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PROPERTY TAX LIMITATIONS AND MOBILITY: THE LOCK-IN EFFECT OF CALIFORNIA'S PROPOSITION 13

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ABSTRACT

Proposition 13, adopted by California voters in 1978, mandates a property tax rate of one percent, requires that properties be assessed at market value at the time of sale, and allows assessments to rise by no more than 2% per year until the next sale. In this paper, we examine how Prop 13 has affected the average tenure length of owners and renters in California versus in other states. We find that from 1970 to 2000, the average tenure length of owners and renters in California increased by 1.04 years and .79 years, respectively, relative to the comparison states. We also find substantial variation in the response to Prop 13, with African-American households responding more than households of other races and migrants responding more than native-born households. Among owner-occupiers, the response to Prop 13 increases sharply as the size of the subsidy rises. Homeowners living in inland California cities such as Bakersfield receive Prop 13 subsidies averaging only $110/year and their average tenure length increased by only .11 years in 2000, but owners living in coastal California cities receive Prop 13 subsidies averaging in the thousands of dollars and their average tenure length increased by 2 to 3 years.

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Property Tax Limitations and Mobility: The Lock-in Effect of California's Proposition 13[1]

In 2003, financier Warren Buffett announced that he pays property taxes of $14,410, or 2.9%, on his $500,000 home in Omaha, Nebraska, but pays only $2,264, or 0.056%, on his $4 million home in California.[2] Although Buffet is known as an astute investor, the low property taxes on his California home are not due to his investment prowess, but to Proposition 13. Proposition 13, adopted by California voters in 1978, mandates a property tax rate of one percent plus the cost of interest on locally approved bonds. It also requires that properties be assessed at their market value at the time of purchase and allows assessments to rise by no more than the inflation rate or 2% per year, whichever is lower. Reassessment to full market value occurs only when the property is sold again. This means that as long as property values increase by more than 2% per year, homeowners gain from remaining in the same house because their taxes are lower than they would be on a different house of the same value. Prop 13 thus gives rise to a lock-in effect for owner-occupiers that increases stronger over time. Prop 13 also affects the rental market, both directly because it applies to landlords and indirectly because it reduces the turnover of owner-occupied homes.

Although California was the only state for many years to adopt such a radical property tax reform, Prop 13-style tax reforms are becoming increasingly popular.[3]

[1] We are grateful for comments from participants in the Harvard Public Economics seminar and for research support from the National Science Foundation under grant number 0212444.

[2] See Joseph T. Hallinane, "Schwarzenegger Adviser Buffett Hints Property Tax is Too Low," *Wall Street Journal*, August 15, 2003, p. A1. Note that Prop 13 benefits non-resident owners of California property such as Buffett, even though they avoid paying other California taxes.

[3] Several other states, including Massachusetts, Oregon, and Florida, adopted property tax limitations in the early 1980's, but these provisions limited the growth of property tax revenues at the jurisdiction level, not at the individual property level. The best known is Proposition 2 ½ in Massachusetts, adopted in 1980, which capped the property tax rate at 2 ½ percent and limited the increase in cities' and towns' property tax revenues to a maximum of 2 ½ percent per year. On Prop 2 ½, see Cutler et al (1999) and Lang and Jian (2004).

Florida adopted a similar property tax reform in the late 1990's and Maine adopted the identical tax reform in November 2004.[4]

In this paper, we test the lock-in effect of Prop 13 on California owners and renters. We find that, holding everything else constant, from 1970 to 2000 the average tenure length of owners and renters in California increased by 1.04 years and .79 years, respectively, relative to the increases in average tenure length of the same groups in other states. These figures amount to increases of 9% and 18%, respectively, in the average tenure length of owners and renters. We also find that the lock-in effect of Prop 13 varies substantially across demographic groups, with African-American households responding more than other racial groups and migrants to California responding more than native-born Californians. Among owner-occupiers, we also find that the response to Prop 13 increases sharply as the subsidy rises: as of 2000, owners with subsidies of $110 (typical of residents of Bakersfield) had increased tenure length of .11 years, but owners with subsidies of $1400 per year (typical of the Los Angeles basin area) had increased tenure length of more than 2 years, and residents of the Bay area had increased tenure length of three years or more.

The paper is arranged as follows. Section I describes Prop 13 and other property tax limitations. Section II discusses the prior literature and section III sketches a theory of how property tax limitations affect mobility. Section IV describes the data and presents regression results. Section V examines how the responsive to Prop 13 varies with the size of individual households' subsidies. Section VI concludes.

I. Property Tax Limitations

California. Proposition 13 was adopted by voter referendum in California in 1978. It rolled property assessments back to the level that prevailed when the owner acquired the property or in 1975-76, whichever was later. It also limited assessment increases to the inflation rate or two percent per year, whichever is lower, until the next time the

[4] The Maine measure is identical to Prop 13 in its treatment of property taxes and it also applies to both residential and commercial property. However, Maine's proposition differs from Prop 13 in that it is not part of the Maine constitution. Also while Prop 13 also required that future state taxes in California be passed by a two-thirds margin, Maine's proposition contains no analogous provisions. Information about the Maine property tax cap is at news.mainetoday.com/indepth/taxreform/040516taxnugget.shtml. The Florida property tax limitation is discussed below.

property is sold. At that point, reassessment to current market value occurs. Prop 13 also limited the property tax rate to one percent of assessed value plus the cost of pre-existing debt and it barred state or local governments from imposing any other taxes on property. These provisions applied to all types of property. An additional amendment adopted in 1978 allows homeowners to petition for their assessments to be reduced to market value if the Prop 13 assessment is greater than market value. If market value later increases to more than the Prop 13 assessment, then the assessed value of the property shifts back to its Prop 13 assessment. Finally, later amendments allowed homeowners to transfer ownership of the house within the family without losing their Prop 13 assessments and allowed homeowners who are at least 55 years of age to take their Prop 13 assessments with them when they move, as long as the new residence is of equal or lower value.[5]

Since 1978, local governments have been given the power to establish various types of special districts that issue property tax-financed bonds or levy per parcel charges on properties within their boundaries. These charges are in addition to the 1% property tax rate. Some of the additional charges require voter approval by a two-thirds majority, while others require only a simple majority vote. Some are levied on all properties, while others are levied only on new development.[6]

To illustrate the long-term effect of Prop 13, suppose buyer A purchases a house for $100,000 in 1975 and buyers B, C and D purchase identical houses in 1985, 1995 and 2005. (We use 1975 because Prop 13 rolled assessments back to 1975.) Assume that the property tax rate is 1%, property values increase at a constant rate of 10% per year and the rate of inflation is 2% per year. By 1985, buyer A's property taxes have risen from $1,000 to $1,195 per year. But buyer B pays $235,800 for an identical house and receives a property tax bill of $2,358. As of 1995, buyer A's taxes have risen to $1,457, but buyer C pays $611,600 for the same house and has yearly taxes of $6,116. Finally in 2005—the 30th anniversary of Prop 13—buyer A's taxes have risen to $1,776, but buyer D pays $1,583,000 for an identical house and receives a property tax bill of $15,863.

[5] The latter provision applies to moves within the same county and to inter-county moves within California, if the origin and destination counties have joined a reciprocal agreement.

[6] An example is the "parcel tax" of $293 per year per property levied by the Palo Alto Unified School District on all properties in its boundaries. This tax, adopted in 2001, required a two-thirds majority vote. A proposal to raise the parcel tax was defeated in November 2004 (see www.pausd.org/community/downloads/supt/parceltax.pdf).

Thus buyer A receives a property tax subsidy of .01*$235,800 - $1,195 = $1,163 per year in 1985, $4,659 in 1995, and $14,087 in 2005. While these figures may seem high, they are much smaller than Warren Buffett's property tax subsidy of $37,830. Landlords receive the same benefit on their rental apartments.

