' calculations

coincides with a strong growth in condominium prices. Third, rent growth is about halfway between the price growth of single-family houses and condominiums and has amounted to 33 percent since 1983. These increases are not too distant from the salary index growth (about 20 percent since 1983).

The Swiss government recently implemented several measures aimed at dampening the price growth of the owner-occupied housing sector (which may have been driven by the all-time-low mortgage interest rates). Under government pressure, banks tightened lending conditions from July 2012 onward. In particular, the own funds required to have access to mortgage lending—typically 20 percent of the property price—cannot be exclusively constituted by the retirement provisions cumulated in the occupational pension funds. The part of own funds represented by retirement provisions is limited to 10 percent of the property price. In addition, the LTV ratio, at most, must be equal to 2/3 after 20 years. To reduce the risk exposure borne by mortgage lenders, in June 2014, the Swiss government forced banks to increase the part of capital held against mortgage loans by an additional 2 percent.

Key Housing Policies and Their Objectives

In this section, we review two policies that currently have a strong impact on the Swiss housing market: rent control and the SHI. The discussion on rent control builds on Werczberger (1997).

Rent Control

The history of rent control in Switzerland is quite tormented. The control of rents was first introduced during World War I. It was subsequently abolished in 1924. In response to the Great Depression, rent control was reintroduced in 1936. After World War II ended, the control's extent was progressively reduced and, subsequently, abolished in 1970. These changes led to a significant increase in rents, inducing the government to reintroduce rent control in 1972. Since then, several law modifications of rent control have been proposed, but a general consensus has not been reached and rent control is currently subject to controversy in political debates. Rohrbach (2014) provides a detailed exposition of the history of rent control in Switzerland.

The current level of renters' protection is high in Switzerland. According to the existing federal law, landlords have to justify the magnitude of rent increases to their tenants.¹⁸ Rent levels can be adjusted according to two main economic indicators. The first indicator is the so-called rent reference index, which is based on the average of mortgage interest rates provided by banks for the whole of Switzerland. The index cannot be used only by landlords to justify rent increases; it can also be used by tenants to ask for rent reductions. The second indicator is the Swiss consumer price index (CPI). Up to 40 percent of the inflation, as measured by the Swiss CPI, can be passed on as higher rents. Although these measures might seem restrictive, the adjustment of rent levels to economic indices was established to prevent abusive rent increases and, at the same time, to provide landlords with reasonable returns on their investments. In addition to these two economic indicators, landlords can generally modify rents under two circumstances. First, the landlord performs a major renovation of the property and/or bears increased maintenance costs, which would lead to a reduction of the return on the investment. Second, rents are usually adjusted when a new tenancy starts, provided that the new rent is in line with the prevailing rent level observed in the same area. It is important that new tenants are allowed to challenge a rent even after having taken possession of the property. This rule effectively prevents landlords from arbitrarily increasing rents between tenancies.

Rent control also protects tenants against abusive evictions. Landlords are not allowed to rescind the tenancy contract simply to obtain more advantageous contract terms or to induce tenants to buy the property. Moreover, a change in the family status of a tenant, which does not inflict damage on the landlord, is not a sufficient reason for an eviction.

Ban on Second (Investment) Homes: The Second Home Initiative

Fiscal competition in conjunction with significant immigration inflows strongly shapes urban development in Switzerland. In particular, as documented by Jaeger and Schwick (2014), urban sprawl has strongly increased during the past few decades. The apparent eagerness of Swiss citizens to protect their country's landscape with its natural beauty and the widespread perception that second-home investors, in particular foreign real estate investors, were "disfiguring" the countryside, creating ghost towns (outside of tourist seasons) in mountainous areas and inflating local housing costs, has led to a political backlash.

¹⁸ The biggest private landlords in Switzerland are insurance companies and banks, and the army and the national railway company are the two major institutional landlords. Figures on the market shares of these landlords, however, are not publicly available.

The SHI was launched to address these concerns.¹⁹ The initiative was approved by the Swiss population in March 2012 by the narrowest of margins. Only 50.6 percent of the voters and 13.5 of the 26 cantons voted in favor of the initiative (for historical reasons six cantons count as “half cantons”).²⁰ The resulting ordinance, which came into force on January 1, 2013, prohibits the creation of new second homes in municipalities in which the second-home share of the housing stock exceeds 20 percent. It is important that, in these municipalities, the initiative also forbids the conversion of primary residences built after January 2013 into second homes. Primary homes built before that date can, in principle, still be converted into second homes. This concession by the lawmakers during the legislation process aims to protect the property rights of existing homeowners in the affected municipalities. The regulation is far from being marginal; figures from the Federal Office for Spatial Development suggest that approximately one municipality out of five faces the restriction.

The definition of *second home* depends on the amount of time the owner of the property spends in it. A *primary home* is a property in which the owner spends most of the time. All other properties a person may possess are considered to be second homes. Although the concept may sound vague, it is based on precise and long-established tax rules that have implications going far beyond the initiative’s regulations. In particular, the tax burden that households face depends on where their primary home is located. The number of second homes in a given municipality is then simply approximated as the total number of dwellings minus the number of primary homes.

Merits and Demerits of Policies

In this section, we illustrate the merits and unintended effects of rent control and of the SHI.

A vast and well-established literature exists on the negative consequences of implementing rent control. Rent control has been shown, among other things, to cause rent increases of not-regulated units (Caudill, 1993), to perturb optimal allocation mechanisms (Glaeser and Luttmer, 2003), to lower housing quality (Gyourko and Linneman, 1990), and to reduce household mobility (Ault, Jackson, and Saba, 1994). Our aim is not to extensively review this literature but, rather, to compare the specific effects of rent control observed in the Swiss housing market with those predicted by the literature.

The effects of the SHI—a recent policy reform—are currently being investigated by us and, to our knowledge, no empirical study on its effects exists. Therefore, only preliminary evidence concerning its effects is presented here.

Rent control in Switzerland has several merits. First, as illustrated in exhibit 6, real rents tend to grow slowly. Since 1983, real rents have grown only 13 percent more than salaries. The dampening effect of rent control becomes apparent when the price growth of condominiums—typically good substitutes for rented units—is considered. In the past few years, asking prices for condominiums have increased at a considerably higher rate than rents; since 1983, the growth differential between

¹⁹ See <http://www.zweitwohnungsinitiative.ch/home.html> for details (in German, French, or Italian). A brief summary in English is provided at http://www.ffw.ch/en/camp_detail/second-homes-initiative-switzerland/2/11.

²⁰ We find it interesting that, from a political-economical point of view, the touristic cantons (and municipalities) that were most strongly affected all rejected the initiative.

the two is 17 percent. Second, in contrast with the cyclicity displayed by single-family homes and condominiums, rent volatility is quite low. Third, because all rental units are subject to rent control, only one regulated rental housing market exists rather than two—a regulated and an unregulated one—with potentially vastly differing prices. Fourth, because the law ensures minimum quality standards, landlords cannot reduce building maintenance in the hope of increasing returns. On the contrary, major renovations present an opportunity to bring the rent of a controlled unit closer to market level. Finally, because new tenants have the right to challenge the rent level after renovation, speculative rent hikes can largely be prevented.

These advantages, however, come at a price. Rent control induces a distortion in the allocation mechanism of the market by creating a disincentive for households to move. In fact, the most effective strategy for tenants to benefit from rent control is to stay in the same unit as long as possible. This strategy is facilitated by the lawmakers, because rent control protects tenants against irregular evictions. As a consequence, rent increases, to some extent, are capped by the reference index and the CPI. In this setting, demand for rent-controlled properties significantly exceeds supply, resulting in an extremely low residential vacancy rate—especially in major urban areas—as illustrated in exhibit 4, and, as a consequence, in a time-consuming and costly search effort for households forced to relocate.

Because the SHI was only recently approved, we can merely speculate about its long-term effects. To begin with, to the extent that local municipalities will not be able to uncover significant loopholes in the legislation, we expect that the policy will be effective in preventing sprawl in the highly touristic places with shares of second homes already exceeding 20 percent. Because demand for second homes may simply shift spatially in the long term, however, sprawl may become an increasing problem in municipalities with shares of second homes at less than but close to 20 percent. Moreover, the ghost-town phenomenon (outside of tourist seasons) in mountainous municipalities with desirable natural amenities can be expected to become worse, because the only way to now add new second homes to the existing stock of such homes is by converting existing primary homes. Because the ban on new second homes has increased the scarcity of such homes in the most desirable tourist places, conversions from primary to second homes may further increase the second-home share.

The SHI legislation also likely will affect the prices of primary and second homes. The restriction to create new second homes in places that exceed the 20 percent threshold can be expected to be immediately capitalized into higher second-home prices—a supply-side effect; because new second homes in restricted municipalities can be created only by converting primary homes constructed before 2013, the second-home supply can be expected to become progressively inelastic, thus capitalizing future demand increases.

The SHI has two opposing effects on the price of primary homes. The price may decrease as the SHI imposes a negative shock on the local economy, thus lowering demand for primary homes. By preserving local natural amenities, however, the SHI may increase the price of primary homes, all else equal. The net effect is theoretically ambiguous.

Using a difference-in-difference approach, Hilber and Schöni (2016) empirically found that the price of primary homes in restricted municipalities decreased significantly, on average, by about 12 percent, after the implementation of the SHI. They found no statistically significant effect of

the SHI on the price of second homes, possibly due to the small number of transacted second homes in their sample. Banning new residential investment thus appears to hurt existing primary homeowners in affected areas but not existing owners of investment properties.

Lessons Learned

The mild implementation of rent control in Switzerland has provided undeniable benefits to renters, such as moderate price increases and protection against abusive evictions. These benefits, however, also make households immobile. As a consequence, the increasing demand for dwellings situated in or near major urban areas—arguably fueled by strong immigration inflows—must mainly be satisfied by new construction. Because the Swiss fiscal decentralized system provides incentives to municipalities to attract new residents, local housing supply is elastic, leading to only moderate price and rent increases when hit by significant demand shocks. The situation is different when the geographic features of the territory decrease the elasticity of local housing supply. Geneva, for example, which has an urban area constrained by natural amenities, a national border with France, and strict land use controls, has very high rents and housing prices compared with rents and prices in other Swiss cities.

All in all, the decentralized system of Switzerland—with its strong local fiscal incentives—appears to be able to solve the housing affordability problem, unlike the centralized system of the United Kingdom. This solution, however, comes at a cost: the ease with which local administrative units can build new homes has led to urban and (even rural) sprawl. With the approval of the SHI, Swiss citizens have given a clear message that they want to preserve the natural environment of the country by limiting the footprint of second-home investors. Separating the primary- and second-home market, however, has hurt local owners of primary residences in restricted areas.

