# The Effect of Property Tax Limitations on Residential Private Governments: The Case of Proposition 13

*Abstract - The proliferation of residential private governments, in the form of homeowners' associations, to deliver public services coincided with a period in which cities faced significant property tax limitations. Using panel data from California in the era of Proposition 13, I test whether cities that were more tax constrained experienced higher rates of private government formation. The degree of constraint is measured by using the limitation's revenue sharing formula and by using crime to proxy for local service demand. I find the more a city is constrained, the higher is the membership in and the rate of growth of, private governments.*

## INTRODUCTION

Despite having an unpopular reputation, in most jurisdictions property taxes form the primary source of local government revenue. The tax revolt era in the 1970s and the 1980s in the United States ushered in attempts by voters to limit the power of local governments to increase property taxes, attempts that still occur. In this paper I ask whether property tax limitations on local governments played a fundamental role in encouraging the formation of and the membership in homeowners' associations (HOAs). HOAs are a form of residential private government, that is, private institutions with the authority to provide public services to tax homeowners and to enact and enforce regulations. They are found primarily in planned developments and condominiums.

After laying out a framework for local responses to property tax limitation, I use data from the years surrounding Proposition 13, a stringent property tax limitation in California that took effect in 1979, to test the implications of the model. As motivation, Figure 1 shows the incredible proliferation of HOAs in California over the last 30 years. The horizontal axis graphs the number of associations incorporated by year. The graph shows that a surge in association incorporation occurred in the late 1970s and early 1980s. This coincided with the passing of Proposition 13, often considered the limitation that sparked the tax revolt throughout the United States. A key question is: Did the stringent conditions of Proposition
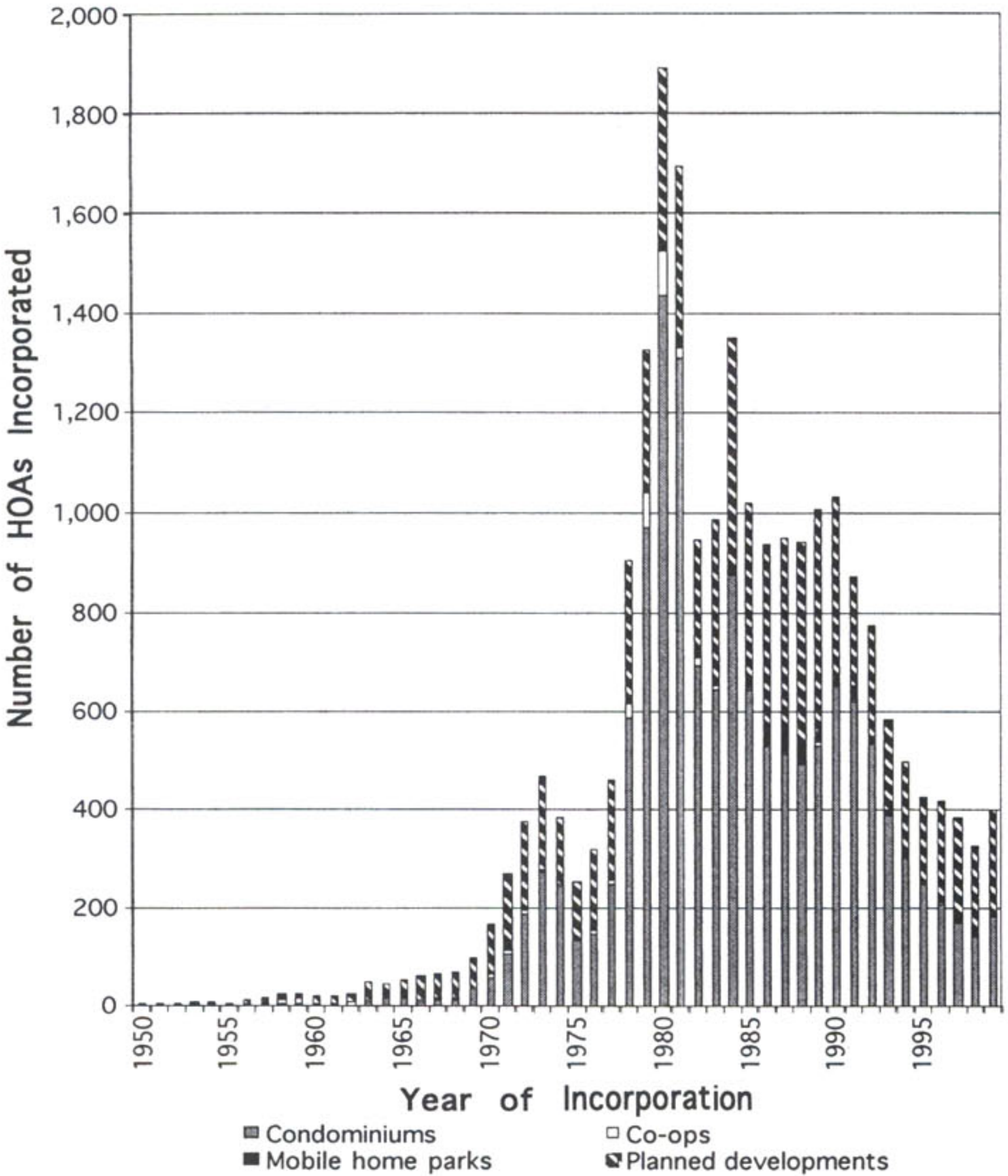
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*Figure 1.* Number of HOAs in California—Entire State, All Types



Source: Levy and Company, 2003.

13 contribute to the tremendous growth of private governments? While the picture would suggest so, there were other forces at work at the same time. Roland (1998) and McKenzie (1994) note that in the late 1970s, the booming housing market and national changes in the construction industry also contributed to private government growth.[1] The challenge of this paper is to isolate the effect of the tax limitation.

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[1] The Community Associations Institute (2004) estimates that between 1970 and 1980, the number of HOAs nationally increased from 10,000 to 36,000. Unfortunately, more detailed yearly data are not available, but the statistic shows that there was a trend towards private government that may not be due to tax limitations.

The empirical hypothesis is that cities responded to the proposition by encouraging the growth and membership in HOAs. Using a novel panel of municipal revenues and HOAs in California, the paper tests whether cities that were more property–tax constrained by Proposition 13 experienced higher rates of private government formation. The paper proposes several ways to define the degree of constraint Proposition 13 places on a city; one compelling finding is that Proposition 13's implementation meant that cities with high pre–Proposition 13 tax rates found themselves to be less constrained and exhibited slower private government growth.

I find that the level and the growth of private government membership significantly increased due to the imposition of Proposition 13. Magnitudes suggest that Proposition 13 results in an increase of 36 percent in new incorporations of private governments every year in an average city in California, relative to the period before Proposition 13. The strongest impact occurs in years immediately following Proposition 13 and attenuates thereafter. Finally, the paper describes several validation exercises that argue that it is differences in the impact of Proposition 13 that are driving the results.

The paper is organized as follows. The second section presents an overview of property tax limitations with particular emphasis on Proposition 13 and provides a theoretical framework to think about its connection to private governments. The third section introduces the empirical framework and describes the data. The fourth section presents the results. The fifth section concludes the paper.

## PROPERTY TAX LIMITATIONS AND PRIVATE GOVERNMENT: BACKGROUND

The property tax revolt marked a fundamental desire by voters to limit the taxing and spending authorities of municipal governments. Shadbegian (1998) notes that between 1970 and 1992, one–half of the states in the country passed some kind of limitation measure. These took many forms: explicit limits on the property tax rate or level, a limitation on the amount of yearly tax increases, a limitation of the rate at which property value assessments can increase, and ceilings on the level and growth rate of expenditures. Together, these measures are known as tax and expenditure limitations (TELs).

TELs usually share several similarities regardless of where they are enacted. They are almost always statewide measures that affect most, if not all, local governments in the state. TELs are generally approved through statewide ballots.[2] TELs tend to be effective: local governments suffered large decreases in property tax revenue and they remain unable to increase property taxes beyond the mandated limit without voter approval.[3]

For this paper, I focus on California's TEL, Proposition 13, which is often cited as the first example of the property tax revolt. Its origin is often attributed to soaring land and property prices in California in the 1970s. While assessed values climbed, local governments were slow to lower the millage rate. Many homeowners saw double–digit increases in their property tax bills every year. Also the unpredictable housing market led to uncertainty about the size of future tax bills. Fueling public support were motivations to curb perceived overspending by local governments. In 1978 California voters approved

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[2] Vigdor (2004) argues that TELs are likely to succeed at statewide ballots rather than local ballots because voters want a way to control tax rates in jurisdictions where they do *not* live.

[3] In some states, such as California, the TEL has even been made part of the state constitution.

