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COMMENTARY



A Methodological Critique of Wassmer and Wahid

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The use of NIMBYism to subvert racial and economic justice requires deep theoretical investigations and methodological innovation to better understand the effects of affordable housing developments on neighborhood dynamics and individual outcomes. Given that wealthy white families have traditionally shown a willingness to pay for racial/social exclusivity, it would not be wholly surprising if a negative association exists between poor and/or minority demographics and house values (e.g., Cutler, Glaeser, & Vigdor, 1999; Yinger, 2016). That being said, we agree with the other critiques here that such a finding would in no way justify NIMBYism. Nor is cap-and-trade an appropriate policy response; civil rights are not to be bartered on the market.

We leave these critiques, however, to those better equipped to make them, and instead focus on Wassmer and Wahid's (2019) methodological decisions. Our critique is fourfold:

- First, there are nontrivial technical flaws in the approach which bias the coefficients of interest.
- Second, the use of cross-sectional data for a single county not only limits the finding's external validity but introduces biases stemming from an uneven (and changing) distribution of home sales during the period.
- Third, the use of hedonic modeling as a causal identification strategy is not appropriate without stronger assumptions than the article is in a position to make.
- Fourth, the treatment effect (of a high number of poor or minority neighbors) that the authors are attempting to estimate has little relevance to the issue at hand and thus does not support the authors' policy conclusions.

We should note that until the first of these points is resolved, there is little value in utilizing the point estimates in the article to either attack or defend any policy intervention. The final three are, to some degree, subjective and we generally find little value in quibbling over external validity and identification strategies. However, the political salience of the topic at hand requires that only work of the highest quality be committed to the public record. We do not believe that Wassmer and Wahid (2019) have achieved that level in the article as published.

Technical Issues

There are a number of instances in which the modeling approach is not fully justified in the article. Issues of functional form, selection of covariates, and approaches to heteroskedasticity are endemic to hedonic modeling (particularly when point estimates are deemed critical, rather than just sign and significance). But these issues, although potentially important, represent the usual analytic trade-offs and thus do not necessarily undermine the article's findings.

Of greater concern is the authors' use of census block group dummy variables to deal with "possible unobservable neighborhood characteristics" (Wassmer & Wahid, 2019). The model contains a relatively sparse set of neighborhood-level covariates, a choice that the authors defend by including a set of dummy variables at the census block group level.¹

The authors note that they have chosen to include block groups rather than census tracts "because of [tracts'] perfect collinearity with the constant socioeconomic measures assigned by census tract" (Wassmer & Wahid, 2019). Although this statement is correct, the use of a wholly nested subgeography does not solve the problem. Tract-level neighborhood characteristics remain invariant at the block group level. Such an error would have been obvious had the authors employed a neighborhood fixed-effects modeling approach (which would also have addressed the issue of induced heteroskedasticity); there would have been no within-group variance for the demographic variables and thus their coefficients would not have been estimated.

Whereas standard ordinary least squares (OLS) approaches will indeed produce coefficients, they will remain biased in the presence of unobserved neighborhood characteristics correlated with both value and neighborhood demographics. Indeed, simulations suggest that the way in which most statistical software deals with collinearity means that these coefficients will be both biased and extremely sensitive to other modeling choices.

Because the coefficients on the neighborhood demographic variables are of utmost interest to the authors and because the block group dummy variable approach will produce biased coefficients in the presence of unobserved neighborhood confounders (which the authors make no attempt to control for), the findings in the article cannot provide evidence with which to inform policy.

Data Issues

Another crucial concern lies in the data used by Wassmer and Wahid (2019). Since the authors approached this topic with cross-sectional rather than longitudinal data, they are forced to ignore several nuances surrounding the housing market of Sacramento County, California, that can lead to both biased estimates and limited external validity.

A common issue for hedonic models is that the value of a home is observed only when that home is sold. Whether a home sells depends not only on its observable characteristics but also on its latent value in that particular quarter (affecting both buyer and seller behaviors). This issue is exacerbated by the authors' use of data from only a short time period—residential home sales in Sacramento County during the last quarter of 2013—when only a subset of homes will reveal their market value.

To assume that the properties sold during this quarter are representative of all homes in Sacramento is to treat homeowners as a homogeneous group and to neglect the changing dynamics of homeownership over the last decade. When we look closely at Sacramento County, we find that home sales across racial groups paint a starkly different story. For example, Black homeownership in Sacramento County has been steadily falling since the housing busts of 2007 and 2008, lagging significantly behind that of Whites and Hispanics. On the other hand, the most common racial or ethnic group living below the poverty line in Sacramento County is White, followed by Latino and Asian. Blacks have the lowest levels of poverty among these racial or ethnic groups.