Housing Policies in the United States

The analysis of U.S. housing policies perhaps represents one of the richest bodies of the policy evaluation literature (see Olsen and Zabel [2015] for an overview). This richness can be attributed to the variety and the extent of the implemented policies at the federal, state, and local levels and to the increasing quality of data available to researchers. It is not feasible to do justice to the richness of this literature in a single subsection of this article. We, therefore, limit our analysis to those policies that were intended to preserve a pillar of the “American Dream”: homeownership.

Owning a house represents the achievement of the American dream for most U.S. citizens. With the 2007-to-2009 global financial crisis, however, this dream has turned into a nightmare for many homeowners. After a peak at the beginning of 2007, house prices fell about 30 percent in less than 2 years. Millions of homeowners found themselves possessing negative home equities, thus being unable to sell their home or not having access to refinancing mortgages in the case of financial need. The bust of the housing boom, coupled with soaring unemployment rates, led many U.S. households to lose their homes, causing a steep decrease of about 5 percent in the country’s homeownership rate. To counter this drop in homeownership attainment, the U.S. government adopted several new housing policies, in addition to the pre-existing policies—importantly the MID. Our aim is to describe the intended and unintended effects of these new and old policies, with a particular focus on the MID.

The discussion of the policies presented in this subsection draws heavily from the work of Olsen and Zabel (2015), who offer an exhaustive review of U.S. low-income rental programs and mortgage policies. In contrast with Olsen and Zabel (2015), our focus is on the description of implications of the MID based on recent evidence provided by Hilber and Turner (2014).

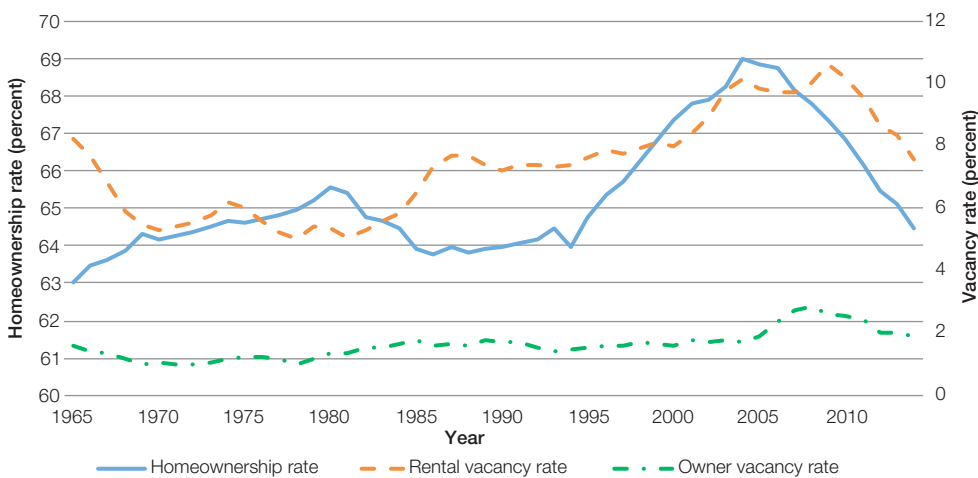
Current Status of the Housing Market

The U.S. housing market has recovered from perhaps the worst housing crisis in its history, or so it seems, at least, when looking at the trends of housing market fundamentals (exhibits 7 and 8). In this positive economic context, from December 2014 and March 2015 onward, respectively, Fannie Mae and Freddie Mac allowed first-time homebuyers to lower their downpayments to 3 percent instead of the usual 5 percent. Moreover, the Federal Housing Administration recently reduced its annual mortgage insurance premium by 0.5 to 0.85 percent. Finally, some of the post-crisis housing programs aiming to boost homeownership are still under way (see the next section).

Given the current state of the U.S. housing market, one might expect that the homeownership rate has stopped decreasing or, at least, has stabilized, yet this is not the case. Exhibit 7 documents the U.S. homeownership rate between 1965 and 2014. Homeownership started to decline between 2004 and 2005, preceding the global financial crisis (2007 to 2009) and its corresponding high number of foreclosures. It continued to decline after the end of the crisis. It is currently still on a downward trend, similar to that in the United Kingdom. From the fourth quarter of 2004 to the fourth quarter of 2014, the homeownership rate fell from 69.2 to 64.0 percent. Exhibit 7 also reports vacancy rates of owner-occupied and rental housing. Consistent with the homeownership statistics that imply an increase in demand for rental housing, vacancy rates for the latter type of

Exhibit 7

U.S. Homeownership and Vacancy Rates

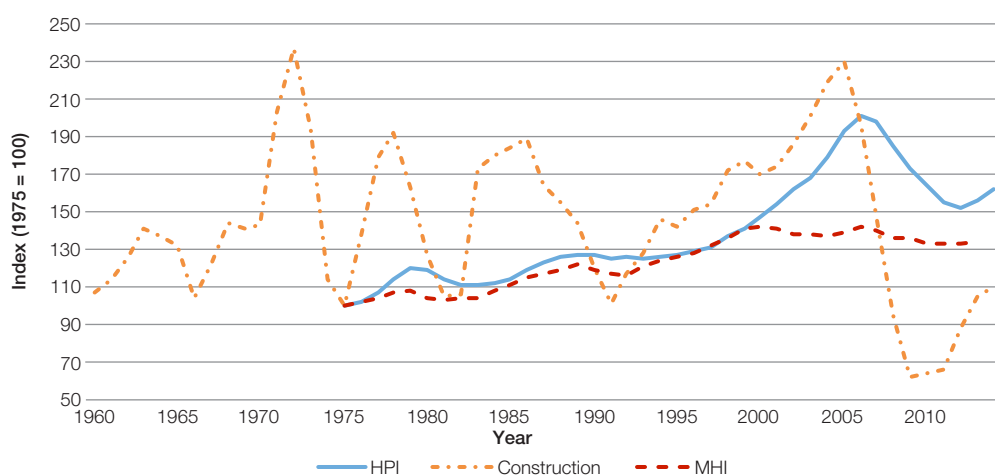


U.S. = United States.

Sources: U.S. Bureau of the Census, obtained via Federal Reserve Economic Data (FRED) database, <https://research.stlouisfed.org/fred2/series/RHORUSQ156N>, <https://research.stlouisfed.org/fred2/series/RRVRUSQ156N>, and <https://research.stlouisfed.org/fred2/series/RHVRUSQ156N>

Exhibit 8

U.S. HPI (real), Construction Index (New Private Housing Units Authorized by Building Permits), and MHI (real)



HPI = house price index. MHI = mean household income.

Sources: Federal Housing Finance Agency, obtained via FRED, <https://research.stlouisfed.org/fred2/series/USSTHPI>; U.S. Bureau of the Census, <https://research.stlouisfed.org/fred2/series/PERMIT> and <http://www.census.gov/hhes/www/income/data/historical/household/>; authors' calculations

housing fell significantly from 10.6 percent in 2009 to 7.5 percent in 2014. It is interesting that vacancy rates of owned units increased only slightly during the peak of the crisis. They generally remained fairly low and stable throughout the crisis.

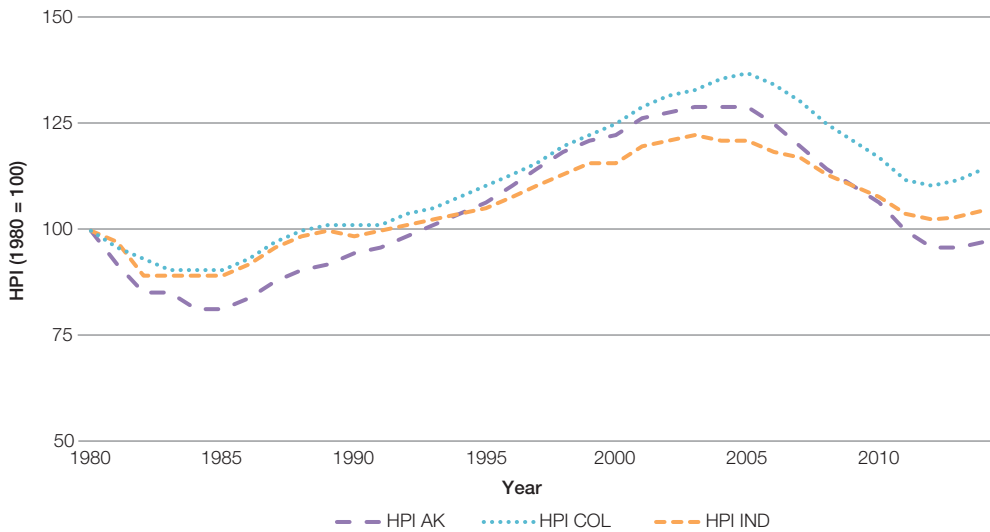
The observed decrease in the rate of homeownership may be explained by three factors. First, the massive increase in the price-to-income ratio in the buildup of the global financial crisis implied that, all else equal, fewer and fewer households were able to afford the monthly mortgage payments (that is, liquidity constraints tightened). Second, the tightening of credit conditions (including downpayment constraints) during the crisis meant that many households that were at the margin of property ownership before the crisis suddenly no longer had access to mortgage lending. Third, and related to the former point, bad credit ratings of households that experienced foreclosure during the crisis meant households could not easily become homeowners again.

Exhibit 8 illustrates the seasonally adjusted purchase-only HPI since 1975 and the mean household income for the same period. Focusing on the past 10 years, although the price-to-income ratio fell significantly during the global financial crisis, the trend has been reversing since about 2011, all else equal, making it increasingly difficult for households to have access to property ownership. At the same time, increasing prices during the past few years appear to have revived the construction sector. Exhibit 8 documents the number of housing starts between 1960 and 2014. Housing construction appears to be highly cyclical in the United States. Although it fell dramatically during the 2000s, housing construction has been recovering since around 2011.