Proposition 13 by a two–to–one margin, despite ominous predictions of drastic cuts to public services. O'Sullivan, Sexton, and Sheffrin (1995) estimated that the immediate effect of Proposition 13 was a 57 percent reduction in property tax revenue in the fiscal year 1978–1979.

Proposition 13 limited the property tax rate and changed the way taxes are collected. Before Proposition 13, each local agency (county, city, school district, and special district) set its own tax rate; the average homeowner's total effective property tax rate was 2.5 percent of market value just prior to 1978. Proposition 13 constrained a homeowner's total property taxes not to exceed one percent of market value, and a rule had to be devised to share the total tax revenues among local agen-

cies. In addition, Proposition 13 limited the yearly increase in assessed value to two percent for those properties that did not change hands. The cap did not allow for growth in government revenues to match the pressures of increased demand for public services or the increasing cost of providing these services.

Figure 2 shows how Proposition 13 affected municipalities statewide by substantially shifting the property tax rate distribution downward. The figure is a histogram of effective property tax rates in the fiscal year 1976–1977, two years before Proposition 13 took effect, and in the fiscal year 1981–1982, two years after. The property tax rate is calculated by dividing property tax revenue by the market value of property in the city.[4] In 1976–1977, the

*Figure 2.* Histogram of Municipal Property Tax Rates in 411 California Cities
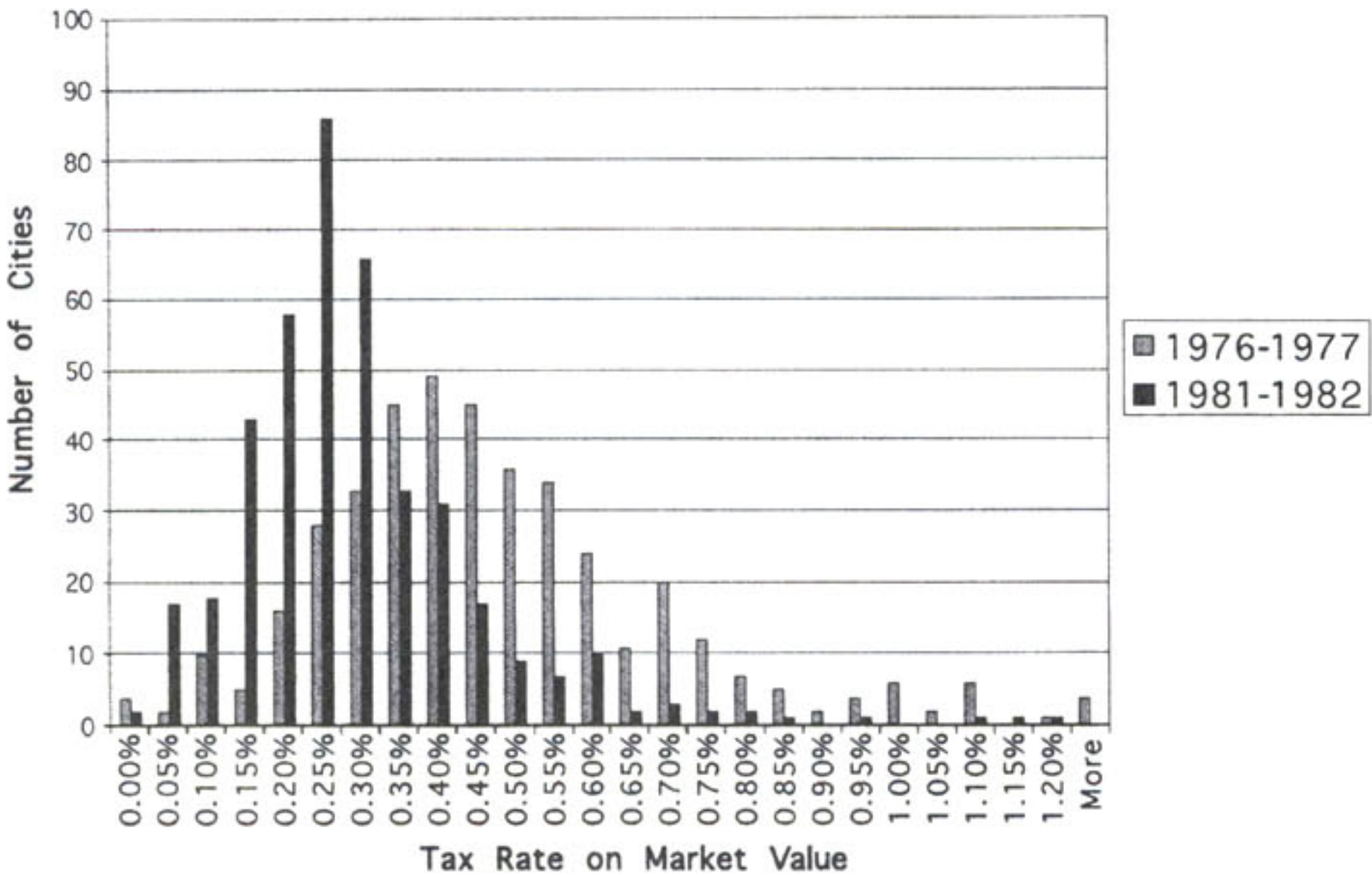


The sample is the set of all cities in California for which the assessed value of property is reported in fiscal year 1975–1976.

Source: Annual Survey of Governments and the Census of Governments, U.S. Census Bureau.

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[4] This rate is the property tax rate for the city only, and it does not include property taxes paid to the county, school district, or special district.

average effective municipal property tax rate was 0.47 percent; in 1981–1982, the average had decreased to 0.27 percent. Compared to pre–Proposition 13 years, the distribution of tax rates shifted to the left, but it also got tighter.

Previous theoretical and empirical research has examined local government responses to TELs. Authors have suggested three main options to deal with the shortfall: cut expenditures, demand more intergovernmental transfers from the state, and find alternate sources of tax revenue in the form of fees and charges. I examine a fourth option: shift public responsibility to private governments.

### Expenditure Cuts

An obvious response to a tax revenue shortfall is to cut the quantity or quality of local expenditures, a response borne out by research (Shadbegian, 1998; Figlio, 1998; Bice and Hoyt, 2000). As a result of Proposition 13, most cities in California reduced their spending, although not as dramatically as critics feared. State subventions cushioned cities' need to cut spending, but decreases were felt in most categories. O'Sullivan et al. (1995) noted that libraries, parks, and contributions to enterprises suffered the largest immediate cuts following Proposition 13. Infrastructure was also affected, as 90 percent of cities reported cutting back on capital improvement programs. On the other hand, in some cities, building regulation, public safety, and public works experienced increases following Proposition 13, reflecting a shift in priorities for city budgets.

### State Aid

Another common response by cities is to turn to the state for help either through bailout funds to cover deficits or by shift-ing functional responsibilities back to the state. O'Sullivan et al. (1995) suggest that the blow of TELs is often moderated by generous state grants, while Shadbegian (1998) provides evidence that increased federal or state funds have acted as a substitute for local expenditure cuts. This is borne out in California. Passage of Proposition 13 was followed by a block grant from the state's surplus to cushion the decrease in property tax revenues. The grants, worth two billion dollars, were designed so that no local government would experience more than a ten percent loss in total revenue for the 1978–1979 fiscal year. Subsequently the state eliminated the bailouts and shifted a portion of property tax revenues from school districts to local agencies. In turn, the state increased assistance to school districts. This, coupled with a ruling on school district equalization,[5] effectively transferred control of school funding from the school district to the state. This is consistent with a finding, presented by Joyce and Mullins (1991) and Schwadron and Richter (1984), that following passage of a TEL there has been a gradual shifting of spending responsibility from local governments to state government.

### Fees and Charges

There is research to suggest that cities have turned to alternative ways of collecting revenue. TELs caused municipalities to reduce their dependence on the property tax and turn instead to charges, fees, and sales taxes. Shadbegian (1999) demonstrates in a national analysis that TELs caused municipalities to increase fees and charges, which partially offset the decrease in property taxes. Colby, Rueben, Rust, and McDonough (2000) mention the increased reliance on fees in California cities following Proposition 13, a finding echoed in Schwadron and Richter (1984).

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[5] *Serrano vs. Priest* mandated the equalization of per pupil spending across school districts.

Schwadron and Richter find that between 1978 and 1981, the fees collected by local governments in California increased by almost 50 percent, and "if any one group has been a prime target for fee boosts, it has been the real estate developers" (p. 109). While fees made up a relatively small portion of local government revenues in the state (only ten percent of city revenues came from fees in 1978), most jurisdictions found that collecting and increasing fees was politically feasible, further contributing to their popularity.

