

Trends in Regulation and Affordability in Select U.S. Metropolitan Areas and Communities

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Abstract

We connect land-use restriction changes in the last decade and a half to the contemporaneous evolution in housing supply and affordability for a diverse set of metropolitan markets across the United States through brief case studies. We further drill-down to the community level to examine patterns within metropolitan areas. Our study indicates that we need to think small, at least for the size of the market area, which is the right unit of analysis. While comparing metropolitan areas across the country can be informative, within-metropolitan area analysis, which holds constant commuting patterns, employment bases, amenities, and other important drivers of housing values, may be more illuminating when examining the impact of different regulatory approaches and changes. Data below the metropolitan level is harder to obtain and may not have the same number of transactions as at higher levels of geography. However, the results are much more likely to be applicable for informing local policymakers regarding the impacts of their potential regulatory actions on housing affordability.

Introduction

There is an intuitive hypothesis that increased regulation leads to decreased affordability. This hypothesis has spurred numerous debates, as well as efforts to reign in restrictions on development in order to boost housing supply and lower cost burdens (Greene and Ellen, 2020). The well-

publicized lack of affordable housing in many locations across the United States has recently prompted heightened attention to these questions.¹

While intuitive, it is not easy to establish a causal relationship between regulation levels and affordability.

One fundamental challenge is that even when looking at affordability and regulatory constraints separately, neither is easy to quantify. Haurin (2016) expresses that the measurement of housing affordability is far from straightforward since affordability measures often attempt to summarize many disparate economic issues into one number. He emphasizes that the focus on a single number (for example, the median) is less desirable than looking across the whole distribution of income and housing costs. Similarly, there have been few sturdy measures by which analysts can assess and track the level of constraint caused by local or other land-use regimes. It is also important to note that while most regulations impose costs on developers and builders, they may also benefit consumers, representing a challenge in measuring the net effect of the many housing-related regulations (pre-, during, and post-development) on social welfare. (Gyourko and Molloy, 2015). As a result, estimating any effect of increased regulation on affordability has remained an empirical challenge due to, among other factors, a lack of “convincing instruments or some form of experimental variation” (Glaeser and Gyourko, 2018).

To better understand these challenges, first, we explore the literature on measuring affordability, on measuring land-use restrictions, and on how the two may interact. We then discuss the measures we find most informative in assessing each of those. Next, we present a series of metropolitan case studies to show how restrictions and affordability interact at a broad geographical level. We conclude with a cross-metropolitan analysis and discussion of the key take-aways.

Land-use regulation is not a new phenomenon, and as Glaeser (2020) and Ganong and Shoag (2017) chronicle, such regulations have been around for at least 50 years. Glaeser’s *Cityscape* article provides a historical narrative on the closing of the American urban frontier that is “associated with unaffordable housing, widening gaps in housing wealth, a spatial mismatch between local productivity, population growth, and the end of regional income convergence.” He reports that migration and movement were possible until the 1960s because “communities made it easy to build. Land-use regulations were modest, and infrastructure could be easily added.”

Ganong and Shoag (2017) seek to measure longer term housing supply regulations by examining state appeals court records. They find that the growth of these regulations was particularly rapid from 1970 to 1990 when they reached about 75 percent of their 2015 level. In this study, we focus on changes in the last decade-and-a-half and look for patterns of similarity and change at the community and metropolitan level. This period—leading up to the Great Financial Crisis and the

¹ The National Low Income Housing Coalition produces an annual and influential report, “The Gap: A Shortage of Affordable Rental Homes,” (2020) that highlights the national shortage of affordable rental homes (<https://reports.nlihc.org/gap>). In addition, many compelling narratives delve deeply into specific locational cases. For example, Conor Dougherty’s recent 2020 book, *Golden Gates: Fighting for Housing in America*, provides a gripping look at different aspects of the Bay Area housing crisis. Case studies highlight the variation in situation across geography, and this is further borne out in a 2020 study from Freddie Mac (Khater, Kiefer and Yanamandra, (2020)) that examines the state-level housing shortages while considering additional factors such as interstate migration flows.

steady recovery and house price appreciation since—is conceivably an auspicious period to look at these changes. Yet, our starting point is one where many constraints were already in place, and despite being a noteworthy decade-and-a-half in real estate, our study is at the intensive margin.

As Glaeser (2020) notes in the previous quote, excessive regulation may lead to an economic loss due to households' inability to move to more productive locations because of a lack of affordable housing. This is also highlighted in a recent U.S. Congressional Budget Office (CBO) report on the slowdown of productivity growth (Shackleton, 2020): "Restrictive land-use regulations increasingly raise housing costs and discourage workers from migrating to denser urban areas, where most growth in productivity occurs." While such macroeconomic effects are beyond the scope of this article, we point to a forthcoming Research Institute for Housing America (RIHA)-sponsored report by Asquith (2021) that will add to the understanding of such productivity effects by estimating how housing market frictions affect migration to locations with higher wages.

In this article, we use the Wharton Residential Land-Use Regulatory Index (WRLURI) survey data from 2006 and 2018 to gauge the restrictiveness of land-use regulations. We also utilize two measures of affordability that build on more traditional approaches and allow us to look at affordability from the perspective of a potential homebuyer (covering both accessibility, i.e., what it takes to gain access to homeownership; and sustainability, i.e., what it takes to be able to stay in the home). Importantly, both affordability measures allow evaluation of affordability across the income distribution.

Armed with these, we present brief case studies from nine large and varied metropolitan areas across the country to provide a view into how affordability and land-use restrictions—and the measures of them—have evolved in recent years. Further, as part of these case studies, we narrow our focus to the community level. As Woodwell (2015) points out, location matters, and it is key to examining how changes in land-use constraints are associated with residential housing supply changes at a granular level. Fortunately, the WRLURI data are collected at the community level and afford us this capacity.

We conclude with a cross-metropolitan discussion of the interactions of land-use restriction and affordability. We observe that on a cross-sectional basis at two points in time, we can say that metropolitan areas with higher levels of regulation have less affordable housing. We also note, however, that this may not be the right question to ask. The relevant question for a given metropolitan area is, we believe, how will changes in land-use regulation at the margin impact housing affordability? Here we note that, while there are many efforts to think big about addressing the lack of affordability, the data indicate that the analysis needs to think small, at least concerning the size of the market area that is the appropriate unit of analysis. While comparing metropolitan areas across the country can be indicative, within metropolitan area analysis—which holds constant commuting patterns, employment bases, amenities, and other important drivers of housing values—may be more illuminating.

Literature Review

The topic under consideration here ties together two subjects that have been targets of intense research. As a result, there are numerous high-quality studies on regulation and land-use restrictions, on affordability measurement, and on the links between them. While this research provides a solid foundation upon which to build, it also demonstrates many of the challenges of comprehensively measuring affordability or land-use restriction, and the challenges connecting the two.

Regulations and Land-Use Restrictions

There are many types of regulations imposed by different levels of government. For example, Downs (1991) lists land-use restrictions, building codes, environmental protection standards, and process requirements that add delay and costs to housing production.

To understand these costs in detail, Emrath (2016) surveyed single-family homebuilders to estimate—at all stages of development and construction—the share of regulatory costs in the price of a home. The report lists a comprehensive set of regulatory line-items and their dollar and time costs. He finds that while the dollar cost of regulations to build a single-family home increased from 2011 to 2016, the proportion of the home value attributed to regulation was constant. Emrath and Walter (2018) conduct a similar exercise for multifamily construction and find that regulation exceeds 30 percent of a typical multifamily project development costs. It is of note that these reports focus on regulatory costs, but as Emrath notes, “Governments presumably impose regulations under the belief that they will generate some benefits.” In this article, we focus on the cost side of the equation but note that regulations may, in many cases, be beneficial for consumers.

The regulatory focus of this article is land-use restrictions. Our data are based on the surveys described in Gyourko, Saiz, and Summers (2008) and Gyourko, Hartley, and Krimmel (2019). The surveys, which we refer to as 2006 WRLURI and 2018 WRLURI, were both conducted nationwide to understand local land-use control environments and how local regulations can affect building—by prohibiting or restricting it or by imposing requirements that cause delays or other costs. The data from these two surveys are discussed in greater detail in the next section.

Notably, the two rounds of WRLURI data collected at the community level are cross-sectional surveys, with more than 500 communities that fully answered both surveys. As Gyourko, Hartley, and Krimmel (2019) note, these surveys provide “the first consistent nationwide data to document changes in residential land-use regulation at the local jurisdiction level.”

In addition to land-use regulations, other factors need to be considered when we discuss housing supply elasticities. Saiz (2010) finds that most areas in which housing supply is inelastic are severely land-constrained by their geography. Regulations and natural geography need to be considered simultaneously to understand patterns of demographic growth and urbanization.

The above reports measure regulatory costs through the laborious collection of survey data. Thus, it is valuable to develop proxy measures, as Ganong and Shoag (2017) do by enumerating the appearance of the words “land use” in state court cases as far back as 1950.

A recent report by Gyourko and Krimmel (2020) estimates the “zoning tax” across 24 metropolitan areas for 2013 through 2018. As Glaeser and Gyourko (2018) described, the zoning tax measures the difference between market prices and the value of the land to homeowners. They argue that the divergence between these two values is due to owners’ inability to divide and sell land due to zoning restrictions. Thus, the zoning tax is ostensibly a measure of how much land-use regulation is artificially increasing the price of land. Gyourko and Krimmel (2020) show it is highly correlated with the degree of regulatory strictness in the market (as measured by 2018 WRLURI values). Moreover, they investigate how the zoning tax varies by location within each metropolitan area and find that the “zoning tax declines with distance from the metropolitan core in the vast majority of our metropolitan areas, but there is much interesting variation around that basic pattern.”²

Affordability

The measurement of housing affordability is not straightforward, notes Haurin (2016), emphasizing that affordability measures attempt to summarize many disparate economic issues into one number. He characterizes a set of criteria that can allow us to quantify affordability and stresses that it is important to look across the whole distribution of income and housing costs as opposed to one point (such as the median).

Mota (2015) echoes many of the points raised by Haurin and delves into the key features of each of these metrics “to obtain a more comprehensive understanding of housing affordability.” Mota also acknowledges that focusing on a single metric “will provide only a partial view of affordability concerns.” He divides the commonly used housing affordability metrics into two categories: household-level measures and market-level measures. The former includes ratios of households’ current housing costs to other household-level parameters (such as housing cost-to-income ratios and residual income approaches), and the latter gauges the “extent to which potential homeowners can afford the recurring monthly costs associated with current mortgage rates and house prices.”

Woodwell (2015) uses American Housing Survey (AHS) data to examine a household-level measure, the ratio of housing costs to incomes, and (per Haurin, 2016) does so across income and housing cost distributions for five metropolitan areas and the whole of the United States. While his focus is on affordable multifamily rental housing, we stress that AHS data can be used for all tenure—rental and homeowner—data.

Regarding market-level indexes, Mota examines three measures, including the National Association of Realtors (NAR) Housing Affordability Index (HAI) and the National Association of Home Builders (NAHB)/Wells Fargo Housing Opportunity Index (HOI). Other recently built indexes include Bourassa and Haurin’s (2017) dynamic housing affordability index (detailed in Haurin’s 2016 RIHA report) and Chung et al.’s (2018) home affordability estimate (HAE) index. HAE builds on some of the earlier indexes (such as NAR HAI and NAHB/Wells Fargo HOI) and analyzes the share of housing stock that is affordable to certain households (such as median-income and low-income households). That is, measures can be built for points across the income distribution.