Local housing markets in the United States show remarkable spatial heterogeneity with respect to their price dynamics. Exhibits 9 and 10 illustrate the price growth since 1980 for three major inland cities—Akron, Ohio; Columbus, Ohio; and Indianapolis, Indiana—and three major coastal ones—Los Angeles, California; New York, New York; and San Francisco, California—respectively. Inland housing markets have rarely been affected by the crisis and display a very low—if not negative—real price growth since 1980. By contrast, the coastal cities (sometimes referred to as “superstar cities”; Gyourko, Mayer, and Sinai, 2013) that possess severe natural and regulatory constraints (Hilber and Robert-Nicoud, 2013; Saiz, 2010) show astonishing long-term price increases—with San Francisco reaching a real price growth of about 300 percent since 1980—and large price volatility. The price trends depicted in exhibits 9 and 10 are consistent with the proposition that given demand shocks (which may or may not be greater in large coastal cities) translate into greater price swings in places with severe long-term supply constraints; that is, the superstar cities.²¹

Exhibit 9

U.S. Inland Metropolitan Areas HPI (real)

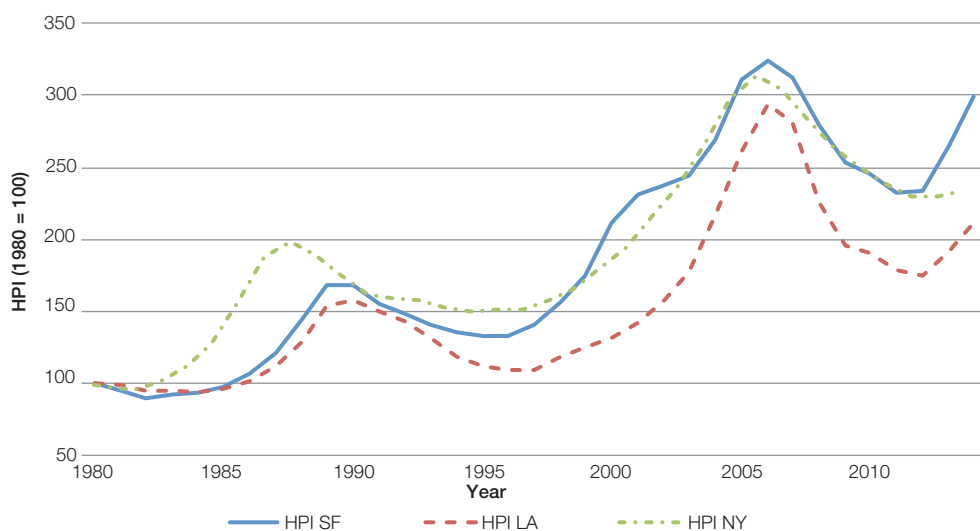


AK = Akron. COL = Columbus. IND = Indianapolis. HPI = house price index.
Source: Federal Housing Finance Agency, <http://www.fhfa.gov/DataTools/Downloads/Pages/House-Price-Index-Datasets.aspx#qat>

²¹ These findings are consistent with the findings of Hilber and Vermeulen (2016) for England. They are also consistent with the theory put forward in Hilber and Robert-Nicoud (2013) that more desirable places (in the United States, coastal cities) are more physically developed and, as a consequence of owners of developed land becoming more politically influential, more regulated.

Exhibit 10

U.S. Coastal Metropolitan Areas HPI (real)



HPI = house price index. LA = Los Angeles. NY = New York. SF = San Francisco.

Source: Federal Housing Finance Agency, <http://www.fhfa.gov/DataTools/Downloads/Pages/House-Price-Index-Datasets.aspx#qat>

Key Housing Policies and Their Objectives

The current U.S. tax system is biased in favor of homeownership. It is important to note that, whereas mortgage interest can be deducted from taxable income, imputed rents associated with property ownership are not taxed.²²

The broad deductibility of interest *on all loans* in the United States dates back to 1894 when the first modern federal income tax was created. It was the Tax Reform Act of 1986 that *confined deductibility to mortgage interest only*. The aim of the reform has been to encourage homeownership. The MID is a costly policy, representing about \$100 billion in foregone annual tax revenue for the U.S. government. Despite the already-existing bias toward homeownership, the bust of the housing boom during the global financial crisis led the U.S. government to adopt yet more fiscal measures in an attempt to halt the decline in homeownership attainment.

In 2008, the Congress passed the Housing Assistance Tax Act (HATA), which provides a tax credit of 10 percent of the purchase price of a property for first-time homebuyers. The maximal tax credit was capped to \$7,500 per household and the requirement was that it had to be repaid within 15

²² Note that the mortgage interest deductibility is a popular policy, implemented in numerous developed countries to promote homeownership. The United Kingdom used to have a form of mortgage interest deduction—the Mortgage Interest Relief at Source (MIRAS). The MIRAS was introduced in 1969 but phased out from 1988 until it was completely abolished in 2000. Because of the numerous demerits and unintended consequences of the MID, which are discussed subsequently, the slow phasing out and subsequent termination of the MIRAS can be seen as a highly successful policy decision.

years. To limit the vacancy of foreclosed properties, while avoiding speculative behavior, in 2009, the American Recovery and Reinvestment Act (ARRA) increased the maximal tax credit to \$8,000 and offered the possibility to waive the credit repayment if the property was not sold during the 3 years after its acquisition and was used as the principal residence. At the end of 2009, President Obama signed the Worker, Homeownership, and Business Assistance Act into law, extending the period during which households could claim the ARRA tax credit. According to the Government Accountability Office, up to July 2010, approximately 1 and 16 million first-time homebuyers benefited from the HATA and ARRA tax credits, respectively.

In addition to providing fiscal incentives, the U.S. government launched several programs to enhance credit conditions.²³ In early 2009, the U.S. Department of the Treasury started the Making Home Affordable (MHA) program to improve credit conditions. Two centerpieces of the MHA are the Home Affordable Modification Program (HAMP) and the Home Affordable Refinance Program (HARP). Both programs end in December 2016. The two programs are not intended to promote homeownership but, rather, to avoid the loss of it by reducing the likelihood of foreclosure. HAMP's aim is to cooperate with mortgage lenders to reduce the monthly mortgage payments of homeowners at risk of foreclosure by decreasing interest rates, lengthen the loan's term up to 40 years, and define a balloon payment at the maturity date. HARP's goal is to provide credit access to homeowners who possess negative home equities. To be more specific, homeowners who had their mortgages owned or guaranteed by Freddie Mac or Fannie Mae and who were current with their payments (in contrast with HAMP) were initially allowed to refinance their debt even if the LTV ratio of their properties was between 80 and 125 percent. In a subsequent modification of the program in 2011, these LTV limits were suppressed for mortgages up to 30 years, thus allowing households with deeply underwater assets to refinance.

In February 2010, President Obama approved the Hardest-Hit-Fund (HHF) program to help households living in states that were particularly affected by the global financial crisis. States displaying unemployment rates greater or equal to the national average and having experienced average housing price decreases greater than 20 percent were accepted into the program. Many of these states (California, Florida, Nevada, and Oregon, among others) host some of the most expensive cities in the world. In the same spirit of the MHA program, the HHF's aim was to reduce the mortgage burden of households owning negative housing equity.

Merits and Demerits of Policies

We first discuss the impact of the MID in some depth, because it offers the most compelling empirical evidence. With the exception of the MID, the policies reviewed in the previous section are recent and many are still current. Therefore, only limited information is available concerning their effects on the U.S. housing market. In this subsection, we offer an analysis based both on informal evidence and on recent empirical findings.

²³ See the U.S. Department of the Treasury website (<http://www.treasury.gov/initiatives/financial-stability/TARP-Programs/housing/Pages/default.aspx>) for a more indepth description of these programs. Because of a lack of participation, we do not consider the HOPE for Homeowners Act in the present subsection of the article.

In light of the staggering cost of the MID, two main questions are of interest: (1) Does the policy produce the effect that justifies its existence; that is, to increase homeownership? (2) Do unintended consequences follow its implementation? The answers to these questions appear to be negative for the first and affirmative for the second.

Glaeser and Shapiro (2003) provided evidence supporting the proposition that homeownership is not influenced by the MID. They point out that households on the margin between owning and renting usually do not use the deduction to reduce their taxable income. As a consequence, the MID does not create new homeowners but, rather, increases the housing consumption of well-off households. According to Gervais and Manish (2008), wealthy households may use equity financing if the MID is not available, further providing support for the hypothesis that the homeownership decision of these households is not influenced by the deduction. Bourassa and Ming (2008) provided some evidence that the MID is not only ineffective, it lowers the homeownership rate among young households due to price capitalization effects. Hilber and Turner (2014) provided strong evidence on the unintended consequences of the MID. They show that the deduction promotes homeownership of only higher-income households in which the housing supply is elastic. This effect on the higher-income group is reversed in housing markets with strong regulatory constraints. We find it interesting that they found no significant relationship between homeownership and the MID for low-income households. The net effect of the MID on homeownership is roughly equal to zero.

We now present some informal evidence concerning the HATA/ARRA and HAMP housing programs.²⁴ Baker (2012) provided a descriptive analysis of the effect of the tax credit. He points out how the program's effects were only temporary. The program considerably boosted home sales when it began (June 2009), and a marked decline was observed when it ended (July 2010). In this respect, it seems that the program—rather than supporting the demand in the long term—simply shifted the homeownership decision in time, thus having no effect on the long-term homeownership rate. We find it interesting that Baker provided some evidence that the program influences the purchase of only bottom-tier properties in less-expensive markets. He justifies his claim by arguing that new homebuyers generally buy inexpensive properties and that the \$8,000 tax credit is not likely to have an influence in expensive housing markets like Boston or New York.

An early theoretical study by Mulligan (2010) discusses how the guidelines imposed by the HAMP to take part in the program may have negative effects on mortgage renegotiations. In particular, he points out that renegotiations, in general, do not lead to a reduction of the principal mortgage and do not decrease households' uncertainty. Because of these facts, he stresses how the program avoids only some foreclosures in the short term but basically shifts in time the efforts required to prevent the others.

Using a difference-in-difference identification strategy, Agarwal et al. (2012) empirically demonstrated the inefficiency of the HAMP. Using second-home investors who are not eligible for the program as the control group, they showed that promoted mortgage renegotiations has only limited influence on the rate of foreclosures and virtually no effect on other economic variables, such as declining house prices and employment. In addition, they point out that the lack of responsiveness to the

²⁴ To the authors' knowledge, no conclusive study is currently available on the effect of the HARP and HHP programs.

program (only 1.2 million mortgages were renegotiated compared with a target of 3 to 4 million) can be attributed to the rigid organizational capability of a few large loan lenders, who were not able to renegotiate mortgages. They conclude by stressing that short-term policies aiming to modify the behavior of large mortgage lenders are of limited effect.

Finally, using a simulation approach, Hembre (2014) assessed the impact of the HAMP on credit defaults by comparing it with a hypothetical counterfactual housing program in which households were not able to renegotiate their mortgage debt. He found that the HAMP expects to prevent slightly more than 500,000 defaults after 5 years. He shows, however, that the exorbitant program cost of \$20.8 billion greatly exceeds the roughly estimated social costs associated with foreclosures, concluding that the program resulted in a net loss of \$12.7 billion.

Lessons Learned

Several lessons can be learned from the present analysis. Some of them directly result from the previous analysis, but others are less straightforward.

To begin with, housing policymakers seem to be obsessed with the desire to modify the demand side of the market (for example, via mortgage subsidies such as the MID), arguably because it is the easiest way to reach a broad consensus among voters. Capozza, Green, and Hendershott (1996) and Hilber and Turner (2014), for example, showed, however, that modifications of fiscal incentives in housing markets that have an inelastic supply are capitalized into higher housing prices. In addition, research conducted by Glaeser, Gottlieb, and Gyourko (2010) and Mayer (2011) demonstrates the important role played by the supply elasticity to determine equilibrium prices.

In particular, we point out that future policies should take the spatial heterogeneity of the housing market into account. The United States provides a good example of the spatial dependence of supply constraints and of the consequences of neglecting them when making housing policies. Supply constraints are influenced by not only local regulatory restrictions but also by the nature of the local geographic area in which the housing market is located (Saiz, 2010).