From 1977 to 1987, the average property tax rate on single-family homes with FHA mortgages fell from .0221 to .0055 in California, or by 75%, compared to a decline from .0167 to .0115, or 31%, in the U.S. overall.[7]

Texas and Florida. Our comparison states are Texas and Florida, both large sunbelt states with high migration rates during the 1970 – 2000 period.[8] Texas and Florida have "traditional" property tax systems, meaning that properties are reassessed each year and assessments are set to equal market value.[9] Localities in each state determine the property tax rate and the rate is not subject to state-imposed limitations. But in 1992, Florida adopted a Proposition 13-style tax reform, which went into effect in 1995. The measure limited assessment increases for individual properties to the inflation rate or 3% per year, whichever is lower. Like Prop 13, assessments revert to market value only when a new sale occurs. Florida's property tax reform also limited the property tax rate to 2 percent. While Florida's tax reform is similar to Proposition 13, it has been in effect for a shorter time period and it does not limit property taxes nearly as tightly as Proposition 13.

Texas has a rule that, when local jurisdictions conduct a general reassessment of all properties, the jurisdiction's property tax revenues cannot increase by more than 8%. This limit differs from Prop 13 in that it applies to the combined value of all properties in the jurisdiction, not to individual properties. Texas also limits the maximum property tax rate, but the limit is above 2% per year. In the empirical work, we treat Texas as having no property tax limitations.

[7] See O'Sullivan, Sexton, and Sheffrin (1993), table 2.
[8] Using Texas and Florida as comparison states allows us to control for the increase over time in households' taste for living in warm climates.
[9] See O'Sullivan et al (1993), Table 3.

As of 1987, the average effective property tax rate was .009 in Florida and .014 in Texas, compared to .0055 in California. [10]

II. Prior Literature

Two previous studies have examined the effect of Proposition 13 on household mobility. Nagy (1997) estimated the change in mobility between 1975 and 1981, using data from three metropolitan areas in California and seven metropolitan areas outside of California. He found that mobility declined both in California and the comparison metropolitan areas and the difference between them was insignificant. Nagy attributed the decline in mobility to the fact that mortgage interest rates rose over the period, so that all households that moved were forced to pay higher interest rates. Our study has the advantage of using data for a longer period.

Stohs, Childs and Stevenson (2001) ran regressions explaining the percent of single-family detached houses that were sold during the 1995-2000 period in census tracts in two California metropolitan areas and in parts of Chicago and Boston. They found that the sale rate in California was lower, a difference that they attributed to Prop 13. One problem with their analysis is that they do not attempt to control for the probability of sale before the adoption of Prop 13. Thus if California had a lower sales rate than Illinois and Massachusetts as far back as the 1970's, their method would attribute the low sales rate in California to Prop 13.[11]

Another recent paper, by Ferreira (2004), examines the effect of the age 55 provision in California that allows households of this age to take their low assessments with them when they move. He finds that the probability of California households moving increases when the household head turns 55.[12]

O'Sullivan, Sexton, and Sheffrin (1993) and (1995) investigate the effect of Prop 13 on property tax receipts, using simulation methods.

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[10] See O'Sullivan et al (1993), Table 2. Also see ACIR (1995) for information on property tax limitations in all states.

[11] An additional complication is the adoption by Massachusetts of Proposition 2 ½ in 1980, which may have affected the probability of sale in Massachusetts during their period.

[12] See Wasi (2005) for an empirical study of moving behavior by California households that emphasizes the role of environmental amenities in location choice.

III. Theoretical Considerations

O'Sullivan, Sexton, and Sheffrin (1995) provide a simple model of the effect of property tax limitations on mobility of owner-occupiers. In their model, a representative household has a fixed lifespan of *N* years, during which it occupies *n* different housing units for *i* years each, so that $n = N/i$. Households' utility from living in any particular housing unit is assumed to decay over time at a constant rate *d*. This may be because the quality of the housing unit gradually declines or because the quality of the fit between the household and the housing unit declines, or a combination of both. Moving to a new housing unit is assumed to cost a fixed amount *C*. For owner-occupiers, *C* includes the costs of selling one house and purchasing another (including real estate agents' fees, the fixed cost of obtaining a new mortgage, and the cost of moving household goods), plus the costs of moving household goods. For renters, *C* includes the costs of finding a new apartment and the cost of moving household goods. Since the utility of remaining in the same housing unit declines over time while the cost of moving remains constant, households eventually prefer to move. Households choose the number of housing units they occupy over their lifetimes so as to maximize lifetime utility.

O'Sullivan et al show that this model has a closed form solution under a set of assumptions concerning functional form and we examine a variant of their model. Assume that the household utility function takes the additive form $U = H + X$, where *H* is lifetime housing consumption and *X* is lifetime consumption of other goods. Housing services per dwelling are denoted *h*. Because of decay, the housing services provided by a given dwelling after i years of occupancy are $h = \int_0^i (1 - dt)dt$. Lifetime housing services consumed by a household equal h times the number of houses occupied, or $H = hN/i$. The price per unit of housing services provided by a dwelling is *p*. If the discount rate is zero, then households' lifetime budget constraint is:

$$YN = X + phN/i + CN/i$$

where the three terms on the right hand side represent lifetime expenditure on other goods, lifetime expenditure on housing, and lifetime moving costs. Households maximize utility over the choice of tenure length, or the number of years spent in each dwelling. Their optimal tenure length per dwelling, $\tilde{i}$, is:

$$\tilde{i} = \frac{\sqrt{2C}}{\sqrt{d(1-p)}}$$

Here, tenure length increases as the cost of moving C rises and falls as the decay rate d rises. Also as the price of housing p increases, households' tenure length increases. This is because a higher price of housing reduces net income, so that the marginal utility of consuming other goods rises.

The effect of Prop 13 on owner-occupiers. Now consider how property tax limitations such as Prop 13 affect owner-occupiers' choice of tenure length. While the simple model just discussed has no explicit property taxes, Prop 13 can be thought of as an increase in the cost of moving, C. This is because when households reduce their tenure length from i years to $i-1$ years, they lose the Prop 13 subsidy for the i^{th} year for each house they occupy. Because the i^{th} year subsidy is the highest, losing it raises the cost of moving. The larger the Prop 13 subsidy, the stronger is the household's incentive to increase its tenure length.[13]

The effect of Prop 13 on renters. Now consider whether and how Proposition 13 affects renters' tenure length. Because Prop 13 treats all properties identically, individual landlords receive the same Prop 13 subsidies as homeowners, i.e., the Prop 13 subsidies depend on how long landlords have owned their rental housing units. However landlords are not under any legal obligation to pass their Prop 13 subsidies on to tenants, so that whether they do depends on conditions in the rental housing market. Landlords are likely to pass on their Prop 13 subsidies to tenants if there is excess supply in the rental housing market--the same conditions under which rents are likely to be low or falling. Similarly, landlords are unlikely to pass on their Prop 13 subsidies to tenants when there is excess demand for rental housing—the same conditions under which rents are likely to be high

[13] One feature of Prop 13 that the O'Sullivan et al model does not capture is the fact that it incorporates a put option. When the market value of housing declines or increases very slowly, the Prop 13 subsidy can become negative, since Prop 13 assessments never fall and may rise by up to 2 percent per year. However when this happens, owners can either petition to have their assessments lowered to market value or can move to a different house, where the new assessment will be equal to market value. These features imply that owners gain from increases in market value because their Prop 13 subsidies increase, but do not bear the full cost of losses in market value because their Prop 13 subsidies cannot be negative.

or rising. These factors suggest that whether individual tenants benefit from Prop 13 depends on conditions in the local rental housing market and on how long their landlords have owned the properties, rather than on individual tenants' tenure length. They also suggest that in the regressions explaining renters' tenure, controls are needed for local housing market conditions.