² The dominance of a monocentric structure for U.S. metro areas is validated by Arribas-Bel and Sanz-Gracia (2014), who use spatial analysis techniques to show that over the 1990–2010 period the monocentric structure persisted in a majority of metropolitan areas in the United States.

HAE measures affordability related to funds available for down payments, initial monthly housing-related payments, and future projections of household income and costs. It also ensures that households have sufficient residual income for typical non-housing expenses.

Linking Restrictions, Housing Supply, and Affordability

In a 2005 *Cityscape* article, Quigley and Rosenthal claim that while, in theory, excessive land-use regulations and restrictions limit housing supply, “measuring the effect of local land-use regulation on housing prices is a formidable empirical challenge.”

Many leading housing scholars repeat this sentiment. For instance, Gyourko and Molloy (2015) summarize that with cross-sectional evidence, “it is very difficult to disentangle the causes and effects of regulation from local demographic and socioeconomic characteristics that might be correlated with regulation,” and even with time-series data, “it is challenging to identify the effects of regulation.”

One of the reasons that the effects of land-use restrictions on social welfare are difficult to assess is because they not only have supply limiting effects, but as described in Hamilton (1975), they also increase local housing demand by improving local quality of life and the provision of public goods. From an econometric standpoint, it is extremely challenging to determine the direction of the causality: Did the increase in regulation lead to higher housing costs, or did the higher housing costs encourage residents to push for increased regulation? Nevertheless, there is a growing literature that tackles these empirical challenges.

Turner, Haughwout, and van der Klaauw (2014) used the 2006 WRLURI, U.S. Geological Survey, and CoStar transactions data to evaluate the effect of land-use regulation on land value and on welfare. They break down the effects of regulation into three components (the cost to the landowner, the cost to one’s neighbors, and a supply effect) that, in turn, are used in a novel estimation strategy. They find that marginal reductions in land-use regulation are likely to have substantial welfare benefits to areas on the less developed edges of towns and smaller benefits for areas near town centers.

Albouy and Ehrlich (2018) estimate that typical land-use restrictions impose costs that appear to exceed quality-of-life benefits, reducing net welfare. They utilize the large inter-metropolitan variation in land values, construction prices, and regulatory and geographic restrictions to estimate a cost function for housing in the United States in a two-step empirical analysis—the effect of restrictions in raising the cost of housing relative to input prices, and the effect of increasing housing prices relative to local wages. They find that observed land-use restrictions raise housing costs by 15 percentage points on average, reducing average welfare by 2.3 percent of income on net. Albouy and Ehrlich also find, through a disaggregated analysis of regulations, that state-level restrictions impose higher costs than local ones.

Lin and Wachter (2019) develop a general equilibrium model with household choices on consumption and location and with housing developer choices on housing production to estimate the impact of land-use regulation on housing prices in cities in California. Using property transaction-assessment data from 1993 to 2017 and the 2006 WRLURI data, they structurally

estimate supply-side and demand-side effects. They find that if land-use regulation in Los Angeles (LA), the city where housing prices are most impacted by regulation, were to be decreased to the level observed in the least regulated cities, housing prices would decline by one-fourth. Lin and Wachter also point out other empirical pitfalls—estimations without quality adjustment underestimate the impact of land regulation on prices, and similarly, estimations without spillover consideration also underestimate them.

While the Lin and Wachter report shows the effect on housing prices, our report's focus is on affordability.

Molloy, Nathanson, and Paciorek (2020) examine how housing supply constraints affect housing affordability, linking housing prices and affordability by defining affordability as the quality-adjusted price of housing services.³ Using metropolitan data from 1980–2016 and addressing multiple issues of endogeneity, the authors find that while there were sizeable effects of supply constraints on house prices, there were modest-to-negligible effects on rent, lot size, structure consumption, location choice within metropolitan areas, sorting across metropolitan areas, and housing expenditures.

Molloy and colleagues link housing supply constraints to affordability through the price of housing services (such as rent levels). In another recent report, Vigdor and Williams (2020) examine the pattern of escalating rents over the past 60 years, considering the role of various policy interventions in the housing market. This report rounds out our literature survey by examining a different type of regulation—landlord-tenant law.⁴ The authors find that in the 1970s, when many American cities witnessed population decline and reduced demand for housing, reforms to landlord-tenant law were associated with an 11-percent rent increase. They also find that more recent laws exposing landlords to liability from lead paint lawsuits are associated with rent increases as high as 15 percent. The authors conclude that “providing a safe and habitable place for renters comes with a price,” and while certain restrictions should be considered a necessity, we must keep in mind a balanced approach. As Woodwell (2015) warns in a different context: “A large gap exists between the income of many American households and the cost of building and maintaining safe and decent housing.”

Description of Data

In our analysis, we rely primarily on three data sets, one of which (the Census Bureau's American Housing Survey) is well established, and two (the Wharton Residential Land-Use Regulatory Index Survey and FHFA's Home Affordability Estimate Data) which are less well known. In concert, they provide a new view into the relationship between land-use restrictions and affordability within and across metropolitan areas.

³ In theory, supply constraints increase the price of housing services by less than the purchase price of a home since the purchase price responds to expected future increases in rent as well as contemporaneous rent levels. Households respond to changes in the price of housing services (“rent”) by altering their housing consumption and location choices.

⁴ We include this report, not only to be cognizant of the effects on the rental market, but also to remind ourselves of the many factors that make up the effects of the regulatory environment.

2006 and 2018 Wharton Residential Land-Use Regulatory Index Surveys

The 2006 WRLURI nationwide survey of municipalities, as described in Gyourko, Saiz, and Summers (2008), was designed to generate, when combined with supplemental state and local information, an index to measure regulatory constraints and rank communities in terms of the stringency of land-use regulatory environments.⁵ The aggregate measure (that we use in this article) comprises 11 subindexes—nine that pertain to local characteristics and two that reflect state court and state legislative/executive branch behavior. The aggregate WRLURI index, generated using factor analysis of the subindexes, is standardized so that the sample mean is zero, and the standard deviation equals one. The 2006 survey includes data on 1,904 communities. Following Gyourko, Saiz, and Summers (2008), the bottom quartile of the 2006 index scores (where $WRLURI < -0.55$) are labeled as lightly regulated, the top quartile (where $WRLURI > 0.74$) as highly regulated, and the interquartile scores are labeled as average regulated.

The 2018 WRLURI survey, as described in Gyourko, Hartley, and Krimmel (2019), examines local residential land-use regulatory regimes for over 2,450 primarily suburban communities across the United States. There are 12 subindexes in the 2018 WRLURI; the 12th (new) subindex—the Affordable Housing Index—indicates whether developers were required to “include affordable housing, however defined, in their projects.” As in the 2006 data, factor analysis was used to create an aggregate WRLURI value for each jurisdiction that was standardized to a mean of zero and a standard deviation of one. Gyourko and colleagues grouped the metropolitan core-based statistical area WRLURI data (2,333 observations) into quartiles so that the bottom quartile (where $WRLURI \leq -0.64$) is labeled as lightly regulated, the top quartile (where $WRLURI \geq 0.64$) as highly regulated, and the interquartile scores are labeled as average regulated.

The WRLURI survey allows us to document changes over time for just over 500 communities that fully answered both surveys in 2006 and 2018. WRLURI thus provides, as Gyourko, Hartley, and Krimmel (2019) describe, the first consistent nationwide data to document changes in residential land-use regulation at the local jurisdiction level.

American Housing Survey Data

AHS is a longitudinal housing-unit survey that is the most comprehensive national housing survey in the United States, providing information on the size, composition, and quality of housing in the nation and measuring our housing stock changes. It is sponsored by the U.S. Department of Housing and Urban Development (HUD) and conducted every odd-numbered year by the U.S. Census Bureau. Data for 2019 were released in September 2020. AHS was redesigned in 2015, and in 2019 it contained survey data on 117,422 units.⁶ The sample design, well suited for studying housing in metropolitan areas, comprises an integrated national longitudinal sample (of 86,151 units in 2019) and an integrated metropolitan longitudinal sample (of 31,271 housing units).

⁵ The WRLURI data we use were downloaded from <http://real-facultywharton.upenn.edu/gyourko/land-use-survey/> on March 11, 2020.

⁶ The 2015 redesign of the AHS was a major undertaking. It included a new sample being redrawn, new households being asked to participate in the survey, a new questionnaire, changes in variables, streamlined recodes and imputation methods, and a new weighting methodology, <https://www.census.gov/programs-surveys/ahs/about/methodology.html>.

The integrated national longitudinal sample includes three parts: representative samples of the U.S. and Census divisions (approximately 35,000 units), a metropolitan survey of each of the 15 largest metropolitan areas (approximately 46,000 units), and a representative sample of housing units receiving HUD rental assistance (approximately 5,000 units). The integrated metropolitan longitudinal sample includes ten additional metropolitan areas with approximately 3,000 units per metropolitan area.

Home Affordability Estimate Data

The Federal Housing Finance Agency (FHFA) HAE proposed by Chung et al. in 2018 estimates the housing stock share in a metropolitan area that is affordable to certain households. As mentioned previously, HAE data are similar in design (and highly correlated) to other market-level measures. However, HAE is our preferred measure because it is more flexible for evaluating households at different places in the income distribution (for example, median income, low income, and very low income). However, FHFA has not yet readied HAE for production, and data are currently only available for select geographies through the second quarter of 2018. Data were downloaded from the FHFA website.⁷ The HAE data are a mix of MSA (metropolitan statistical area) and MSAD (metropolitan statistical area division) level data. For example, the Dallas-Fort Worth-Arlington MSA comprises two MSADs (Dallas-Plano-Irving and Fort Worth-Arlington) in the HAE dataset. There are multiple MSADs in the HAE data for the Los Angeles, Dallas, and Philadelphia MSAs for our case studies. Since HAE values are close for MSADs within these MSAs, we select and report on one set of MSAD data for each of these MSAs—Los Angeles-Long Beach-Glendale, Dallas-Plano-Irving, and Philadelphia, respectively.

Case Studies

To better understand the relationships between affordability and land-use regulations—and their evolution in recent years—we look at how these data play out in a series of metropolitan areas. We start with a deep-dive into Washington, D.C., to explore various aspects of the data, and then conduct shallower dives into other metro areas to present a picture of the range of experiences.

Washington, D.C. Metropolitan Area

While the Washington, D.C. metropolitan area is not typical from a socioeconomic standpoint, being the highest educated metropolitan area (de Vise, 2010) and, according to the 2010 Census, the highest per-capita income metropolitan area in the nation, the area exemplifies high house price growth, affordability issues, and higher than mean land-use restrictions. It is also home to the three authors, so it is a good starting point for analysis. We begin the analysis with a detailed discussion of the interplay of various affordability measures in the Washington area, and then relate them to changes in land-use restrictions.

⁷ <https://www.fhfa.gov/PolicyProgramsResearch/Research/Pages/wp1804.aspx>.