Our analysis suggests that simply pouring subsidies homogeneously across the country through ad hoc programs aiming to shift the housing demand without considering the local supply elasticity of housing markets can be counterproductive. The HHF program is an example of such bad practice. The largest allocation share (almost \$2 billion) went to California. Given the nature of supply conditions in the large coastal California metropolitan areas, it seems reasonable to assume that the only effect of the allocation on the housing markets of Los Angeles and San Francisco was to further increase housing prices and augment the market volatility. Consistent with this proposition, illustrated in exhibit 10, the two cities experienced a strong price increase after the HHF was implemented.

Other lessons that can be learned are typically intrinsic to some flaws present in the policy implementation itself. Financial incentives and mortgage policies should avoid simply shifting purchase decisions and foreclosures in time. Otherwise, all these policies will achieve is a short-term disequilibrium of the housing market that will disappear as soon as the program ends.

Finally, a trivial lesson is to take the legal and organizational frameworks into account. If the demand or supply side of the market cannot react to the proposed incentives, the policies will

be largely ineffective. An example of limited supply response is provided by the inability of large mortgage lenders to renegotiate mortgages. On the demand side, it appears that credit score constraints of delinquent borrowers prevent them from benefiting from the policies' incentives.

Synthesis

In this article, we review the key housing policies implemented in three developed countries that differ markedly in their institutional settings, economic conditions, and geographic features. Our analysis suggests that differences in these factors manifest themselves in diverse supply conditions (that is, supply price elasticities) and these, in turn, are associated with two distinct housing problems: (1) housing affordability (in the case of inelastic supply) and (2) sprawl (in the case of elastic supply). The housing policies implemented to address these problems typically focus on the demand side, perhaps because they are politically more appealing. These demand-side policies, in turn, often have unintended (distributional and allocative efficiency) consequences via house price capitalization effects that policymakers typically ignore.

Our analysis of the United Kingdom and Swiss government systems—highly centralized versus decentralized—suggests that fiscal incentives may play a major role in determining the local housing supply elasticity and may thus explain issues of local housing affordability or of sprawl, respectively. The two opposite systems come with their own advantages and drawbacks. A highly centralized government providing few fiscal incentives at the local level for residential development, corresponding urban containment via greenbelts, height restrictions that prevent vertical expansion, and other regulatory constraints prevent urban sprawl but generate an acute housing-affordability crisis. By contrast, a system of fiscal competition with strong incentives at the local level to permit residential development implies lower house-price inflation but comes at the cost of urban sprawl.

The United States differs enormously across space in its geographical constraints and in its fiscal and regulatory features. While urban sprawl is a concern in large parts of the Midwestern and Southern United States, high house prices and a corresponding lack of affordability are major issues in coastal superstar cities such as Los Angeles, New York, and San Francisco. The United States, which has implemented numerous housing policies in recent years and provides access to rich data, thus provides a unique laboratory for empirical research.

Policymakers in the United States and the United Kingdom faced with housing-affordability problems and concerns about homeownership attainment tend to focus on demand-side solutions. Demand-side policies such as the MID or Help-to-Buy may be popular among voters, but they tackle symptoms rather than root causes. The key problem with these demand-side policies is that they have unintended and counterproductive consequences in severely supply-constrained places, because the demand-induced price increases offset the desired effects of the policy.

In a more general sense, the impact of housing policies ought to be evaluated in a general equilibrium framework rather than in a partial one. For example, a partial equilibrium analysis may focus on the direct incentive effects of demand-side subsidies such as the MID or Help-to-Buy and ignore the fact that such subsidies spur housing demand and thus increase house prices in supply inelastic places. Another example is the Swiss SHI. Whereas the SHI may achieve one objective—to combat

sprawl in the most touristic areas—it may create a few new problems (via general equilibrium effects): adverse effects on the local economy in the touristic areas, an increase of the ghost town phenomenon in these areas (outside of tourist seasons), long-term sprawl in semitouristic areas (slightly less than the initiative's threshold of 20 percent second homes), and price declines for existing local primary homeowners in touristic areas. Given the particular features of the legislation, the latter effect is arguably more pronounced among the elderly and less-educated, lower-income homeowners because they are typically less mobile, so the cost of converting their primary home into a second home *and* move away to another region may render their conversion option worthless.

One central conclusion from our analysis is that policymakers ought to be cautious when implementing new housing policies, especially “blanket” demand-side policies in countries that contain areas with severe supply constraints. Instead, policymakers ought to focus on correcting market failures and take supply conditions into account when designing policies.

Whereas large greenbelts (with intensive agricultural use) surrounding cities, in combination with tight height controls and lack of fiscal incentives at the local level (as is the case in the United Kingdom), are a recipe for a housing-affordability crisis, creating and maintaining local public parks (a local public good), preserving areas of outstanding natural beauty (because of their positive externalities and option values), or protecting truly historical buildings or neighborhoods (again because of positive externalities) are all sensible local (planning) policies. They increase social welfare yet will not create a housing affordability problem as long as enough incentives still exist to permit and develop tall buildings in the center of the locality and larger single-family houses in the periphery. If the lack of sufficient new housing construction is the perceived problem, then local taxes that provide fiscal incentives to local policymakers to permit development could be an effective means to create more affordable housing.

In a similar vein, if sprawl is perceived by voters to generate negative externalities, then a new national tax on the consumption of developed residential land (that is, a property [or, ideally, land-value] tax that has to be paid irrespective of whether a property or a parcel of land is used as the primary or secondary home) could discourage nonintensive use of residential land and could provide the right kind of incentives to prevent sprawl. At the same time, it would not provide additional incentives to local planning boards to permit development. Such a national tax might provide a much more efficient tool to combat sprawl with fewer side effects than banning second homes in touristic areas altogether. Such a reform could be designed revenue neutral. For example, in the case of Switzerland, the federal income tax (and corresponding deadweight losses) could be reduced by the amount of revenue the new tax generates.

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Financial support from ADBI, which made this synthesis article possible, is gratefully acknowledged. This work is protected by copyright and is used with the permission of the copyright owner ADBI. All errors are the sole responsibility of the authors. Address correspondence to Christian Hilber, London School of Economics, Department of Geography and Environment, Houghton Street, London WC2A 2AE, United Kingdom. Phone: +44-20-7107-5016. E-mail: c.hilber@lse.ac.uk.

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Sensitivity of Treatment on Treated Effects in the Housing Vouchers Welfare Experiment to Alternative Measures of Compliance

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Abstract

In the social experimentation literature, the treatment-control outcome difference is the “intention to treat” and the adjustment of that difference to reflect actual participation in treatment as the “treatment on treated” (TOT) effect of the intervention. Previous contributions to this literature have been silent on the sensitivity of TOT to alternative definitions of treatment.

In this article, we apply alternative methods of estimating treatment-on-the-treated to data from the Effects of Housing Vouchers on Welfare Families experiment. The final

Abstract (continued)

report on that experiment employs an original method of calculation of TOT and finds that early negative impacts on earnings fade out after 1.5 to 2 years. We test for sensitivity of these results to alternative concepts of participation: participation at time of measurement, exposure to treatment over time, and definition of the intervention as housing assistance per se rather than as vouchers.

We find that the published TOT results are qualitatively robust to the definition of treatment. We believe this finding is likely to apply more generally in large, well-controlled experiments.

Introduction

Controlled experiments to obtain unbiased estimates of the impacts of social interventions began in the 1960s in the United States and have since spread worldwide (Greenberg and Shroder, 2004). Because these are field (not laboratory) experiments, and because the subjects are human beings with rights, members of treatment groups do not always get the treatment that the researchers intended them to receive, and members of control groups may obtain access to the treatments that researchers intended to deny them or to equivalent treatments in the community.

The value of experimental findings may depend on the extent to which policymakers can accurately adjust for this noncompliance. The difference between treatment and control is an unbiased and consistent estimate of the impact of the difference in the regimes those two groups experience. The policymaker, however, is usually not interested in this difference per se but in the impact on those actually exposed to the treatment intervention for two reasons. First, when compliance with the experimental protocol is not universal, the treatment-control difference generally will understate the impact of the intervention. Second, when the treatment is costly to implement, the noncompliant members of the treatment group do not add to the costs, but the noncompliant members of the control group do. Thus noncompliance may distort the benefits and costs of the treatment.

Compliance and noncompliance, in general, are not random but reflect systematic differences in the personalities and backgrounds of the subjects. Exclusion of data from noncompliant subjects would destroy the integrity of the experiment; thus, some other method must be applied.

A convenient and well-accepted adjustment to experimental findings is called “treatment on treated” (TOT). The first rigorous articulation of TOT occurs in Bloom (1984). The full defense using the notation of Bayesian probability theory is in Imbens and Angrist (1994) and Imbens and Rubin (1997), who consider TOT (called by them the “local average treatment effect [LATE]”) the only valid measure of intervention impact that an experiment can supply.

The TOT/LATE concept has been highly influential. Citations to “Treatment on Treated” in Google Scholar as of June 2016 number 896; to “Local Average Treatment Effect,” 5,070. The concept has faced some controversy, centering on whether it is inherently meaningful (see, for example, Imbens

[2010] and the response by Deaton [2010]), but, to our knowledge, the literature on social experiments does not address the sensitivity of TOT to the definition of participation. This concern does not seem trivial. If the intervention is a training program, is it meaningful to include as participants those individuals who showed up on the first day and were never seen again? Must they actually graduate to qualify?

In the simplest case, let there be just one treatment and one control group, with no access whatever to the treatment by control group. A regression for the outcome of interest will have a binary variable for treatment on the right-hand side of the equation, and the estimated coefficient for this dummy is called the *intention to treat* (ITT), because the researchers intended to expose all members of the treatment group to the treatment. If, however, only a fraction p of the treatment group actually is exposed to it, and the impact on the fraction of noncompliers $(1-p)$ can be assumed to equal zero, then

$$\text{TOT} = \text{ITT}/p. \tag{1}$$

Thus, if, other things equal, a treatment raises earnings by an average of \$1,000 but only 20 percent of the treatment group actually received it, the value of the treatment to those actually exposed was, on average, \$5,000.

If some members of the control group *did* manage to obtain the treatment (or its equivalent) in the community, call the fraction of the group that these “crossovers” represent c . The natural assumption is that the impact of the treatment on the crossover controls will be the same as the impact on the compliant members of the treatment group. If so,

$$\text{TOT} = \text{ITT}/(p - c). \tag{2}$$

To continue the previous example, if 10 percent of the controls received the treatment despite not being assigned to it, the value of the treatment must average \$10,000.

To our knowledge, the literature on social experiments does not address the sensitivity of TOT to the definition of participation. We previously noted a concern about the minimum length of exposure to treatment, but the concern is broader. Suppose some other training program was available, and that some control group members enrolled in it. How closely must an alternative training program approximate the treatment curriculum for control group members enrolled in the alternative to be considered crossovers?