However Prop 13 is also likely to affect renters' tenure indirectly via its effect on households' propensity to shift from rental to owner-occupied housing. Suppose a typical household rents until (say) age 30 and then shifts to owning. Because of the Prop 13 lock-in effect, existing owner-occupiers move less often and therefore the supply of owner-occupied housing units offered for sale falls. While the Prop 13 lock-in effect also causes demand by households who are already owners to fall, demand by renter households who wish to become owners remains the same. Unless the supply of newly-built houses increases enough to fully offset the supply reduction, the price of owner-occupied houses will rise. This forces renter households to delay their transition to owning and therefore raises the demand for rental housing. Because households remain renters for longer, their average tenure length as renters increases.[14]

Thus Prop 13 is predicted to cause renters' tenure length to rise, because households spend more time as renters before becoming owners.

The effect of Prop 13 on incentives to migrate to California from other states. Finally, consider how Prop 13 affects households' decisions to move to California from other states. Suppose potential migrants to California are divided into two groups, frequent movers versus infrequent movers (corresponding to high versus low values of the decay parameter *d*). Infrequent movers have an incentive to move to California from other states, since they anticipate that they will benefit in the future from Prop 13; while frequent movers have an incentive to avoid California, since they will be harmed by Prop

[14] This story would suggest that, since the adoption of Prop 13, the homeowning rate should have risen more slowly or fallen faster in California than in Texas/Florida. In fact from 1970 to 2000, the average homeowning rate declined in the metropolitan areas that benefited the most from Prop 13 (see below for discussion of which metropolitan areas benefited more versus less from Prop 13). Specifically the rate declined by 2.8 percentage points in San Francisco, 2 percentage points in San Jose, and 0.6 percentage points in Los Angeles. In comparison it increased over the same period by 1.1 percentage point in Florida, but declined by 1.0 percentage point in Texas. The overall change in the average homeowning rate over the period in California was an increase of 1.3 percentage points.

13. This suggests that migrants to California from other states will tend to be selected from the group of infrequent movers, since the latter are willing to pay the most for California housing. As a result, migrant households are predicted to respond more strongly to Prop 13 than native-born California households.[15]

Summing up, this section suggests several testable hypotheses: (1) California owner-occupiers are predicted to increase their tenure length after the adoption of Prop 13 by more than owner-occupiers in other states over the same time period; (2) California renters are predicted to increase their tenure length after the adoption of Prop 13 by more than renters in other states over the same time period; (3) households who migrate to California are predicted to respond more strongly to Prop 13 than native-born California households; and (4) the lock-in effect of Prop 13 will depend on the size of the subsidy, so that it will be higher in areas where housing values are higher and/or increase more quickly.

IV. Data and summary statistics

Our data are taken from the Integrated Public Use Microdata Series (IPUMS, available at www.ipums.org), which combines a 1% random sample of households from the 1970 Census of Population and 5% random samples of households from the 1980, 1990 and 2000 Censuses of Population. We include all households living in metropolitan areas in California and, as a control group, all households living in metropolitan areas in Florida and Texas. Florida and Texas are used as control states because, like California, they are large sunbelt states that experienced substantial immigration during our sample period. Our sample includes all metropolitan areas that met the Census definition of a metropolitan area as of 1970. Households with heads less than 25 years of age are

[15] An offsetting factor is that frequent movers among native-born Californians have an incentive to leave the state, while infrequent movers among native-born Californians have an incentive to stay. But moving costs are likely to make the selection effect for migrants stronger than that for natives. This is because migrants to California are only observed if they actually migrated from another state, meaning that their gains from moving exceed their moving costs. However native-born Californians are observed as long as they did not leave for another state, meaning that their gains from moving were less than their moving costs.

dropped. Unweighted sample sizes are approximately 48,000 in 1970 and between 350,000 and 450,000 in each of the later years.

Households' tenure length in their current housing units is coded in intervals of up to 1 year, 2-5 years, 6-10 years, 11-20 years, 21-30 years, and more than 30 years. We set individual households' tenure length at the midpoint of the relevant range, or 40 years for those whose tenure length is more than 30 years.[16]

V. DD and DDD models of the lock-in effect

We estimate a treatment effects model. Our basic specification is:

$$Y_{hmt} = aA_m + bB_t + bT_{st} + dX_{hmt} + e_{ist} \qquad (1)$$

Here, the household index is *h*, the time index is *t*, and the location index is either state *s* or metropolitan area *m*. Y_{hmt} is the number of years that household *h* in metropolitan area *m* in year *t* has lived in its current residence, A_m is a set of dummy variables for metropolitan areas (Austin, Texas is omitted) and B_t is a set of year dummy variables (1970 is omitted). We include metropolitan area dummies rather than state dummies to take account of differences across metropolitan areas in average tenure length that existed prior to the adoption of Prop 13.[17] The treatment effect T_{st} consists of three separate state-year interactions for California households in each of the years when Prop 13 was in effect, i.e., 1980, 1990 and 2000. The three b coefficients measure the difference-in-difference (DD), or the change in average years of tenure from 1970 to 1980 or later years for California households minus the change in average years of tenure for Texas/Florida households over the same period. Because Prop 13 is predicted to have an

[16] For 1970, the categories are less than one year, 2 years, 3 years, 4-6 years, 7-10 years, 11-20 years, more than 20 years, and "always lived here." We code more than 20 years as 35.5 years and "always lived here" as age of the household head minus 14.

[17] Average tenure length by metropolitan area in 1970 ranges from 7.2 years in Fort Lauderdale-Hollywood-Pompano Beach FL to 13.4 years in Beaumont-Port Arthur-Orange TX. In California in 1970, the range is from 7.6 years in Ventura to 12.5 years in Stockton.

increasing effect over time, we expect that the coefficients of the T_{st} variables will increase as more years have elapsed since 1970. Finally X_{hmt} is a vector of control variables that include individual household characteristics, individual house characteristics, and metropolitan area characteristics for each of the relevant years. We estimate (1) both with and without the control variables. Also since Prop 13 affects owners and renters differently, we estimate (1) separately for each group.

We also break the treatment effects down by race or migration status. To do so, we estimate a difference-in-difference-in-difference (DDD) model of the following form:

$$Y_{hmt} = aA_m + bB_t + cC_r + bI_{st} + b'I_{sr} + b''I_{rt} + b'''T_{rst} + dX_{hmt} + e_{ist} \qquad (2)$$

Here C_r is a set of dummy variables for race (white is omitted), I_{st}, I_{sr} and I_{rt} are state-time, state-race and race-year interactions, respectively, and T_{rst} is a set of interactions of California, years after 1970, and races other than white. The coefficient b''' measures the DDD for a particular racial group relative to whites, or the DD for the particular racial group minus the DD for whites over the same period.[18] The specification is the same when migration status is substituted for race. Again we estimate (2) both with and without the vector of control variables and we estimate it separately for owners versus renters.[19]

A. Results without control variables

Table 1A gives average tenure length by year, separately for owner-occupiers versus renters and for residents of California versus Texas and Florida. Average tenure length for owner-occupiers in California in 1970 was 10.76 years, compared to 10.65 years for Texas/Florida residents in the same year. By 2000, these figures had risen to 13.43 years in California versus 11.65 years in Texas and Florida. Table 1A also gives the difference-in-difference for California versus the other states. From 1970 to 2000, it was

[18] See Gruber (1994) for discussion of DDDs. Note that some households are counted as both African-American and Hispanic. We follow Betts (2000) in our coding of the race variables, as well as the education variables.

[19] We were unable both to use interval regression and to cluster the error terms. If we use interval regression but do not cluster the error terms, the coefficients remain virtually the same.

1.66 years, or 16% of the average tenure length in 1970. Because of the large sample sizes, all of these figures are highly statistically significant.[20]

Turning to renters, average tenure length in 1970 was 4.30 years in California versus 4.09 years in Texas and Florida, but by 2000 it had increased to 5.25 years in California, while remaining constant at 4.07 years in Texas and Florida. The difference-in-difference from 1970 to 2000 was .97 years, or 23% of the average tenure length in 1970. The large DD figure for renters in California is surprising, since Prop 13 has a more indirect effect on renters than on owners. All of the figures in table 1A are strongly statistically significant.