### A Fourth Option: Private Providers

There is relatively little research on the role of private providers in supplementing public services; however, a fourth possible avenue for local governments to take when faced with TELs is the encouragement of service provision by private associations. Theoretical research into the growing impact of HOAs suggests that they can be viewed as "private governments." An HOA is a private association that has the authority to provide public services to residents of a specified area. An association's board can levy fees for the provision of these services and has abilities to enact regulations and to enforce them. The association has characteristics of a government because by buying a property within the area that is governed by an HOA, a resident is automatically an association member and subject to all the fees and regulations imposed by the board.

The services provided by private government associations are similar to those provided by a traditional local government. These include garbage collection, security (gates or guards), parks, recreational facilities, and private roads. Some municipal governments even shift the responsibility of providing new infrastructure entirely to private associations. Because homeowners who live in an association pay both association fees and public property taxes, the private government and the public government supplement each other's service levels. This suggests that TELs create an incentive for municipal governments to encourage the formation of private governments as a way to supplement decreased public expenditures. The desire to offload municipal services may partly explain the dramatic proliferation of HOAs. The Community Associations Institute (2004) estimates that one–half of all new housing in the United States now includes membership in an HOA. Whereas in the 1960s a few hundred HOAs existed in the United States, by 2003 their number had climbed to 249,000.

Recent literature has sparked renewed interest in the idea that private supplementation of public services can arise as a response to municipal budget constraints. The issue has been considered in theoretical and in empirical settings. The private government model of Helsley and Strange (1998) shows that when private governments are available to supplement traditional public governments, both governments behave strategically in setting their levels of provision. When city residents own homes and pay property taxes, the problem becomes markedly more complicated. This is because property taxes are levied on the value of housing, but the value of housing will depend on the levels of service provision provided by both the public and the private governments. The additional complexity added by the housing market implies that the comparative static effect of a tax limitation on private government membership is not necessarily clear cut.[6]

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[6] A working version of this paper includes an illustrative theoretical model that generates the comparative static that a tax limitation increases the degree and the growth rate of private government membership in a city. This model is available on request.

The ambiguous theoretical implications of a tax limitation motivate empirical investigation. These have looked at the consequences of TELs on residents' consumption of public and private services. Sonstelie (1979) and Figlio (1998) ask whether limitations move students from public to private schools. Tax limitations have also had wide-ranging impact on housing prices and impeded efficient household mobility, as shown by Ferreira (2004) among others. In this paper, I show tax limitations may have a significant impact on the public sector by their effect on the growing membership of residents in HOAs.[7]

Focusing on Proposition 13 in particular, there has been some empirical research on its impact on private agents. This literature generally examines the growing popularity of agreements between local governments and private developers. Chapman (1981) notes that even before Proposition 13, "local governments were finding it difficult to finance capital infrastructure. Proposition 13's passage accelerated the trend [of shifting improvements to the developer] since it virtually eliminated debt financing." In a later work, Chapman (1998) states that since Proposition 13, municipalities have increased their use of "sophisticated public–private development agreements." A natural way for developers to fund the services they are asked to provide is through the creation of private governments. While there has been no empirical research on tax limitations' effect on residential private governments, Brooks (2007) acknowledges limitations may have spurred the creation of business improvement districts (BIDs), the commercial analogue to HOAs. A BID is a private government whose members are neighboring businesses as opposed to homeowners. Brooks exploits Proposition

13's binding power as a source of heterogeneity in assessed values among cities and ties it to adoption patterns of BIDs in Los Angeles. However, Brooks does not treat the imposition of Proposition 13 as the central issue of her empirical model. In this paper, I focus on Proposition 13 as a driver of residential private government prevalence because the constraint imposed by the proposition was so substantial and so binding for most jurisdictions in California.

## EMPIRICAL MODEL

The empirical model takes the form of an event study. To begin with, Proposition 13 is assumed to have a similar effect on all cities in the sample. Then, the model allows differentiation between cities and tests whether or not cities that are "more constrained" by Proposition 13 experience increased growth in private government.

### Proposition 13 in an Event Study Model

In the simplest formulation, the test for the effect of Proposition 13 is expressed by

$$[1] \quad y_{it} = \beta Prop13_{it} + \delta x_{it} + \xi_i + \lambda_t + \varepsilon_{it},$$

where $y_{it}$ is the measure of private government activity in city $i$ in year $t$. $Prop13_{it}$ takes a value of one for all cities in all years starting with 1979, and 0 otherwise. Other time–varying covariates, $x_{it}$, discussed later, control for time–varying characteristics that affect private government membership. The $\xi_{it}$ control for unobserved time–invariant city fixed effects. Finally the $\lambda_t$ control for year effects using a linear year trend to take account of unobserved statewide, time–variant variation.

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[7] Cheung (forthcoming) provides empirical evidence that public governments may respond to this proliferation of private providers by reducing expenditures, especially for services in which private associations provide close substitutes, for example, policing, parks, and waste disposal.

There are two ways to interpret the effect that Proposition 13 had on private government activity in a city, giving rise to two dependent variables representing $y_{it}$. The first measure of $y_{it}$ is the private government membership rate, which is the percentage of the housing units in the city that belong to an HOA. If we were interested in how Proposition 13 affected the number of the people who turned to private substitutes for local public services, the membership rate would be an appropriate variable as it measures the "extent of coverage" of the residents by private government. It represents the proportion of the city population that has access to a private provider of supplementary services.

The second dependent variable is based on the view that Proposition 13 primarily affected the growth of private government. Focusing on growth captures the way in which Proposition 13 may have prompted local governments to encourage alternative public service providers. The extra fees and charges in particular made it more attractive for a developer to incorporate an HOA to pay for them. In this regard, it may be more sensible to think of each HOA as an individual agent in the interaction between public and private governments. As each developer's decision whether to set up an HOA is a separate decision, and as all common interest developments have only a single HOA regardless of the number of housing units, an appropriate dependent variable $y_{it}$ would be the number of new incorpo-rations in a city. Because this variable can only take on nonnegative values and there are likely many observations for which the number of new incorporations in a city is zero, ordinary least squares (OLS) regression does not make efficient use of the data whereas count data models do. In this context, the dependent variable, $y_{it}$, is the number of new HOA incorporations in city $i$ in year $t$. The conditional mean of $y_{it}$ depends on regressors $xit$, one of which is the constraint of Proposition 13. In these models, I assume that the $y_{it}$ are Poisson distributed given $x_{it}$.[8]

## Data

The time period for the analysis is fiscal year 1975–1976 through fiscal year 1981–1982. These are referred to simply as 1976 through 1982. Proposition 13 took effect in fiscal year 1978–1979. Thus, the pre–Proposition 13 years are 1976 through 1978, and the post–Proposition 13 years are 1979 through 1992.[9]

The data on local government revenues come from the U.S. Census Bureau's Annual Survey of Governments and Census of Governments. The unit of analysis is the municipality; however, not all municipalities are surveyed in each fiscal year.[10] The sample consists of California cities that respond to the survey for at least six of the seven years of the analysis. As of 1982 out of 419 cities in the state, 199 of them fit this criterion, although one more city is dropped from the sample for reasons explained following. This selection

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[8] See Cameron and Trivedi (1998) for more details on the econometrics. Specifications were also run assuming a negative binomial distribution on the $y_{it}$. These allow for a more flexible modeling of the variance than the Poisson model. However, Poisson estimates are reported here because they are the traditional strategy for dealing with count data models and the coefficients are still consistent even in the face of a misspecification of the variance.

[9] It is possible that Proposition 13's impacts would be better reflected in the long run in the event that property developers and cities are slow to respond. In this case, it may be more appropriate to extend the time frame of the analysis to more than four post–Proposition 13 years. However, the point of this paper is to specifically examine the immediate, short–run response to the revenue shock of Proposition 13, and, thus, the chosen time frame is appropriate.

[10] The two exceptions are 1977 and 1982, which are Census of Governments years in which every municipality responds to the survey.

guarantees that every city in the sample reports at least two years before and after Proposition 13.[11]

The dependent variables measure the degree of private government activity in a city. These require knowing the number of HOAs in California and their membership. However, because of their private nature, one obstacle to empirical research on HOAs is the lack of comprehensive data. This paper turns to a novel source of data to develop the measures of private government. A database of HOAs was obtained from the accounting firm of Levy and Company in Oakland. Compiled from the Secretary of State's incorporation records, it provides detailed information about each of the 37,655 incorporated HOAs in California as of May 2003.[12] I construct a panel of associations in each year from 1976 to 1982, aggregating the number of households that belong to an association at the city level. The result is a time series of the HOA membership rates for each city in the sample.[13] For the count data model, the dependent variable is the number of new incorporations. Each association is counted once regardless of size (associations can range from a handful of housing units to thousands of them) and type (planned development, condominium, or cooperative). Thus, an appeal to the count data model is that there is no measurement error owing to the imputation of the membership rates (see footnote 13).

