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Gentrification, Property Tax Limitation, and Displacement

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Abstract

Scholars have long argued that gentrification may displace long-term homeowners by causing their property taxes to increase, and policy makers, including the U.S. Supreme Court, have cited this argument as a justification for state laws that limit the increase of residential property taxes. We test the hypotheses that gentrification directly displaces homeowners by increasing their property taxes, and that property tax limitation protects residents of gentrifying neighborhoods from displacement, by merging the Panel Study of Income Dynamics with a decennial Census-tract-level measure of gentrification and a new data set on state-level property tax policy covering the period 1987 to 2009. We find some evidence that property tax pressure can trigger involuntary moves by homeowners, but no evidence that such displacement is more common in gentrifying neighborhoods than elsewhere, nor that property tax limitation protects long-term homeowners in gentrifying neighborhoods. We do find evidence that gentrification directly displaces renters.

Keywords

gentrification, TELs (Tax and Expenditure Limitations), property tax, homeownership

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Scholars have long argued that gentrification, the migration of affluent individuals into working-class neighborhoods, may harm urban communities by displacing long-term residents (Glass 1964; Marcuse 1985). To date, however, the evidence for a causal connection between gentrification and displacement has been mixed. Although some scholars have found evidence of demographic change and involuntary moves in particular places undergoing gentrification (Ley 1996; Marcuse 1985; Smith 1996), others have argued that rates of out-migration from gentrifying and nongentrifying neighborhoods are similar (Ellen and O'Regan 2011; Freeman 2005; Freeman and Braconi 2004; McKinnish, Walsh, and White 2011; Vigdor 2002). In light of these mixed findings, scholars have begun to move beyond the sterile debate over whether or not displacement occurs to examine when and how it occurs, or the specific mechanisms by which gentrification sometimes may displace residents, and the conditions under which those mechanisms operate (see Brown-Saracino 2009; Newman and Wyly 2006; Wyly et al. 2010).

We contribute to this literature by testing the hypothesis that gentrification may induce longtime homeowners to move out by causing their property taxes to increase (see, for example, Brown-Saracino 2009; Immergluck 2009; Vigdor 2002; Zukin 1987). This hypothesis has received surprisingly little empirical scrutiny despite its prominence in public debates over gentrification and displacement. Most of the quantitative literature on gentrification and displacement concerns renters, or else treats renters and homeowners interchangeably. The mechanisms by which gentrification is thought to displace these two groups may differ, however, and the displacement of homeowners may affect a neighborhood differently from the displacement of renters. Homeowners share an interest in their neighbors' property values, and this common interest in the economic value of a place may produce a capacity for collective action (Logan and Molotch 1987). There is also some evidence that homeowners, on average, display more attachment to their neighborhoods, more civic engagement in their communities, and more trust in their neighbors than do renters (see, for example, Brown, Perkins, and Brown 2013; Fischel 2001; McCabe 2012). The displacement of homeowners, then, is worth investigating on its own terms because it may have particular kinds of external costs.

Perhaps for this reason, the hypothesis that gentrification drives out homeowners by raising their property taxes sometimes has been a subject of particular concern to policy makers. Several state and local governments have debated or enacted caps on the taxation of owner-occupied property that were justified explicitly as anti-displacement measures (Williams 2014). The Supreme Court ruled in 1992 that the state's interest in preventing the "displacement of lower income families by the forces of gentrification" was

sufficient to justify a policy of unequal property taxation that might otherwise be found to violate the Fourteenth Amendment's guarantee of equal protection (*Nordlinger v. Hahn*, 505 U.S. 1, at 13). Many policy makers appear to assume that long-term homeowners in gentrifying neighborhoods require special tax treatment to prevent their displacement. At least some residents of gentrifying places agree (Brown-Saracino 2009).

But is this hypothesis true? Does gentrification drive out long-term homeowners by driving up their property taxes, and do laws that limit the taxation of long-term homeowners prevent them from being displaced by gentrifiers? We test these hypotheses by employing Freeman's (2005) influential approach to measuring displacement, and extending it to a larger sample of respondents, Census tracts, and years. The key to this method is a merged data set that combines data on gentrification from the decennial Census with longitudinal data on residential moves from the Panel Study of Income Dynamics (PSID) and annual data on state-level variation in property tax policy.[1] We first replicate, and generalize, Freeman's (2005) finding that gentrification is associated with increased risk of displacement among renters, and we show that the effect of gentrification on the displacement of renters may be substantial. We then show that the same is not true of homeowners. We find no evidence that gentrification displaces homeowners in this national sample. There is some evidence that homeowners with heavy property tax burdens relative to their incomes are especially likely to move involuntarily, but such tax-induced displacement is no more common in gentrifying neighborhoods than elsewhere. We also find no evidence that homeowners' propensity to move out of gentrifying neighborhoods is moderated by state-level property tax policy.

How Gentrification Might Displace Homeowners

For decades, policy makers and scholars have argued that gentrification may displace homeowners by increasing their property taxes (DeGiovanni 1984; Henig 1981; U.S. Senate Committee on Banking, Housing and Urban Affairs 1977). As early as 1977, officials in the Department of Housing and Urban Development were expressing concern that "reinvestment" could displace homeowners from urban neighborhoods: "Moderate or low-income homeowners particularly the elderly on fixed incomes may face dramatic increases in property tax assessments, eventually forcing them to sell" (U.S. Senate Committee on Banking, Housing and Urban Affairs 1977, p. 31). Zukin (1987, p. 136), 10 years later, described the underlying mechanism in an influential review article: "[O]nce assessments have been raised to reflect some rehabilitation activity, the assessed value of unimproved properties in the

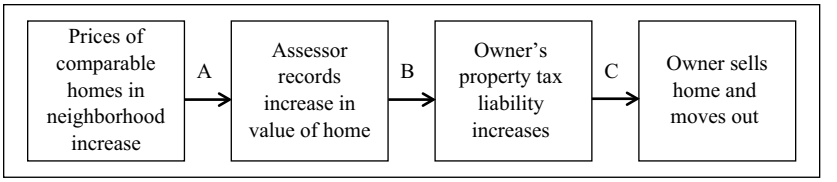

Figure 1. From gentrification to displacement, via the property tax.

neighborhood also rises. So gentrifiers carry their less affluent neighbors with them on a rising tide of property tax assessments." This argument has received renewed attention from scholars and policy makers in recent years, as news of rapidly rising property values in some local places has increased concern that long-term residents may be priced out of their communities by rising tax bills (see Brown-Saracino 2009; Immergluck 2009; Williams 2014).

While the causal logic underlying this argument is straightforward, it entails several ceteris paribus assumptions that may not be met. The assumed causal sequence is as follows: Gentrification increases demand for owner-occupied housing, thereby increasing prices, which in turn increases the market values of comparable homes in the neighborhood, which increases the assessed values of those homes recorded for tax purposes, which—given a fixed property tax rate—increases the property tax liability of the long-term residents of those homes, who may thereby be forced to move. We represent a simplified version of this causal sequence, focusing on the crucial steps after the in-migration of the gentrifiers, in Figure 1. Most importantly for our present purposes, several links in this causal chain are mediated by local tax policies that are, in fact, variable from one jurisdiction to the next.

The first link in the causal chain, as it is summarized in Figure 1, assumes that rising prices will result in rising property assessments. This assumption, represented in the figure by the arrow labeled "A," is often reasonable: Most states require officials to assess the value of real property at a fixed multiple of its current market value, which is appraised by applying a statistical model to data from comparable sales. In practice, however, this legal norm is not always followed. Assessed values often lag the market by years, resulting in an implicit subsidy for owners of property in neighborhoods where prices are increasing. Furthermore, case studies suggest that some local assessors have sometimes deliberately refused to record rising market values on the property tax rolls to protect homeowners from displacement (Kuttner 1980). Some states have gone further and formalized this practice by enacting so-called *property tax assessment limitations* that provide for residential property to be reassessed only at the time of sale, and that cap the permissible rate of increase

of the taxable value recorded in the interim between sales (Sexton and Haveman 2008). Where any of these practices or policies are in place, gentrification need not result in rising assessments for long-term homeowners. (For an early empirical study that made this point, see DeGiovanni 1984.)

The second assumption, represented by arrow "B" in Figure 1, is that property tax rates will remain constant in the face of rising tax assessments. This assumption, too, is often reasonable, but sometimes may be incorrect. Local officials in some jurisdictions may offset rising property values by reducing the property tax rate (see Lutz 2008). Indeed, it is the practice of some local governments to set the property tax rate by, in effect, dividing the budget by the value of the local tax base—so that increases in the aggregate value of property, absent any change in local spending, will automatically be met by decreases in the tax rate. Some states have enacted laws to mandate that property tax rates be cut when aggregate property values increase rapidly. The most common form of this mandate is a *property tax levy limitation* that constrains the annual growth of the local property tax levy to a fixed percentage: Such laws implicitly require local officials to decrease the property tax rate whenever aggregate property values are increasing too rapidly. For our present purposes, the import of these policies is that they bear on the relationship between gentrification and the property tax liability faced by long-term homeowners. Even when gentrification causes an increase in the assessed value of homes, it need not result in increasing property taxes.