Table 1B breaks these figures down by race, where the categories are whites, African-Americans, Hispanics, and Asians.[21] The table gives the difference-in-differences for white households in California versus Texas/Florida between 1970 and later years and it also gives DDD figures for other races relative to whites. For white homeowners, the DD from 1970 to 2000 is 2.12 years. A surprising result is that African-American homeowners responded more strongly to Prop 13 than white homeowners—the DDD for African-American owners relative to white owners is 1.40 years from 1970 to 2000. This means that African-American owners' tenure length in California relative to Texas/Florida increased over the period by 1.40 years more than the same increase for white owners. The same pattern holds for renters: the DD for whites is 0.71 years from 1970 to 2000, while the DDD for African-American relative to white renters is 1.96 years from 1970 to 2000. These results are consistent with the hypothesis that African-Americans faced a more restricted menu of housing choices than whites because of discrimination, and therefore responded more strongly when their incentive to stay put increased under Prop 13.

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[20] Each of the figures in table 1A is computed from a separate regression. The average tenure length for California homeowners in 1970 is computed by regressing tenure length of California homeowners in 1970 on a constant term. The DD figure for owners from 1970 to 1980 is computed by estimating (1) without the control variables, using owners in all three states in 1970 and 1980 as the sample. The DD figure is the coefficient of California*1980. The same procedures are followed in the rest of table 1A and in tables 1B and 1C. Robust standard errors are given in parentheses.

[21] Households are coded as Hispanic if they identify themselves as white with Hispanic origin (Mexican, Mexican-American, Puerto Rican Cuban, Central American, South Dominican or other Hispanic). A fourth category, "other races," is not reported. It includes Eskimos, Aleuts, Pacific Islanders and American Indians.

Table 1C breaks the figures down by migration status, where the categories are (1) households living in the head's state of birth ("native-born"), (2) migrants that moved to the state from a different U.S. state ("out-of-state migrants"), and (3) immigrants that moved to the state from another country. As discussed above, the theory predicts that migrants will respond to Prop.13 more strongly than native-born households.

For native-born owner-occupiers, the difference-in-difference between tenure length in California versus Texas and Florida from 1970 to 2000 is only .16 years. But the DDD for migrants versus native-born homeowners over the same period is a strikingly large 3.37 years.[22] For native-born renters, the DD from 1970 to 2000 is .61 years—larger than the figure for homeowners, while the DDD for migrants versus native-born renters over the same period is .77 years. Thus, as the theory predicts, migrants to California from other states respond more strongly to Proposition 13 than native-born households, regardless of whether they were owners and renters. However immigrants responded less strongly to Prop 13 than native-born households—the DDD figures relative to native-born households from 1970 to 1990 and 2000 are mainly negative. This may be because there was a large increase in immigration to all three states over the period, so that many immigrant households had low tenure because they had been in the U.S. for only a few years. In the regressions below, we control for immigrant/migrant status.

These results suggest that Proposition 13 had several important effects. First, migrants to California from other states responded more strongly to Prop 13 than native-born California households, suggesting that California migrants were selected from the group of infrequent movers. Second, African-American households responded more strongly to Prop 13 than white or Hispanic households. Third, the response of renters to Prop 13 is surprisingly large—in some cases even larger in absolute terms than that of owners. This suggests that Prop 13 also had strong effects on tenants, both because landlords passed on part of their Prop 13 benefit to tenants on the form of lower rents and

[22] In 1970, native-born homeowners California had longer average tenure length than migrants from other states: 10.92 years versus 10.48 years, respectively. By 2000, the figures were reversed, with an average tenure of 15.53 years for migrants versus 13.01 for native-born households. The pattern is similar for renters in California; the average tenure length in 1970 was 4.52 years for native-born households versus 4.15 for migrants, while the 2000 figures are 5.84 for migrants versus 5.01 for native-born households.

because tenants found it more difficult to become homeowners after the adoption of Prop 13.

B. Results with control variables

In this section, we re-estimate eqs. (1) and (2) with the vector of control variables X_{hmt}. The household-level control variables are total income, income from welfare, the number of children in the household, and a dummy variable for the presence of children aged 6 or below. We also include a set of dummy variables representing the age of the household head (26-35 years of age is omitted), the head's marital status (single is omitted), the education level of the household head (high school dropout is omitted), the head's race (white is omitted), and the head's migration status (native-born is omitted). The detailed marital status variables are entered since being married, divorced or widowed often leads to a move and the detailed work status variables are entered since changing jobs or joining the armed forces or retiring may lead to a move. We also include several dummy variables for employment status: at work (which means being employed but not working at the time of the Census), self-employed, not self-employed, in the armed forces, and unemployed (not in the labor force is omitted). We also include several interactions of these categories, as well as a separate proxy for retirement, which equals one if the head is at least 65 and out of the labor force. A dummy variable for living in a large metropolitan areas is also included (small metropolitan areas are the omitted category). The individual-level housing variables are dummy variables for housing type (multi-family housing is omitted). The metropolitan area-level variables are the unemployment rate, the change in housing values over the previous ten years, and the increase in the population over the previous ten years.

Table 2 gives summary statistics for the control variables, broken down by year, by California versus Texas/Florida and by homeowner versus renter. For Texas/Florida to be good controls for California, the two states must have similar characteristics in 1970. In fact the 1970 figures are very similar for California versus Texas/Florida. The strongest exception is that California had more migrants from other states than Texas/Florida, 63% versus 51% for owners, respectively, and 65% versus 51% for renters, respectively. Also California had fewer African-American households than

Texas/Florida: 5% versus 10% for owners, respectively, and 10% versus 19% for renters, respectively. Over the period when Prop 13 was in effect, the percent of owners who were migrants from other states fell more sharply in California than in Texas/Florida; the decrease was from 63% in 1970 to 39% in 2000 in California, while the figure remained nearly constant at about 50% in Texas/Florida. For renters, the percent who were migrants from other states declined from 65% to 31% over the period 1970 to 2000 in California, compared to a smaller drop in Texas/Florida from 51% to 38% over the same period. In addition, California had more Asian immigration at an earlier date than Texas/Florida. In other respects, demographic changes were similar in California and the comparison states.

Table 3 gives the results of estimating eq. (1) with the vector of controls.[23] The results for owners are on the left and those for renters on the right. (Results for the metropolitan area dummies are not reported.) Robust standard errors clustered by state-year are shown in parentheses. The qualitative results are remarkably similar for owner-occupiers versus renters, although the coefficients tend to be smaller in absolute value for renters—not surprising since renters' average tenure length is much shorter. In both regressions, tenure length rises steeply with the age of the household head—households with heads greater than 65 have 13.2 additional years of tenure if they are owners and 5.7 additional years if they are renters, compared to heads aged 26-35. Tenure length falls with income and education and is lower for married, separated and divorced household heads than for single household heads. Households with young children have lower tenure length, presumably because they often move to accommodate the children's needs, but additional children in the household are associated with slightly greater tenure length. Living in a single-family detached house is associated with 4.7 and 1.3 additional years of tenure for owners and renters, respectively, compared to living in multi-family housing. Average tenure length for African-American and Hispanic households is longer than that for whites, regardless of whether they own or rent. Migrants from other states and

[23] In these regressions, households whose total income was top-coded are treated as having the highest income level, which was $75,000 in 1980, $400,000 in 1990, and $999,997 in 2000. To check for whether the results are sensitive to how the highest income levels are coded, we reran the regressions with additional dummy variables for households with top-coded income in each year and we also reran the regressions without the top-coded households. The results for the treatment variables were essentially unchanged.

immigrants both have shorter tenure than native-born households, regardless of whether they are owners or renters. Compared to households with heads who are out of the labor force, those who are employed or self-employed have shorter tenure length, while those who are retired have longer tenure length. The dummy variables for 1980, 1990 and 2000 indicate that tenure length increased over time. All of these variables are strongly statistically significant.