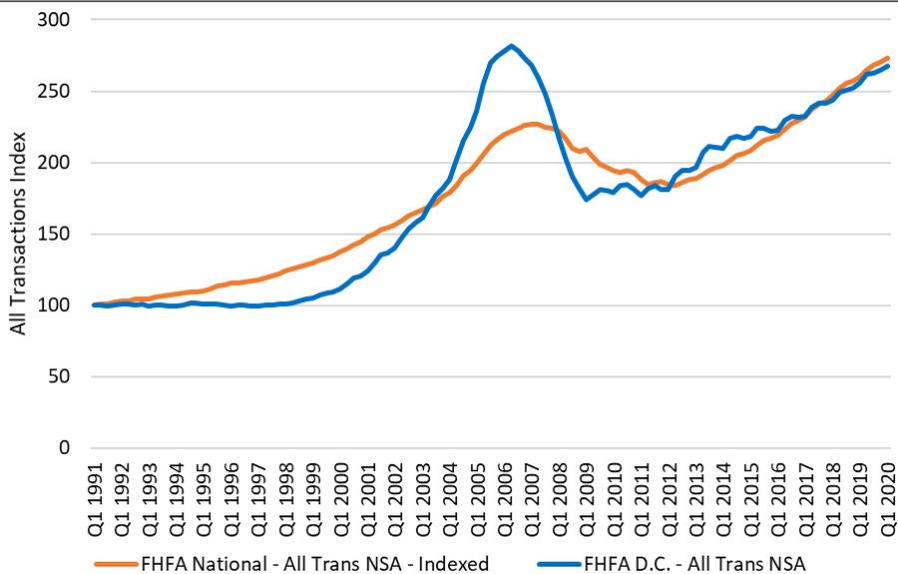
Affordability

We are aware from Molloy, Nathanson, and Paciorek (2020) that housing supply constraints likely distort housing affordability by less than their estimated effects on house prices suggest, and therefore contrast the change in house prices to the change in several measures in affordability to corroborate this relationship.⁸

Exhibit 1 shows that house prices in the D.C. area remained relatively constant through most of the 1990s but then increased 2.7-fold between 1997 and 2006 (when the first WRLURI survey took place). During the boom years, the D.C. area house price appreciation was faster than for the United States, as was the subsequent decline. In the last 8 years, the index has increased at an average annual pace of approximately 5 percent (a rate similar to the national rate). The house price index for Washington, D.C. had rebounded to approximately 90 percent of its 2006 level in 2018 when the second WRLURI survey was administered.

Exhibit 1

Federal Housing Finance Agency All-Transactions House Price Indices for the United States and the Washington, D.C. Metropolitan Area



FHFA = Federal Housing Finance Agency; NSA = not seasonally adjusted. Q = quarter.

Note: Not seasonally adjusted, first quarter 1991, indexed to 100.

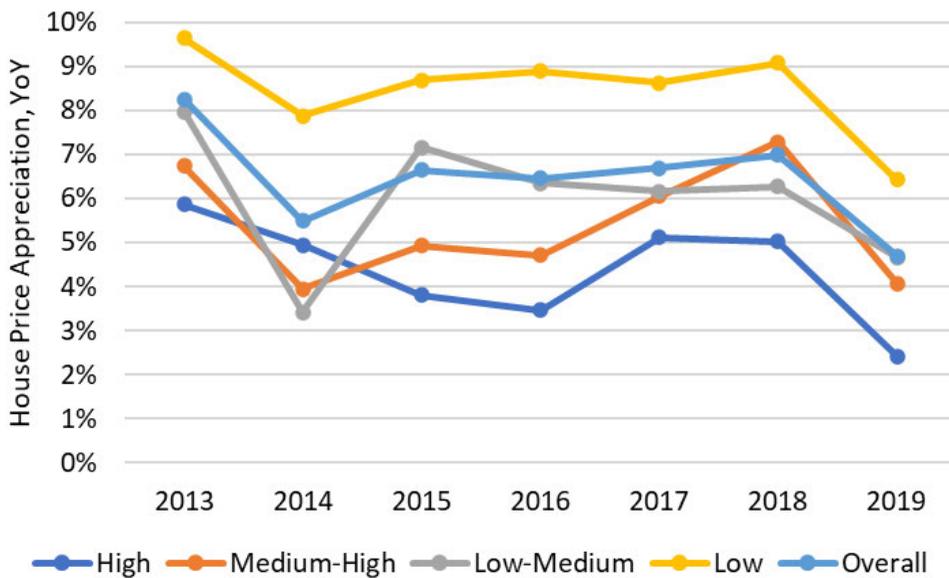
Source: Federal Housing Finance Agency

⁸ Neal, Goodman, and Young (2020) report, “Since 2009, housing demand has outstripped supply, quite significantly in some areas.” For example, their report shows that while 1.2 million households were formed in 2018, the net addition to the housing stock was 850,000 units, creating a 350,000-unit shortage in 2018 alone. The authors conclude the opening paragraph, “This shortage has increased home prices and rents, a trend that will continue for the foreseeable future absent policy changes.” The situation in the Washington, D.C. metro area from 2013–2017 shows a relatively smaller shortfall—over this period there were approximately 65,000 housing units added (based on AHS data), and there were 71,000 additional households (American Community Survey 1-year estimates). However, to understand if there are binding supply constraints, additional factors need to be considered. In a forthcoming RIHA paper, Asquith (2021) uses a theoretical framework to provide an estimation of what would occur in terms of migration and labor markets if house price polarization were reversed, namely by easing the land use regulations in the highest priced places.

While overall house price appreciation for a metropolitan area is of consequence, not all housing types appreciate at the same rate. Indeed, research by the American Enterprise Institute Housing Center indicates that lower price-tier houses have appreciated faster than higher tier houses in the D.C. area in recent years (exhibit 2). While this helps build housing wealth faster for owner-occupants, it also can adversely affect the affordability of these homes.

Exhibit 2

Year-Over-Year House Price Appreciation for the Washington, D.C. Metropolitan Area, by Housing



YoY = year over year.

Source: Authors' Tabulations of American Enterprise Institute Data

The price of a home is only one of many inputs used to estimate owner-occupied (and tangentially, rented) housing affordability. As Haurin (2016) points out, measurement of housing affordability is not straightforward since the summary indexes (often) attempt to summarize multiple disparate economic issues into one number. Moreover, the focus on a single number is also limiting—as demonstrated in exhibit 2—and thus, Haurin highlights the importance of looking across the whole distribution of income and housing costs instead of one point (such as the median).

With that in mind, we look at three affordability measures to illustrate the recent experience in the Washington, D.C. metropolitan area.

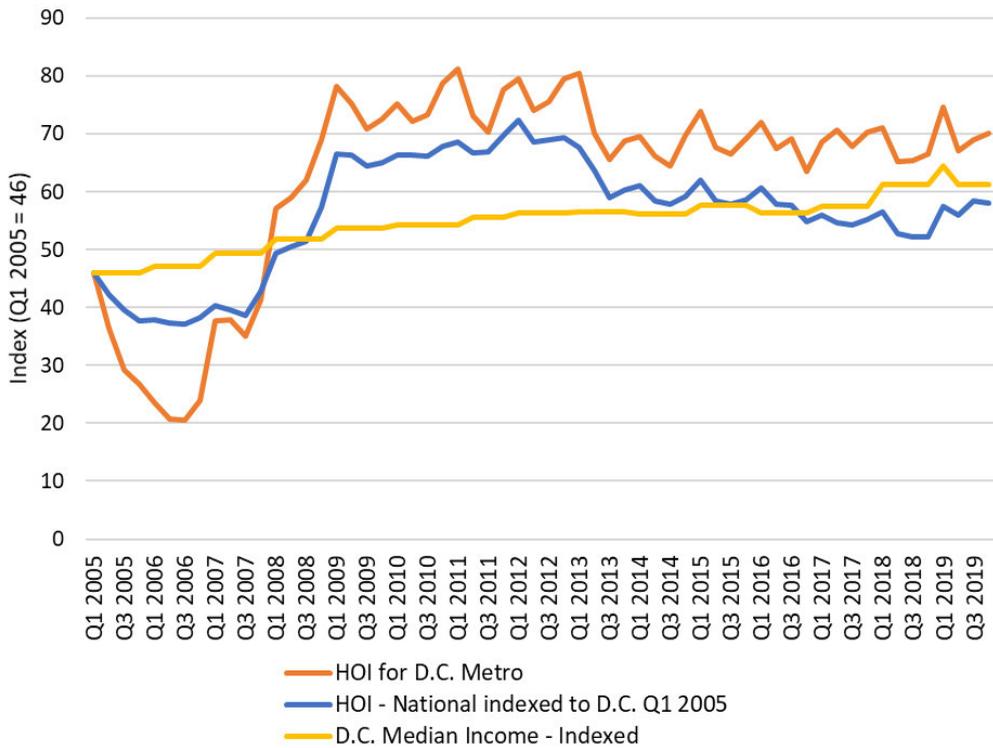
The first measure, the NAHB/Wells Fargo HOI, measures the share of home sales in a metropolitan area for which the monthly income available for housing (equal to 28 percent of metropolitan median income) is at or above the monthly cost for that unit.

While recent year-over-year house price increases have averaged 5 percent annually in the D.C. metropolitan area, the HOI decreased by 10 points (from around 80 to 70) over the same period

and has been centered around 70 since 2013 (exhibit 3). In part due to increasing metropolitan median incomes and decreasing interest rates, the HOI has not been highly correlated with house prices since 2013 in the D.C. metropolitan area. At the national level, the HOI is near where it was 6 years ago.

Exhibit 3

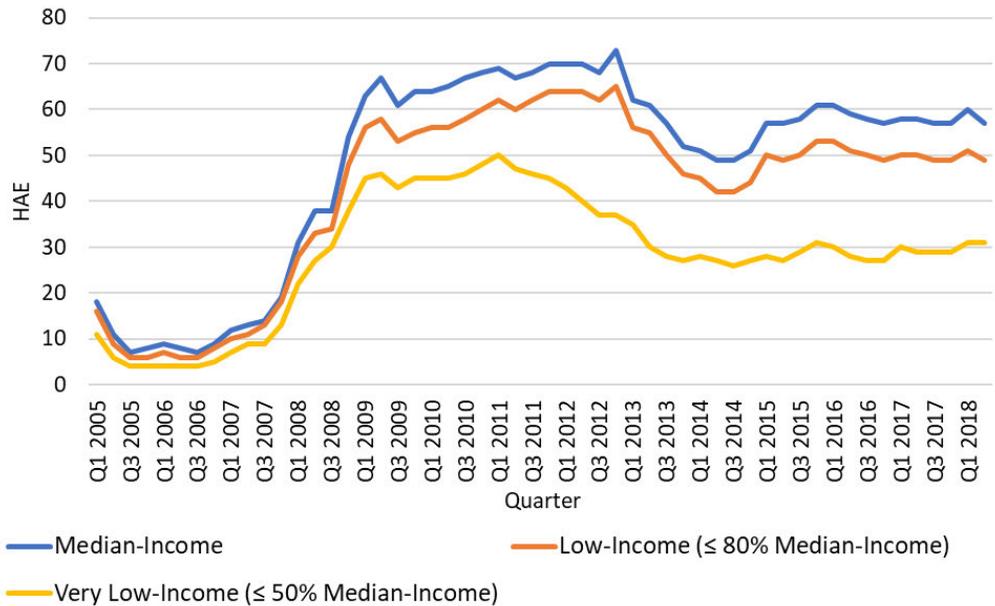
Housing Opportunity Index for the Washington, D.C. Metropolitan Area and the United States, and Index of D.C. Median Income



HOI = housing opportunity index. Q = quarter.