Because there is a distinction between the various forms of common interest development, the next question is whether the term "private government" should be interpreted to encompass all types of developments with an HOA, or to refer only to planned developments, as some previous literature has done. I choose to consider all types of developments: all HOAs have the same private governmental structure no matter the type of development and they all provide private versions of public goods to their members. Also the construction of condominiums or the conversion of apartments to condominiums may be an important consequence of Proposition 13.[14] On the other hand, there are reasons to restrict attention only on planned developments.[15] However, the estimations with only planned developments give similar results to those with the broader definition of private government, and so I do not report them here. Table 1 presents some summary statistics for the private government variables.

The remaining covariates are time–varying variables posited to affect the degree of private government. Because the study period is short, the usual demographic and socioeconomic variables are unlikely to have substantially changed. Thus, the effect of these variables will be subsumed in the city fixed effect $\xi_i$. On the other hand, two notable time–varying covariates that I do explore are the levels of intergovernmental revenue and charges

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[11] The analysis was also performed with a balanced panel, in which only cities that report to the survey for all seven years were included. Estimation results were qualitatively similar and so are not reported.

[12] All condominiums, cooperatives, and planned developments in the state are included in the database.

[13] Because of data availability, an imputation method is used to calculate how many households are in each homeowner's association. For further information on the data and the imputation method used to calculate the membership rates, consult Cheung (forthcoming). For one city in the sample, the imputation method yields an HOA rate of greater than one for some years. This city is, therefore, dropped from the sample, reducing it to 198 cities.

[14] The property tax cap lowered the cost of owning relative to renting, thus potentially precipitating an increase in demand. Alternatively, cities may try to reduce expenditures by taking advantage of the economies of scale of providing public services to high–density condominium development.

[15] For example, planned developments are more likely than condominiums to produce public services that are more like what municipalities produce. Also, the growth in condominiums in the study period may simply be reflective of the trend towards condominium construction occurring in the country at that time.

**TABLE 1**
SUMMARY STATISTICS FOR PRIVATE GOVERNMENT VARIABLES

| Private Government Variable | All HOAs | Planned Developments (PDs) Only |
|---|---|---|
| Membership Rate | | |
| Mean | 0.079 | 0.042 |
| Standard deviation | 0.097 | 0.069 |
| Minimum | 0 | 0 |
| Maximum | 0.677 | 0.516 |
| | | |
| Number of New Incorporations | | |
| Mean | 4.8 | 0.83 |
| Standard deviation | 19.1 | 1.58 |
| Minimum | 0 | 0 |
| Maximum | 372 | 15 |
| | | |
| Frequency of New Incorporations (with % of Observations) | | |
| 0 incorporations | 465 (33.6%) | 859 (62.0%) |
| 1 | 232 (16.7%) | 260 (18.8%) |
| 2 | 169 (12.2%) | 135 (9.7%) |
| 3 | 119 (8.6%) | 53 (3.8%) |
| 4 | 87 (6.3%) | 31 (2.2%) |
| 5–10 | 199 (14.4%) | 44 (3.2%) |
| 11–20 | 76 (5.5%) | 4 (0.3%) |
| 21–372 | 39 (2.8%) | 0 (0%) |

Note: The sample consists of 198 cities for the 1976–1982 period (1,386 observations).
Source: Levy and Company, 2004.

revenue. As mentioned earlier, some cities substituted for the loss in property tax revenue by immediate heavy increases in fees and intergovernmental aid. Finally, I consider two other time–varying covariates to proxy for residential growth, which may be correlated with the popularity of private governments: one–year population growth and land area.[16]

## ANALYSIS

### Initial Analysis

I begin the analysis with the simplest model of Proposition 13. Columns 1 through 3 of Table 2 present various fixed–effects specifications where the dependent variable is the HOA membership rate. The coefficient of interest is that of the Proposition 13 indicator variable. Because of the inclusion of city–specific, time–invariant effects, these specifications identify the effect of Proposition 13 using only the within–city variation in the HOA membership rate.

The specification in column 1 simply controls for city fixed effects and a linear year trend. The Proposition 13 coefficient is significant and positive, and the magnitude indicates that Proposition 13 is responsible for a 0.4 percent shift in the HOA membership rate within a city. Given that the mean HOA rate is 7.9 percent, this represents a relatively small, but economically significant shift.

For columns 2 and 3, I control for other demographic and budgetary factors that affect HOA membership. Also, an interaction term (*Proposition 13 × year*) allows Proposition 13 to shift not only the intercept in the predicted HOA membership rate, but also the slope. Column 2 shows

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[16] Yearly population numbers are found in the Annual Survey of Governments. Yearly land area numbers come from a variety of sources: the Census Bureau's *Boundary and Annexation Survey* (1976–1979), the U.S. Census Bureau (1980), and the California Planners' Information Network's *The California Planner's Book of Lists* (1981–1982). See Cheung (forthcoming) for evidence that the pattern of land area growth through annexations is correlated with the degree of private government activity in a locality.

**TABLE 2**
FIXED–EFFECTS ESTIMATION RESULTS FOR THE EFFECT OF PROPOSITION 13

| | Dependent Variable = HOA Membership Rate (mean = 0.079) | | | Dependent Variable = New HOA Incorporations (mean = 4.8) | | |
|---|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) | (6) |
| Proposition 13 | 0.004* | −0.201** | −0.144 | 1.026*** | 48.287*** | 54.813*** |
| | (0.002) | (0.093) | (0.122) | (0.050) | (2.807) | (3.130) |
| Year | 0.006*** | 0.004*** | 0.005*** | −0.019 | 0.515*** | 0.547*** |
| | (0.001) | (0.001) | (0.001) | (0.012) | (0.034) | (0.035) |
| Land area | | 0.001* | 0.001* | | −0.008 | −0.008 |
| | | (0.0004) | (0.0004) | | (0.006) | (0.009) |
| 1–yr. pop. growth | | 0.042** | 0.043** | | −0.497 | −0.751 |
| | | (0.018) | (0.018) | | (0.639) | (0.683) |
| Charges revenue | | | 0.040** | | | 0.348 |
| | | | (0.019) | | | (0.663) |
| Intergovernmental revenue | | | 0.019 | | | −2.834*** |
| | | | (0.019) | | | (0.588) |
| Proposition 13 × year | | 0.003** | 0.002 | | −0.609*** | −0.692*** |
| | | (0.001) | (0.002) | | (0.036) | (0.040) |
| Number of cities | 198 | 198 | 198 | 187 | 186 | 186 |
| $R^2$ within | 0.242 | 0.259 | 0.275 | | | |

Notes:
Sample years: 1976 through 1982. Robust standard errors in parentheses. All specifications control for city fixed effects.
Columns 1–3 are estimated with linear regression, while columns 4–6 are estimated with Poisson regression. In the Poisson models, some cities are dropped because of all zero observations.
*, **, and *** denote significance at the 10%, 5%, and 1% levels, respectively.

that the Proposition 13 dummy is large and negative, while the slope term is positive, suggesting that the HOA membership rate climbs faster after Proposition 13 than before. However, column 3 suggests that the Proposition 13 shift disappears when intergovernmental revenue and charges revenue are added as controls, with only charges being significant. This finding is consistent with the increased use of developer impact charges following Proposition 13.

As Proposition 13 may have affected the growth of HOAs rather than the levels, the right half of Table 2 reports the results with the dependent variable being the *number of new HOA incorporations*. As these are count data, I estimate these

specifications using a Poisson model.[17] The simplest specification in column 4 shows that Proposition 13 was associated with an upward shift in incorporations. The magnitudes of the coefficient are reasonable; on average Proposition 13 is associated with a 36 percent increase in the number of new incorporations. In other words, for a city with a mean 4.8 HOA incorporations every year, Proposition 13 increases that to 6.5 incorporations yearly.[18]

Column 5 includes an interaction term between Proposition 13 and the year. The positive Proposition 13 term combined with the negative interaction term suggest that incorporation activity after Proposition 13 was concentrated in years immediately after, with a distinct slow-

[17] Negative binomial regression models are available on request. Qualitative results are similar.
[18] The percentage change in the conditional $y$ is given by $\exp(\beta) - 1$, where $\beta$ is the coefficient on Proposition 13.

down later on. The magnitudes suggest that the number of new incorporations is 21 percent higher in 1979, the year immediately following Proposition 13, but this decreases afterward because of the negative slope coefficient. This suggests a pattern of immediate response in the growth of private governments, consistent with the story that local governments, faced with a pressing budgetary constraint, asked developers to begin shouldering large fees and infrastructure costs. This encourages the formation of HOAs and the conversion of existing units to HOAs. The slowdown in subsequent years may have risen because of a supply reduction, if HOA incorporation is viewed as a one–time decision by a housing developer. If developers are not rapidly building new developments, there are no HOAs left to incorporate. An alternative explanation is the availability of other sources of revenues. Evidence of this is found in column 6, which adds in the intergovernmental and charges revenues as explanatory variables. The qualitative result regarding Proposition 13 remains similar, but an interesting observation is that intergovernmental transfers are associated with lower numbers of incorporations. This is consistent with the notion that cities that substitute lost property tax revenues with state transfers have less incentive to encourage the growth of private governments.