Some treatments continue during the course of the experiment. Are the effects of participation supposed to be static or dynamic? Suppose a mother receives a food supplement for her family in the second and fourth quarters of the year, but not in the third. Do we expect the feeding program to affect her behavior only in the second and fourth quarters or in the third quarter as well?¹

¹ We had some expectation that biometricians would have preceded us in this area, and perhaps would have offered a theoretical solution, because inconsistent compliance by patients in clinical trials could bias the evaluation of new drugs. Our hasty review of a vast literature indicates that the compliance problem is well known but that theorists tend not to accept the practical adjustments that practitioners make.

We investigate these issues using data from a large randomized experiment on the effects of portable housing assistance on the behavior of families with children receiving welfare.² A housing voucher will subsidize the rent of a low-income family in a privately owned decent and affordable unit, if the family can find such a unit in the community. The United States spends about \$20 billion a year on housing vouchers for nearly 2.2 million low-income households (HUD, 2016a), of whom about 46 percent are families with children (HUD, 2016b).

We focus on the findings involving earnings impacts. The impact of assistance on labor supply is theoretically ambiguous (see Shroder [2002] for a literature review). On the one hand, the subsidy formula taxes income, including earnings, at 30 cents on the dollar by increasing the family's required contribution to rent and, in principle, permits the recipient to lease a decent unit with no earnings at all. On the other hand, the voucher cuts the price of housing only and may stimulate demand for other goods and reduce the opportunity cost of job search. One important finding of the experiment, not further tested here, was that it essentially eliminated homelessness among the families that actually used the voucher, and this added stability might be expected to improve functioning in the job market.

Exhibit 1 extracts the critical information from the final evaluation of the experiment by Mills et al. (2006).³ During a 3-year period, the members of the control group had average earnings of \$485 a month (\$17,458 divided by 36 months). Adjusting for random differences between groups, the average treatment group member earned \$5 a month less. All the negative impact essentially occurred in the first 18 months after voucher eligibility (about \$17 a month), with positive but statistically insignificant impacts thereafter. Using one definition of compliance (discussed later in this article), the published analysis concludes that the TOT effect of using the voucher was about -\$17 per month overall, with TOT of about -\$33 per month in the first 18 months, subsequently fading to insignificance.

Exhibit 1

Impact of Housing Vouchers on Biannual and Total Earnings

| Half-Year | Control Mean (\$) | ITT Impact (\$) | TOT Impact (\$) |
|-----------|-------------------|-----------------|-----------------|
| 1 | 2,651 | - 124** | - 306** |
| 2 | 2,837 | - 100 | - 174 |
| 3 | 2,889 | - 76 | - 195 |
| 4 | 3,007 | 16 | - 20 |
| 5 | 3,029 | 30 | - 32 |
| 6 | 3,046 | 72 | 103 |
| Total | 17,458 | - 182 | - 624 |
| N | | | 8,664 |

ITT = intention to treat. TOT = treatment on treated.

* p < .10. ** p < .05.

Source: Extracted from Mills et al. (2006: 100, exhibit 4.9); see our discussion at footnote 3

² The eligibility for the program technically extended to eligible nonrecipients of the Temporary Assistance for Needy Families (TANF) program. About 20 percent of the sample was not receiving TANF at baseline.

³ We have suppressed standard deviations and “all sites but Los Angeles” data from Exhibit 4.9 of Mills et al. (2006). Including Los Angeles adds about 1,000 subjects but subtracts 6 months of data. Non-Los Angeles ITT estimates are significantly negative at the .1 level in the second and third half-years, insignificantly negative in the fourth and fifth, and insignificantly positive in the sixth and seventh. In general, Los Angeles impacts by themselves are more positive than in other sites, but the differences are not statistically significant.

Although one would prefer having no negative earnings impacts whatever, these impacts are much smaller than those found for cash assistance in, for example, the Negative Income Tax experiments. In conjunction with negative impacts on homelessness and doubling up, they suggest that vouchers are an effective housing program but are not an effective antipoverty program.

These findings, however, provoke all the questions noted earlier. Some members of both treatment and control groups lived in public housing or Section 8 project-based assisted units before randomization, and some moved into such units thereafter. Public housing and Section 8 project units have the same 30 percent of income rent rule noted previously, but they are not portable—the tenant cannot take the assistance with her if she moves out. In calculating TOT, should one treat these project-based families as receiving an equivalent treatment? Some voucher holders left the program after first leasing up. Should impacts be adjusted to reflect the absence of subsequent participation?

Social experiments on the scale of the voucher demonstration cost millions of dollars to administer and are often simply too costly for agencies to fund, despite the major attractions of rigor and precision. We test whether any substantive inability to interpret their findings undermines these attractions.

In the remainder of this article, we describe the experimental data, define 10 alternative methods for estimating TOT in the context of this experiment, present the results of implementing these alternatives, and interpret the findings. We conclude that alternative adjustments to construct TOT do *not* substantively affect the findings from the experiment, and we think this conclusion will be applicable to the findings of most large, well-controlled randomized experiments.

Data

The data we use are from the Effects of Housing Vouchers on Welfare Families study (Mills et al., 2006), sponsored by the U.S. Department of Housing and Urban Development (HUD). In this study, families who either received or were eligible to receive Temporary Assistance for Needy Families (TANF) cash assistance were randomly assigned to either a treatment of an immediate offer of a housing choice (Section 8) voucher or a control group. Control group families were placed on housing authority waiting lists to receive a housing voucher. The study took place in six cities: Atlanta, Georgia; Augusta, Georgia; Fresno, California; Houston, Texas; Los Angeles, California; and Spokane, Washington. Data collected for the study included a baseline information form, unemployment insurance (UI) wage records, and HUD administrative records; they also included address history tracking, TANF and Food Stamp program administrative records, a followup survey, and qualitative indepth interviews. For this article, we make use of the baseline information, UI-derived earnings data, and housing subsidy receipt data derived from HUD records.

Not all treatment group members actually chose to accept the treatment offer. Roughly one-third of the treatment group families never leased an apartment using a housing voucher. In addition, about two-fifths of control group families eventually leased an apartment using a voucher. Mills et al. (2006) modeled the effects of using a voucher as cumulative over time and used an original method for estimating TOT impacts we call the “Orr method.”⁴ Mills et al. (2006) processed HUD

⁴ The “Orr method” is named for Larry Orr, its originator, who laid out the algebra and statistical properties of the model in appendix B of Mills et al. (2006).

administrative records to produce a series of period-by-period dummy variables that indicate whether a family had ever leased up with a housing voucher. The definition of treatment received as “ever leased up” implies that, if a family had ever leased up in period t , then it would also have “ever leased up” in all subsequent periods.

For this study, we used three other sets of dummy variables that describe the receipt of housing subsidies. In addition to (i) ever leased up with a housing choice voucher (HCV), we used (ii) leased up with a housing voucher in half-year t , (iii) ever received any housing subsidy (HCV, public housing, or project-based Section 8), and (iv) received any housing subsidy in half-year t .⁵

Dummy variable sets ii and iv take into account whether the housing voucher or housing subsidy has been relinquished. Therefore, in these sets, it is possible for the dummy variable for period $t + 1$ to equal zero if the dummy variable for period t equals 1.

We chose these alternative dummies out of consideration of the static labor supply model, which predicts a drop in labor supply due to the receipt of a voucher or housing subsidy (income effect) and due to the subsidy formula’s tax on earnings (substitution effect). If the effect of the voucher on earnings is solely through a labor supply disincentive effect, then the voucher’s effect should apply only in periods when the voucher is actually being received. Furthermore, other housing subsidies, such as public housing or project-based Section 8, with identical formulas to the HCV should have identical effects on earnings.⁶

Estimation

In this article, we present 10 sets of results for earnings impacts.⁷ We use two different estimation methods with each of the four sets of dummy variables that describe housing assistance receipt. Additional complexities with one of the estimation methods lead to 10 sets of results, rather than 8 sets. Exhibit 2 summarizes the overall estimation strategy.

The period-by-period Bloom (1984) method simply applies the Bloom adjustment ($1/(p - c)$) to the ITT in each period, using the appropriate definition of treatment to calculate treatment group participation (p) and control group participation (c).

The Orr method assumes that the time path of effects for treatment group participants and control group crossovers who initially receive the treatment in period 2 or after is *identical* to the time path of effects for non-crossover-like participants who initially receive the treatment in period 1. The Orr assumption parallels the assumption in the Bloom adjustment that the impact on crossovers is the same as the impact on compliant members of the treatment group.

⁵ Use of a voucher or housing subsidy for a period is defined as use of a voucher or housing subsidy on the first day of the period.

⁶ The authors thank Scott Susin for making the point that the high receipt of other housing subsidies in the Effects of Housing Vouchers on Welfare Families experiment would bias TOTs based solely on housing vouchers downward. Susin also made the point that the decrease of multiple program participation in the wake of welfare reform serves to increase the potential “bite” of the housing voucher marginal tax, suggesting a renewed focus on the prediction of the static labor supply model.

⁷ We have also computed 10 TOT estimates associated with the “all sites but Los Angeles” ITT estimates, but we do not present them here. The additional estimates are available from the authors. The conclusions we reach are not affected by this choice.

Exhibit 2

Static and Dynamic Estimation of TOT

| Definition of Participation or Crossover in Period t | Estimation Method | |
|---|--|---|
| | Period-by-Period Bloom (static) Adjustment | Orr (dynamic) Adjustment |
| 1.) Ever leased up (since RA) with a housing voucher | (1) | (5) (Method used in Mills et al., 2006) |
| 2.) Uses a housing voucher in period t (takes account of voucher relinquishment) | (2) | (6) Calculates periods leased up as periods leased up since RA (7) Calculates periods leased up as periods leased up in current spell |
| 3.) Ever received (since RA) a housing subsidy, including housing voucher, public housing, or project-based Section 8 | (3) | (8) |
| 4.) Receives housing subsidy (HCV, public housing, project-based Section 8) in period t (takes account of voucher relinquishment) | (4) | (9) Calculates periods of subsidy receipt as periods of receipt since RA (10) Calculates periods of subsidy receipt as periods of receipt in current spell |

HCV = housing choice voucher. RA = random assignment. TOT = treatment on treated.

For example, if there were two periods, and subjects could be first exposed to treatment in either the first or the second period, under the Orr method,

$$ITT_1 = (p_{1,1} - c_{1,1})TOT_1,$$

$$ITT_2 = (p_{2,1} - c_{2,1})TOT_1 + (p_{2,2} - c_{2,2})TOT_2,$$

where $(p_{k,j} - c_{k,j})$ is the difference in the fraction of treatment and control groups who in period k of the experiment have been participating for j periods, and TOT_j is the treatment on treated effect for those who have been participating for exactly j periods. From standard linear algebra, it follows that the TOT vector is the product of the ITT vector and the inverse of the $(p_{k,j} - c_{k,j})$ matrix.⁸

An additional wrinkle here is that the adjustment requires information in each period on how many periods each family has been leased up (or received a subsidy). If cumulative effects of housing assistance since random assignment (RA) do not dissipate because of breaks in receipt, then counting the periods of receipt is appropriate. On the other hand, if cumulative effects of housing assistance since RA do dissipate because of breaks in receipt, then the salient length of receipt is the length of receipt in the current spell of housing assistance receipt.