The difference-in-difference results are reported at the bottom of table 3 and collected in table 4A. For owners, the figures are -.14 years in 1980, .32 years in 1990 and 1.04 years in 2000. Only the figure for 2000 is statistically significant, but the results suggest that the effect of Prop 13 is increasing over time. For renters, the figures are 0 in 1980, .39 years in 1990 and .79 years in 2000, with only the 2000 figures being statistically significant. Both sets of figures are about 2/3rds the size of the raw difference-in-difference results shown in table 1A.

Table 4B gives the results of estimate eq. (2) with control variables, where we break the treatment variables down by race. Only the results for the treatment effects are shown, since the results for the control variables are very similar to those given in table 3. For whites, only the diff-in-diff from 1970 to 2000 for owners is statistically significant; it is 1.16 years compared to 2.12 years in table 1B. For African-American owners, only the DDD from 1970 to 1990 is statistically significant—it is 1.33 years. For African-American renters, the DDD from 1970 to 1990 is 1.8 years and the DDD from 1970 to 2000 is 1.7 years and both are statistically significant. Thus African-American households still respond much more strongly than whites to Prop 13 when we take account of demographic and market level factors. The DDDs for Asian owners from 1970 to 1990 and 2000 are 1.5 years and 1.86 years, respectively, and both figures are statistically significant. However the DDDs for Asian renters are large and negative, which is similar to the results in table 1B.

Finally, table 4C gives the results of breaking down the treatment effects by migrant status. Again the results show that migrants responded much more strongly to Prop 13 than native-born households. For owners, none of the difference-in-difference results for

native-born households are statistically significant, but the DDD results for migrants relative to native-born are large and statistically significant in both 1990 and 2000. The DDDs are 1.56 years from 1970 to 1990 and 1.51 years from 1970 to 2000. For renters, the diff-in-diff for native-born households from 1970 to 2000 is .49 years and is statistically significant, while the DDD figures for out-of-state migrants relative to natives are .44 years, .40 years, and .57 years from 1970 to 1980, 1990 and 2000 and all are statistically significant. Thus when we control for individual and metropolitan area characteristics, the result that migrants respond more strongly than native-born households continues to hold.

VI. Effects of higher Prop 13 subsidies

In this section we compute an individual-household specific measure of the Prop 13 subsidy and use it to examine how tenure length responds to increases in the subsidy level. The Census asks owner-occupiers both the market value of their homes and their property taxes. This allows us to compute a household-specific measure of the Prop 13 subsidy for homeowners in California, which equals (market value)*(property tax rate) – (actual property taxes). In the calculations, we use a property tax rate of 1.25 percent.[24] Note that this calculation of the Prop 13 subsidy ignores the fact that Proposition 13 also mandated a permanent reduction in the California property tax rate.

Table 5, top panel, shows how the average Proposition 13 subsidy varies by year and by metropolitan area, for all metropolitan areas in California. All figures are in 2000 dollars. Average subsidy levels rose for all metropolitan areas from 1980 to 1990, but fell in many metropolitan areas from 1990 to 2000. This generally reflects the pattern of housing price changes during the 1990's, when Southern California experienced a prolonged recession but Northern California did not. For comparison purposes, we also compute hypothetical "Prop 13 subsidies" for each Texas and Florida metropolitan area

[24] In 1980, the Census asked only for the combined amount paid for property taxes and insurance; while in 1990 and 2000, it asked separate questions concerning the amounts paid for property taxes and insurance. To separate property taxes versus insurance in 1980, we estimated a model of insurance costs, using all California owner-occupiers in 1990 and 2000 (see table A1). We used this model to predict insurance costs for California homeowners in 1980. The predicted property taxes for homeowners in 1980 is the combined expenditure on property taxes and insurance in 1980 minus the predicted cost of insurance.

in 1990 and 2000, using exactly the same procedure. These figures are shown in the lower half of table 5. Not surprisingly, they are smaller than the figures for California and are often negative—reflecting the fact that property values are lower in Texas and Florida and assessed values change frequently in response to changes in market value. The "subsidy" figures fell rather than rose in all but one of metropolitan area in Texas and Florida between 1990 and 2000.[25]

In order to examine the subsidy distribution, we code dummy variables for each quartile of the distribution, using separate distributions for California homeowners in 1980, 1990 and 2000. Table 6A, columns (1) – (3), shows the average value of the subsidy for each quartile. The distribution is quite unequal. In 1990, the average household in the lowest quartile received a subsidy equal to about one-tenth of the average subsidy in the highest quartile--$428 versus $4,188. In 2000, the distribution was even wider, mainly because the average in the lowest quartile fell to $102. In column (4) of table 6A, we show subsidy values for Florida homeowners in 2000, where the calculations use the statutory Florida property tax rate of 2%. The average subsidy varies from $193 in the lowest quartile to $2707 in the highest.

Table 6B gives mean tenure length by quartile for homeowners in California in 1980 through 2000 and in Florida in 2000. The striking result here is how strongly tenure length increased in the highest quartiles of the subsidy distribution. From 1980 to 2000, mean tenure length of California households in the highest quartile increased sharply from 10.3 to 16.8 years and mean tenure length in the next-to-highest quartile increased from 9.2 to 15.4 years. In contrast, mean tenure length in the lowest subsidy quartile fell from 13 to 9.6 years. These results suggest that the mobility response to Prop 13 varies strongly depending on the size of the individual household's subsidy and is very large for households in the top half of the subsidy distribution.

These figures may be influenced by other factors that affect mobility and/or by endogeneity, since longer tenure itself leads to higher subsidies whenever property values

[25] The "subsidy" values in Texas in 2000 are affected by the "Robin Hood" school finance plan, which transfers property taxes from richer to poorer school districts. Hoxby and Kuziemko (2004) show that the plan caused property values in richer/more urban Texas school districts to fall during the late 1990's.

increase by more than 2% per year. We therefore run a regression model explaining tenure as a function of the household-specific Prop 13 subsidy and other control variables, using instruments for the subsidy variable. Because the Prop 13 subsidy is positive only for California households in 1980-2000, we use a cross-section rather than a difference-in-difference specification.

The sample is homeowners in all three states in 1970, 1990 and 2000. We drop observations in 1980 because we cannot compute the Prop 13 subsidy as accurately in 1980 as in 1990 and 2000 (see the discussion above). Our regression model explains years of tenure as a function of the property tax subsidy (in dollars), the property tax subsidy squared, year dummies, metropolitan area dummies, and the same control variables as in table 3. We include both the subsidy and the subsidy squared, because responsiveness to the subsidy appears to increase as the subsidy gets larger. The coefficients of the subsidy and subsidy squared variables capture the change in tenure length in 1990/2000 per dollar increase in the 1990/2000 subsidy.

As an instrument for the subsidy, we use the predicted subsidy level if all households had tenure length of 10 years. To compute the predicted subsidy, we first regress the actual subsidy on tenure and the same control variables as in table 3, using separate regressions for California homeowners in 1990 and 2000. Then we predict the subsidy for each household assuming that it has tenure length of 10 years. We use 10 years because it is the average tenure length of homeowners in the three states in 1970. We also use the predicted subsidy squared as an additional instrument.

The OLS and IV regression results for the subsidy and subsidy squared variables are given in table 7A, with robust standard errors clustered by year-state given in parentheses. Column (1) shows that both the subsidy and subsidy squared variables are highly significant in the OLS regression. In the IV specification, the coefficients are slightly smaller and only the subsidy variable is statistically significant. Columns (3) and (4) repeat the regressions shown in columns (1) and (2), but drop observations in Florida in 2000, because these households also received property tax subsidies. The results are very similar to those in columns (1) and (2).