### Heterogeneity in the Proposition 13 Treatment Variable

In the previous section, I find a significant, positive Proposition 13 effect on the levels and the growth of HOA membership. That estimation strategy, however, assumes that Proposition 13 has the same effect on all cities. However, recalling the histogram of effective property tax rates

in Figure 2, there is a large range in property tax rates across cities. Presumably, some cities experienced (or anticipated) relatively large drops in property tax revenue following Proposition 13, while others experienced small drops. Thus, it is natural to ask if cities that were relatively "more constrained" by Proposition 13, experienced relatively larger increases in private government levels and incorporations. In this section, I formulate several measures of the constraint that Proposition 13 places on a city and relate these to private government growth and formation. The heterogeneous treatment variables provide a way to compare cities where the impact of Proposition 13 was strong to cities where the impact was minimal.[19]

I propose three measures of the degree of constraint that Proposition 13 placed on a city. The first measure posited is the *pre–Proposition 13 property tax rate* in the city. If the rate is high, and the city anticipates a large cut, then it is likely that Proposition 13 has a strong constraining effect on the city's revenues, and more private government activity would be expected.

However, looking at only the property rate may be misleading because it ignores how property tax revenues were allocated after Proposition 13. In particular, McCarty, Sexton, Sheffrin, and Shelby (2002) note that "enabling legislation passed in 1978 and 1979 sets the share of the revenues allocated to each local jurisdiction based on the proportion of countywide property tax revenues it received prior to Proposition 13 implementation." Thus, if a city had high property tax revenues relative to other cities in the county, it stood to gain from the allocation formula, and it would be relatively *less* constrained by Proposition 13. This suggests the second measure of pre–Proposition 13 heterogeneity: the *city's pre–Proposition 13 property tax revenue relative to other cities in the county.*

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[19] In addition, the inclusion of a heterogeneous treatment variable allays the problem of not having counter–factual municipalities that did not experience Proposition 13.

The third measure of heterogeneity is driven by demand for local public services, as proxied by the *city's pre–Proposition 13 crime rate*. In cities with high crime rates, the possibility of drastically lower tax revenues and public expenditures may be quite troubling. These cities may be more inclined to allow planned developments and gated communities to form.

The equation estimated is

$$[2] \quad y_{it} = \beta \, Prop13_{it} + \zeta_j \, Prop13_{it} \, Z_{ij} + \delta x_{it}$$
$$+ \, \xi_i + \lambda_t + \varepsilon_{it},$$

where $y_{it}$ are the dependent variables as before. $Prop13_{it}$ indicates whether Proposition 13 is in place, $Z_{ij}$ is an interaction variable representing a pre–Proposition 13 condition, and $x_{it}$ are other time–varying covariates. As in the previous section, the city fixed effect is $\xi_i$ and the year controls are $\lambda_t$.

The three versions of $Z_{ij}$ are defined as follows. The property tax rate (called "Model A") is the 1976 property tax revenue divided by the assessed value of property.[20] The tax–to–county average measure ("Model B") is taken as the ratio of 1977 property tax revenues in the city to the average property tax revenues for municipalities in the same county.[21] Finally the crime rate ("Model C") is the FBI's 1976 crime index (which aggregates violent and property crimes), normalized by population.

### Verifying Pre–Limit Trends

The estimation strategy consists of comparing the trends of those cities constrained by Proposition 13 to those cities that were not constrained, or at least not as constrained to the same extent. As an initial comparison between these groups, I plot the mean of the dependent variables against time for the first and the fifth quintiles of cities ordered according to each of the three pre–limit variables: property tax rate in Figure 3, tax–to–county average in Figure 4, and crime rate in Figure 5. I expect that before Proposition 13, cities in the two quintiles should have similar trends in the variables. After Proposition 13, I expect private government trends to differ among cities in the first and the fifth quintiles.

In general, the figures suggest that cities in the low quintiles of the heterogeneity variable have similar HOA trends to cities in high quintiles prior to Proposition 13. Post–Proposition 13, there is some evidence of divergence in the trend between high– and low–constraint cities. The most evident is when cities are grouped according to crime rate in Figure 5. Cities in the highest crime rate quintile seem to have faster growth in HOA membership rate and new incorporations in the years following Proposition 13.

### Results: Exploiting Differences in Property Tax Revenues and Sharing

The first question is whether heterogeneity in the Proposition 13 constraint causes differences in HOA membership rates. These results are presented in columns 1 through 4 of Table 3. Each column summarizes three different regressions, representing the three different pre–limit interaction variables. The only reported coefficients in the table are those that include the Proposition 13 variable. Column 1 does not have any covariates controlling for local residential demand. Column 2 includes population growth and land area as covariates that proxy for local demand. Column 3 also has a

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[20] The data source for tax revenues is the Annual Survey of Governments, while the source for assessed values is the State Board of Equalization.

[21] The measure uses the 1977 level for data availability reasons: because 1977 is a Census of Governments year, every municipality is surveyed. This allows for a more accurate calculation of the denominator of the ratio. There are a few cities that are the only municipality in their county; these are dropped from the sample.

*Figure 3.* Quintile Plots by Pre–Limit Heterogeneity in Property Tax Rate (Model A)