The third assumption is that the cost of increasing property taxation shifts the balance of costs and burdens sufficiently to impel homeowners to move. This assumption is represented by arrow "C" in Figure 1. Here, too, we may question the ceteris paribus assumption that rising taxes leave all else equal. In practice, increases in local tax revenue may arrive simultaneously with improvements in public service delivery, some of which are captured by long-term residents. Freeman (2006), for example, reported that long-term residents of two gentrifying neighborhoods in New York City described substantial improvements in police services after the onset of gentrification. Even if homeowners do not consume these public services themselves, they may welcome the improvements to the extent that they expect those improvements to increase the values of their homes. It is an axiom of Tiebout's (1956) classic model of local public expenditures that the quality of locally provided public goods may affect residential location choices, including the choice to stay or move, and it follows from this assumption that high property taxes, if they are spent on locally provided public goods, can make a location more attractive and thereby increase the value of local housing, which may benefit homeowners in the long run. Most homeowners have invested the great majority of their savings in their homes, and they may welcome property

taxes that are spent on local public services as a way to protect the value of their savings (Fischel 2001). If public services in gentrifying neighborhoods improve sufficiently to offset the cost of rising taxes, then many long-term homeowners may be willing to make other financial sacrifices to stay.

The quantitative literature on gentrification and displacement provides little direct evidence to assess the mediating impact of property taxes on the displacement of long-term homeowners. Most of the recent studies have excluded homeowners by design to focus on dynamics peculiar to the rental housing market (e.g., Freeman 2005; Freeman and Braconi 2004; Newman and Wyly 2006; Wyly et al. 2010). This focus has been analytically valuable, but it has left open the question of whether and how gentrification contributes to the displacement of homeowners. Two other methodological decisions also have limited our knowledge of whether, how, and how much gentrification may displace homeowners. First, most of the detailed quantitative studies of gentrification and displacement have focused on central cities (e.g., Freeman and Braconi 2004; McKinnish, Walsh, and White 2011; Newman and Wyly 2006; Vigdor 2002; Wyly et al. 2010). The focus on central cities is consistent with the classic concerns of gentrification scholars, but it may limit our ability to measure the displacement of homeowners by focusing attention on places where rates of homeownership are comparatively low. Other recent qualitative scholarship has drawn attention to gentrification in suburban (Niedt 2006) and rural (Brown-Saracino 2009; Hines 2010) places where rates of homeownership may be higher, and the displacement of homeowners a correspondingly greater problem. Second, most quantitative studies of gentrification have focused on data from one (or at most a few) urban housing markets. Their samples lack sufficient variation in state-level property tax regimes to assess whether and how property tax policy mediates the link between gentrification and displacement. Vigdor (2002), for example, included both homeowners and renters in his study of displacement, but his focus on Boston—a city in a state with a relatively stringent property tax levy limitation, which was enacted under political pressure from homeowners who hoped it would protect them from displacement (see Martin 2008)—may account for his finding that there is little or no displacement. State-level tax policy limits the degree to which gentrification can increase local property taxes in Boston.

Studies of property tax limitation suggest that property tax policy may indeed affect residential mobility. In particular, assessment limitations may discourage homeowners from moving by providing an implicit subsidy whose value increases the longer that the property is held in the same hands. Consistent with this reasoning, several studies find evidence that assessment limitations reduce the turnover of owner-occupied homes (Ferreira 2010;

Ihlanfeldt 2011; Stohs, Childs, and Stevenson 2001; Stohs and Park 2007; Wasi and White 2005). Although this evidence is consistent with the view that certain property tax limitations reduce residential mobility of homeowners on average, the existing literature does not provide any evidence as to whether or how much they moderate the impact of gentrification on displacement.

Measuring Displacement and Gentrification

We address the limitations in prior studies by measuring the rate at which homeowners are displaced from gentrifying neighborhoods in a national sample that is not limited to central city areas, and then testing whether the effect of gentrification on residential mobility is mediated by property tax policy. Our focus is on direct, economic displacement of individual households, which we define as residents' moving out because they cannot afford the rising cost of housing attributable to gentrification. (We have no quibble with scholars who would employ a broader definition of displacement that also encompasses indirect, gradual, or community-level processes of succession, although those processes are not the focus of this article; cf. Marcuse 1985; Slater 2009.)

Our measures of residential mobility come from the PSID, a nationally representative, longitudinal survey of household heads and their families conducted since 1968, which includes data on a broad spectrum of social and economic indicators ("PSID, Restricted Use Data" 2015). Because of its longitudinal design, and because it provides detailed information about residential location and housing conditions, the PSID has become a particularly valuable source for housing researchers who study the effects of neighborhood conditions on residential mobility and displacement, including Freeman's (2005) influential study of gentrification, among dozens of others (for a review, see McGonagle and Sastry 2016). Some of the PSID variables we use in the present analysis have been collected since 1986. In 1997, the PSID scaled back its data collection from annual to biennial surveys. We, therefore, limit our sample to observations from odd-numbered years over the whole period from 1987 through 2009. By matching individual respondents across waves of the survey, it is possible for us to identify respondents who moved within the prior two years. This is our first, inclusive measure of mobility. Because this measure of mobility is based on the location of the household where PSID interviewers contacted respondents, it has the advantage that it is not purely reliant on self-reporting. Because it includes all moves, however, it has the disadvantage of being overly inclusive for our purposes: It may include many people who moved voluntarily without having been displaced. Following

Freeman (2005), we, therefore, also replicate all of our analyses with a second measure of *involuntary* mobility that includes only those residential moves for which the respondent indicated in a subsequent interview that the choice to move was economically or otherwise constrained. To identify involuntary moves, we rely on a catchall response category coded by the PSID from an open-ended question about the reasons for moving; the "involuntary" category includes respondents who said that they "moved in response to outside events including being evicted, health reasons, divorce, joining the armed services, or other involuntary reasons" (Freeman 2005, p. 469). This indicator of involuntary mobility is likely to exclude most voluntary moves, but because it is dependent on self-reporting, it also may exclude some moves that an observer would regard as involuntary: One recent interview study found, for example, that even tenants who had been evicted often denied that their decisions to move were constrained, and instead offered alternative accounts that "maximized their own volition" (Desmond 2016, p. 330). Because these two measures of mobility have complementary advantages and disadvantages, we report our analyses of both.

For information about which respondents lived in gentrifying neighborhoods, we rely on restricted-use geocodes provided under special arrangement by the PSID that allow us to match individual survey respondents to their Census tracts of residence. We then identified the potential for gentrification and the presence of gentrification in a given Census tract by identifying decennial changes in the aggregate housing and population characteristics of the tract. The identification of changing neighborhood characteristics by comparing data from one decennial Census with the next is complicated by changing Census-tract boundaries. We, therefore, relied on U.S. Bureau of the Census data as aggregated to standardized 2010 tract boundaries by the Longitudinal Tract Database (LTDB) (Logan, Xu, and Stults 2014). We also include decennial Census data on the housing vacancy rate at the county level, from Summary Tape Files, to control for broader housing market conditions. The data merge is described in more detail in Appendix A.

Following Freeman (2005), we distinguish between *potentially gentrifying* neighborhoods and *gentrifying* neighborhoods. Our operational definitions of these concepts differ from his in some particulars because we require a measure of gentrification that can be applied equally to nonurban and nonmetropolitan places. We code a Census tract as a *potentially gentrifying* neighborhood if, as of the last decennial Census, its housing stock was older than the average for the county in which it was located, and its median income was less than that of the county in which it was located. We code a potentially gentrifying Census tract as a *gentrifying* neighborhood during any decennial period in which average housing prices in the tract increased, as recorded by the Census,

and the increase in the share of adults with a four-year college degree resident in the tract exceeded the increase in the share of such adults resident in the county. We use the LTDB to measure gentrification in the United States over three periods: 1980 to 1990, 1990 to 2000, and 2000 to 2010.

To determine whether the displacement of homeowners is conditional on property tax policy, we also merge the PSID with data on state-level property tax policy in the United States. The sources of the policy data are described in Appendix B. We define two relevant property tax policies. The first is the presence of an *assessment limitation*. This is a law that limits the annual increase in the value at which a residential parcel is assessed for tax purposes. The second is a *levy limitation*. This is a law that limits the annual increase in the total property tax revenues raised by any local government. Because our interest is in the total property tax liability faced by an individual homeowner, we define a state as having the relevant property tax limitation only if state law limits the property tax of all local governments in the state, including municipalities, counties, and school districts.

The analyses described below refer to a merged data set that includes every observation of a PSID respondent in an odd-numbered year from 1987 to 2009 who was a householder at the time of the interview, together with information about the respondent's Census tract, county, and state of residence, and information from the PSID reinterview two years later about whether the respondent subsequently moved out of that residence. Because the data set is a national sample with geographic information sufficient to identify each respondent's Census tract, it permits us to compare the pace of gentrification and displacement in jurisdictions with and without property tax limitation laws. Our dependent variable is a residential move (or an involuntary move) that was reported to the PSID within two years after the interview when the respondent was resident in the specified tract. (See Table 1 for descriptive statistics.)

The theory that gentrification may displace homeowners, at its simplest, implies the following hypotheses:

> **Hypothesis 1 (H1):** Residence in a gentrifying neighborhood increases the probability that a homeowner will report a residential move.

We measure the displacement attributable to gentrification by the difference in the probability of a residential move by a respondent in a gentrifying tract and the probability of a residential move by an otherwise identical respondent in a potentially gentrifying tract.

We also test whether the rising cost of the property tax is a mechanism by which gentrification displaces homeowners.

Table 1. Descriptive Statistics.