⁸ The static Bloom adjustment can produce a sign reversal from ITT to TOT only if $(p - c)$ is negative (that is, controls get treatment more frequently than experimentals, which should not occur in well-controlled experiments). The Orr method, however, can produce a sign reversal simply because the TOT vector is the solution to a system of simultaneous equations (that is, a linear combination of the whole ITT vector). Further, the Bloom TOT estimate will always have the same t -statistic as the ITT estimate, because the standard error of the Bloom TOT is just the standard error of the ITT multiplied by the same scalar that transformed the ITT into the TOT. The Orr TOT in general will not have the same t -statistic as the corresponding ITT, however, because the standard error of the Orr TOT is a linear combination of the standard errors of the entire ITT vector.

The following varieties of TOT estimation are summarized in exhibit 2.

Bloom Estimates

(1) and (3):

Assumption in Method

The effect of having received a housing subsidy is not cumulative but may change over time since RA.

Assumption in Participation Definition

The effect occurs at initial lease up or receipt and impacts all outcomes thereafter.

(2) and (4):

Assumption in Method

The effect of having received a subsidy is not cumulative but may change over time since RA.

Assumption in Participation Definition

The effect occurs at lease up or receipt but disappears with relinquishment of the subsidy.

Orr Estimates

(5) and (8):

Assumption in Method

The effect of having received a subsidy is cumulative, and the time path of effects for treatment group participants and control group crossovers who initially receive the treatment in period 2 or after is *identical to* the time path of effects for non-crossover-like participants who initially receive the treatment in period 1.

Assumption in Participation Definition

The effect occurs at initial lease up or receipt and impacts all outcomes thereafter.

(6) and (9):

Assumption in Method

The effect of having received a subsidy is cumulative, and the effect for treatment group participants and control group crossovers who initially receive the subsidy in period 2 or after and who have held a subsidy for j periods is *identical to* the effect for non-crossover-like participants who initially receive the treatment in period 1, never relinquish the subsidy, and have held the subsidy for j periods.

Assumption in Participation Definition

The effect occurs at initial lease up or receipt but disappears during any subsequent periods of nonreceipt.

(7) and (10):

Assumption in Method

The effect of having received a subsidy is cumulative, and the effect for treatment group participants and control group crossovers whose current subsidy spell started in period 2 or after and whose current spell is j periods is *identical* to the effect for non-crossover-like participants who initially receive the treatment in period 1, never relinquish the subsidy, and have held the subsidy for j periods.

Assumption in Participation Definition

The effect occurs at initial lease up or receipt but disappears during any subsequent periods of nonreceipt.

Results and Discussion

Exhibit 3 presents the results of our calculations, and the final column summarizes the results.⁹ Our view of the results is that they show that the method of calculation simply does not matter very much. The maximum range of estimates for any particular half-year is in the second half-year, where the high and the low TOT estimates are, respectively, -\$40 and -\$61 per month but are not statistically different from zero. The policy implication would be precisely the same, using either the highest or the lowest estimate of the range.

During 3-year period, the 10 differences in estimation method yield cumulative TOT of between -\$458 and -\$770 (that is, between -\$13 and -\$21 per month). A policymaker would react to the highest number in substantially the same manner as to the lowest.

Why should the significant differences in TOT estimation methods result in such insignificant differences in their end products? We think the answer is in the source of the data: a large, well-controlled experiment. The size of the sample (7,622 or 8,664, depending on whether one excludes Los Angeles) greatly reduces the standard error of the ITT, and the variance-covariance matrix of the TOT in all versions is a linear transformation of the variance-covariance matrix of the ITT.¹⁰ We say the experiment was well controlled because, at all times, a substantial difference existed in participation in treatment, however defined, between experimentals and controls.

Exhibit 4 illustrates the latter point. It presents the half-year scalars constituting the four different Bloom adjustments. A substantial, relatively consistent gap always exists in the rate of participation between treatment and control groups. As a consequence, the different methods of estimation all produce reasonably similar results.

⁹ Column (5) of exhibit 3 uses the same TOT estimation method as Mills et al. (2006). A quick comparison of the point estimates in exhibit 1 with column (5) reveals a discrepancy between what is ostensibly the same set of results. This discrepancy comes from two sources: (1) the HUD administrative data used in this article were abstracted at a later time than the data used in Mills et al. (2006) and may contain corrections of records and (2) data cleaning decisions, which are consistent across the sets of subsidy receipt dummies in this article, may differ from those in Mills et al. (2006).

¹⁰ See Mills et al. (2006: B-9).

Exhibit 3

TOT Estimates for All Sites

| | Control Mean ^a (\$) | ITT Impact (\$) | Period-by-Period Bloom (static) | | | | | | | | | | Range of 10 TOTs | | | | | | | | | | |
|-----------------------|--------------------------------|-----------------|---------------------------------|----------------|--------------|----------------|----------|------------|--------------|----------------|----------|------------|------------------|--------------|----------------|----------|------------|--------------|----------------|----------|------------|--------------|----------------|
| | | | (1) | | (2) | | (3) | | (4) | | (5) | | | (6) | | (7) | | (8) | | (9) | | (10) | |
| | | | Voucher Ever | Voucher Period | Subsidy Ever | Subsidy Period | HCV Ever | HCV Period | Subsidy Ever | Subsidy Period | HCV Ever | HCV Period | | Subsidy Ever | Subsidy Period | HCV Ever | HCV Period | Subsidy Ever | Subsidy Period | HCV Ever | HCV Period | Subsidy Ever | Subsidy Period |
| Half-year 1 | 2,651 | -124** | -429** | -429** | -510** | -510** | -510** | -510** | -429** | -429** | -429** | -429** | -429** | -429** | -510** | -510** | -510** | -510** | -510** | -510** | -510** | -429 to -510 | |
| | 3,434 | (59) | (205) | (205) | (243) | (243) | (243) | (243) | (205) | (205) | (205) | (205) | (205) | (205) | (243) | (243) | (243) | (243) | (243) | (243) | (243) | -242 to -368 | |
| Half-year 2 | 2,837 | -100 | -279 | -281 | -368 | -364 | -364 | -364 | -242 | -242 | -242 | -242 | -242 | -242 | -350 | -348 | -348 | -348 | -348 | -348 | -348 | -181 to -270 | |
| | 3,705 | (67) | (187) | (188) | (246) | (243) | (243) | (243) | (202) | (202) | (202) | (202) | (202) | (202) | (257) | (256) | (256) | (256) | (256) | (256) | (256) | -242 to -368 | |
| Half-year 3 | 2,889 | -76 | -204 | -209 | -270 | -269 | -269 | -269 | -184 | -184 | -184 | -184 | -184 | -184 | -251 | -253 | -253 | -253 | -253 | -253 | -253 | -181 to -270 | |
| | 3,868 | (73) | (195) | (200) | (258) | (257) | (257) | (257) | (215) | (215) | (215) | (215) | (215) | (215) | (273) | (272) | (272) | (272) | (272) | (272) | (272) | -181 to -270 | |
| Half-year 4 | 3,007 | 16 | 45 | 49 | 60 | 62 | 62 | 62 | 95 | 95 | 95 | 95 | 95 | 95 | 87 | 99 | 99 | 99 | 99 | 99 | 99 | +45 to +121 | |
| | 4,091 | (80) | (223) | (243) | (297) | (307) | (307) | (307) | (241) | (241) | (241) | (241) | (241) | (241) | (307) | (311) | (311) | (311) | (311) | (311) | (311) | +45 to +121 | |
| Half-year 5 | 3,029 | 30 | 90 | 105 | 121 | 135 | 135 | 135 | 37 | 37 | 37 | 37 | 37 | 37 | 59 | 71 | 71 | 71 | 71 | 71 | 71 | +37 to +135 | |
| | 4,225 | (83) | (249) | (292) | (334) | (372) | (372) | (372) | (251) | (251) | (251) | (251) | (251) | (251) | (322) | (332) | (332) | (332) | (332) | (332) | (332) | +37 to +135 | |
| Half-year 6 | 3,046 | 72 | 240 | 307 | 319 | 393 | 393 | 393 | 156 | 156 | 156 | 156 | 156 | 156 | 196 | 233 | 233 | 233 | 233 | 233 | 233 | +156 to +393 | |
| | 4,268 | (86) | (287) | (366) | (380) | (468) | (468) | (468) | (267) | (267) | (267) | (267) | (267) | (267) | (343) | (364) | (364) | (364) | (364) | (364) | (364) | +156 to +393 | |
| Total, all half-years | 17,458 | -182 | -538 | -458 | -649 | -553 | -553 | -553 | -567 | -567 | -567 | -567 | -567 | -567 | -770 | -707 | -707 | -707 | -707 | -707 | -707 | -458 to -770 | |
| | 20,359 | (365) | | | | | | | (1,085) | (1,085) | (1,085) | (1,085) | (1,085) | (1,085) | | | | | | | | -458 to -770 | |

HCV = housing choice voucher. ITT = intention to treat. RA = random assignment. TOT = treatment on treated.

N = 8,664. ** p < .05.

^a The standard deviation of the control group mean for each half-year appears below it in this column.

Exhibit 4

$(\rho - c)$ for Four Bloom Adjustments

| Half-Year | 1 Voucher Ever | 2 Voucher Current | 3 Subsidy Ever | 4 Subsidy Current | Range of Adjustments |
|-----------|----------------------|-------------------------|----------------------|-------------------------|-------------------------|
| 1 | 0.288 | 0.288 | 0.242 | 0.242 | .242–.288 |
| 2 | 0.359 | 0.358 | 0.273 | 0.276 | .273–.359 |
| 3 | 0.373 | 0.364 | 0.282 | 0.284 | .282–.373 |
| 4 | 0.361 | 0.330 | 0.270 | 0.261 | .261–.361 |
| 5 | 0.333 | 0.284 | 0.248 | 0.222 | .222–.333 |
| 6 | 0.300 | 0.235 | 0.226 | 0.183 | .183–.300 |

The $(p_{k,j} - c_{k,j})$ matrix in the Orr adjustments is not reproduced to save space. All entries to the northeast of the diagonal are zeros, the entries representing the first two periods after RA are large positive proper fractions, and many of the remaining entries are small negative proper fractions, because the controls begin to gain access to subsidy at a faster rate than the experimentals. These small negative values result in small effective weights on the corresponding values of the ITT covariance matrix. This result merely confirms the good judgment of the researchers (and HUD) in the selection of sites and the oversight of the demonstration: control group members at these sites had relatively poor access to housing subsidy throughout the period of the demonstration, and data collection did not extend beyond the period where catchup began to threaten the value of the evidence.