**Quintiles by Property Tax Rate in 1976**



Mean HOA membership rate by quintiles of property tax rate in 1976
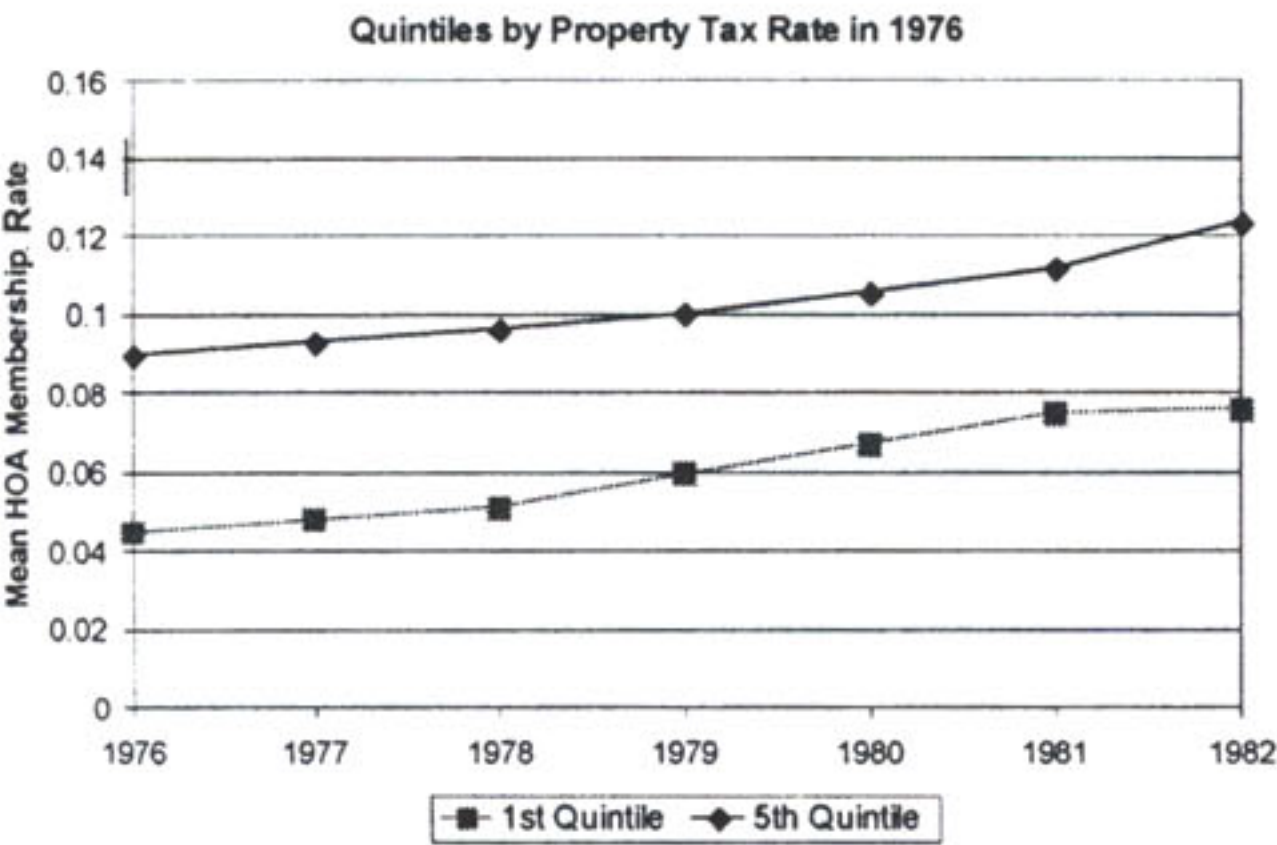
**Quintiles by Property Tax Rate in 1976**
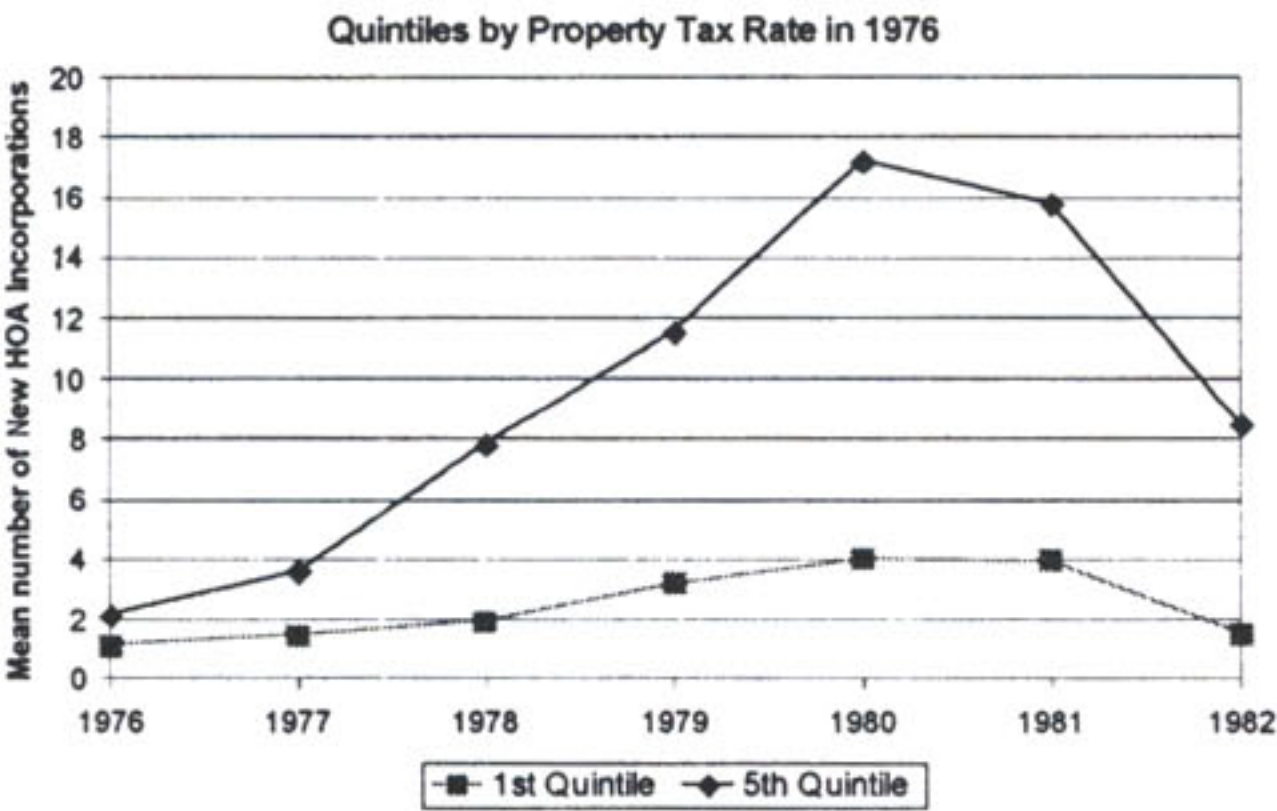


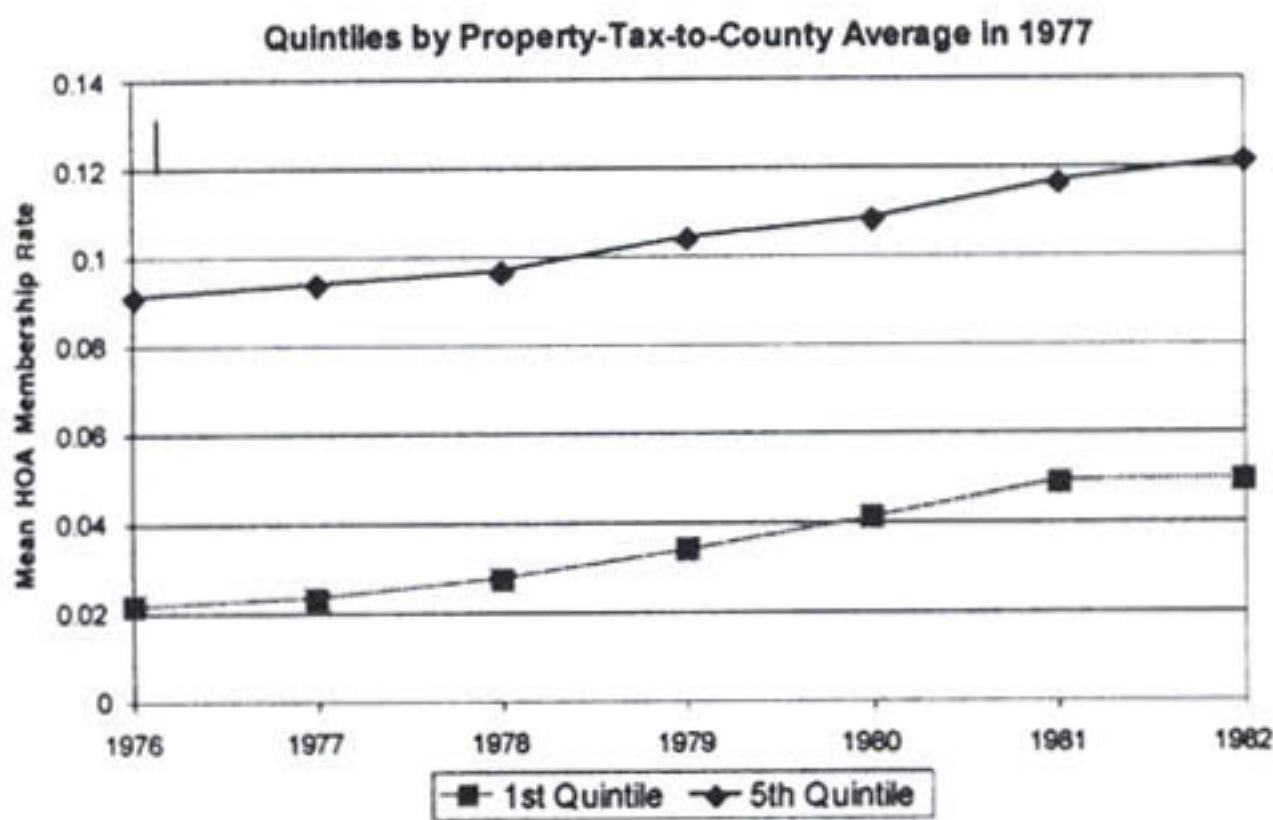Mean new HOA incorporations by quintiles of property tax rate in 1976

three–way interaction variable between the year, Proposition 13, and the pre–limit condition. Column 4 contains similar controls as column 2, but it uses year dummy variables instead of a linear year trend. This allows for more flexible modeling of fluctuations in statewide year effects; the estimated coefficients are not much different in this case, so I focus on the specifications of columns 1–3.