	Renters		Homeowners	
	M	*SD*	*M*	*SD*
Move within two years? (1 = yes)	0.54	0.50	0.16	0.37
Involuntary move within two years? (1 = yes)	0.13	0.34	0.03	0.17
Education, in years	12.41	2.45	13.64	2.39
Subsidized rental unit (1 = yes)	0.16	0.37	—	—
Time in residence, years	1.73	3.03	4.91	5.12
Income, natural log	9.78	1.20	10.91	0.84
Black non-Hispanic (1 = yes)	0.49	0.50	0.21	0.41
Hispanic (1 = yes)	0.07	0.26	0.05	0.22
Other non-White (1 = yes)	0.01	0.12	0.01	0.11
Age, years	36.91	14.10	43.53	12.75
Female (1 = yes)	0.42	0.49	0.14	0.34
Married (1 = yes)	0.29	0.45	0.76	0.43
Divorced (1 = yes)	0.31	0.46	0.16	0.36
Has children (1 = yes)	0.48	0.50	0.56	0.50
Family size	2.25	1.42	2.84	1.33
Weeks unemployed last year	3.14	9.15	0.85	4.61
Crowded unit (1 = yes)	0.08	0.27	0.02	0.14
House value in US$1000s, natural log	—	—	11.59	0.98
Property tax (% of income)	—	—	2.73	2.66
Vacancy rate (share of housing units in county)	0.083	0.046	0.085	0.054
Gentrified tract (1 = yes)	0.18	0.37	0.11	0.31
Potentially gentrifying tract (1 = yes)	0.44	0.49	0.25	0.43
Assessment limitation (1 = yes)	—	—	0.30	0.46
Levy limitation (1 = yes)	—	—	0.50	0.50
N person–observations	21,963		22,133	

Hypothesis 2 (H2): The property tax bill as a percentage of income will mediate the effect of residence in a gentrifying neighborhood on the probability that a homeowner will report a residential move.

Finally, we test whether the association between gentrification and the displacement of homeowners is conditional on the rules governing property tax assessment. We distinguish between property tax assessment limitations and property tax levy limitations. A property tax assessment limitation is a

state law that restrains the increase in the value that local property tax assessors may record for any individual parcel. Such laws typically permit reassessment of a parcel at its market value only at the time of a sale or transfer. The longer that a homeowner remains in residence, the more that the market value of his or her home may diverge from the value at the time of acquisition, and the greater the implicit subsidy that could result from his or her being taxed on the latter rather than the former. The Supreme Court ruled in *Nordlinger v. Hahn* (505 U.S. 1) that a policy of limiting property assessment increases met a legitimate government purpose of preventing the displacement of families by gentrification. We test whether property tax assessment limitations have any such effect. In particular, we distinguish between states that limit assessment increases, and states that do not.

Hypothesis 3 (H3): Residence in a state with a property tax assessment limitation decreases the association between residence in a gentrifying neighborhood and the probability that the homeowner will report a residential move.

A property tax levy limitation is a state law that restrains the increase in the aggregate local property tax revenue of a local government. Where a property tax levy limitation is in force, officials may respond to an increase in aggregate property values by reducing the property tax rate, so that individual property owners need not face any increase in their property tax liability.

Hypothesis 4 (H4): Residence in a state with a property tax levy limitation decreases the association between residence in a gentrifying neighborhood and the probability that a homeowner will report a residential move.

Because the data will consist of repeated observations of individuals within Census tracts within counties within states, with measured covariates at the levels of the interview, the person, the tract, the county, and the state, we will estimate a hierarchical linear model. We follow the advice of Schmidt-Catran and Fairbrother (2016) to include a random error term at each of these five levels. Our models have the following linear probability form:

$$\begin{aligned} m_{ickst} = {} & \alpha + \beta_{ickst}^{T}\mathbf{X}_{ickst} + \varphi w_{kst} + \delta_1 g_{ckst} + \delta_2 \mathrm{p}_{ickst} + \delta_3 g_{ckst} \times \mathrm{p}_{ickst} \\ & + \gamma_1 h_{ckst} + \gamma_2 h_{ckst} \times \mathrm{p}_{ickst} + \theta_i + \upsilon_c + \xi_k + \omega_s + \varepsilon_{ickst}, \end{aligned} \tag{1}$$

where i indexes individuals, c indexes Census tract, k indexes county, s indexes state of residence, and t indexes time; m_{ict} is a dummy variable equal

to one if respondent *i* moved out of Census tract *c* in year *t;* g_{ct} is a dummy variable for gentrification in tract *c* and year *t;* h_{ct} is a dummy variable for a *potentially* gentrifying neighborhood in tract *c* and year *t;* p_{ict} is a dummy variable for the presence of a property tax limitation; **X** is a vector of control variables including the age, race, gender, marital status, income, family size, and years in residence at the current address of respondent *i* in tract *c* in year *t;* w_{kst} is the vacancy rate in county *k* at time *t*, which we include to control for opportunities for residential mobility within the local housing market; the subscripted δ are the coefficients of theoretical interest; α is a fixed intercept; **β** is a vector of coefficients for person- and observation-level control variables; φ is the coefficient of the county-level housing vacancy rate; the subscripted γ control for propensities to move associated with residence in a potentially gentrifying tract, net of the actual effects of gentrification; and ε, θ, υ, ξ, and ω are random error terms at the level of the observation, the person, the Census tract, the county, and the state of residence, respectively. The coefficient δ_1 represents the difference in the probability of out-mobility between a gentrifying neighborhood and a potentially gentrifying neighborhood. The test of our H1 is, thus, whether the coefficient δ_1 is significantly greater than zero. The coefficient δ_3 represents the incremental difference in the probability of out-mobility from a gentrifying neighborhood if the homeowner is protected by a state-level assessment limitation law. The test of H3 (or H4, depending on the type of property tax limitation law measured by c_{ipst}) is whether the coefficient δ_3 is significantly less than zero. In some models, we include a measure *f* of property taxes as a share of family income, to test H2:

$$m_{ickst} = \alpha + \boldsymbol{\beta}^{T}_{ickst}\mathbf{X}_{ickst} + \varphi w_{kst} + \delta_1 g_{ckst} + \gamma_1 h_{ckst} + \zeta f_{ickst} + \theta_i + \upsilon_c + \xi_k + \omega_s + \varepsilon_{ickst}. \quad (2)$$

The test of H2 is whether ζ is significantly greater than zero, and δ_1 is attenuated relative to a baseline model that omits ζ.

Results

We begin by fitting hierarchical linear regression models to data on renters. We attempt to reproduce the well-known findings of Freeman (2005) to validate our application of his method for measuring displacement. Our models of biennial residential mobility among renters over the period 1987 to 2009 are reported in Table 2. These models reasonably closely reproduce the results that Freeman (2005) obtained in a model of annual mobility for the

Table 2. Gentrification and Renters' Residential Mobility: Results of Hierarchical Linear Regression Models.

	All Moves		Involuntary Moves Only	
	Model 1	Model 2	Model 3	Model 4
Female	−0.038**	−0.038**	−0.023**	−0.023**
	(0.009)	(0.009)	(0.006)	(0.006)
Black non-Hispanic	−0.049**	−0.049**	0.0006	−0.0005
	(0.009)	(0.009)	(0.006)	(0.006)
Hispanic	−0.070**	−0.071**	−0.008	−0.008
	(0.015)	(0.015)	(0.010)	(0.010)
Other non-White	−0.030	−0.030	0.003	0.003
	(0.029)	(0.029)	(0.020)	(0.020)
Education	0.004**	0.004*	−0.005**	−0.005**
	(0.002)	(0.002)	(0.001)	(0.001)
Time in residence	−0.020**	−0.020**	−0.006**	−0.006**
	(0.001)	(0.001)	(0.0008)	(0.0008)
Log income	0.0006	0.0005	−0.008**	−0.008**
	(0.003)	(0.003)	(0.002)	(0.002)
Age	−0.007**	−0.007**	−0.001**	−0.001**
	(0.0003)	(0.0003)	(0.0002)	(0.0002)
Married	0.011	0.011	−0.026**	−0.026**
	(0.012)	(0.012)	(0.008)	(0.008)
Divorced	0.024*	0.024*	0.005	0.005
	(0.009)	(0.009)	(0.007)	(0.007)
Has children	−0.017	−0.017	0.0008	0.001
	(0.011)	(0.011)	(0.008)	(0.008)
Family size	−0.013**	−0.013**	−0.002	−0.002
	(0.005)	(0.005)	(0.003)	(0.003)
Weeks unemployed	0.0002	0.0002	0.0006*	0.0006*
	(0.0004)	(0.0004)	(0.0003)	(0.0003)
Crowded unit	0.075**	0.075**	0.010	0.010
	(0.013)	(0.013)	(0.009)	(0.009)
Subsidized unit	−0.050**	−0.050**	−0.022**	−0.021**
	(.010)	(0.010)	(0.007)	(0.007)
Vacancy rate	−0.087	−0.083	0.024	0.032
	(0.084)	(0.084)	(0.054)	(0.054)
Gentrified tract		0.017		0.026**
		(0.011)		(0.007)

(continued)

Table 2. (continued)

	All Moves		Involuntary Moves Only	
	Model 1	Model 2	Model 3	Model 4
Potentially gentrifying tract		−0.006 (0.008)		−0.007 (0.006)
Constant	0.880** (0.039)	0.880** (0.040)	0.393** (0.027)	0.391** (0.027)
Standard deviation of random intercepts				
State	0.047	0.047	0.008	0.008
County	0.030	0.030	0.000	0.000
Census tract	0.033	0.032	0.017	0.017
Person	0.134	0.135	0.098	0.098
Residual	0.445	0.445	0.313	0.313
N person–observations	21,963	21,963	21,963	21,963

Note. All models also include fixed intercepts for years; year-specific intercepts omitted. Standard errors in parentheses.
*$p < .05$. **$p < .01$.

period 1986 to 1996 using PSID and Census data. The first model in Table 2 estimates the relationship between control variables and moving, and the second model estimates the relationship between residence in a gentrifying neighborhood and moving, net of the mobility difference associated with residence in potentially gentrifying neighborhoods. The overall patterns of mobility are consistent with prior research: Young, White, male, highly educated, and childless residents of crowded units are most likely to move out, whereas Black householders, householders with large families, long-term residents, and residents of subsidized units are least likely to move out. Net of these associations, Model 2 shows a positive association between gentrification and the probability of moving out, but the coefficient is small and statistically insignificant. Consistent with Freeman's findings, Model 2 indicates that we cannot be confident that the average effect of gentrification on the probability of moving out is different from zero.