Source: National Association Home Builders/Wells Fargo

While the correlations between the HOI and the three HAE series (in exhibit 4) are very high—96.9 percent (median-income), 96.9 percent (low-income), and 91.7 percent (very low-income)—the spreads between the three HAE lines show the change in varying levels of affordability for the three income levels in the D.C. metropolitan area and emphasize the importance of looking across the distribution of income and housing costs.

Exhibit 4**Home Affordability Estimate for the Washington, D.C. Metropolitan Area**

HAE = home affordability estimate. Q = quarter.

Source: Federal Housing Finance Agency

Before examining our third affordability measure for the D.C. metropolitan area, AHS data waves from 2013, 2015, 2017, and 2019 that allows us to look across the income and housing cost distributions, we briefly discuss what has happened to rental affordability in the D.C. area.

As mentioned previously, measuring affordability for ownership can be tricky because it integrates several disparate economic factors to produce a single number. On the other hand, renter affordability measures may be considered more straightforward in that one can directly compare contemporaneous housing expenditures to income. Indeed, the attractive “simplicity” of the traditional expenditure-to-income ratio is also commonly used to determine if homeownership is sustainable.^{9,10}

The Joint Center for Housing Studies of Harvard University (JCHS) employs useful cutoff points to emphasize expenditure-to-income affordability issues: moderately burdened households are those paying between 30 percent and 50 percent of their income to housing costs, and severely burdened households are those paying 50 percent or more of their income to housing costs (JCHS, 2020, 2019).

⁹ A PD&R Edge article from 2017 (available at: <https://www.huduser.gov/portal/pdr/pdr-edge-featd-article-081417.html>) discusses the traditional measure and references a recent paper by Ben-Shahar, Gabriel, and Golan (2019) that uses a novel consumption-adjusted approach that finesses the traditional housing price-to-income approach to account for variations in household incomes and preferences.

¹⁰ The HOI and HAE are, in many respects, indexes that measure accessibility to homeownership. Expenditure-to-income measures focus on sustainability. That is, can homeowners afford to make their monthly payments once they are in the home?

Exhibit 5 shows the evolution of the number of renter and owner burdened households, by income levels, from 2001–2017. The exhibit summarizes some stylized facts:

- Since lower-income households are more likely to rent than to own, and the rental market is composed of a higher share of low-income households (Woodwell, 2015), households with affordability challenges are more heavily concentrated in rental than ownership markets.
- Growth in the number of low-income households during the great recession, and more recent declines, have been a key driver of overall affordability metrics.

Exhibit 5

Number of Owner and Renter Households, by Real Income and Level of Housing Cost Burden, Selected Years (Millions of Households, 2017 \$)

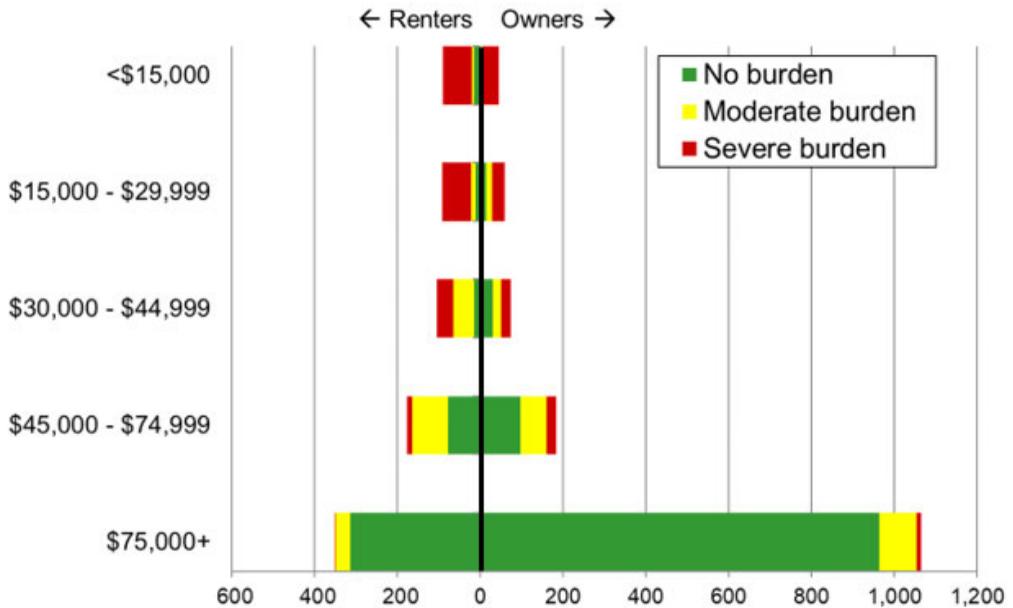


Source: Authors' tabulations of Joint Center Housing Studies data

Exhibit 6 shows the situation for the Washington, D.C. metropolitan area in 2017.

Exhibit 6

Number of Owner and Renter Households in the Washington, D.C. Metropolitan Area, by Real Income and Level of Housing Cost Burden, 2017 (Thousands of Households)

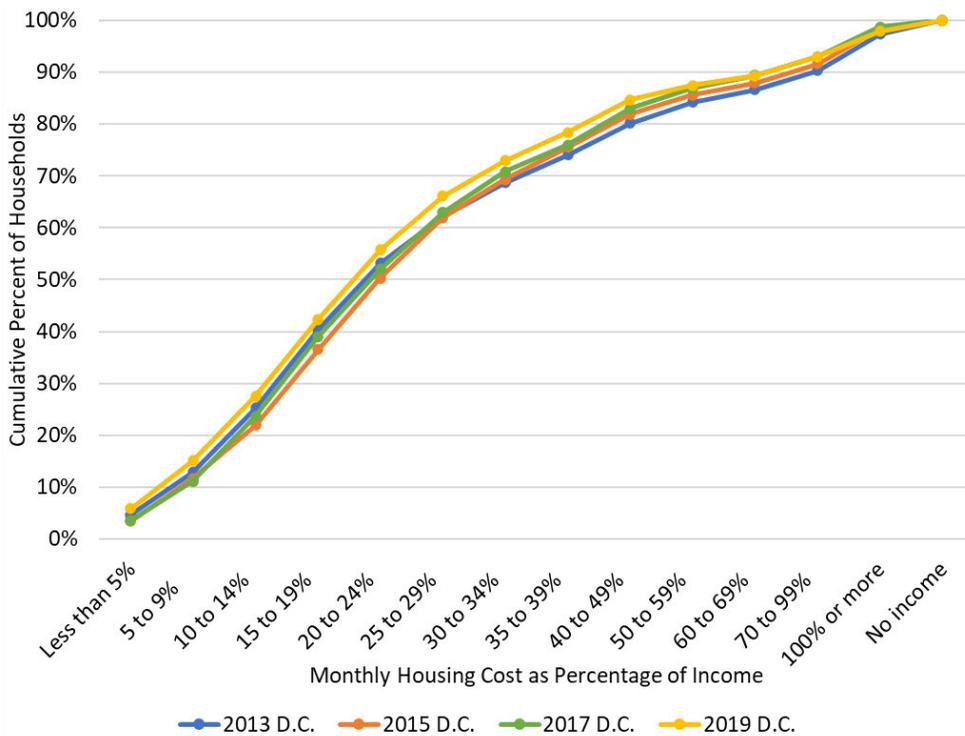


Source: Authors' tabulations of Joint Center Housing Studies data

Exhibit 7 demonstrates, using the four most recent waves of AHS data collection, how housing costs as a percentage of household income evolved from 2013 to 2019 for households in the Washington, D.C. metropolitan area.

Exhibit 7

Cumulative Distribution of Monthly Housing Cost as Percentage of Income for the Washington, D.C. Metropolitan Area



Source: Authors' tabulations of American Housing Survey data

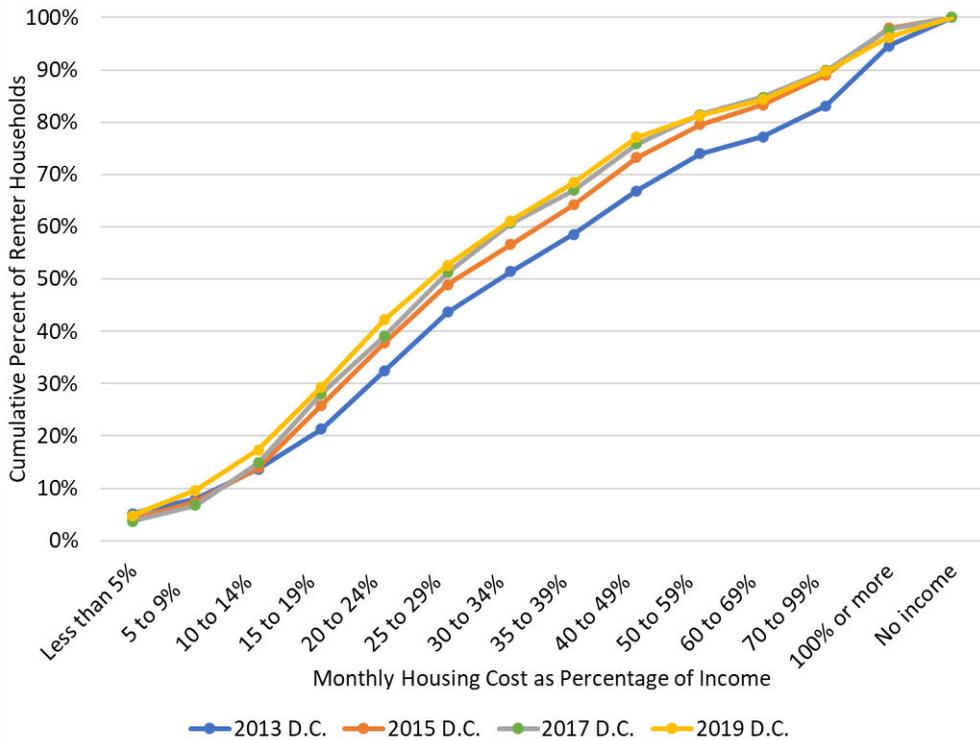
In the 2013 data, 80.2 percent of households spent less than 50 percent of their income on housing costs. In 2015 and 2017, 81.9 percent and 83.1 percent did, and in 2019 84.6 percent did so. In other words, the proportion of households that were severely burdened fell from 19.8 percent to 15.4 percent over these 6 years.

When we filter the AHS data for owner-occupied homes, the proportion of severely burdened homeowners stayed at approximately 13 percent through the first three waves of data and improved to 11 percent in 2019. On the other hand, the share of renters facing affordability challenges decreased over each of the four waves (as demonstrated by the upward movement of the lines in exhibit 8). Indeed, the severely burdened rate for renters fell from 33.1 percent in 2013 to 26.8 percent and 24.1 percent in 2015 and 2017 and 22.9 percent in 2019. However, while the share of severely burdened renters decreased by more than 10 percentage points, it should be noted that the number of higher income renter households increased over this 6-year period. For example, in 2013, 51.5 percent of renters had incomes of at least \$50,000, while in 2019, 61.5 percent did so.

This example highlights a drawback of traditional cost-burdened measures—a measurement of a broad group may belie the experiences of many individual members of that group.¹¹

Exhibit 8

Cumulative Distribution of Monthly Housing Cost as Percentage of Income for Renters in the Washington, D.C. Metropolitan Area



Source: Authors' tabulations of American Housing Survey data

Land-Use Restrictions

The 2006 WRLURI included 15 communities in the D.C. metropolitan area. Excluding the communities for which there were missing data in one or more subindexes (and thus no aggregate WRLURI score available), we are left with 12 communities. Exhibit 9 lists the communities and their WRLURI scores.