Sacramento County also decreased its housing inventory during this period. According to the Sacramento Association of Realtors (2013), the total sales volume decreased by 13.8% from December 2012 to December 2013, with a contemporaneous decrease in the overall homeownership rate in the County. We see patterns to suggest unevenness in sales volume across income groups as well. The number of homes sold in Sacramento for under \$100,000 has decreased over the years. In 2011, they accounted for 18% of all homes sold, but in 2013 that percentage fell to 2.4%. Taken together these data suggest that the distribution of homes sold during this period is not representative of all owner-occupied homes in the county to a degree that can impact the estimated coefficients. Of course, Wassmer and Wahid's (2019) article is far from the first to conduct a hedonic analysis vulnerable

to this form of bias. However, for the findings to be applicable to policy for Sacramento County, not to mention beyond, more work needs to be done to clarify how these uneven sales effect the validity of their findings.

Identification Strategy

Hedonic modeling is a strategy for identifying the preferences of consumers for particular amenities relative to one another (Rosen, 1974; Xiao, 2017). Regressing a large number of these amenities on sales prices can thus reveal the value of specific components of a housing bundle. However, it also retains all the limitations of correlational cross-sectional analysis.

Wassmer and Wahid's (2019) modeling, like all hedonic modeling, is sensitive to omitted variable bias. In this case, the most concerning omissions are those related to neighborhood and locational amenities that the block group dummy strategy fails to address. It is beyond the scope of this comment to list all of the potential neighborhood dis-amenities that the literature suggests are disproportionately experienced by poor and minority families that in turn would have an impact on housing value. But given that neighborhood demographics represent Wassmer and Wahid's (2019) core research question, it is remarkable how little attention is paid to this issue.²

Additionally, there are clearly unmeasured selection effects at work here regarding poor and minority families' preferences and constraints. Poor families' housing searches have been shown to be highly constrained by informational gaps, predatory lending, real estate steering, and so forth (Krysan & Crowder, 2017; Yinger, 1995). In addition, it has been shown, in a vast literature, that all families express preferences that can drive locational attainment, specifically a desire to maintain kin networks and racial homophily (Yinger, 2016). For some Latino families, the need for Spanish language services and concerns over immigration enforcement result in limited search sets (Asad & Rosen, 2018). Each of these factors means that it is likely that poor and minority families select into neighborhoods with lower values, conditional on the observed set of covariates.

Moreover, even if a perfect set of variables were identified, hedonic modeling produces unbiased coefficients if and only if the market being studied is at equilibrium and contains consumers with homogeneous preferences. Although no housing market, clearly, fits these criteria, the problems associated with these assumptions are exacerbated when attempting to value neighborhood amenities broadly and preferences for particular racial/economic groups specifically. Not only do different consumer groups express uneven preferences for poor and minority neighbors, but the myriad policy tools created to keep particular types of families out of some neighborhoods explicitly push those markets out of equilibrium. If housing suppliers cannot provide housing at certain price points in areas where the market would otherwise promote the construction of that housing, then the preferences of consumers for the amenities in those markets cannot be accurately measured with a standard hedonic.

Isolation of Treatment

Finally, building off these limitations, the hedonic specification used by Wassmer and Wahid (2019) fails to address the policy issue at hand: the construction of affordable housing in areas from which it has been historically excluded. The authors' model attempts to isolate the value of poor minority neighbors, a sort of average treatment effect over all the contexts in which homes are sold within tracts also containing poor and minority families. It is not at all obvious that such a homogeneous causal estimate (even if properly estimated) would apply to the NIMBY case.

Take, for example, the mechanism of comparable properties used for real estate valuation. It is likely that proximity to lower valued housing (presumably inhabited by lower income families) would result in the selection of comparable properties (comps) with lower value, pulling down appraisals. But if affordable housing were excluded from comparable analysis (either explicitly because it is income restricted or implicitly because it is not single family), this mechanism would not be relevant. This is just one potential mechanism, but it makes the point. How the distribution

of race and class across metropolitan areas came to be will profoundly affect its relative impact on surrounding property values. There are many approaches that could produce a more relevant causal effect estimate, but the current approach is too broad to inform specific policy.

In this vein, we are obliged to mention that the use of African American and Latino racial composition in a census tract ignores the likelihood that the development of affordable housing may be composed of White low- to moderate-income groups. The included measures of racial dynamics center on a long history of understanding people of color as poor or low-income and White homebuyers as the default. In the case of Sacramento County, it is likely that White individuals may have occupancy rates disproportionately higher than other racial groups as both homeowners and affordable housing residents. According to the American Community Survey (ACS) for the same period, White householders make up 58.9%³ of rental units whereas Black and Hispanic householders occupy 15.6% and 21.3% of all other rental units, respectively.

To conclude, the article confronts a critically important topic as an increasing number of bipartisan voices speak up against NIMBYism. It is perhaps because the issue is so immediate that we felt compelled to draft this comment. We believe the technical flaws with the analysis must be addressed and encourage the authors to be more circumspect regarding the limitations outlined in the second, third, and fourth sections of this note.

Notes

1. It is unclear why only 234 block group dummies are used of the approximately 900 in Sacramento County, although we would not expect the full set given that some block groups contained no sales.
2. There is also no attention paid to locational amenities such as access to transportation, proximity to the central business district, and so forth.
3. It is important to note that White, non-Hispanic, and Latino householders together make up 46.6% of all rental-occupied housing units.

Disclosure Statement

No potential conflict of interest was reported by the authors.

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