As did Freeman (2005), we find stronger evidence of displacement when we restrict our attention to involuntary moves. Model 3 replicates Model 1, except that the dependent variable equals one only for those moves that were coded by the PSID as undertaken for involuntary reasons. Such involuntary moves are rare—they comprise 13% of the sample observations, compared with 54% for all moves—but they are more consistently associated with

gentrification. Controlling for other differences in individual and household characteristics, residence in a gentrifying neighborhood is associated with a probability of moving out that is 2.6 percentage points greater than it would be otherwise. This coefficient is significant at the 5% level.

How large is the effect of gentrification on involuntary moves? Popular commentary on Freeman's (2005) results characterized the effect as small, perhaps because the reported effect of gentrification on the annual probability of an involuntary move, while greater than zero, was smaller than some critics of gentrification expected (for a review of coverage in the popular press, see Newman and Wyly 2006). Because there is no standard benchmark for determining what constitutes a "large" or a "small" effect on the probability of moving out, we find it more instructive to compare coefficients. The expected difference between residents of gentrifying and potentially gentrifying tracts in the probability of moving out is comparable with the expected difference between residents of subsidized and unsubsidized rental units, the expected difference between a married and an unmarried householder, the expected difference between a college graduate and a high school graduate who never enrolled in college, or the expected difference between two householders who report family incomes of US$6,000 and US$300,000, respectively, if they were identical in every other respect. We note, too, that gentrification, in contrast to the other independent variables in the model, is measured with decennial frequency, and the low temporal resolution of this variable is equivalent to averaging the pace of gentrification over observations of the sample respondent within any given 10-year intercensal period. (Even a very large immediate effect of gentrification on displacement might yield a small coefficient if a given tract was only really gentrifying for, say, three years of the 10 that it is classified as a "gentrifying" tract.)

We have validated our application of Freeman's (2005) method by reproducing the finding that gentrification may displace renters. To test our hypotheses, we now apply analogous models to homeowners. We begin by fitting regressions to model the effect of gentrification on all moves, voluntary and involuntary. Table 3 reports the results. Model 5 shows the baseline model, with characteristics of individuals and housing units. Model 6 introduces coefficients for gentrifying and potentially gentrifying neighborhoods, to test our H1, that residence in a gentrifying neighborhood increases the probability that a homeowner will report a move. On average, residence in a gentrifying neighborhood is associated with a lesser probability of moving out, and the coefficient is not statistically significant. H1 is not supported. Is this because the effect of gentrification is mediated by property taxes? Some homeowners may be able to afford the increasing property taxes that are assumed to follow

Table 3. Gentrification, Property Taxes, and Homeowners' Residential Moves: Results of Hierarchical Linear Regression Models.

	Model 5	Model 6	Model 7	Model 8	Model 9	Model 10
Female	−0.051**	−0.051**	−0.048**	−0.051**	−0.051**	−0.051**
	(0.011)	(0.011)	(0.012)	(0.011)	(0.011)	(0.011)
Black	−0.047**	−0.047**	−0.050**	−0.047**	−0.047**	−0.047**
	(0.008)	(0.008)	(0.008)	(0.008)	(0.008)	(0.008)
Hispanic	−0.017	−0.017	−0.017	−0.017	−0.017	−0.018
	(0.013)	(0.013)	(0.014)	(0.013)	(0.013)	(0.013)
Other race	−0.007	−0.007	−0.003	−0.007	−0.007	−0.008
	(0.024)	(0.024)	(0.025)	(0.024)	(0.024)	(0.024)
Education	0.004**	0.004**	0.005**	0.004**	0.004**	0.004**
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Time in residence	−0.005**	−0.005**	−0.004**	−0.005**	−0.005**	−0.005**
	(0.0006)	(0.0006)	(0.0006)	(0.0006)	(0.0006)	(0.0006)
Log income	0.006	0.006	0.003	0.006	0.006	0.006
	(0.004)	(0.004)	(0.006)	(0.004)	(0.004)	(0.004)
Age	−0.004**	−0.004**	−0.004**	−0.004**	−0.004**	−0.004**
	(0.0003)	(0.0003)	(0.0003)	(0.0003)	(0.0003)	(0.0003)
Married	−0.035**	−0.035**	−0.044**	−0.035**	−0.035**	−0.034**
	(0.012)	(0.012)	(0.013)	(0.012)	(0.012)	(0.012)
Divorced	0.029*	0.029*	0.017	0.029*	0.030*	0.030*
	(0.012)	(0.012)	(0.013)	(0.011)	(0.012)	(0.012)
Has children	−0.033**	−0.033**	−0.032**	−0.033**	−0.033**	−0.033**
	(0.009)	(0.009)	(0.010)	(0.009)	(0.009)	(0.009)
Family size	0.001	0.001	0.002	0.001	0.001	0.001
	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)
Weeks unemployed	0.001**	0.001**	0.001*	0.001*	0.001*	0.001*
	(0.0005)	(0.0005)	(0.0006)	(0.0005)	(0.0005)	(0.0005)
Crowding	0.067**	0.066**	0.060**	0.066**	0.067**	0.067**
	(0.020)	(0.020)	(0.021)	(0.020)	(0.020)	(0.020)
Log of house value	−0.035**	−0.035**	−0.033**	−0.035**	−0.035**	−0.035**
	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)
Vacancy rate	−0.021	−0.020	−0.004	−0.019	−0.022	−0.022
	(0.056)	(0.056)	(0.057)	(0.056)	(0.056)	(0.055)
Gentrification		−0.009	−0.009	−0.004	0.010	0.011
		(0.011)	(0.011)	(0.013)	(0.016)	(0.016)
Potentially gentrifying		0.007	0.004	0.005	0.006	0.005
		(0.008)	(0.009)	(0.009)	(0.012)	(0.012)
Property tax bill			−0.002			
			(0.001)			
Assessment limitation (1 = yes)				0.013		0.012
				(0.008)		(0.008)

(continued)

Table 3. (continued)

	Model 5	Model 6	Model 7	Model 8	Model 9	Model 10
Gentrification × Assessment Limitation				−0.017		−0.010
				(0.023)		(0.024)
Potentially Gentrifying × Assessment Limitation				0.007		0.007
				(0.017)		(0.018)
Levy limitation					0.011	0.009
					(0.008)	(0.008)
Gentrification × Levy Limitation					−0.034	−0.032
					(0.021)	(0.022)
Potentially Gentrifying × Levy Limitation					0.0008	0.0006
					(0.016)	(0.016)
Constant	0.702**	0.697**	0.708**	0.701**	0.695**	0.699**
	(0.047)	(0.048)	(0.054)	(0.048)	(0.048)	(0.048)
Standard deviation of random intercepts						
State	0.012	0.012	0.011	0.011	0.012	0.011
County	0.028	0.028	0.030	0.029	0.028	0.028
Census tract	0.025	0.025	0.021	0.025	0.025	0.024
Person	0.088	0.089	0.089	0.089	0.088	0.089
Residual	0.350	0.350	0.346	0.350	0.350	0.350
N person–observations	22,113	22,113	19,386	22,113	22,113	22,113

Note. All models also include fixed intercepts for years; year-specific intercepts omitted. Standard errors in parentheses.
*$p < .05$. **$p < .01$.

gentrification. Others may be unable to afford the property tax increase. Model 7 tests whether property tax pressure on the household budget mediates the effect of gentrification, by controlling for property tax as a share of family income. We find no support for H2: Contrary to the hypothesis, the property tax share of income is negatively, not positively, associated with the probability of moving out, although the coefficient is not statistically significant, and the coefficient for gentrification is not measurably attenuated in Model 7, but remains indistinguishable from the corresponding coefficient in Model 6, and indistinguishable from zero. There is no evidence here that the effect of gentrification on the probability of moving out is mediated by property tax pressure.

Perhaps the coefficient of gentrification is suppressed by the presence in many states of property tax limitations that protect residents from displacement.

As Wyly et al. (2010) noted, displacement from gentrifying neighborhoods may be infrequent only because policies have been implemented to protect households from displacement; controlling for the presence of such policies would then reveal the suppressed association. We test this hypothesis in Models 8, 9, and 10. In Model 8, we introduce a dummy variable for the presence of an assessment limitation and an interaction term for gentrification and assessment limitations. The coefficient for assessment limitations is positively associated with displacement but not statistically significant at the .05 level. The interaction term suggests that living in a gentrifying Census tract within a jurisdiction that has an assessment limitation in place is associated with a decrease in the probability of homeowner displacement; however, this interaction term also is not statistically significant. We find no evidence for H3, the hypothesis that property tax assessment limitation moderates the effect of gentrification on the probability that long-term homeowners will move out.