Table 7B gives the predicted effects of higher subsidies on tenure length, using the results in table 7A. We evaluate the effect on tenure length at the average subsidy levels prevailing in four different California metropolitan areas that represent the range of Prop 13 subsidy levels. Using the IV results in column (2), Prop 13 has little effect on average tenure length in Bakersfield, where the average subsidy is only $110, but it raises average tenure length by .77 years in Fresno, where the average subsidy is $450. However the effects of Prop 13 are much greater in coastal California cities. Tenure length increases by 2.3 years in Los Angeles/Orange County, where the average subsidy is $1400, and by 3.0 years in San Francisco/San Jose, where the average subsidy is $3500. The predicted effects are even larger if we drop Florida households in 2000 from the sample—5 years in San Francisco/San Jose. These results suggest that Prop 13 caused an enormous drop in mobility of owner-occupiers in the coastal areas of California.

These results suggest that an unintended result of Prop 13 is to transfer public funds from inland to coastal California residents. This is because, following the adoption of Prop 13, the state of California took over responsibility for funding public education. The combination of higher property values and uniform school spending would normally lead to a transfer of tax revenue from coastal to inland California, since property values are higher on the coast. But because Prop 13 holds down property tax collections, it reduces the transfer.

VII. Conclusion

In 1992, the U.S. Supreme Court upheld Proposition 13, in part on the grounds that it furthered the policy goals of increasing "local neighborhood preservation, continuity, and stability."[26] Our results suggest that Prop 13 definitely furthered continuity and stability, since it caused a substantial increase in the average tenure length of California households relative to that of households in other states. From 1970 to 2000, the average tenure length of California homeowners and renters increased by 1.04 and .79 years relative to that of homeowners and renters in the control states. These figures represent

[26] Nordlinger v. Hahn (US Law Week, 60 LW 4563-4574) (1992).

increases in average tenure of 10% and 19%, respectively. The large effect of Prop 13 on renters' tenure length is particularly striking and suggests that longer tenure by owner-occupiers forces younger households to delay their transition from renting to owning. We also find that African-American households responded more strongly to Prop 13 than white households and out-of-state migrant households responded more strongly than native-born households. From 1970 to 1990, the tenure length of African-American homeowners and renters increased by 1.3 years and 1.8 years, respectively, relative to that of white homeowners and renters; while from 1970 to 2000, the tenure length of migrant homeowners and renters increased by 1.5 years and .6 years, respectively, relative to that of native-born homeowners and renters. Finally, the effect of Prop 13 on mobility varies widely depending on the size of the subsidy, with the largest effects occurring in coastal California cities where the increase in property values has been greatest. From 1970 to 2000, average tenure length increased by less than one year in inland California cities, but by more than two years in the Los Angeles area and by three years in the Bay area.

Whether the Prop 13-induced increases in continuity and stability have been worth the cost in lost tax revenue and the resulting redistribution from inland to coastal California communities remain subjects for further research.

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Table 1A: Average Tenure Length for Metropolitan Area Residents (Years)

	1970	1980	1990	2000
Owners:				
CA	10.76 (.005)	11.13 (.005)	12.64 (.005)	13.43 (.005)
FL/TX	10.65 (.007)	10.35 (.005)	11.89 (.005)	11.65 (.005)
Diff-in-diff (DD) since 1970		.67 (.011)	.64 (.011)	1.66 (.011)
Renters:				
CA	4.30 (.004)	4.49 (.004)	4.67 (.003)	5.25 (.003)
FL/TX	4.09 (.006)	3.96 (.005)	3.54 (.003)	4.07 (.004)
Diff-in-diff (DD) since 1970		.31 (.009)	.92 (.009)	.97 (.009)

Notes: Figures in parentheses are standard deviations. The sample consists of households living in metropolitan areas in California, Texas and Florida in 1970, 1980, 1990 and 2000. All calculations use weights.

Table 1B: Differences in Tenure Length by Race Relative to Whites (Years)

	DD	DDD	DD	DDD	DD	DDD
	1970 to 1980		1970 to 1990		1970 to 2000	
Owners:						
White	.85 (.01)		.88 (.01)		2.12 (.01)	
African-American		0.44 (.04)		1.80 (.05)		1.40 (.05)
Asian		3.11 (.20)		2.38 (.20)		2.42 (.20)
Hispanic		-0.58 (.04)		-.15 (.04)		-1.10 (.04)
Renters:						
White	0.21 (.01)		0.63 (.01)		0.71 (.01)	
African-American		.84 (.03)		1.94 (.03)		1.96 (.03)
Asian		-1.93 (.12)		-2.54 (.12)		-2.38 (.12)
Hispanic		-.004 (.03)		.29 (.02)		.15 (.02)

Notes: DD indicates the difference-in-difference, or the change in average tenure length of white California households minus the change in average tenure length of white Texas/Florida households over the same time period. DDD indicates the DD for other household groups minus the DD for white households. The sample consists of households living in metropolitan areas in California, Texas and Florida in 1970, 1980, 1990 and 2000. Figures are calculated using weights.

Table 1C: Differences in Tenure Length by Migrant Status Relative to Native-born Households (Years)

	DD	DDD	DD	DDD	DD	DDD
	1970 to 1980		1970 to 1990		1970 to 2000	
Owners:						
Native-born	-.71 (.02)		-1.40 (.02)		.16 (.02)	
Out-of-state migrant		2.35 (.03)		3.68 (.03)		3.37 (.03)
Immigrants		.47 (.04)		.55 (.04)		-.26 (.04)
Renters:						
Native-born	-.16 (.02)		.58 (.02)		.61 (.02)	
Out-of-state migrant		.71 (.02)		.63 (.02)		.77 (.02)
Immigrants		.05 (.03)		-.25 (.03)		-.08 (.03)

Notes: DD indicates the difference-in-difference, or the change in average tenure length of native California households minus the change in average tenure length of native Texas/Florida households over the same time period. DDD indicates the DD for migrant/immigrant households minus the DD for native-born households. The sample consists of households living in metropolitan areas in California, Texas and Florida in 1970, 1980, 1990 and 2000. Figures are calculated using weights.