¹¹ JCHS tabulations of 2017 American Community Survey (1-year) data show this starkly for San Francisco, where the median income for homeowners is \$130,000 versus \$75,000 for the United States, and more than one-third of renters earn more than \$100,000. High housing costs are partially met by high household incomes.

Exhibit 9

Communities in the Washington, D.C. Metropolitan Area and Their Associated 2006 Wharton Residential Land-Use Regulatory Index

Community	2006 WRLURI
Manassas Park City, VA	-0.4490
Warrenton Town, VA	-0.3814
Brentwood Town, MD	-0.2402
Laurel City, MD	-0.2292
Falls Church City, VA	-0.1075
Indian Head Town, MD	0.0334
Vienna Town, VA	0.1847
Forest Heights City, MD	0.5105
Herndon Town, VA	0.6928
Front Royal Town, VA	0.8947
Mouth Airy Town, MD	1.6360
Bowie City, MD	1.9114

*WRLURI = Wharton Residential Land-Use Regulation Index.
Source: Authors' tabulations of WRLURI data*

The sample of 1,904 nationwide 2006 WRLURI scores were standardized (to sample mean zero and standard deviation one) and grouped into three buckets: lightly regulated communities with WRLURI < -0.55 (the bottom quartile of scores), highly regulated with WRLURI > 0.74 (the top quartile), and average regulated (with scores in the interquartile range, -0.55 to 0.74). The 2006 D.C. metropolitan area has no lightly regulated communities in the sample, nine average regulated, and three highly regulated communities. The (simple) average WRLURI for the 12 communities is 0.37.¹²

The 2018 WRLURI survey includes 15 communities in the D.C. metropolitan area with WRLURI scores.¹³ These are shown in exhibit 10.

¹² For more details on WRLURI weights see the discussions in Gyourko, Saiz, and Summers (2008) and Gyourko, Hartley, and Krimmel (2019). All our reported results use equal weighting of observations, following the presentation of all results in the main body of the 2019 WRLURI paper. Note that weighting does not affect any major conclusions (see footnote 12 in the 2019 paper).

¹³ The 2018 WRLURI data include two communities in West Virginia. The authors focused on core-based statistical areas for the 2018 sample. We exclude them to be consistent with the 2006 geographic metropolitan area definition.

Exhibit 10

Communities in the Washington, D.C. Metropolitan Area and Their Associated 2018 Wharton Residential Land-Use Regulatory Index

Community	2018 WRLURI
Manassas Park City, VA	-0.9416
Culpeper, VA	-0.6957
Hyattsville, MD	0.0315
Fairfax, VA	0.2678
Vienna, VA	0.2963
Cheverly, MD	0.3171
Middletown, MD	0.3464
Manassas, VA	0.5591
Purcellville, VA	0.9087
Alexandria, VA	1.0282
Walkersville, MD	1.0904
Brunswick, MD	1.2491
District Heights, MD	1.3823
Rockville, MD	2.5716
Warrenton, VA	2.7155

*WRLURI = Wharton Residential Land-Use Regulatory Index.
Source: Authors' tabulations of WRLURI data*

The standardized sample of 2,233 nationwide 2018 WRLURI scores means that lightly regulated communities have a WRLURI ≤ -0.64 and highly regulated ones have WRLURI ≥ 0.64 . As such, the 2018 D.C. metropolitan area has two lightly regulated communities in the sample, six average regulated, and seven highly regulated communities. The (simple) average WRLURI for the 15 communities is 0.74.

It is thus tempting to conclude that land-use regulations have increased in the D.C. metropolitan area in the period between the two samples. However, comparing the two samples may not be apt. First, the means and standard deviations for the two overall samples may have shifted so that a simple comparison may be spurious.¹⁴ Second, the data are not longitudinal, and sample sizes are small. Of the 12 communities in the 2006 D.C. metropolitan area sample, three are repeated in 2018. The WRLURI for Manassas Park, Virginia, decreased from -0.45 to -0.94 (to become lightly regulated), the index for Vienna, Virginia, increased from 0.18 to 0.30 (to remain average regulated), and the index for Warrenton, Virginia, increased dramatically from -0.38 to a metropolitan area high of 2.72 (with scores increasing on multiple subindexes).

¹⁴ Gyourko, Hartley, and Krimmel (2019) provide a summary of the communities they can compare across the two samples. They conclude that the fundamental nature of the local regulatory environment has not changed much; what existed near the start of the century is still there in basic form. There is no evidence of tools and methods being abandoned or of radically new methods in use. Moreover, they find that the Great Recession clearly did not lead to general declines in regulatory intensity. Finally, at the metro level, they find no cases in which a previously highly regulated area reversed course and became lightly regulated on average.

The apparent increase in land-use regulations between the two samples for Warrenton begs whether there was an associated decrease in housing supply over this period.¹⁵ We analyze this using U.S. Census Bureau Building Permit Survey data. In exhibit 11, we show, for every third year from 2006–2018, the number of annual residential permits for Warrenton, for all Fauquier County, and three neighboring counties: Prince William, Loudoun, and Stafford.¹⁶

Exhibit 11

Number of Residential Building Permits for the Town of Warrenton and Four Counties for 2006–2018

	Year	One Unit Buildings	Two-Four Unit Buildings	Five+ Unit Buildings	Total
Town of Warrenton	2006	67	0	3	70
	2009	7	0	0	7
	2012	11	1	0	12
	2015	0	0	0	0
	2018	7	0	1	8
Fauquier County	2006	506	0	7	513
	2009	106	0	0	106
	2012	164	1	0	165
	2015	200	0	0	200
	2018	289	0	1	290
Loudoun County	2006	2,937	0	17	2,954
	2009	1,638	0	27	1,665
	2012	2,980	9	36	3,025
	2015	2,635	0	35	2,670
	2018	2,511	3	28	2,542
Prince William County	2006	3,007	0	6	3,013
	2009	1,729	79	6	1,814
	2012	1,397	21	22	1,440
	2015	1,444	0	27	1,471
	2018	1,248	0	13	1,261
Stafford County	2006	818	0	2	820
	2009	455	2	0	457
	2012	638	7	1	646
	2015	785	0	0	785
	2018	1,048	0	0	1,048

Source: Authors' tabulations of U.S. Census Building Permit Survey data

¹⁵ For a richer understanding of the Town of Warrenton—its population, demand for housing, and other details regarding its town planning and issues—see Town of Warrenton, Virginia (2009).

¹⁶ These three neighboring counties are east of Fauquier County (and thus closer to Washington, DC) and have all seen large population growth in the last few decades.

Between 2006 and 2018, the two WRLURI survey years, the number of permits in Fauquier County decreased by 43 percent. There were 513 permits issued in the county in 2006 and only 106 in 2009. The number of permits then steadily increased as we moved further from the Great Recession, with 290 residential permits issued in 2018. Interestingly, the patterns in the three neighboring counties are all different, with only Stafford County having more permits in 2018 than in 2006.

Warrenton had eight permits issued in 2018 versus 70 in 2006. This is a decrease of 89 percent. The average number of residential permits issued from 2000–2005 was 156, so 2006 reflects a slowing down as the housing boom turned. The pace of permits issued was last in double digits in 2010 (30 permits) and 2011 (20 permits), and the most recent data for 2019 show that only three permits were issued in 2019.

The Washington, D.C. metropolitan area example makes evident many of the challenges of formalizing the relationships between land use and affordability, including the abstract measurement of land-use regulation, the small area sample size of some of the data on levels of construction, and the challenges of disentangling the many components of affordability.

Survey of Other Metropolitan Areas

As mentioned previously, while the Washington metropolitan area is a strong choice for exploring the various concepts related to affordability and land-use restriction, it is in no way representative of the country as a whole. In this subsection, we expand our examination through data on eight additional metropolitan areas with varied housing and socioeconomic characteristics. The order of the metropolitan areas is presented geographically west to east. For each metropolitan area, we look at what has happened regarding affordability in recent years and compare their WRLURI survey results with a key finding that each area is subject to a unique set of circumstances and trends.

Los Angeles-Long Beach-Anaheim, CA

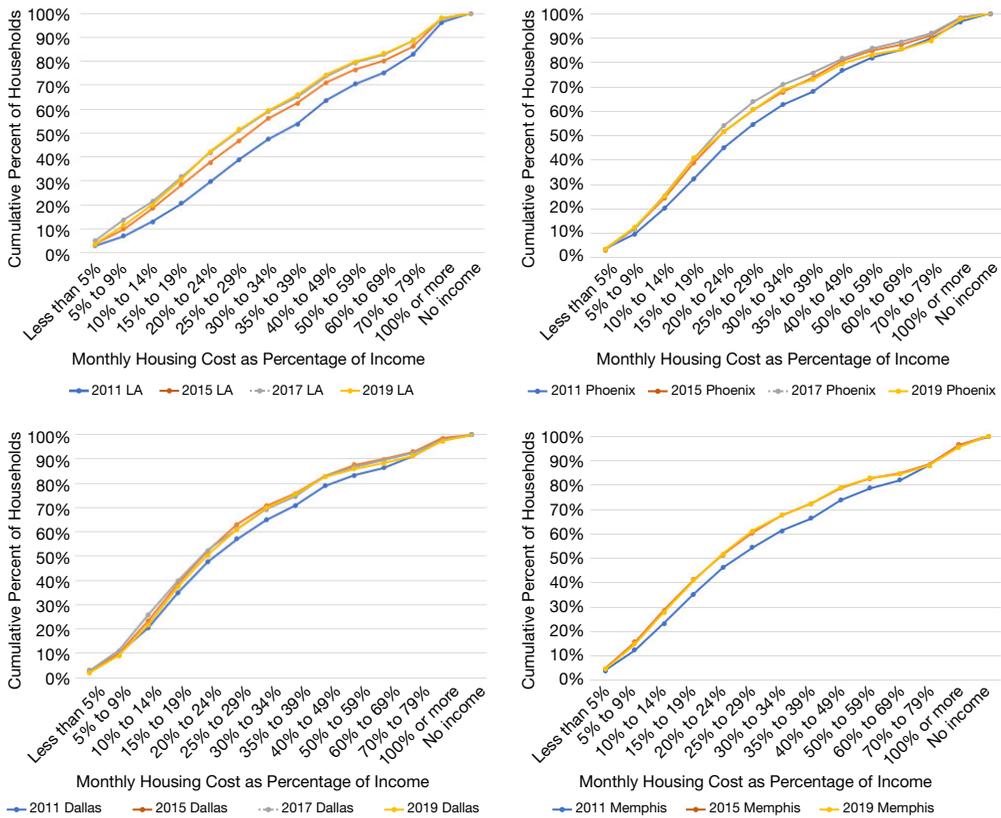
The Los Angeles metropolitan area (comprising Los Angeles and Orange Counties) is one of the least affordable in the country, with HAE affordability measures for homeowners in the single digits in the first quarter of 2018; only 7 percent of the housing stock was affordable for the median household in the Los Angeles metropolitan division, 5 percent for low-income households, and 1 percent for very low-income households.¹⁷ Only one MSA had lower affordability in the FHFA measure in the first quarter of 2018: San Francisco.

Exhibit 12 demonstrates, using the 2011, 2015, 2017, and 2019 waves of AHS data collection, how housing costs as a percentage of household income evolved in the LA metropolitan area.