We also find no evidence that property tax *levy* limitations reduce the probability that a homeowner in a gentrifying neighborhood will move out. In Model 9, we introduce a dummy variable for the presence of a levy limitation and an interaction term for gentrification and the presence of a levy limitation. The coefficient of 0.010 implies that in the absence of a property tax limitation, the probability of moving out is greater by 1.0 percentage points in a gentrifying neighborhood than in a potentially gentrifying neighborhood. In the presence of a property tax levy limitation, by contrast, the resident of the gentrifying neighborhood is less likely to move out by 2.4 percentage points (−2.4 = 1.0 − 3.4). We find similar results in Model 10, which controls for the presence of property tax assessment limitation. The direction of the coefficients is consistent with H4, that property tax levy limitations moderate the effect of gentrification on the probability that long-term homeowners move out, but we cannot reject the null hypothesis. The interaction between gentrification and property tax levy limitation is not statistically significant in either model.

These models provide some information about factors other than gentrification that *do* affect the likelihood of moving. Men in this sample are more likely to move than women, and White homeowners more than Black homeowners. Older residents and long-term residents are more inclined to stay put: The chance of moving is less by 0.4 percentage points per year of age, and 0.5 percentage points per year in residence, for every model in Table 3. Family relationships are associated with greater attachment to place: Married homeowners are less likely to move than single homeowners, and parents of coresident children are less likely to move than homeowners without children. Economic investments in place are also associated with residential attachment. The greater the value of the respondent's home, the less likely the respondent is to move: The coefficient of −0.035 for the natural logarithm of

housing value in Model 10, for example, corresponds to the difference in the probability of moving between a homeowner whose home was worth US$100,000 and another whose home was worth US$272,000. The tendency to hold onto valuable property may help to explain why some long-term homeowners choose to remain in gentrifying neighborhoods.

Would we find more consistent evidence of displacement from gentrifying neighborhoods if we restricted our attention to involuntary moves only? Table 4 reports the results of several regression models whose dependent variable is equal to one for an involuntary move, and zero otherwise. Model 11 is a baseline model that includes individual and household characteristics. Model 12 incorporates measures of gentrifying and potentially gentrifying neighborhoods. The coefficient for residence in a gentrifying Census tract is negative, small in magnitude, and statistically insignificant. There is no evidence here that gentrification causes homeowners to move involuntarily. Model 13 incorporates our measure of property tax pressure, property taxes paid as a percentage of family income. If gentrification increases the risk of displacement by making it difficult for income-constrained homeowners to afford their property taxes, then we should observe that a measure of the property tax bill as a share of family income is positively associated with moving out, and that the measured coefficient for gentrification is suppressed in a model that controls for the annual property tax bill as a share of family income (H2). In Model 13, property taxes as a share of family income are associated with a small, statistically significant increase in the likelihood of an involuntary move. The coefficient of 0.002 implies an increase of 0.2 percentage points in the probability of an involuntary move for each percentage point of family income that is spent on property taxes. However, controlling for property taxes as a share of family income does not measurably attenuate the coefficient for gentrifying neighborhoods in Model 13 relative to Model 12. Therefore, H2 is not supported. There is evidence here that property tax pressure sometimes can displace homeowners, but no evidence that such property-tax-induced displacement is more common in gentrifying neighborhoods than in nongentrifying neighborhoods.

Nor do we find any evidence that property tax limitations protect homeowners in gentrifying neighborhoods from involuntary displacement. Model 14 tests whether the coefficient of residence in a gentrifying neighborhood differs between states with and without property tax assessment limitation laws; Model 15 tests whether it differs between states with and without property tax levy limitation laws; and Model 16 controls for the presence of both types of property tax limitation policy. None of these models reveals any suppressed association between gentrification and involuntary moves. The coefficients for residence in a gentrifying neighborhood *without* the protection of

Table 4. Gentrification, Property Taxes, and Homeowners' *Involuntary* Residential Moves: Results of Hierarchical Linear Regression Models.

	Model 11	Model 12	Model 13	Model 14	Model 15	Model 16
Female	−0.0006	−0.0007	−0.001	−0.0008	−0.0006	−0.0007
	(0.006)	(0.006)	(0.007)	(0.006)	(0.006)	(0.006)
Black	−0.006	−0.007	−0.003	−0.007	−0.007	−0.007
	(0.004)	(0.004)	(0.005)	(0.004)	(0.004)	(0.004)
Hispanic	−0.018*	−0.019*	−0.016*	−0.019**	−0.019*	−0.019**
	(0.007)	(0.007)	(0.008)	(0.007)	(0.007)	(0.007)
Other	−0.009	−0.010	−0.005	−0.010	−0.010	−0.010
	(0.014)	(0.014)	0.015	(0.014)	(0.013)	(0.014)
Education	−0.002**	−0.002**	−0.002*	−0.002**	−0.002**	−0.002*
	(0.0008)	(0.0008)	(0.0008)	(0.0008)	(0.0008)	(0.0008)
Time in residence	0.0003	0.0003	0.0005	0.0003	0.0003	0.0003
	(0.0003)	(0.0003)	(0.0003)	(0.0003)	(0.0003)	(0.0003)
Log of income	0.0001	0.0003	0.004	0.0003	0.0002	0.0003
	(0.002)	(0.002)	(0.003)	(0.002)	(0.002)	(0.002)
Age	−0.0005**	−0.0005**	−0.0005**	−0.0005**	−0.0005**	−0.0005**
	(0.0001)	(0.0001)	(0.0002)	(0.0001)	(0.0001)	(0.0001)
Married	−0.008	−0.007	−0.015*	−0.007	−0.007	−0.007
	(0.006)	(0.006)	(0.007)	(0.006)	(0.006)	(0.006)
Divorced	0.008	0.008	−0.002	0.008	0.008	0.008
	(0.006)	(0.006)	(0.007)	(0.006)	(0.006)	(0.006)
Has children	−0.001	−0.001	0.0008	−0.001	−0.001	−0.001
	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)
Family size	−0.001	−0.001	−0.001	−0.001	−0.001	−0.001
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
Weeks unemployed	0.0007**	0.0007**	0.0003	0.0007**	0.0007**	0.0007**
	(0.0003)	(0.0003)	(0.0003)	(0.0003)	(0.0003)	(0.0003)
Crowding	0.012	0.012	0.013	0.011	0.012	0.011
	(0.010)	(0.010)	(0.010)	(0.010)	(0.010)	(0.010)
Log of house value	−0.0007	−0.0004	−0.003	−0.0006	−0.0004	−0.0006
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
Vacancy rate	−0.016	−0.016	−0.013	−0.015	−0.016	−0.016
	(0.031)	(0.031)	(0.033)	(0.031)	(0.031)	(0.031)
Gentrification		−0.003	−0.002	0.003	−0.006	−0.002
		(0.005)	(0.006)	(0.006)	(0.008)	(0.008)
Potentially gentrifying		0.009	0.006	0.007	0.012*	0.010
		(0.004)	(0.005)	(0.005)	(0.006)	(0.006)
Property tax bill			0.002**			
			(0.0006)			
Assessment limitation				0.005		0.005
				(0.004)		(0.004)

(continued)

Table 4. (continued)

	Model 11	Model 12	Model 13	Model 14	Model 15	Model 16
Gentrification × Assessment Limitation				−0.019		−0.021
				(0.012)		(0.012)
Potentially Gentrifying × Assessment Limitation				0.008		0.010
				(0.009)		(0.009)
Levy limitation					0.001	0.001
					(0.004)	(0.004)
Gentrification × Levy Limitation					0.006	0.009
					(0.010)	(0.011)
Potentially Gentrifying × Levy Limitation					−0.006	−0.008
					(0.008)	(0.008)
Constant	0.113**	0.105**	0.089**	0.106**	0.104**	0.106**
	(0.024)	(0.025)	(0.029)	(0.025)	(0.025)	(0.025)
Standard deviations of random intercepts						
State	0.006	0.006	0.007	0.004	0.006	0.004
County	0.000	0.000	0.000	0.000	0.000	0.000
Census tract	0.014	0.014	0.009	0.014	0.014	0.014
Person	0.094	0.094	0.106	0.094	0.094	0.094
Residual	0.151	0.151	0.145	0.151	0.151	0.151
N person–observations	22,113	22,113	19,386	22,113	22,113	22,113

Note. All models also include fixed intercepts for years; year-specific intercepts omitted. Standard errors in parentheses.
*$p < .05$. **$p < .01$.

a property tax limitation are statistically insignificant and trivially different from zero in every model, and they are negative in Models 15 and 16. There is no support for H3 or H4 in these models.

In summary, we find no evidence that gentrification directly displaces long-term homeowners by increasing their property taxes. We also find no evidence that property tax limitation laws provide income-constrained homeowners in gentrifying neighborhoods with any measurable protection against involuntary displacement. In states that are not subject to any property tax levy limitation, gentrification is positively correlated with an increased propensity of homeowners to move out, but the relevant coefficient is slight, it is not statistically distinguishable from zero at the 5% confidence level, and we find a positive coefficient only when the dependent variable includes residential moves that survey respondents described as taking place for voluntary reasons.

Conclusion: Why Doesn't Gentrification Drive Out More Homeowners?

These findings provide what is, to our knowledge, the first direct test of the hypothesis that gentrification displaces homeowners by causing their property taxes to increase. This hypothesis has long been a staple of social science and policy discourse about gentrification. By testing whether the hypothesized mechanism operates, and how its operation may vary across states and institutional contexts, over the period from 1987 to 2009, this study advances our understanding of gentrification. It also may help to reconcile conflicting findings from prior studies of gentrification and displacement, which generally cover a smaller geography, time period, or segment of the housing market. Studies that find the least evidence of displacement, for example, tend to be those that include both renters and homeowners (Ellen and O'Regan 2011; McKinnish, Walsh, and White 2011; Vigdor 2002). Our results imply that such studies may conclude that there is little displacement because they overlook substantial differences between homeowners and renters, not only in the average risk of displacement conditional on gentrification but also in the *mechanisms* of displacement, and the policy parameters that may moderate the operation of those mechanisms.