Table 2: Summary Statistics for Owner-Occupiers

	1970		1980		1990		2000	
Owners	**CA**	**FL&TX**	**CA**	**FL&TX**	**CA**	**FL&TX**	**CA**	**F**
	mean	mean	mean	Mean	mean	mean	mean	
Years in residence	10.76	10.65	11.13	10.35	12.64	11.89	13.43	
Income:								
Family total income ($)	13292	11053	27711	24108	57220	45625	83600	
Income from welfare ($)	30.94	13.33	74.45	49.79	113.39	88.09	28.19	
Race dummies:								
African-American	0.05	0.10	0.06	0.10	0.05	0.10	0.05	
Hispanic	0.11	0.10	0.11	0.11	0.14	0.14	0.18	
Asian	0.02	0.00	0.05	0.01	0.08	0.01	0.10	
Other races	0.00	0.00	0.01	0.00	0.01	0.00	0.03	
Education dummies:								
High school	0.30	0.26	0.27	0.28	0.19	0.23	0.17	
Some college	0.18	0.13	0.24	0.19	0.32	0.27	0.32	
Bachelor	0.09	0.08	0.12	0.12	0.19	0.18	0.21	
Post graduate	0.10	0.07	0.16	0.11	0.14	0.11	0.15	
Marital status dummies:								
Married	0.80	0.78	0.73	0.73	0.69	0.68	0.67	
Separated	0.01	0.01	0.02	0.02	0.02	0.02	0.02	
Divorced	0.05	0.05	0.10	0.09	0.11	0.11	0.12	
Widowed	0.10	0.13	0.10	0.13	0.11	0.14	0.10	
If children age <=6	0.21	0.20	0.16	0.16	0.17	0.15	0.16	
Number of children	1.41	1.31	1.08	1.00	0.94	0.84	0.97	
Age dummies:								
Age 36-45	0.24	0.21	0.22	0.20	0.25	0.23	0.24	
Age 46-55	0.26	0.23	0.21	0.19	0.20	0.18	0.25	
Age 56-65	0.18	0.19	0.19	0.18	0.17	0.17	0.17	
Age 66 up	0.17	0.21	0.18	0.23	0.22	0.26	0.23	
Migration status dummies:								
Born in state	0.24	0.40	0.28	0.38	0.31	0.32	0.34	
Migrant	0.63	0.51	0.57	0.52	0.49	0.53	0.39	
Immigrant & 0-10 years in US	n.a.	n.a.	0.03	0.02	0.03	0.02	0.02	
Immigrant & 11-20 years in US	n.a.	n.a.	0.04	0.03	0.06	0.04	0.08	
Immigrant & 21+ years in US	n.a.	n.a.	0.08	0.05	0.11	0.09	0.16	
Immigrant	0.13	0.09	0.15	0.10	0.20	0.15	0.27	
Metropolitan area size:								
If large metropolitan area	0.78	0.58	0.76	0.60	0.73	0.56	0.72	
If small metropolitan area	0.22	0.42	0.24	0.40	0.27	0.44	0.28	
Housing characteristics:								
Single family detached	0.93	0.94	0.87	0.85	0.85	0.84	0.82	
Single family attached	0.02	0.01	0.05	0.03	0.09	0.05	0.09	
Multi-family housing unit	0.05	0.06	0.08	0.12	0.06	0.10	0.06	
Employment status:								
At work & self-employed	0.11	0.11	0.12	0.10	0.13	0.11	0.11	
At work & not self-employed	0.63	0.60	0.60	0.58	0.57	0.55	0.54	
Not at work & self-employed	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Not at work & not self-employed	0.02	0.01	0.01	0.01	0.01	0.01	0.01	
At work & armed forces	0.01	0.01	0.01	0.01	0.01	0.00	0.00	
Not at work & armed forces	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Unemployed	0.02	0.01	0.02	0.01	0.02	0.02	0.02	
Retired	0.13	0.17	0.14	0.19	0.18	0.22	0.19	
Not in labor force	0.20	0.25	0.24	0.29	0.27	0.31	0.32	
	2.30	1.20	1.85	1.27	1.74	2.03	1.79	

Metropolitan area characteristics:								
Metropolitan area unemp rate								
Metropolitan area growth rate	31.44	36.90	17.28	38.34	27.87	27.82	14.21	1
% increase in average property value, previous 10 years	94.36	99.77	270.12	213.71	105.20	32.56	27.36	4
% increase in average property value since 1970	0	0	270.12	213.71	659.26	309.36	871.33	4
No. of observation (unweighted)	29985	18490	189507	153145	210676	176442	238174	2

Table 2, continued

Renters	1970 CA	1970 FL&TX	1980 CA	1980 FL&TX	1990 CA	1990 FL&TX	2000 CA	F
	mean	mean	mean	mean	mean	mean	mean	
Years in residence	4.30	4.09	4.49	3.96	4.67	3.54	5.25	
Income:								
Family total income ($)	8125	7440	14666	13824	29217	24568	40910	
Income from welfare ($)	143.41	43.72	337.29	132.08	610.66	194.46	281.61	
Race:								
African-American	0.10	0.19	0.11	0.18	0.10	0.19	0.10	
Hispanic	0.14	0.14	0.18	0.18	0.24	0.22	0.31	
Asian	0.03	0.00	0.05	0.01	0.08	0.02	0.11	
Other races	0.00	0.00	0.01	0.01	0.01	0.00	0.04	
Education:								
High school	0.29	0.23	0.28	0.29	0.21	0.24	0.19	
Some college	0.17	0.12	0.22	0.19	0.30	0.27	0.29	
Bachelor	0.07	0.07	0.09	0.09	0.14	0.14	0.16	
Post graduate	0.08	0.06	0.10	0.08	0.07	0.07	0.09	
Marital status:								
Married	0.48	0.56	0.38	0.42	0.41	0.39	0.41	
Separated	0.06	0.06	0.07	0.07	0.06	0.07	0.06	
Divorced	0.17	0.13	0.22	0.21	0.20	0.23	0.19	
Widowed	0.15	0.15	0.12	0.14	0.08	0.10	0.07	
If children age <=6	0.20	0.23	0.17	0.18	0.22	0.20	0.22	
Number of children	0.91	1.08	0.77	0.82	0.94	0.82	0.99	
Age:								
Age 36-45	0.19	0.20	0.19	0.18	0.26	0.25	0.29	
Age 46-55	0.17	0.16	0.13	0.13	0.13	0.12	0.18	
Age 56-65	0.14	0.14	0.11	0.11	0.08	0.08	0.09	
Age 66 up	0.18	0.19	0.16	0.18	0.13	0.14	0.12	
Migration status:								
Born in state	0.19	0.36	0.24	0.36	0.27	0.33	0.29	
Migrant	0.65	0.51	0.54	0.48	0.43	0.45	0.31	
Immigrant & 0-10 years in US	n.a.	n.a.	0.10	0.06	0.13	0.10	0.12	
Immigrant & 11-20 years in US	n.a.	n.a.	0.05	0.05	0.10	0.06	0.15	
Immigrant & 21+ years in US	n.a.	n.a.	0.06	0.05	0.07	0.07	0.13	
Immigrant	0.17	0.13	0.21	0.16	0.30	0.22	0.40	
Metropolitan area size:								
If large metropolitan area	0.84	0.64	0.82	0.65	0.78	0.61	0.78	
If small metropolitan area	0.16	0.36	0.18	0.35	0.22	0.39	0.22	
Housing characteristics:								
Single family detached	0.34	0.40	0.25	0.27	0.25	0.25	0.24	
Single family attached	0.04	0.03	0.06	0.05	0.08	0.06	0.07	
Multi-family housing unit	0.62	0.57	0.68	0.68	0.67	0.69	0.68	
Employment status:								
At work & self-employed	0.05	0.05	0.06	0.05	0.07	0.06	0.07	
At work & not self-employed	0.58	0.62	0.59	0.62	0.62	0.65	0.57	
Not at work & self-employed	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Not at work & not self-employed	0.02	0.02	0.02	0.02	0.01	0.01	0.01	
At work & armed forces	0.02	0.03	0.02	0.01	0.02	0.01	0.01	
Not at work & armed forces	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Unemployed	0.04	0.02	0.04	0.03	0.04	0.04	0.04	
Retired	0.15	0.16	0.14	0.16	0.11	0.12	0.10	
Not in labor force	0.28	0.26	0.27	0.27	0.24	0.22	0.30	
Metropolitan area characteristics:								
Metropolitan area unemp rate	2.35	1.23	1.85	1.26	1.76	2.07	1.80	

Metropolitan area growth rate	25.96	36.16	14.35	36.87	25.18	27.14	12.51	
% increase in average property value, previous 10 years	94.39	100.28	270.04	217.71	107.93	30.79	27.88	
% increase in average property value since 1970	0	0	270.04	217.71	669.52	311.62	893.16	
No. of observation (unweighted)	21635	9159.00	131579	71806.00	144912	90331	169507	