The two measures based on property tax revenues strongly suggest that exploiting the institutional implementation of Proposition 13 explains private government membership and formation. In the Model A section of Table 3, the negative coefficients on (*Proposition 13 × 1976 tax rate*) in columns 1 and 2 suggest that cities with a high effective property tax rate in 1976 have a lower private government membership rate after Proposition 13. This seems counterintuitive to the notion that high–tax cities may feel the brunt of Proposition 13 harder and are more likely to turn to private governments. However, this result may be partially explained by

*Figure 4.* Quintile Plots by Pre–Limit Heterogeneity in the City Property Tax to County Average Ratio (Model B)

**Quintiles by Property-Tax-to-County Average in 1977**



Mean HOA membership rate by quintiles of the property tax to county average ratio in 1977

**Quintiles by Property Tax-to-County Average in 1977**
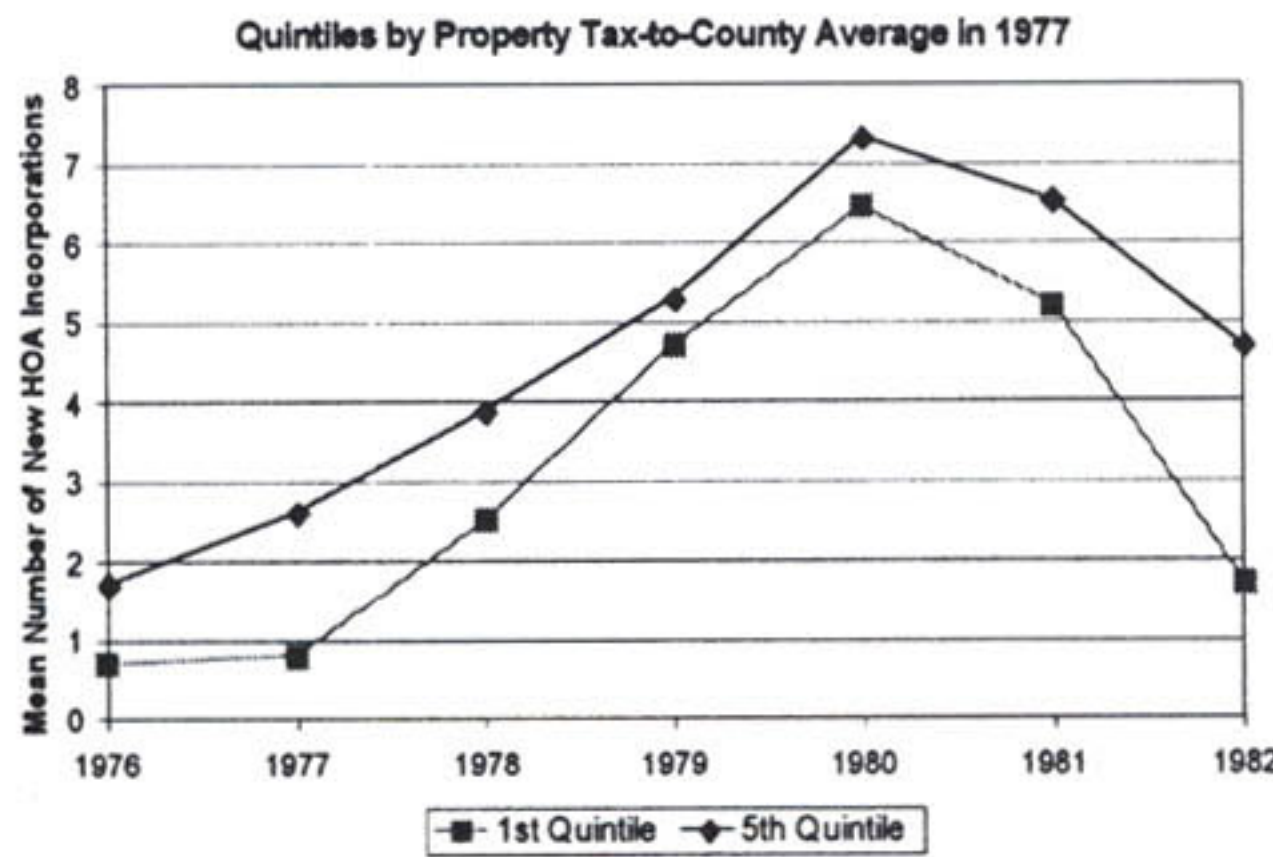


Mean new HOA incorporations by quintiles of the property tax to county average ratio in 1977

looking at the second pre–limit variable, the city's tax–to–county average ratio, in the Model B section. In column 1, the negative sign of the interaction term suggests that the relative position of a city's property taxes compared to others in the county matters. Cities with a high ratio stand to gain more from the revenue sharing rule, and, thus, tempers their need to turn to private providers. Given that Proposition 13 was supposed to curb runaway property taxes, this is a troubling finding, suggesting that redistribution of post–Proposition 13 tax revenues was occurring from low–tax municipalities to high–tax municipalities.[22] However, the

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[22] It seems unlikely that cities tried to take advantage of the revenue sharing rule by greatly increasing tax rates prior to Proposition 13 because the law defining the rule was passed weeks after voters approved Proposition 13.

*Figure 5.*    Quintile Plots by Pre–Limit Heterogeneity in Crime Rate (Model C)

**Quintiles by Crime Rate in 1976**



Mean HOA membership rate by quintiles of crime rate in 1976
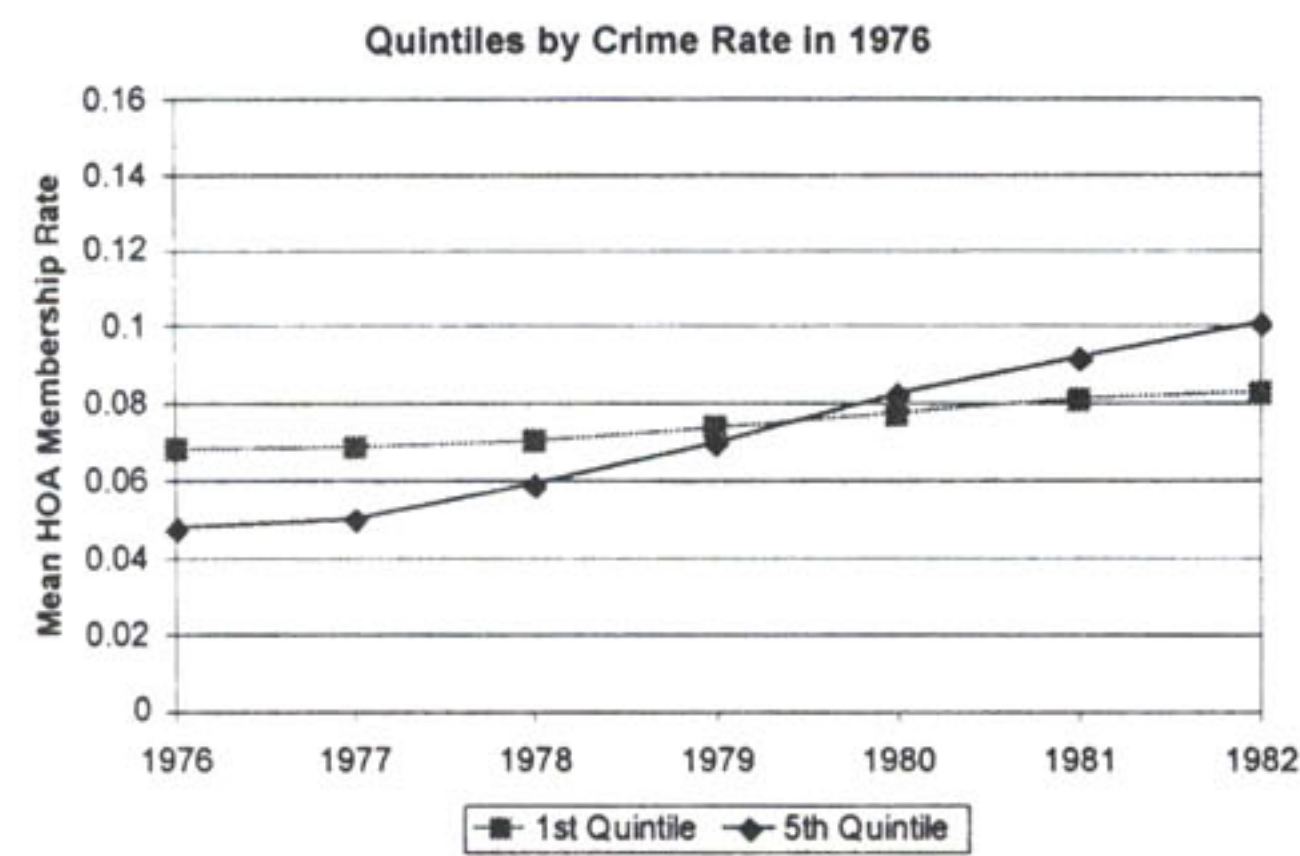
**Quintiles by Crime Rate in 1976**
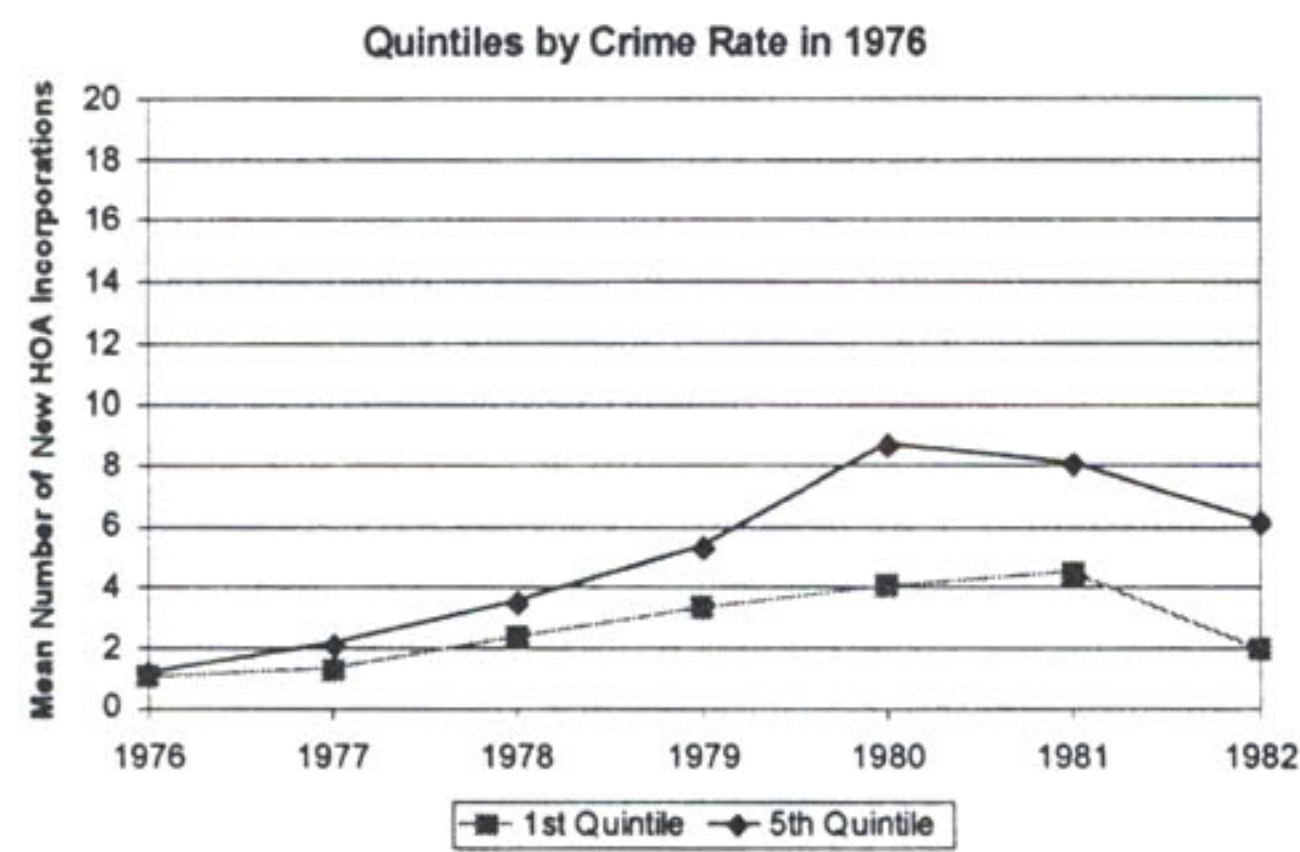