With respect to renters, we have replicated and extended Freeman's (2005) influential study of displacement. We have reproduced and updated his finding that gentrification is associated with involuntary moves. Our findings also provide some quantitative context for interpreting this result. A renter in a gentrifying neighborhood is more likely than another renter to move in any given biennial period, and to report that the move was involuntary, by 2.6 percentage points; this is greater than the difference between residents of subsidized and unsubsidized units, and similar to the difference between a married renter and one who is divorced. If we think that divorce or the loss of a rental subsidy makes a substantial difference for the likelihood of an involuntary move, then we may say the same of gentrification.

With respect to homeowners, by contrast, the same method produces no evidence of displacement from gentrifying neighborhoods. The greater rootedness of homeowners may be, at least in part, a result of their greater place-specific social attachments. Compared with the average renter, the average homeowner in the PSID is older, has lived for a longer time in his or her current residence, and is more likely to have a spouse and children—who may, in turn, have attachments of their own to jobs, schools, or community institutions in the neighborhood. All of these are characteristics that would be associated with a reduced likelihood of moving regardless of ownership status. Homeowners also may have a greater economic interest in staying put.

Our models show that the greater the value of a home, the less likely the homeowner is to move. Most homeowners regard their homes at least in part as vehicles for savings. The promise of long-term capital appreciation may incline them to remain in gentrifying neighborhoods, even if gentrification increases the property tax burden in the short run.

We find that property tax pressure on homeowners sometimes contributes to involuntary moves—but such pressure is no more common in gentrifying neighborhoods than anywhere else. Why not? One possible reason is that the places where effective property tax rates are highest tend to be segregated Black communities (Martin and Beck 2016), which are precisely the communities that are least likely to be targets of new investment by affluent homebuyers (Hwang and Sampson 2014; McKinnish, Walsh, and White 2011). Another possible reason is that the administration of the property tax can introduce substantial slippage between the market value of a home and the assessed value recorded for tax purposes. Even ordinary delays and imperfections in the process of property tax assessment—say, a quadrennial assessment cycle, or a method of appraisal that happens to benchmark a property against comparable sales outside of the gentrifying neighborhood—may buffer homeowners against tax increases that might otherwise result from the fluctuating market value of their housing in a gentrifying place. Still a third reason is that homeowners may be more likely than renters to respond to the costs of gentrification with voice rather than exit (cf. Fischel 2001), and policy makers may be more likely to respond to them when they do so. If homeowners can pressure local government to shift the tax burden onto commercial or industrial property, or to raise other taxes instead of residential property tax, then they may be able to offset the costs of gentrification.

We find no evidence that state-level property tax policy regimes moderate the effect of gentrification on homeowners' residential mobility. In particular, there is no evidence that property tax limitation laws are protecting homeowners from involuntary displacement by rising property taxes. Property tax levy limitation may slightly reduce their incentive for voluntary moves. Such limitations impose austerity on the local public sector, thereby reducing variation in service quality across local areas, in a pattern that McMillen and Singell (2010, p. 63) have described as "leveling down" (see also Downes, Dye, and McGuire 1998; Figlio 1997; Figlio and Rueben 2001). This process could reduce the perceived public service advantage of affluent suburbs to which homeowners would otherwise move. But any such effect on the incentive to move voluntarily is too slight to be distinguished from zero in these models.

This negative result speaks to an important issue of public concern. For decades, neighborhood activists and policy makers have expressed concern

that gentrification may displace long-term homeowners by increasing their property taxes. Advocates of property tax limitation laws mobilized this fear of displacement in the late twentieth and early twenty-first centuries. Howard Jarvis, the author of Proposition 13, the most famous property tax limitation law, justified the policy by explaining that its purpose was "to save a couple of million people from losing their homes" (quoted in Schrag 1998, p. 146). The argument that property tax limitation provides protection against displacement in gentrifying neighborhoods informed Supreme Court jurisprudence on the constitutionality of Proposition 13 and of property tax limitation in general (*Nordlinger v. Hahn*, 505 U.S. 1). Most recently, property tax limitation has been proposed as a way to protect low-income residents against tax increases that might result from an influx of wealthy real estate speculators (Povich 2014; Seelye 2015; Williams 2014). All of these policy arguments rest on the theory that gentrification drives out long-term owners by driving up their property taxes. Whatever the merits of property tax limitation laws, our results suggest that they are poorly targeted remedies for the costs of gentrification, because the threat of displacement by rising property taxes is not usually any greater in gentrifying neighborhoods than anywhere else. If the goal is to protect long-term residents in gentrifying neighborhoods, then policies to stabilize the rental market should be a higher priority.

That is not to say that the property tax plays no role in neighborhood change. Future research should consider alternative pathways through which gentrification might result in a change in the population of local homeowners. One possibility is that succession plays a greater role in neighborhood change than direct displacement (Freeman 2005). Although our findings suggest that gentrification does not change the rate of homeowner out-mobility, rising property taxes might affect the flow of new residents moving into a gentrifying neighborhood. Because affluent newcomers could more easily afford the cost of higher property taxes, they may be more likely than potential homebuyers on restricted budgets to purchase a home in a gentrifying neighborhood once property taxes start to increase. Such a process could produce gradual turnover among local homeowners even if direct displacement is limited. Future research might also consider how long-term homeowners in gentrifying neighborhoods are able to adapt in those cases when their property taxes *do* increase. To what extent do they change their political behavior, for example, to demand offsetting tax cuts or subsidies? What financial strategies do homeowners use to compensate for the rising costs of remaining in a gentrifying neighborhood? These remain open questions.

The most general implication of the present study is that the mechanisms by which gentrification can affect the residential trajectories of long-term residents differ substantially between homeowners and renters, in ways that

may be obscured if analysts simply measure average rates of neighborhood turnover. For some neighborhood residents, gentrification may mean rising rent and the threat of eviction. For other residents, it may mean an opportunity to sell a home for an unexpected windfall gain. Both processes induce residential mobility. We might even imagine that some of the external costs of mobility for the neighborhood might be similar in the two cases: Either way, the community loses a long-term resident, which could have the effect of severing community bonds, and thereby depriving the neighborhood of the attendant capacities for collective action and informal social control. But despite any such similarities, the outcomes for individual lives and for socioeconomic inequality are likely to be substantially different in the two cases, because the experience of being evicted is not much like the experience of selling your home at a profit. Analyses of gentrification should distinguish carefully among mechanisms that produce residential mobility. Not all turnover in gentrifying neighborhoods is displacement—and not all displacement is the same.

Appendix A

Measuring Gentrification

Although we closely follow Freeman's (2005) operational definition of gentrification, we deviate in one important way to permit measurement of gentrification in nonurban areas. As Freeman (2005) explained, gentrification refers to the change in a neighborhood's social class composition over time, relative to other neighborhoods in the same area. Gentrification is usually considered an urban phenomenon, and Freeman, therefore, limited his focus to central city tracts, and measured gentrification by measuring tract-level changes in social class relative to the surrounding metropolitan area. But scholars report gentrification in suburban and rural areas as well. We, therefore, include all tracts, including noncentral-city and nonmetropolitan tracts, and we measure gentrification by measuring tract-level changes relative to the surrounding county. This is a straightforward extension of Freeman's (2005) measure to encompass urban, suburban, and rural settings.

We measured gentrification in Census tracts over three periods: 1980 to 1990, 1990 to 2000, and 2000 to 2010. To be at risk for experiencing gentrification in the decennial interval between Census year t_1 and Census year t_2, a tract had to meet two criteria. First, as of t_1, it had to exhibit a higher percentage of housing 30 years or older than the percentage in the surrounding county. This was our measure of relative divestment, which scholars have typically seen as a characteristic precondition of gentrification (Freeman 2005; Hammel and Wyly 1996; Smith 1996). Second, as of t_1, the Census tract had to exhibit

a median household income lower than that of the surrounding county. This was our indicator that a neighborhood was low-income relative to the surrounding county. If a Census tract met both of these conditions, then we coded it as "potentially gentrifying" during the interval from t_1 to t_2.

For a potentially gentrifying Census tract to be coded as *actually* gentrifying, it had to satisfy two additional criteria. First, between t_1 and t_2, the Census tract had to experience an increase in the percentage of the population 25 years old or older with at least a college degree, and this increase had to be greater than, or equal to, the increase in the percentage of the population 25 years old or older with at least a college degree in the corresponding county. Second, between t_1 and t_2, the Census tract had to experience an increase in the median home value, measured in constant dollars. If a potentially gentrifying Census tract met these additional conditions, then we determined that it was gentrifying between t_1 and t_2.

The measurement of gentrification at the Census-tract level is complicated by the fact that Census-tract boundaries may change between each decennial Census. To avoid confounding arbitrary geographic changes with true change over time in aggregate characteristics of the neighborhood, we relied on the Longitudinal Tract Database (LTDB) (Logan, Xu, and Stults 2014). Census tracts in the LTDB are standardized to 2010 Census-tract boundaries, thereby enabling the user to measure change within Census tracts over time (for details, see Logan, Xu, and Stults 2014). We relied on the LTDB for tract-level Census data on household income, educational attainment, percentage of the housing stock 30 years and older, home values, and population socioeconomic characteristics, for each of the Census years 1980, 1990, 2000, and 2010. We then merged these tract-level variables with county-level Census data on household income, educational attainment, percentage of the housing stock 30 years and older, home values, and population 25 years and older. Tract- and county-level Census aggregates for 2010 came from the 2006 to 2010 five-year sample of the American Community Survey. We adjusted home values for inflation using the Federal Housing Finance Agency's state-level quarterly House Price Index. We used second quarter indices, as the second quarter most closely corresponds to the April 1 date that the Census is administered.