¹⁷ As discussed in the data section, the FHFA data separates out Anaheim-Santa Ana-Irvine MSAD. The HAE measures for the first quarter of 2018 are even lower than the LA-Long Beach-Glendale metropolitan division—only 3 percent of the housing stock was affordable to the median-income household, 2 percent to low-income households, and 0 percent to very-low-income households.

Exhibit 12

Cumulative Distribution of Monthly Housing Cost as Percentage of Income in the Los Angeles, Phoenix, Dallas, and Memphis Metropolitan Areas



Source: Authors' tabulations of American Housing Survey data

In 2011, 63.6 percent of households spent less than 50 percent of their income on housing costs. In 2015, 71.1 percent did, 73.7 percent did in 2017, and 74.3 percent did in 2019. In other words, the proportion of households that were severely burdened fell from 36.4 percent to 25.7 percent over these 8 years. Similarly, the proportion of burdened households fell from 61.1 percent to 48.5 percent.

That is, one-half of the households in the LA metropolitan area was housing cost-burdened in 2017 and 2019, whereas the proportion of the housing stock within reach of the median-income family in the LA metropolitan division continued to fall from over one-third in the first quarter of 2012 to 7 percent in the first quarter of 2018.

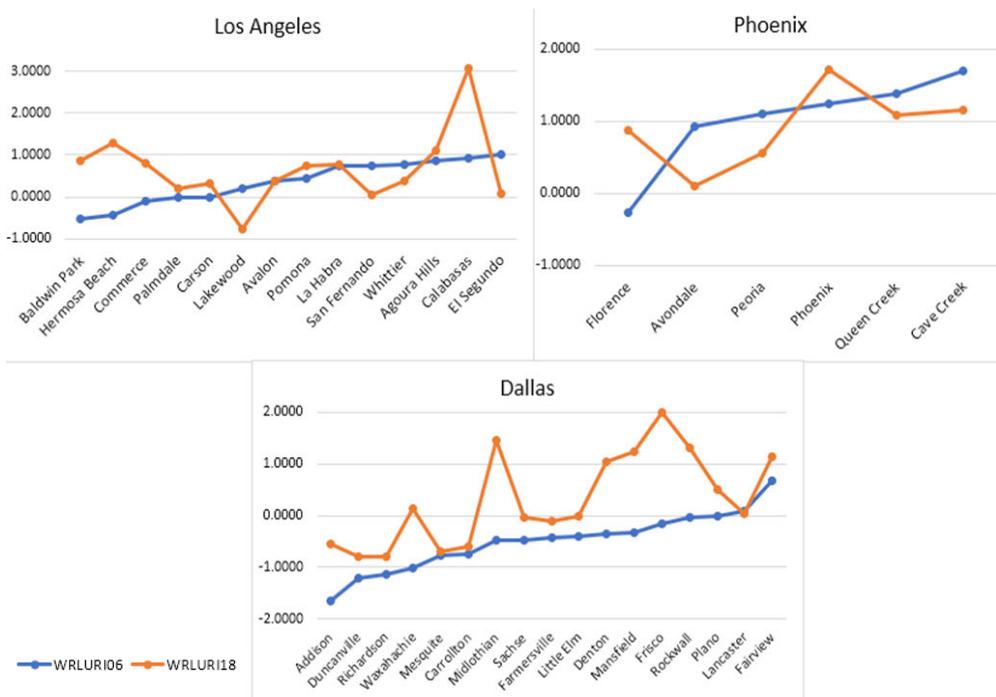
The 2006 WRLURI survey included 32 communities for the LA metropolitan area. Of these, 1 was lightly regulated, 19 were average regulated, and 12 heavily regulated. The average WRLURI in 2006 was 0.52. In 2018, there were 48 communities (3 were lightly regulated, 23 average regulated, and 22 heavily regulated). The average WRLURI in 2018 was 0.73.

While having WRLURI indexes above the mean, the LA area also has 52 percent of its land unavailable for residential or commercial real estate development (Saiz, 2010). These two factors are important determinants of housing supply inelasticity. As Saiz concludes, taken together, these two factors can “help us understand why robust national demographic growth and increased urbanization has translated mostly into higher housing prices” in Los Angeles.

Of the 32 communities in the 2006 WRLURI sample, 14 were also surveyed in 2018. The average WRLURI for these communities increased from 0.36 to 0.67 over this period, and the standard deviation increased from 0.51 to 0.86. As shown in exhibit 13, 4 of the 14 moved to a higher regulated status, 4 to a lower status, and 6 remained in the same status.

Exhibit 13

Wharton Residential Land-Use Regulatory Index Scores for Communities in Both the 2006 and 2018 Surveys for the Los Angeles, Phoenix, and Dallas Metropolitan Areas



WRLURI = Wharton Residential Land-Use Regulatory Index.
 Source: Authors' tabulations of WRLURI data

Phoenix-Mesa-Scottsdale, AZ

The Phoenix metropolitan area has experienced strong house price growth since the FHFA All-Transactions House Price Index bottomed out in 2011. In the last 6 years, house prices have increased between 7 percent and 9 percent annually, and the HAE affordability measures of owner-occupied accessibility that were at 82, 76, and 64 respectively for median-, low- and very low-income households in 2011, fell to 52, 43, and 21 in the first quarter of 2018. On the other hand,

as seen in exhibit 12, the percentage of housing-burdened households decreased from 45 percent in 2011 to 39 percent in 2015 and 36 percent in 2017. However, that proportion bounced back to 39 percent in 2019.

The 2006 WRLURI survey included 18 communities for the Phoenix metropolitan area. Of these, nine were average regulated and nine heavily regulated. The average WRLURI in 2006 was 0.71. In 2018, there were 11 communities (1 was lightly regulated, 4 average regulated, and 6 heavily regulated). The average WRLURI in 2018 was 0.64.

Furthermore, six Phoenix metropolitan area communities were in both the 2006 and 2018 WRLURI surveys (see exhibit 13). The average WRLURI for these communities decreased from 1.02 to 0.91 over this period; one of the six communities—Florence Town—moved to a higher regulated status (average to highly regulated), while two moved to a lighter regulated status (highly to average regulated).

While having WRLURI indexes above the mean, the Phoenix area has only 14 percent of its land unavailable for residential or commercial real estate development (Saiz, 2010). These two factors taken together can help us understand the rapidly growing population in the Phoenix metropolitan area.

Dallas-Fort Worth-Arlington, TX

The Dallas area has recently experienced the largest metropolitan population growth in the nation, with approximately 245,000 occupied housing units added between 2015 and 2019.¹⁸ While the HAE affordability measure of owner-occupied accessibility decreased between 2015 and 2018, it remained above 2006 levels for median-income households (75 in the first quarter of 2018 versus 59 in 2006) and low-income households (65 versus 54). However, it decreased for very low-income households from 45 in 2006 to 33 in the first quarter of 2018. As shown in exhibit 12, 43 percent of households were housing burdened in 2011, 37 percent in 2015, and 39 percent in 2017 and 2019.

The 2006 WRLURI survey included 31 communities for the Dallas metropolitan area. Of these, 10 were lightly regulated, 19 average regulated, and 2 heavily regulated. The average WRLURI in 2006 was -0.33. In 2018, after dropping non-MSA counties, there were 47 communities with a WRLURI score (10 were lightly regulated, 22 average regulated, and 15 heavily regulated). The average WRLURI in 2018 was 0.18.

Furthermore, as shown in exhibit 13, 17 Dallas metropolitan area communities were in both the 2006 and 2018 WRLURI surveys. The average WRLURI for these communities increased from -0.50 to 0.31 over this period, and 9 of the 17 moved to a higher regulated status (3 from light to average and 6 from average to heavy). No communities moved to a lower regulated status. Moreover, the WRLURI standard deviation for these communities increased from 0.56 to 0.89 from the 2006 to the 2018 surveys.

¹⁸ Also see <https://www.census.gov/newsroom/press-releases/2018/popest-metro-county.html>.

Memphis, TN-MS-AR

While the Memphis metropolitan area has relatively low housing costs—in the 2015 AHS, the median housing cost was \$807 a month (compared to \$977 nationally and \$1,089 in the Dallas metropolitan area)—it also has a relatively low median income (\$41,900 in the 2015 AHS versus \$50,300 nationally and \$58,000 in Dallas). As such, as shown in exhibit 12, housing burden rates were 46 percent in 2011, 40 percent in 2015, and 39 percent in 2019 (higher than the comparable rates for the Dallas metropolitan area).^{19,20}

The 2006 WRLURI data for the Memphis MSA includes three communities. All are classified as highly regulated with a mean WRLURI of 1.16. The 2018 survey data includes three communities for which a WRLURI score is computed. Two of these communities are highly regulated, and one is lightly regulated. The mean WRLURI for 2018 is 0.31. Furthermore, while no communities were included in both surveys, the city of Memphis is included in the 2018 survey. Its WRLURI score is 1.01, in the highly regulated quartile.

Atlanta-Sandy Springs-Roswell, GA

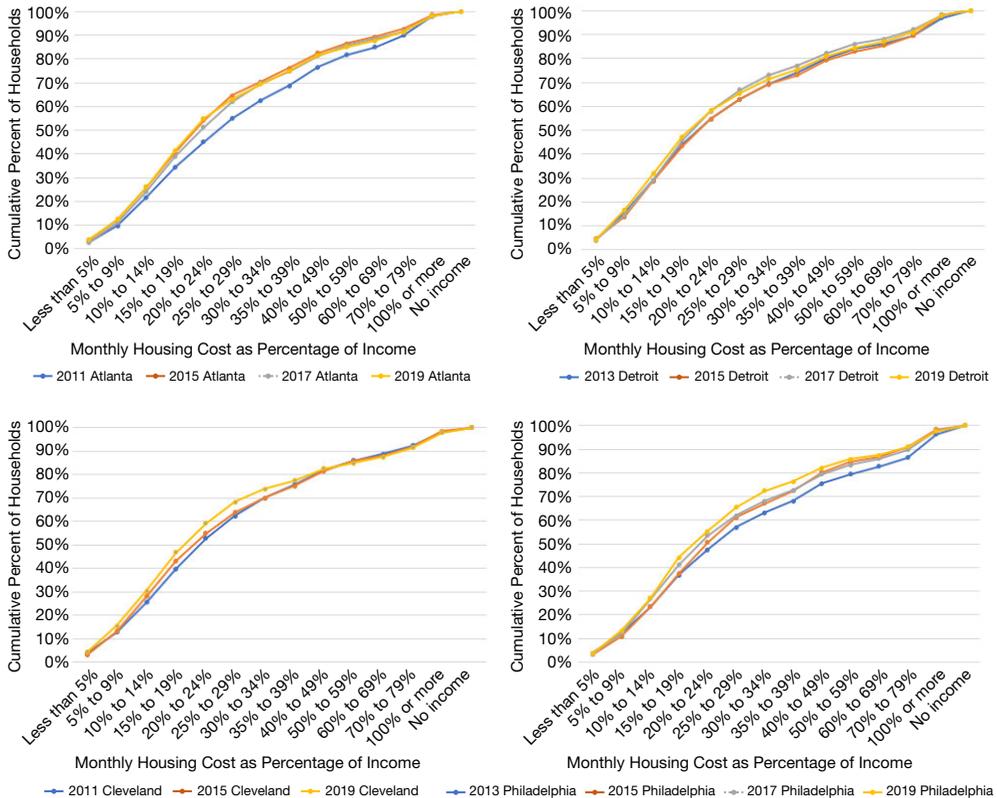
The Atlanta metropolitan area has experienced strong house price growth since the FHFA All-Transactions House Price Index bottomed out in 2012. In the last 6 years, house prices have increased between 6 percent and 10 percent annually, and the HAE affordability measures of owner-occupied accessibility that were at 81, 76, and 67 respectively for median-, low- and very low-income households in 2011, fell to 69, 63, and 45 in the first quarter of 2018. On the other hand, as seen in exhibit 14, the percentage of housing burdened households decreased from 45 percent in 2011 to 36 percent in 2015 and then increased to 38 percent and 37 percent in 2017 and 2019, respectively.