Thus, in this experiment we find that TOT estimates are relatively insensitive to a wide range of differences in assumptions. We believe that this conclusion ought to be generally applicable to most large, well-controlled experiments. As long as the control group will not be exposed to the treatment or to a close substitute for the treatment, reasonable alternative estimates of TOT should not exhibit substantively significant deviations in a large sample.

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Affordable Design

The U.S. Department of Housing and Urban Development sponsors or cosponsors three annual competitions for innovation in affordable design. This Cityscape department reports on the competitions and their winners. Each competition seeks to identify and develop new, forward-looking planning and design solutions for expanding or preserving affordable housing. Professional jurors determine the outcome of these competitions.

2016 Innovation in Affordable Housing Student Design and Planning Competition: Monteria Village, Santa Barbara, California

Regina Gray, compiler

Social science analyst, Affordable Housing Research and Technology Division, U.S. Department of Housing and Urban Development

Winning Team: University of Texas at Austin

Brett Clark, Brianna Garner-Frey, Tatum Lau, Megan Recher, and Sarah Simpson

Runner-Up Team: University of Maryland, College Park

Nicole Akpedeye, David Brothman, Robert Grooms, Meghan Leahy, and Oluwatobi Thomas

The Jury

Eliza Edelsberg Datta, James Bowman, Anne Torney, Thomas Vaccaro, and Michael Ruane

Concluding Remarks: What Constitutes Innovative Design?

Bill Zoeller, registered architect, Steven Winter Associates

Introduction

Regina Gray

The Innovation in Affordable Housing (IAH) Student Design and Planning Competition, now entering its fourth year of competition, invites teams of graduate students from multiple disciplines

to submit plans in response to an affordable housing design issue of an existing home or residential building. The goals of the competition are to encourage research and innovation in high-quality affordable housing that strengthens the social and physical fabric of low- and moderate-income communities and to foster crosscutting teamwork within the design and community development process. This article includes notes about the challenges, solutions, and lessons learned by the first- and second-place student teams in 2016; the thoughts of the jury regarding how to recognize innovation in housing design; and the thoughts of an architect who helped the U.S. Department of Housing and Urban Development (HUD) structure the competition on the definition of innovation in affordable design and its importance.

The IAH Student Design and Planning Competition is open to graduate students in architecture, planning and policy, finance, and other disciplines. The competition challenges the students to address social, economic, and environmental issues in responding to a specific housing problem developed by a public housing agency.

HUD partnered with the Housing Authority of the City of Santa Barbara (HACSB) to develop the 2016 challenge—to incorporate innovative design techniques to improve the quality of family housing at a site called Monteria Village. HACSB was interested in proposals for either gut rehabilitation (deep energy retrofit plus new amenities) of the existing buildings or new construction. The secondary interest of HACSB was to incorporate the provision of social amenities for the residents into the solution.

Monteria Village is a 56-unit multifamily housing development built in 1973. The students' task for the 2016 competition was to develop a site plan to improve and expand realistic, high-quality housing options for families living in the development. The students also had to account for the social and environmental needs of the residents, local zoning restrictions, and leveraging opportunities. To foster multidisciplinary efforts, teams were required to submit proposals that embodied innovative approaches in five general elements of design: (1) planning context and analysis, (2) building solutions and technology, (3) community development solutions, (4) site-specific illustrations of new development or redevelopment, and (5) schedule and finances.

The competition is designed in two phases. During phase I, a jury of five practitioners, planners, and architects evaluated first-round proposals, which teams from approximately 30 universities submitted electronically. From these submissions, the jury selected four finalist teams. During phase II, finalists further refined their plans—addressing complex issues, incorporating more detail, improving floor plans, and conducting additional analyses following the site visit to Monteria Village. The site visit enabled the finalists to expand on their original proposal and submit a revised final project. Several weeks after the site visit, all jurors and finalists traveled to Washington, D.C., for the final competition and awards ceremony event at HUD Headquarters on April 19, 2016. At this event, finalist teams presented their revised project solutions in front of the jury and an audience. Following the presentations, the jury selected the team from the University of Texas at Austin as the winner and the team from the University of Maryland, College Park, as the runner-up.

In the remainder of this article, the winning student teams, the jurors, and an architect share their thoughts about the competition. The students reflect on the biggest challenges the team faced and how they attempted to address them, opportunities to learn from mistakes, ideas of what *innovation* is, elements observed that provided value to the design of the project, and any tradeoffs that had to

be made to get a feasible site plan. Jurors share the elements of the winning site plans that represented innovative solutions and address whether the proposed solutions could be implemented at Monteria Village and possibly replicated at similarly situated sites. Finally, an architect from Steven Winter Associates offers lessons on what constitutes innovative design.

The Winning Team: University of Texas at Austin

Brett Clark, Brianna Garner-Frey, Tatum Lau, Megan Recher, and Sarah Simpson

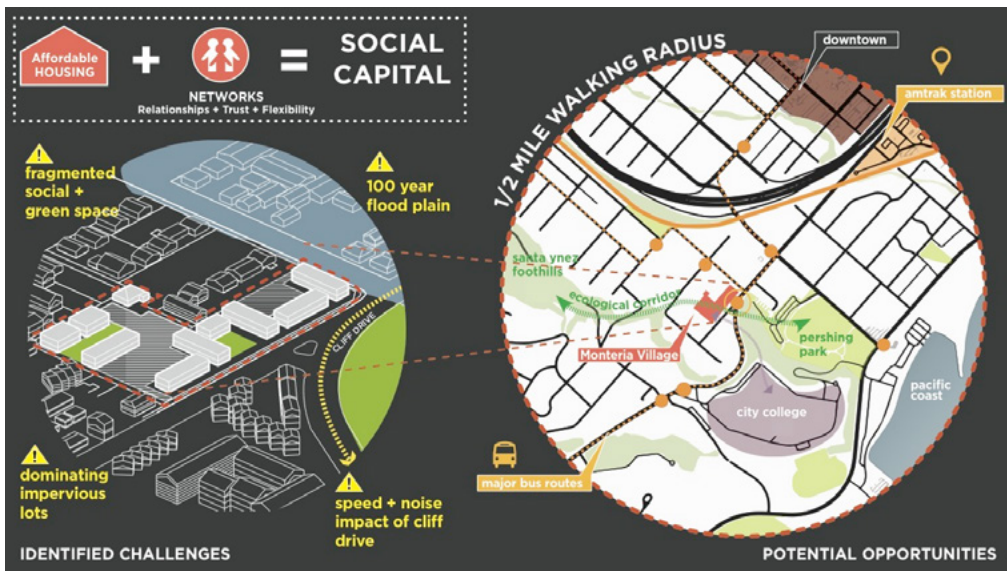
The award-winning site plan from the University of Texas at Austin, called *Meet Monteria*, is a plan for new construction totaling \$17 million. It features an updated functional space for the existing Family Opportunity Center and includes an education center that will be developed in partnership with Santa Barbara City College, a nearby community college. The new design emphasizes social interaction, expanded open space for a playground and recreation, and a common area where residents can gather. Also noteworthy is the integrated purification system that reuses gray water and stormwater runoff.

The student team's reflections on the competition experience follow.

What does innovation in affordable housing look like? Our team pondered this question throughout our participation in the IAH competition, ultimately coming to understand that innovation is less about invention and more about integrating existing aspects of living with design in thoughtful ways to improve on current conditions. So, we started with our country's roots in affordable housing and, after reviewing the trajectory of public housing in the United States, we found a general absence or undervaluation of social capital within affordable housing communities and also the lack of integration into the larger community. Thus, the building of social capital became central to our understanding of innovation along with the integration of timely, localized opportunities available in Santa Barbara, such as those tied to learning and low-impact design.

Within Santa Barbara, our team found a multitude of social and spatial issues to tap into to contribute to an innovative solution, and, ultimately, our biggest challenge was prioritizing which aspects to resolve to the highest detail in a short amount of time. Developing three core values of (1) 21st-century family, (2) lifelong education, and (3) holistic sustainability to ensure that every aspect of design worked toward achieving our goals and helped us overcome this hurdle and pushed us to think broadly in our search for integrative design solutions. For instance, to address the changing nature of the American family, we emphasized flexible unit design for all the housing units in the development, which would accommodate extended family members—a challenge that Monteria Village faces.

These same core values also helped direct each of our team members to different research directions, opening up opportunities to gather information and pull from different areas of planning, design, and finance. Our team members represented five different fields of expertise—planning, sustainability, architecture, urban design, and business—so we already brought an extensive set of skills to the table, but we were able to branch out even further under a guiding social concept. Our varied backgrounds contributed to team learning about many different aspects of sustainability in a relatively short amount of time, including opportunities to enhance access to local transportation; to increase human interaction and social capital, using existing community assets, such as the public garden; and to educate the community about how to reduce energy and utility consumption in buildings.

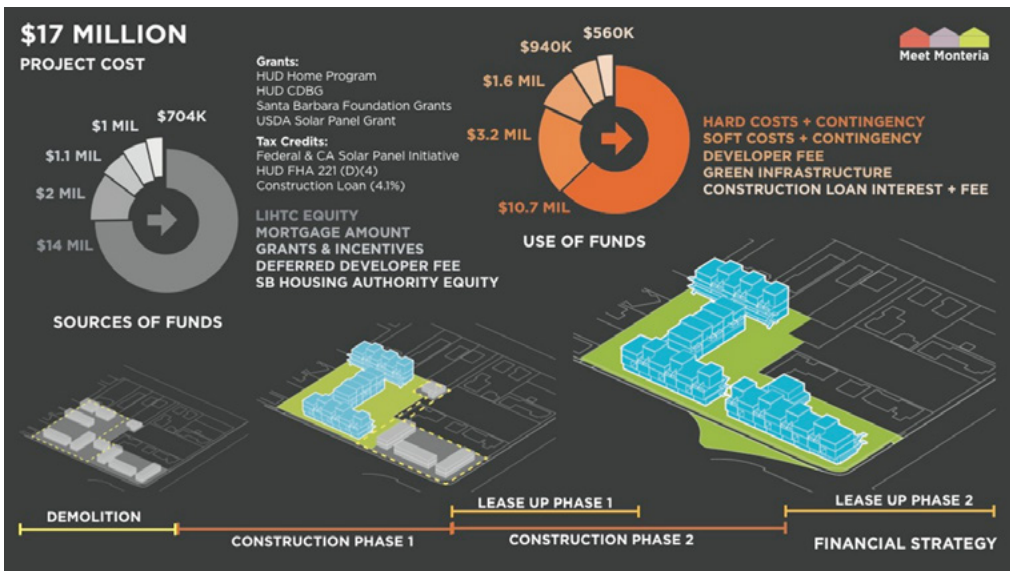


At the same time, in thinking holistically at the broad conceptual level, our team had to make various tradeoffs, the most notable of which was sacrificing a certain level of detail to ensure the big ideas were incorporated into every aspect of the design. We were constantly negotiating the level of detail necessary to bring resolution to our ideas and asking what pieces of information deserved space in our submission limits. We ultimately decided that, to preserve income and minimize displacement of the residents, the project should be developed into phases. We also tried variations in site configuration to accommodate the 65 total affordable housing units while also preserving open space for recreation and resident interaction.