We then matched each Panel Study of Income Dynamics (PSID) observation of a householder to the householder's Census tract of residence at the time of the interview. We relied on a restricted-access geocode matching file provided under special contract with the University of Michigan that included a Census-tract identifier for each PSID household observation. The PSID interviews conducted between 1986 and 1999 inclusive were indexed to Census tracts as defined for the 1990 Census; the PSID interviews conducted

between the years of 2000 and 2009 inclusive were indexed to Census tracts as defined for the 2000 Census. We refer to the indexed 1990 or 2000 tract as the "current tract." Because our measure of gentrification corresponded to standardized 2010 Census-tract boundaries, we assigned each PSID observation a value of the tract-level indicator of gentrification that was a weighted average of the values for all standardized 2010 Census tracts with which the respondent's current tract overlapped. Weights were proportional to the share of the current tract allocated to the 2010 Census tract under the combined population and areal weighting algorithm described by Logan, Xu, and Stults (2014).

To control for broader housing market conditions, we also matched each PSID household observation to the county-level housing vacancy rate, using information about the county of residence at the time of the interview. The county-level housing vacancy rate was computed as the total number of vacant housing units divided by the total number of housing units, both reported at the county level by summary tape files of the 1980, 1990, and 2000 Censuses. We assigned to each PSID observation the county of residence at the time of the interview, and assigned to each county the vacancy rate that had been measured in that county as of the most recent Census.

Appendix B

Property Tax Limitations

The purpose of this appendix is to describe our data on state laws that limit local residential property tax rates, levies, or assessments; to document the sources for these data; to explain our coding judgments where these are debatable; and, finally, to offer our data as a resource for housing scholars who wish to investigate the effects of property taxation. Where secondary sources disagree or are ambiguous, we have consulted primary sources. We list the years when a rate, assessment, or levy limitation was applied to property taxes levied by *all* regular local governments (including county, municipal, and school district) in the state. We limit our attention to limitations that are *mandatory*, meaning that local governments may not opt out, and that are *comprehensive*, meaning that they apply to all local governments within the state. We omit limitations that apply only to one category of government (county, municipality, or school district) if other categories of local government may continue to levy property taxes without a limitation of the same type; thus, for example, we would not count a levy limitation that applies only to school districts, but leaves counties and municipalities free to increase their own property tax levies, and therefore does not legally constrain the

growth of the total property tax burden from the standpoint of the taxpayer. If a subsequent act of legislation in the same state limited the increase of county and municipal property tax levies, then we would count the state as limiting the local residential property tax levy from that time forward. We also omit limitations that are advisory or nonbinding, limitations that are implemented at local discretion (often described as "local option"), limitations that apply only to specific local governments within a state, and limitations that apply to state property taxes but not local property taxes.

Alabama. Rate limitation, 1916–present.
The first local rate limitation, in 1875, applied only to county and municipal governments. School district property tax rates were limited in 1916 (Mullins and Wallin 2004). Rate limitations were tightened in 1972 by a bill called the "Levy Lid"; perhaps because of the name, Paquin (2015, p. 28) classified this rate limitation as a "levy limitation," but it did not limit the annual increase of the levy.

Alaska. Rate and levy limitations, 1972–present.
State law limited rates of municipal property tax and growth rate of municipal property tax revenues in 1972. Alaska does not have county government. Boroughs, which the Census treats as the equivalent of county governments for statistical purposes, are municipalities under Alaska law (see Alaska Stat. §29.04.030), and thus subject to the municipal property tax limitation. School districts do not levy property tax in Alaska (Verstegen and Jordan 2007). Thus, the municipal limitations reported by Mullins and Wallin (2004) in fact apply to all local property tax in Alaska.

Arizona. Rate, assessment, and levy limitations, 1980–present.
State law limited property tax levy of county and municipal governments, but not school districts, in 1913. The combination of rate limitations and assessment limitations in 1980 created a de facto limitation on the annual increase of the local property tax levy (Mullins and Wallin 2004).

Arkansas. Rate limitation, 1883–present; levy limitation, 1981–present; and assessment limitation, 2001–present.
The constitution of 1874 authorized local property tax for schools, subject to a rate limitation. County and municipal property tax rates were limited in 1883. A levy limitation applying to county, municipal, and school district property taxes became effective in 1981, and a limitation on assessment increases became effective in 2001 (see Arkansas Bureau of Legislative Research 2007; Paquin 2015).

California. Rate, assessment, and levy limitations, 1978–present.
Proposition 13, passed and immediately effective in 1978, limited the rate, the annual growth of assessed values, and thereby de facto the annual growth of total property tax levied by counties, municipalities, and school districts. See California (1978).

Colorado. Rate limitations, 1913–present, and levy limitations, 1913–1969.
Colorado's "levy limit law" of 1913 (Session Laws 1913, chap. 137, sec. 11) imposed several specific rate limitations covering local governments, and capped the annual growth of local property tax levies to 5% or less; the "Public School Foundation Act of 1969" removed the levy limitation from school districts, and replaced it with a limitation on the annual increase of school district budgets (see Colorado General Assembly 1982, p. 27; Session Laws 1969, chap. 299). The 1982 "Gallagher Amendment" fixed the ratio of residential to nonresidential property tax valuation in the aggregate at the state level but did not limit the annual increase of either; thus, Colorado is coded as having no assessment limitation. The "Taxpayer's Bill of Rights" (TABOR), enacted in 1992, limits the annual growth of total local revenues and total local expenditures, but limits increases in the local property tax levy only indirectly, and only to the extent that they either (1) arise from acts of legislation or (2) result in increases in total local revenues; certain increases in the property tax levy that are compensated by other tax cuts, for example, would not trigger the limit. For this reason, we follow Mullins and Wallin (2004) and do not code TABOR as a property tax levy limitation (cf. Paquin 2015).

Connecticut. None.
Connecticut has no statewide, mandatory limitation on the local property tax; statutory limitations apply to particular local governments or apply at the option of localities (see Paquin 2015).

Delaware. None.
The 1972 property tax levy cap applies to counties only (Mullins and Wallin 2004; Paquin 2015).

Florida. Rate limitation, 1968–present, assessment limitation, 1995–present, levy limitation 2008–present.
Florida limited the rate of school district property taxes effective 1855, and additional rate limitations were extended to county and municipal governments in 1968. The "Save Our Homes" homestead assessment limitation, enacted 1992, became effective in 1995. The principle of assessment limitation was extended to nonhomestead property in 2008, at which point the

combination of rate and assessment limitations created a de facto limitation on the increase of the property tax levy (Paquin 2015).

Georgia. None.
Georgia law has limited school and municipal property tax rates, but not county tax rates, and has authorized local governments to freeze assessment increases temporarily, but has not applied a comprehensive and mandatory limitation to levies or assessments (Paquin 2015).

Hawaii. None.

Idaho. Rate limitation, 1967–present; assessment limitation, 1980–1982; levy limitation 1979–1992.
A limitation on assessment increases, enacted in 1978 and effective 1980, was repealed in 1981, with repeal effective 1982 (see Dornfest 2006; Idaho State Tax Commission 2015). Levy limitations covering county, municipal, and school property tax levies were in effect from 1979 to 1992 (see Idaho State Tax Commission 2015; Mullins and Wallin 2004; Paquin 2015).

Illinois. Rate limitation, 1961–present.
Illinois statute limited the rate of county property tax in 1939, and statute law extended rate limitations to school districts and municipalities in 1961. The 1991 "Property Tax Extension Limitation Law" limited the annual growth of the property tax levy only in nonhome-rule counties contiguous to Cook County (Mullins and Wallin 2004, p. 5, fn. 1). We, thus, code Illinois as having no property tax assessment or levy limitation.

Indiana. Levy limitation, 1973–present.
Indiana's local governments have been subject to a property tax levy limitation since 1973 (Mullins and Cox 1995).

Iowa. Assessment limitation, 1978–present.
An Iowa state law, effective 1978, limited the annual increase of assessed values (Iowa Code §441.21(4); Mullins and Wallin 2004; Paquin 2015).

Kansas. Rate limitation, 1933–1989.
Kansas adopted a levy limitation in 1970 that did not apply to school property taxes. State statutes limited property tax rates of school districts effective 1989, at the same time that the existing rate limitation for municipal and county governments was repealed and replaced with a levy limitation (Helm 2015; Mullins and Cox 1995); because municipal and county rates have not been subject to a limitation after 1989, we code rate limitation as absent after that date.

Kentucky. Rate limitation, 1946–present; levy limitation, 1965–present.
The state of Kentucky limited county and municipal property tax rates in 1908, and school property tax rates in 1946, so we record the latter as the date of comprehensive and mandatory rate limitation. The state enacted mandatory levy limitations in 1965 (Paquin 2015; Vasek and Bradly 1980; cf. Mullins and Wallin 2004 who incorrectly record 1979).

Louisiana. Rate limitation, 1974–present, and levy limitation, 1978–present.
See Paquin (2015), Mullins and Wallin (2004), and Mullins and Cox (1995).