Table 3: Results of the Treatment Effects Model With Controls

OLS	Owner		Renter	
	Coef	Std.err	Coef	Std.err
Family total income	-9.E-06	1.E-06	-1.E-06	4.E-07
Income from welfare	0.00	0.00	-5.E-05	8.E-06
Race (compared to white):				
African-American	1.02	0.26	0.82	0.17
Hispanic	0.34	0.17	0.33	0.06
Asian	-0.44	0.23	-0.12	0.17
Other races	-0.15	0.11	-0.10	0.06
Education (compared to high school dropouts):				
High school	-0.29	0.16	-0.16	0.06
Some college	-1.06	0.18	-0.41	0.06
Bachelor	-1.65	0.11	-0.64	0.06
Post graduate	-1.69	0.13	-0.67	0.10
Marital status and children				
Married	-0.87	0.21	-0.86	0.05
Separated	-0.81	0.19	-1.29	0.08
Divorced	-0.66	0.11	-0.81	0.06
Widowed	1.75	0.14	-0.38	0.11
If children age <=6	-1.45	0.12	-0.15	0.04
Number of children	0.17	0.03	0.06	0.01
Age (compared to age 26-35)				
Age 36-45	2.51	0.12	1.21	0.11
Age 46-55	6.09	0.19	2.45	0.19
Age 56-65	9.92	0.41	3.82	0.19
Age 66 up	13.20	0.61	5.69	0.26
Migration status (compared to native born)				
If migrant from out-of-state	-1.49	0.21	-0.46	0.08
If immigrant	-3.25	0.22	-0.73	0.06
Housing characteristics (compared to multi-family housing unit)				
Single family detached	4.68	0.38	1.25	0.09
Single family attached	0.73	0.29	0.41	0.05
Employment status (compared to not in labor force):				
At work & self-employed	-0.14	0.30	0.06	0.07
At work & not self-employed	-0.54	0.20	-0.10	0.03
Unemployed	-0.79	0.15	-0.39	0.06
Retired	0.59	0.17	0.27	0.12
Year dummies				
Year = 1980	0.23	0.36	.013	0.20
Year = 1990	2.39	0.25	0.79	0.19
Year = 2000	2.60	0.22	1.12	0.15
Other variables and constant				
Year=1980*CA	-0.13	0.14	.0003	0.14
Year=1990*CA	0.32	0.34	0.39	0.22
Year=2000*CA	1.04	0.27	0.79	0.20
Metro pop growth rate, previous 10 yrs	-0.02	0.005	0.00	0.00
Metro unemployment rate	-0.02	0.25	-0.21	0.13
Metro housing value growth rate, previous 10 yrs	.003	.002	.003	.001
Constant	2.18	0.61	1.92	0.27
Metro dummies	yes		yes	
R-squared	.36		.16	

Table 4A: Difference-in-Difference Results

From the Regressions in Table 3

	1970 to 1980, CA vs TX/FL (years)	1970 to 1990, CA vs TX/FL (years)	1970 to 2000, CA vs TX/FL (years)
Owners:	-.14 (.14)	.32 (.34)	1.04** (.27)
Renters:	.0003 (.14)	.39 (.22)	.79** (.20)

Table 4B: Differences in Tenure Length by Race Relative to Whites (Years)

	DD	DDD	DD	DDD	DD	DDD
	1970 to 1980		1970 to 1990		1970 to 2000	
Owners:						
White	-.04 (.18)		.37 (.33)		1.16*** (.32)	
African-American		0.25 (.69)		1.33* (.66)		.79 (.55)
Hispanic		-0.14 (.25)		.46 (.41)		-.30 (.40)
Asian		1.59* (.70)		1.51** (.78)		1.86** (.75)
Renters:						
White	-.18 (.25)		0.06 (.32)		0.50 (.30)	
African-American		.79 (.78)		1.78** (.70)		1.70** (.68)
Hispanic		.43 (.48)		.54 (.33)		.30 (.26)
Asian		-2.13*** (.19)		-2.90*** (.24)		-2.77*** (.21)

Table 4C: Differences in Tenure Length by Migrant Status Relative to Native-born Households (Years)

	DD	DDD	DD	DDD	DD	DDD
	1970 to 1980		1970 to 1990		1970 to 2000	
Owners:						
Native-born	-.63 (.39)		-.58 (.34)		.34 (.39)	
Migrants		.82 (.60)		1.56** (.55)		1.51*** (.45)
Immigrants		-.04 (1.76)		-.04 (1.49)		-.59 (1.39)
Renters:						
Native-born	-.32 (.21)		.17 (.28)		.49** (.17)	
Migrants		.44** (.18)		.40** (.17)		.57*** (.18)
Immigrants		.23 (.79)		-.32 (.73)		-.35 (.66)

Table 5:

Average Proposition 13 Subsidies by Metropolitan Area, 1980-2000

	1980	1990	2000
California metropolitan areas:			
Bakersfield	$643	$558	$110
Fresno	769	658	457
Los Angeles-Long Beach	1339	2221	1360
Anaheim-Santa Ana-Garden Grove	1377	2135	1494
Sacramento	938	1320	788
Salinas-Sea Side-Monterey	1291	2090	2316
San Diego	1387	1707	1364
San Francisco-Oakland-Vallejo	1379	2873	3499
San Jose	1485	2569	3237
Santa Barbara-Santa Maria-Lompoc	1416	2158	2270
Riverside-San Bernadino	854	1113	456
Stockton	723	1146	637
Ventura-Oxnard-Simi Valley	1285	2177	1432
Texas metropolitan areas:			
Austin		-252	-628
Beaumont-Port Arthur-Orange		55	-180
Corpus Christi		-139	-572
Dallas-Fort Worth		-12	-567
El Paso		-141	-631
Houston-Brazoria		-235	-718
San Antonio		-119	-566
Florida metropolitan areas:			
Fort Lauderdale-Hollywood-Pompano Beach,		200	-192
Jacksonville		308	264
Miami-Hialeah		-102	-268
Orlando		449	176
Tampa-St. Petersburg-Clearwater		289	77
West Palm Beach-Boca Raton-Delray Beach		294	-7

Notes: Subsidies are equal to .0125* market value – actual property taxes. For comparison purposes, the same method is followed to construct subsidies for all metropolitan areas in Texas and Florida. All figures are in 2000 dollars.

Table 6A: The Distribution of Property Tax Subsidies in California and Florida, Mean Values by Quartile

	CA			FL
	1980	**1990**	**2000**	**2000**
	(1)	**(2)**	**(3)**	**(4)**
Mean of quartile 1 (lowest)	-$8	$428	$102	$193
Mean of quartile 2	$331	$1,333	$645	$635
Mean of quartile 3	$763	$2,354	$1,498	$978
Mean of quartile 4 (highest)	$1,483	$4,188	$4,237	$2,707

Note: Dollar figures are in 2000 dollars. California subsidies equal .0125*property value – property taxes. Florida subsidies equal .02*property value – property taxes.

Table 6B: Average Years of Tenure by Subsidy Quartile for Owner-occupiers

	California			Florida
	1980	1990	2000	2000
Quartile 1	12.98	9.19	9.65	11.17
Quartile 2	9.73	11.13	11.91	11.85
Quartile 3	9.22	12.98	15.40	11.15
Quartile 4	10.33	17.23	16.84	9.96

Note: Figures in parentheses are standard errors.

Table 7A:

Regression Results Explaining Tenure Length as a Function of the Property Tax Subsidy

	OLS 1970/90/00 with FL [1]	IV 1970/90/00 with FL [2]	OLS 1970/2000 w/o FL [3]	IV 1970/2000 w/o FL [4]
Subsidy	.00171*** (.0000989)	.000968** (.00037)	.00177*** (.000084)	.00199** (.000575)
Subsidy squared	-9.08e-8*** (1.14e-8)	-2.96e-8 (6.52e-8)	-1.02e-7*** (4.42e-9)	-1.63e-7* (6.8e-8)

Note: *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively. The sample is homeowners in California, Texas and Florida in 1970, 1990 and 2000 in columns [1] and [2]. In columns [3] and [4], all households in 1990 and Florida households in 2000 are excluded. The explanatory variables are year dummies, metropolitan area dummies, and the same individual-level and metropolitan area-level controls as in table 5A. The instruments are the predicted subsidy if all households have 10 years of tenure and the predicted subsidy squared. All regressions report robust standard errors clustered by year-state.

Table 7B: Predicted Change in Years of Tenure as the Property Tax Subsidy Increases

Subsidy	**[1]**	**[2]**	**[3]**	**[4]**
$110 (Bakersfield)	.19	.11	.19	.22
$450 (Fresno)	.75	.77	.77	.86
$1400 (LA/Orange Co.)	2.2	2.3	2.3	2.5
$3500 (SF/San Jose)	4.0	3.0	4.6	5.0

Note: results are based on the regressions in table 7A.