¹⁹ Moreover, while the median monthly housing cost to own was (only) \$71 more than to rent in 2015 (versus a \$336 difference for the Dallas metro area), the homeownership rate in Shelby County, Tennessee (that includes approximately 70 percent of the metro area population) continued on a downward trend, falling from 57.8 percent in 2015 to 56.3 percent in 2018 (Source: ACS).

²⁰ Given the prevailing situation in the Memphis area, the Mortgage Bankers Association, in collective action with lenders, other industry participants, and government partners has developed a major program, CONVERGENCE, to promote “more sustainable, affordable homes for purchase and rental for underserved people and communities, especially minorities and low-to-moderate-income Americans.” (See: <https://www.mba.org/advocacy-and-policy/convergence>). As part of the CONVERGENCE program design, the collective partners are working to reform regulatory barriers in the Memphis area, as well as redefining land use and zoning rules (details are available in MBA, 2020).

Exhibit 14

Cumulative Distribution of Monthly Housing Cost as Percentage of Income in the Atlanta, Detroit, Cleveland, and Philadelphia Metropolitan Areas



Source: Authors' tabulations of American Housing Survey data

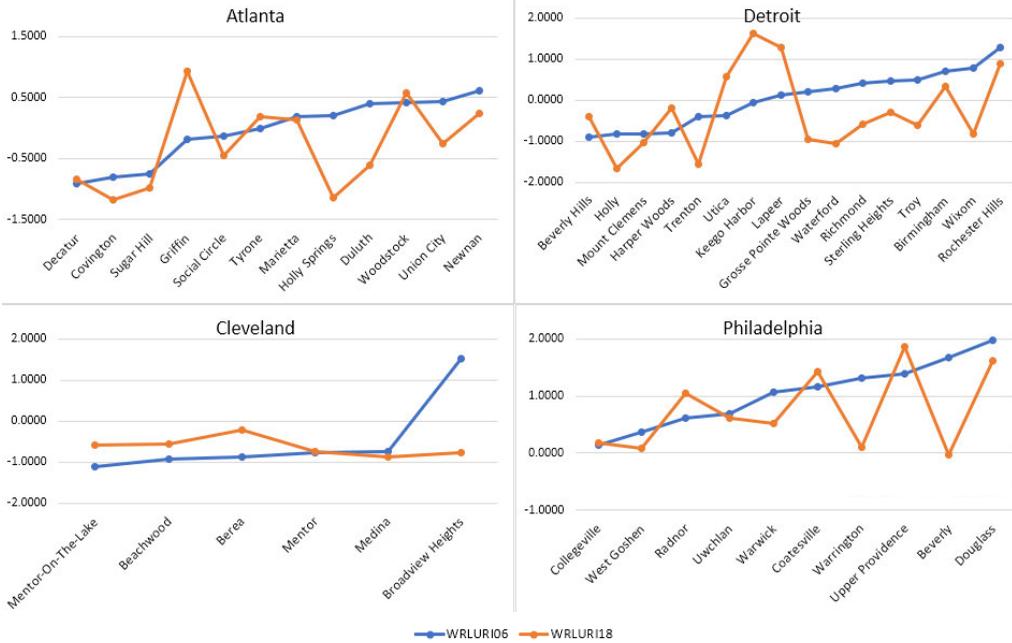
The 2006 WRLURI survey included 26 communities (with WRLURI scores) for the Atlanta metropolitan area. Of these, 4 were lightly regulated, 17 were average regulated, and 5 heavily regulated. The average WRLURI in 2006 was 0.04. In 2018, 27 communities were surveyed in the Atlanta MSA (6 were lightly regulated, 19 average regulated, and 2 heavily regulated). The average WRLURI in 2018 was -0.12.

Furthermore, 12 Atlanta metropolitan area communities were in both the 2006 and 2018 WRLURI surveys (see exhibit 15). The average WRLURI for these communities decreased from -0.04 to -0.28 over this period, and the standard deviation increased from 0.52 to 0.70. One of the 12 communities—Griffin City—moved to a higher regulated status (average to highly regulated). One of the 12 communities—Holly Springs—moved to a lighter regulated status (average to lightly regulated).

While having WRLURI indexes near the mean, the Atlanta area also has a low 4 percent of its land unavailable for residential or commercial real estate development (Saiz, 2010). These two factors taken together can help explain the “sprawling” growth of the Atlanta region (Van Mead, 2018).

Exhibit 15

Wharton Residential Land-Use Regulatory Index Scores for Communities in Both the 2006 and 2018 Surveys for the Atlanta, Detroit, Cleveland, and Philadelphia Metropolitan Areas



WRLURI = Wharton Residential Land-Use Regulatory Index.
 Source: Authors' tabulations of WRLURI data

Detroit–Warren–Dearborn, MI

The AHS data, as depicted in exhibit 14, show that the distribution of monthly housing costs as a percentage of household income did not change in a meaningful way from 2013 to 2015, but did so from 2015 to 2017 when the proportion of households that were burdened decreased from 37 percent to 33 percent. However, the proportion increased to 35 percent in 2019.

The HAE affordability measures of owner-occupied accessibility at 92, 90, and 85 respectively for median-, low- and very low-income households in 2011, fell to 81, 78, and 67 in the first quarter of 2018. With that said, only the Kansas City, Pittsburgh, and Cleveland metropolitan areas had HAE values as high (that is, as affordable) as the Detroit area in the 2018 HAE data.

The 2006 WRLURI survey included 46 communities for the Detroit metropolitan area. Of these, 10 were lightly regulated, 30 were average regulated, and 6 heavily regulated. The average WRLURI in 2006 was 0.10. In 2018, there were 60 communities with WRLURI scores (25 were lightly regulated, 27 average regulated, and 8 heavily regulated). The average WRLURI in 2018 was -0.42.

Of the 46 communities in the 2006 WRLURI sample, 16 had WRLURI scores in 2018 (see exhibit 15). The average WRLURI for these communities decreased from 0.03 to -0.28 over this period,

but the standard deviation increased from 0.67 to 0.98; 4 of the 16 moved to a higher regulated status, 4 to a lower status, and 8 remained in the same status.

The WRLURI values change for the Detroit metropolitan area between 2006 and 2018 point to the well-documented narrative of the efforts to stem the decline in its population from a high in 1970 and nurture the (ongoing) revival of its urban core. There have been innovative efforts, such as the urban agriculture zoning enacted in 2013, which added urban gardens and other agriculture activities as allowed principal uses in most land-use categories. As described on the City of Detroit website, another example is a project named “Mix Tape Zoning Detroit” that sought to transform Detroit’s complex land-use regulations into a positive force for neighborhood revitalization.²¹ This project was set up to provide better mixing of the land uses along commercial corridors. Moreover, the city continues in its efforts to improve ordinances. As recently as August 2020, amendments to existing Traditional Main Street Overlay Area regulations were implemented without requiring a hearing.

Cleveland-Elyria, OH

Even when compared to the other MSAs of the industrial heartland, the Cleveland metropolitan area has performed weakly in terms of employment, unemployment, population, and real per capita personal income levels (Schweitzer, 2018). Indeed, the FHFA All-Transactions annual house price appreciation averaged 2.2 percent from first quarter 2010 to first quarter 2020. HAE affordability measures of owner-occupied accessibility were at 85, 82, and 73 respectively for median-, low-, and very low-income households in 2011, fell slightly to 82, 78, and 66 in the first quarter of 2018 (similar in magnitude to the Detroit area). Furthermore, as seen in exhibit 14, the distributions of costs to incomes moved upward from 2011 to 2019 for those households that spent less than 40 percent of their incomes on housing expenses.

The 2006 WRLURI data for the Cleveland MSA includes 31 communities for which a WRLURI score is computed. Of these, 10 were lightly regulated, 15 average regulated, and 6 heavily regulated. The mean WRLURI was -0.14. The 2018 survey data include 19 communities for which a WRLURI score is computed. Of these, seven were lightly regulated, nine were average regulated, and three were heavily regulated. The mean WRLURI for 2018 is -0.28.

Furthermore, six Cleveland metropolitan area communities were in both the 2006 and 2018 WRLURI surveys. As shown in exhibit 15, all had WRLURI scores that were less than zero in both surveys except for the community of Broadview Heights, which had a highly regulated score of 1.51 in 2006 but a lightly regulated -0.77 in 2018.

According to the U.S. Census Bureau Building Permit Survey data, there were 289 residential permits given in 2003 in Broadview Heights. This decreased to 50 permits in 2006 (an 83-percent decrease), while the decrease was 32 percent (from 1,920 permits in 2003 to 1,297 in 2006) for all Cuyahoga County. In 2018, there were 21 residential permits given in Broadview Heights, a level consistent with recent years as the strong community growth slowed after the Great Recession (and even became negative in the last decade). The community is currently in the process of updating

²¹ See: <https://detroitmi.gov/departments/planning-and-development-department/design-and-development-innovation/zoning-innovation/mix-tape-zoning> (accessed on October 9, 2020).

its zoning code to foster “consistent, walkable, and high-quality developments” in the face of a shrinking regional population.²²

Philadelphia-Camden-Wilmington, PA-NJ-DE

Following the Great Recession, the Philadelphia metropolitan area experienced relatively slow house price growth through mid-2016. However, since then, the FHFA All-Transactions House Price Index has increased by an average of 5.9 percent year-on-year. The HAE affordability measures of owner-occupied accessibility were at 73, 67, and 49 respectively for median-, low-, and very low-income households in 2012 and fell to 66, 61, and 45 in the first quarter of 2018. On the other hand, as seen in exhibit 14, the percentage of housing burdened households decreased modestly from 39 percent in 2013 to 38 percent in 2015 and then decreased sharply to 32 percent in 2017 and 28 percent in 2019.

The 2006 WRLURI survey included 53 communities for the Philadelphia metropolitan area.²³ Of these, only 2 were lightly regulated, 17 were average regulated, and 34 were heavily regulated. The average WRLURI in 2006 was 1.03. In 2018, of the 49 communities surveyed (that had WRLURI scores), 5 were lightly regulated, 24 average regulated, and 20 heavily regulated. The average WRLURI in 2018 was 0.48.

Furthermore, 10 Philadelphia metropolitan area communities were in both the 2006 and 2018 WRLURI surveys (see exhibit 15). The average WRLURI for these communities decreased from 1.04 to 0.74 over this period, and the standard deviation increased from 0.59 to 0.70. Out of the 10 communities, only 1—Radnor, Pennsylvania—moved to a higher regulated status (average to highly regulated), and 3 moved to a lighter regulated status (highly to average regulated).