Maine. None.
The "Municipal Property Tax Levy Limit," enacted in 2005, specifically exempts local property taxes raised for schools or counties (see Maine State Office of Policy and Management 2015; Standard and Poor's Ratings Services 2013, p. 9). In contrast to Paquin (2015), we, therefore, code Maine as having no property tax levy limitation.

Maryland. Assessment limitation, 1957–present.
Maryland has had a homestead assessment limitation in place since 1957; it was amended in 1990 (Mullins and Cox 1995; Paquin 2015).

Massachusetts. Rate and levy limitation, 1980–present.
Massachusetts' "Proposition 2 1/2" applied rate and levy limitations to municipal governments (see Mullins and Wallin 2004, p. 4). Because all local property tax in Massachusetts is levied by municipal governments, this is a comprehensive and mandatory limitation.

Michigan. Rate limitation, 1949–present, levy limitation, 1978–present, and assessment limitation, 1994–present.
See Mullins and Wallin (2004), Mullins and Cox (1995), and Paquin (2015).

Minnesota. Assessment limitation, 1973–1979, 1993–2009.
The state of Minnesota enacted "limited market value" legislation, effective 1973, that limited the annual growth of assessed value for residential property. The legislation was repealed in 1979, and reinstated in 1993 (Baker and Hinze 1998). It was phased out fully, effective 2009 (Baker and Hinze 2009). Paquin (2015, p. 36) listed a series of levy limitations that applied to specific categories of local government (e.g., the 1971 "Minnesota Miracle," which included a property tax levy limitation that applied only to schools). We omit these because they were not comprehensive when taken singly or together.

Mississippi. Levy limitation, 1983–present.
Mississippi enacted levy limitations covering county and municipal governments, effective 1980, and covering school districts, effective 1983 (Mullins and Cox 1995; Paquin 2015).

Missouri. Rate limitations, 1875–present, and levy limitation, 1980–present.
Missouri has had rate limitations covering counties, municipalities, and schools since 1875, and levy limitations since 1980 (Mullins and Cox 1995; Paquin 2015).

Montana. Rate limitations, 1971–present; levy limitations, 1987–present.
The "phased assessment" provisions of Montana law require assessment increases to be phased in over time, but do not impose an absolute limit on the annual rate of increase. Mullins and Wallin (2004) incorrectly had the 1987 levy limitation covering only counties and municipalities; but see Montana Code Annotated §20-9-331, §20-9-333, §20-9-360, and §20-25-439.

Nebraska. Rate limitations, 1957–present.
The state enacted a local option property tax levy limitation in 1978 (see Nebraska Revised Statutes, chap. 77, sec. 3402); because it was neither comprehensive nor mandatory, we code Nebraska as having no levy limitation (cf. Paquin 2015). A levy limitation effective 1990 applied to counties and municipalities (Mullins and Cox 1995), but not to schools, which have independent taxing authority in Nebraska (Lacost, Inbody, and Knoche 1999).

Nevada. Rate limitations, 1936–present, levy limitations, 2005–present.
See Paquin (2015).

New Hampshire. None.
See Paquin (2015) and Mullins and Wallin (2004).

New Jersey. Levy limitation, 2007–present.
The annual increase in the county property tax levy was subject to a new limitation effective 1980 (Mullins and Cox 1995), but municipal and school property taxes remained unlimited until the 2007 Property Tax Cap Act (Standard and Poor's Ratings Services 2013).

New Mexico. Rate limitation, 1914–present; levy limitation, 1979–present; and assessment limitation, 2001–present.
The 1979 "yield control" provision coded by Mullins and Cox (1995, p. 42) as an assessment limitation merely limited the growth of the aggregate

valuation, not every individual parcel. In our coding scheme, it is therefore a levy limitation but not an assessment limitation. The state enacted a homestead assessment limitation effective 2001 (Paquin 2015; see N.M. Stat. §7-36-21.2).

New York. Assessment limitations, 2012–present.
The assessment limitation enacted in 2011 became effective 2012 for all local taxing units (Standard and Poor's Ratings Services 2013). Rate limitations, which have existed in New York since 1894, covered municipalities and counties but excluded most school districts in the state (Standard and Poor's Ratings Services 2013; see also Mullins and Cox 1995; Nguyen-Hoang 2013). Levy limitations enacted in the 1980s cover only a few counties (Mullins and Cox 1995).

North Carolina. Rate limitations, 1973–present.
School districts are dependent on county and municipal governments for property tax revenues (Testerman and Brown 1999), so we code county and municipal rate limitations, effective 1973 (Paquin 2015), as comprehensive.

North Dakota. Rate limitations, 1929–present; levy limitations, 1981–present.
See Paquin (2015). Mullins and Wallin (2004) listed the 1981 levy limitation as covering municipalities and counties only, but North Dakota Legislative Council (2013) made clear that levy limitations covered school districts as well.

Ohio. Rate limitations, 1929–present; levy limitations, 1976–present.
See Paquin (2015) and Mullins and Cox (1995).

Oklahoma. Rate limitations, 1933–present; assessment and levy limitations, 1996.
See Mullins and Wallin (2004), Mullins and Cox (1995), and Paquin (2015). The assessment limitation provisions, effective 1996, together with the rate limitations already in place, produce a de facto limitation on the annual increase of the property tax levy.

Oregon. Rate limitations, 1991–present; assessment limitations, 1980–1985, 1997–present; levy limitations, 1916–present.
See Paquin (2015) and Oregon Department of Revenue (2009).

Pennsylvania. Rate limitations, 1965–present; levy limitation, 2006–present.

School district rates were limited in 1949, county rates in 1955, and municipal rates in 1965 (see Paquin 2015). A levy limitation was enacted in 2006 (see Standard and Poor's Ratings Services 2013). Earlier levy limitations were not comprehensive (see Pennsylvania Local Government Commission 2007, n. 33).

Rhode Island. Levy limitations, 1985–present.
As with other New England states, all local property taxes in Rhode Island are levied by municipal governments, so the municipal levy limitation enacted in 1985 (see Mullins and Wallin 2004) covers all local property taxing jurisdictions.

South Carolina. Assessment limitation, 2007–present; levy limitation, 1995–present.
Act 388, passed in 2006 and effective 2007, limits the annual increase of individual assessments and local property tax levies (Standard and Poor's Ratings Services 2013; cf. Paquin 2015 who codes it as an assessment limitation only). Perhaps because of the name, Paquin (2015, p. 44) classified the "rollback millage rate limit" of 1995 as a rate limitation; we classify it instead as a levy limitation, because it did not impose a fixed limit on the property tax rate, but instead imposed a limitation on the annual growth of local government property tax levy (see S.C. Code §6-1-320).

South Dakota. Rate limitations 1915–present, levy limitation 1997–present.
See Paquin (2015) and South Dakota Legislative Research Council (2005).

Tennessee. None.
See Mullins and Cox (1995), and Mullins and Wallin (2004).

Texas. Rate limitations, 1883–present; levy limitation, 1982–present; assessment limitation, 1998–present.
Mullins and Wallin (2004) recorded the rate and levy limitations, but omitted the homestead assessment limitation. Paquin (2015) correctly recorded the latter. See Tex. Tax Code § 23.23 (a).

Utah. Rate limitations, 1929–present; levy limitations, 1969–1986.
On rate limitations, see Mullins and Wallin (2004); on levy limitations, see Mullins and Cox (1995) and Paquin (2015).

Vermont. None.
See Mullins and Wallin (2004) and Paquin (2015).

Virginia. None.
A Virginian law enacted in 1975, sometimes characterized as a property tax levy limitation (cf. Paquin 2015), is a nonmandatory full disclosure law that permits local governments to increase the property tax levy after holding a public hearing (Mullins and Cox 1995). We, therefore, code Virginia as having no levy limitation.

Washington. Rate limitation, 1944–present; levy limitation, 1979–present.
A levy limitation, enacted in 1971, was extended to school districts in 1979 (Mullins and Cox 1995). An assessment limitation, enacted in 2000, was ruled unconstitutional before it took effect (cf. Mullins and Wallin 2004).

West Virginia. Rate limitation, 1932–present; levy limitation, 2004–present.
The 1990 "levy limitation" is ambiguously classified by Mullins and Cox both as a mandatory levy limitation (Mullins and Cox 1995, p. 37) and as a nonmandatory full disclosure law that permits local governments to increase the property tax levy after holding a public hearing (Mullins and Cox 1995, p. 56). The former classification as mandatory is correct (see West Virginia Code §11-8-6e (c)), but the law, as effective in 1990, was not comprehensive; it only applied to county and municipal property taxes. It was first extended to cover county boards of education in 2004 (see Higginbotham, Sen, and Gurley-Calvez 2009; cf. Paquin 2015). Paquin (2015) correctly dated rate limitations to 1932, instead of 1939, as Mullins and Cox (1995) and Mullins and Wallin (2004) did.

Wisconsin. Levy limitations, 2005–present.
An Act of 1993 limited the annual increase of the sum of school property tax levies and state school funding; because the state legislature determines the sum of state aid, this limitation is, in practice, a state limitation on local property tax raised by school districts. The county and municipal levy limitation became effective in 2005 (see Kava and Olin 2013).

Wyoming. Rate limitations, 1911–present.
See Paquin (2015) and Mullins and Wallin (2004).

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Note

1. Some of the data used in this analysis are derived from Restricted Data Files of the Panel Study of Income Dynamics, obtained under special contractual arrangements designed to protect the anonymity of respondents. These data are not available from the authors. Persons interested in obtaining Panel Study of Income Dynamics (PSID) Restricted Data Files should connect through the Internet at PSIDHelp@isr.umich.edu.

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