Parallel to our design strategy was the development of financial innovation. The competition asked teams to simulate the Rental Assistance Demonstration (RAD) program¹ and to also simulate other funding sources that would strengthen our proposal. Coming to understand the potential impact of the availability of the low-income housing tax credit (LIHTC) and RAD funding on the housing crisis by providing more secure funding to affordable housing associations was interesting for our team, so we also proposed the use of \$4.2 million in tax credits to fund 80 percent of the total project costs. Over the course of the competition, however, we learned that 9-percent LIHTC funding is very competitive to achieve and realized too late that other funding strategies also should have been investigated should we be unable to secure the 9-percent LIHTC.

Nevertheless, the use of sustainable technologies, such as onsite solar energy production and storm and domestic water reuse to decrease typical lifetime operating costs, was the most exciting potential funding strategy our team realized. With our proposed rooftop solar and water cycling design, we estimated that daily operating costs could be more than cut in half, having a major impact on both the residents and HACSB's lifelong utility burden.

¹ HACSB currently owns and operates the property, which will be converted to a RAD property.



The Runner-Up Team: University of Maryland, College Park

Nicole Akpedeye, David Brothman, Robert Grooms, Meghan Leahy, and Oluwatobi Thomas

The runner-up team from the University of Maryland, College Park, also presented a plan for new construction on the site. The plan emphasizes energy-efficient, durable materials that would be incorporated into site buildings. To reduce operating and maintenance costs, the team proposed a passive cooling system that features the use of clerestory roof and windows that remove heat

during summer, reducing the need for air conditioning in Santa Barbara's hot climate. The jury seemed most impressed with the green roofs that would be integrated in all eight Monteria Village residential buildings. Each townhome unit includes a palate wall for plants and herbs. A two-pronged approach to financing the project using either 9- or 4-percent LIHTC funds, combined with other grant funding, allowed the students more flexibility in addressing the site's specific challenge of expanding affordable housing options for families living on site.

The Maryland student team's reflections on the competition experiences follow.

One of the biggest challenges we initially faced was our lack of familiarity with the Santa Barbara site and our clients—the residents. Designing for a group of people without knowing their exact needs left us with the challenge of forming our strategy based purely on Internet research. Some of the ways in which we design for housing on the east coast simply do not apply to a project in Santa Barbara. For example, geothermal heating systems—and heating, ventilation, and air-conditioning systems in general—were unnecessary for this assignment. This unfamiliarity with the region prompted us to think outside the box, however, ultimately leading to our incorporation of an aquaponics system and individual growing screens for each resident's unit. We designed new retail space for the co-op and café that would attract residents of all ages and the larger public. We included a bike-share and carpool program that would allow for less reliance on automobiles and reduce neighborhood traffic, further enhancing the safety of the residents. We also incorporated defensive space principles into the site design.



Our team settled on some tradeoffs in response to challenges encountered during the development of project plans. For example, we faced the question of how to address the incorporation of a sustainable lifestyle while having to meet such a high parking demand. The question boiled down to this: *Do we maximize the number of units and decrease parking, or do we accommodate a larger parking ratio by building fewer units?* To compromise, we increased the parking ratio to a level higher than our initial submission but also added sustainable alternatives to driving, such as a bike-share depot on the ground floor of our multifamily building. Cars and our reliance on them are a reality that cannot be ignored, and yet we all wanted to push the housing trend toward using alternative modes of transportation. This back-and-forth between choices led to countless passionate discussions within our team.

The financial modeling required for this competition was a complicated but rewarding learning experience. We leveraged the fact that four out of our five team members were students in the Real Estate Development program; thus, many of us had been introduced to the process of creating pro formas. We still had much to learn, however, about financing an affordable housing deal. With help from our faculty advisor and many sleepless nights researching the nuances of tax credit financing, we ended up with a feasible plan to finance the project using a combination of tax credits and other sources of funding, including grants and bond options from local and state governments. An alternative approach would be to pursue debt financing at 56 percent of the cost and secure a Federal Housing Administration 221(d) construction loan if the tax credit financing proved unfeasible.



Thoughts From the Jury

Eliza Edelsberg Datta, James Bowman, Anne Torney, Thomas Vaccaro, and Michael Ruane

The jury for the 2016 IAH Student Design and Planning Competition faced the difficult task of deciding which of the four outstanding student site plans best exemplified an innovative design. The members were asked specifically to consider how well the student teams successfully and convincingly addressed the following critical elements:

- The aspects of the site design that are innovative but that meet the needs of low-income families.
- The way in which the proposed design interacts with the existing physical site.
- The innovative approaches that were employed in developing the design relative to the restrictions or opportunities presented by the site.
- The innovative energy efficiency, water conservation, and renewable energy strategies that were incorporated into the design.
- The innovative approaches that were employed to integrate the design that complements the existing cultural and ethnic neighborhood context.
- The planned services and activities designed to improve the quality of life for the population served.²
- The way in which the project will be financed, including the innovative financing solutions for leveraging and establishing partnerships.
- The way in which the proposed design integrates innovative practices.

After eliminating two of the four presentations, the jurors emphasized that the deciding factor would be how well the student teams identified and discussed innovation in their site plans. Although understanding neighborhood context and the needs of the residents is important, the concept of innovation would be greatly emphasized here. After narrowing the competition down to the University of Texas team and the University of Maryland team, the jury set about identifying elements of the site plans they thought were particularly innovative while keeping an eye on the critical elements listed previously.

Defining innovative design was not an easy task, but the discussions offered some insight into what they thought captured the essence of what innovation is: Is the design element new or groundbreaking? Is the approach to problemsolving something that is untried or unexpected? Is the design concept “out of the box,” defying or challenging generally accepted techniques? Does the approach introduce a new and creative technology that is functional and applicable to human needs?

² For example, the Monteria Village site currently includes a separate one-story building, which houses the Family Opportunity Center (FOC) where various activities for youth and adults are held. As part of the overall program, HACSB desires that the present onsite FOC be expanded or replaced to meet an additional set of activity requirements. This change to the FOC ideally would include a two-story building with the lower-level space for youth programs and childcare for parents attending workshops and the upper-level space for young adult and adult programs. HACSB also requested two small 2nd-floor offices; a full kitchen; toilet rooms; storage for equipment, tables, and chairs; an outdoor youth garden with a contiguous outdoor play area; and two staff parking spaces.

The University of Maryland team's submission highlighted the use of aquaponics as the example of an innovative design and as a solution for preserving water resources in the community. Other standout innovative features that members of the jury noted were the incorporation of retail as a community attraction and the greening of the existing buildings to promote an environmentally friendly ethos. The jurors similarly identified various aspects of the University of Texas team plan that were particularly impressive: incorporating a traffic island; creatively using public space by reducing parking and increasing density; combining units, where feasible, to acknowledge extended family settings; and making effective use of existing buildings and infrastructure, such as the FOC. The jurors noted that the University of Texas team placed a high value on the importance of enhancing social capital through creative use of space that respects the cultural norms of a community. This approach was the deciding factor in selecting the University of Texas team as the winner of the competition.

Concluding Remarks: What Constitutes Innovative Design?

Bill Zoeller

To discuss the application of a theoretical concept—in this case, innovative design—we must first define the meaning of “innovation.”

Innovation has three basic definitions: (1) a new idea, device, or method; (2) the act or process of introducing new ideas, devices, or methods; and the process of translating an idea or invention into a good or service that increases value. Innovation must be mission oriented, with an objective of improvement. In other words, innovation is an idea with a job to do.

It is interesting that the root term *novation* was a 13th century legal term meaning to renew a contract—essentially, to do the same thing over again. *Innovation* is the opposite—that is, to do something new or different.

The two types of innovation are *disruptive* and *incremental*.

Disruptive, or radical, innovation figuratively upsets the apple cart and is market shattering. A prime example of this type of innovation is the advent of digital photography. Invented by a young engineer at Eastman Kodak in 1975, the technology went through a series of research and development (R&D) improvements for more than a decade, but it was never allowed to come to market for fear of undermining Kodak's dominant camera film business. Other companies eventually caught up in the digital revolution, but, for Kodak, the business focus turn came too late, forcing the once dominant company to file for bankruptcy in 2012.

Disruptive innovation is often marked by the inferiority of its initial prototypes compared with the product that it would supplant. For example, the first digital camera was black and white, low resolution, not cost effective, and not nearly as good as a roll of Kodachrome in a Nikon single-lens reflex or Kodak Instamatic camera.

Incremental innovations, on the other hand, move from an established point in technology development to a place a notch above. Incremental innovations typically occur in small steps and

may be the result of an R&D effort to improve something, or an incremental innovation may be an aha! moment in which the idea presents itself to the observer who then connects the insight to the existing condition, resulting in the improvement.

Innovative building design is nearly always incremental. We start with a known condition (a site, a design program, zoning and code restrictions, a budget) and set out to produce a design solution that meets all the project's objectives while improving on one or more aspects of the built solution's performance. We cannot accept the initial lower-performance outcomes typified by disruptive innovation. The client, specifically, and society, in general, have expectations of building design professionals, which we are obligated to meet and exceed. We exceed those expectations through incremental innovation: taking a known and applying an idea that has the objective of improvement. As such, innovative design is not an end point, solution, or product. It is a process that happens when problemsolving analysis is applied to every element of the planner's problem.

The starting point for innovative design is deconstructing the design program and the owner's objectives for the project. What is it exactly we are attempting to accomplish? What are the performance attributes we wish to improve? Starting with the broad concepts, we must question preconceived notions and standard practices. How can we improve durability, reduce energy consumption, improve resource utilization, improve indoor environmental quality, reduce environmental impact, increase community integration, increase density, improve residents' quality of life, all while reducing first cost? By analyzing and deconstructing the problem statement and by asking the insightful questions, we place ourselves in a position to uncover, develop, and deploy innovative solutions. It is this journey that constitutes innovative design.

Acknowledgments

The U.S. Department of Housing and Urban Development (HUD) thanks the award-winning student teams from the University of Texas at Austin and the University of Maryland, College Park, for sharing their thoughts and for all the hard work they put into their submissions for this year's competition. HUD also greatly appreciates the 2016 Innovative Affordable Housing jury members' dedication and hours devoted to the awards selection process. HUD also thanks Steven Winter Associates for its planning and logistics efforts, the work that made this year's competition a success, and the notes and writings that made a valuable contribution to this piece.

Postscript

The competition is thoroughly documented on the web.

To learn more about the award: huduser.gov/portal/challenge/about.html.

To read about the 2016 award guidelines: huduser.gov/portal/challenge/past_competitions.html#2016.

To learn more detail about the winning submissions: huduser.gov/portal/challenge/home.html.

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