Observations on Case Studies

Our approach at this stage is to look within metropolitan areas, focusing on the differential levels of regulatory change that have actually happened between the two observation periods, with all the caveats that apply to this measurement. By doing so, we control for several factors (state and metropolitan-level constraints and economic patterns, most importantly), leaving primarily local development patterns and regulatory changes as the prime movers.

We certainly cannot ascribe the regulatory change as a causal impact on housing costs. There are many confounding forces at play. It is certainly plausible that the regulatory changes were a result of faster growth in a prior period. However, identifying these communities that experienced either more or less regulatory constraints over this period shines the flashlight on the object of interest. When it comes to formulating policies to increase the supply of affordable and safe housing, we need to be clear concerning the direction of the causality and be mindful that some of the regulatory changes are likely endogenous. However, we do see value in illustrating the empirical correlations between regulatory changes and affordability.

²² See the community’s Master Plan at https://www.countyplanning.us/wp-content/uploads/2020/08/BH_Full-Plan_Final.pdf.

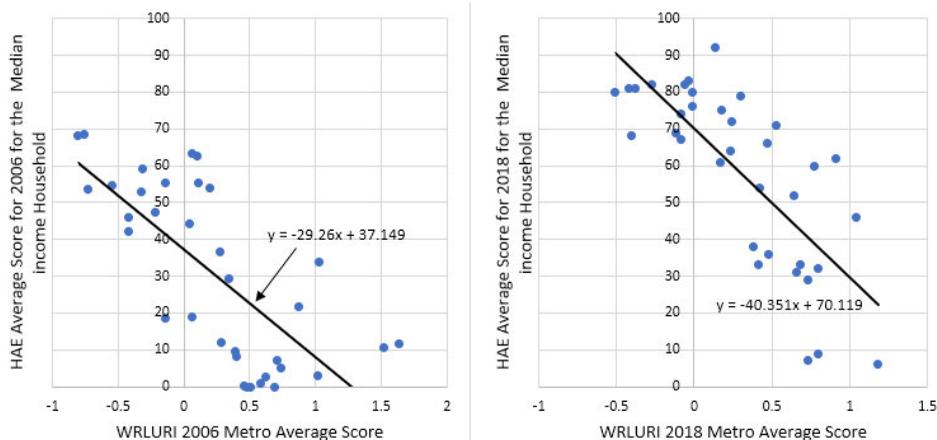
²³ We include the following counties in Pennsylvania and New Jersey in the 2006 and 2018 WRLURI analysis: Bucks, Burlington, Camden, Chester, Delaware, Montgomery, and Philadelphia.

At Mortgage Bankers Association (MBA), we have recently launched an effort to advance affordability in selected metropolitan areas by bringing together community leaders, lenders, housing counselors, and others to identify the key obstacles impeding the purchase financing of affordable housing. This effort, named CONVERGENCE, is beginning in Memphis, Tennessee, and Columbus, Ohio, and is particularly focused on identifying and reducing barriers to Black homeownership in these markets. Not unexpectedly, while some of the challenges in these markets are related to local or state regulation, others are due to insufficient information regarding the homebuying process that keeps potential buyers hesitant and market conditions that lead to appraisal and other operational challenges. With this effort, MBA is hoping to identify strategies or tactics that are effective in one market that could be usefully exported to other markets around the country while understanding that some of the most difficult challenges will often be market-specific.

Differences Across Metropolitan Areas

The case studies we examined in the empirical section beg the question as to what the WRLURI and affordability data look like across metropolitan areas. That is, are higher (more restrictive) WRLURI indexes associated with less affordable metropolitan areas? As noted previously, this exercise is purely to stimulate discussion, and there are no causal empirical inferences that should be assumed. As such, we have placed this in the discussion (and not the empirical section) of the report.

Taking the average of the quarterly HAE data for 2006 and the same HAE data for the first quarter of 2018, we plot these against the contemporaneous WRLURI scores for the metropolitan areas for which there is a WRLURI index in both surveys and HAE scores (36 observations). Exhibit 16 shows these scatter plots for 2006 (in the left panel) and 2018 (right panel). A simple regression using the 2006 data shows that for these 36 metropolitan areas, an increase in the WRLURI 2006 index of one standard deviation is associated with an HAE score that is (a statistically significant) 29.3 points lower. In 2018, the synonymous exercise had an associated (significant) 40.4 decrease in the HAE score.

Exhibit 16**Metropolitan Level Wharton Residential Land-Use Regulatory Index Scores Versus Home Affordability Estimate Scores for Median Income Households in 2006 and 2018**

HAE = home affordability estimate. WRLURI = Wharton Residential Land-Use Regulatory Index.
Sources: Federal Housing Finance Agency; WRLURI

Thus, observing these areas on a cross-sectional basis at these two points in time, we can say that metropolitan areas with higher levels of regulation have less affordable housing.

However, that may not be the right question to ask. San Francisco residents are unlikely to make a wholesale change in their regulatory framework (or other aspects of living in the Bay area) to achieve the level of housing affordability in other metropolitan areas. Similarly, Detroit residents are unlikely to adopt land-use practices of higher cost areas to increase housing value. Further, even if San Francisco residents made wholesale changes to their regulatory framework, it is highly unlikely that such changes would lead them to other areas' affordability levels.

The relevant question for a given metropolitan area is, how will changes in land-use regulation at the margin impact housing affordability? While cross-sectional analysis could provide information regarding the sign of the relationship, it is unlikely to be insightful regarding the magnitude or even the specific levers that could be changed to impact affordability.

Moreover, as Gyourko, Hartley, and Krimmel (2019) noted when they compare the communities in both WRLURI surveys, the fundamental nature of the local regulatory environment at the metropolitan level has not changed much. This is true of these 36 metropolitan areas. The linear relationship between the WRLURI 2006 and WRLURI 2018 values gives a non-significant intercept of -0.03 and a slope of 0.90 (that is not significantly different from unity, with a p-value of 0.56). If the intensity of regulation has not changed, how could this variable be driving a large decline in affordability in many metropolitan areas?

Taking this one step further, we ask whether the metropolitan area changes in WRLURI from 2006 to 2018 is associated with a change in the HAE. We regress the metropolitan level differences in HAE scores for different periods on the metropolitan level change in WRLURI and find that

the slope is not significantly different from zero for all regressions. In other words, for these 36 metropolitan areas, on average, changes in land-use restrictions had a negligible association to changes in HAE. The conundrum is that the evidence for regulatory change being the primary driver of metropolitan-level changes in affordability seems weak, abstracting from the clear difficulty of econometrically identifying the direction of causality.

However, the thought process outlined previously could be extended. The marginal changes in land-use regulation that we are looking for do not seem to be occurring at the metropolitan level. Metropolitan-level averages can mask local changes. Perhaps we are looking in the wrong place.

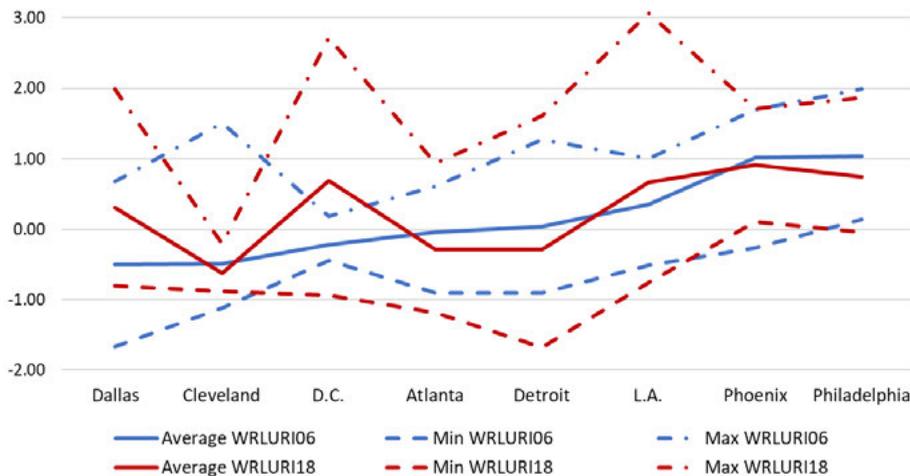
Observations

Taking a deeper dive into the WRLURI data, we know that while the metropolitan areas may not be exhibiting large changes, certain communities within these metropolitan areas do show notable shifts over these dozen years. We need to drill down to communities within metropolitan areas to look at changes. Gyourko and Krimmel (2020) offer an example of how to approach the patterns within metropolitan areas. Moreover, while we have not narrowed our focus within the WRLURI subindexes, this is a promising way to expand the case studies from this report.

Exhibit 17 highlights eight metropolitan areas for which we have data on multiple communities for both 2006 and 2018. They were rank ordered by their average WRLURI in 2006. The solid lines show the average WRLURI for these 2 years for these cities, while the dashed lines show the minimum and maximum community values at each date. The main takeaway is that while the averages have not changed more than moderately between the two surveys, there is a community-level change.

Exhibit 17

Metropolitan Area Average, Minimum, and Maximum Wharton Residential Land-Use Regulatory Index Values for Communities Included in Both of the 2006 and 2018 Surveys



WRLURI = Wharton Residential Land-Use Regulatory Index.
 Source: Authors' tabulations of WRLURI data

WRLURI had 11 subindexes in 2006 and 12 in 2018. Two of these were state level (The State Political Involvement Index and The State Court Involvement Index), but most of the subindexes were based on local land-use restrictions. In other words, as the WRLURI authors designed the surveys, they understood that local restrictions matter. This is illustrated by Pinto and Peter (2020) using a land-use restriction case study in Bergen County, New Jersey. The impacts on housing supply and affordability in the community of Palisades Park differed from its neighboring communities due to less restrictive up-zoning policies.

The question we set out to address, whether and how the extent of regulation impacts affordability for renters and owners, is not a new question. Many have struggled to both clearly define what is being asked and to apply the right data and techniques to uncover the underlying relationships. We reviewed much of the extensive research that has been done in this space because the prior work illuminates many of the challenges.

First, because defining affordability by a single measure is an impossible exercise, we focus on two alternative measures to obtain a more plausible range of affordability and provide a complete picture.

Second, while theory would clearly predict that artificially restricting housing supply should put upward pressure on home prices, *ceteris paribus*, the available data find relatively little change to regulatory constraints during a period in which home prices and housing costs have increased substantially relative to income, thereby impinging on affordability, at least by some of the measures.

If regulatory changes were not a primary cause of this upshift in the cost of housing, is it a false promise that removing regulatory constraints would lead to improved housing affordability? The conceptual experiment of simulating the impact of reducing the regulation level in a highly regulated metropolitan area to a less regulated metropolitan area may provide the right indication of the effect but is unlikely to be a reasonable guide to the actual impact.

While there are many efforts to think big about addressing the lack of affordability in many parts of the country, the data indicate that to be impactful, the analysis needs to think small, at least concerning the size of the market area that is the right unit of analysis. Comparing metropolitan areas across the country can be broadly indicative, but future research on these topics should focus on within metropolitan area analysis. Such research holds constant commuting patterns, employment bases, amenities, and other important drivers of housing values and operates more on the same scale as housing markets and land-use decisions. As a result, it is likely to be more illuminating when examining the impact of different regulatory approaches.

Data below the metropolitan-level will be harder to obtain and may not have the same depth of transactions that can be achieved at higher levels of geography. However, the results are much more likely to be applicable for informing local policymakers regarding the impacts of their potential actions, thus better bridging the divide between analysis and practice.

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