Mean new HOA incorporations by quintiles of crime rate in 1976

inclusion of land area and population growth controls in columns 2–4 weakens the story. The city tax–to–county average ceases to be significant, although the estimated coefficients remain negative.

Next, there is substantial evidence that Proposition 13 drove the formation of HOAs. Results for Poisson models with the number of incorporations as the dependent variable are given in columns 5–8 in Table 3. This time, the Model A section suggests that cities with high pre–Proposition 13 tax rates seem to face a

stronger budgetary constraint post–Proposition 13 by encouraging more private governments. Column 5 suggests that a one percentage point increase (relatively sizeable) in the 1976 property tax rate leads to roughly 41 percent increase in the number of HOA incorporations after Proposition 13.

However, it seems that the relative position of the city within the county matters too. Focusing on column 5 in the Model B section, the (*Proposition 13 × tax–to–county average*) coefficient is nega-

**TABLE 3**
FIXED–EFFECTS ESTIMATION RESULTS WITH PRE–LIMIT INTERACTIONS

| Specification | Dependent Variable = HOA Membership Rate (mean = 0.079) | | | | Dependent Variable = New HOA Incorporations (mean = 4.8) | | | |
|---|---|---|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
| **Model A: Interacted with 1976 property tax rate** | | | | | | | | |
| Prop 13 | 0.014*** (0.004) | 0.014*** (0.004) | 0.015*** (0.005) | 0.049*** (0.004) | 0.771*** (0.077) | 0.758*** (0.077) | 0.423*** (0.096) | 0.750*** (0.092) |
| Prop 13 × 1976 PT rate | −2.938*** (0.942) | −2.782*** (0.930) | −9.934 (24.472) | −2.789*** (0.925) | 41.439*** (11.288) | 44.204*** (11.332) | 2122.344*** (367.348) | 42.975*** (11.239) |
| Year × Prop 13 × 1976 PT rate | | | 0.089 (0.306) | | | | −25.838*** (4.567) | |
| **Model B: Interacted with 1977 ratio of property tax revenue to county average** | | | | | | | | |
| Prop 13 | 0.005* (0.003) | 0.005 (0.003) | 0.005 (0.003) | 0.039*** (0.003) | 1.138*** (0.066) | 1.137*** (0.067) | 1.007*** (0.079) | 1.137*** (0.086) |
| Prop 13 × 1977 PT/county avg. | −0.004* (0.002) | −0.003 (0.003) | −0.023 (0.087) | −0.003 (0.003) | −0.185*** (0.049) | −0.184*** (0.050) | 4.953*** (1.645) | −0.221*** (0.050) |
| Year × Prop 13 × 1977 PT/co. avg. | | | 0.0003 (0.001) | | | | −0.064*** (0.020) | |
| **Model C: Interacted with 1976 crime rate** | | | | | | | | |
| Prop 13 | −0.019*** (0.006) | −0.017** (0.007) | −0.008 (0.008) | 0.019*** (0.006) | 0.574*** (0.137) | 0.519*** (0.141) | −0.523*** (0.164) | 0.545*** (0.146) |
| Prop 13 × 1976 crime rate | 0.279*** (0.083) | 0.264*** (0.091) | −4.020** (1.563) | 0.267*** (0.091) | 5.209*** (1.570) | 5.877*** (1.616) | 415.130*** (33.605) | 5.282*** (1.610) |
| Year × Prop 13 × 1976 crime | | | 0.053*** (0.019) | | | | −5.098*** (0.418) | |
| Year controls | Linear | Linear | Linear | Dummies | Linear | Linear | Linear | Dummies |
| Pop. growth and land area | No | Yes | Yes | Yes | No | Yes | Yes | Yes |

Notes:
*, **, and *** denote significance at the 10%, 5%, and 1% levels, respectively.
Sample years: 1976 through 1982. All specifications control for city fixed effects and intergovernmental and charges revenue. Columns 1–4 are estimated with linear regression, while columns 5–8 are estimated with Poisson regression. In the Poisson models, some cities are dropped because of all zero observations. Number of cities in sample when dependent variable is HOA rate (new HOA incorporations)—Model A: 198 (185); Model B: 197 (185); Model C: 168 (166).

tive and significant. Combined with the positive coefficient on the Proposition 13 indicator, the results suggest that while on average all cities increased the number of incorporations following Proposition 13, relatively high–tax ratio cities exhibit less incorporation. For example, take a city with the mean number of yearly incorporations, 4.8. If that city has a pre–limit condition in the 80th percentile (1977 property taxes are 1.2 times the county average), Proposition 13 increases the number of yearly incorporations to 7.2.[23] On the other hand, if this city has a tax–to–county average ratio in the 20th percentile (0.3 times the county average), the number of yearly incorporations is 9.36 after Proposition 13.

Columns 6–8 show that the results are robust to different specifications of controls. Adding in controls for land area and population growth does not greatly affect the coefficients of interest. Column 7, which includes the pre–limit condition interacted with the year, allows the impact of Proposition 13 to vary with time. The negative coefficient on the interaction again implies that the rate of incorporation was greatest in the year immediately following Proposition 13. For example, going back to the city with the mean 4.8 new incorporations yearly, if it had a high tax–to–county average ratio (80th percentile), Proposition 13 increases the number of incorporations to 11.6 in 1979, and this drops to 9.2 in 1982. If it had a low ratio (20th percentile), the number of incorporations goes to 12.7 in 1979 and drops to 12.0 in 1982.

Put together, the picture emerges that the drastic reduction in property tax revenues implied a stronger constraint on cities with existing high property tax rates,

and this encouraged greater numbers of HOA incorporations. At the same time, however, cities also realized that their position relative to other cities within the county matters crucially as well; the revenue sharing formula meant that cities that had low taxes relative to other cities in the county were most at a disadvantage, and these were the ones to turn to private government.

## Results: Exploiting Differences in Local Demand

The third measure of municipal heterogeneity comes from the demand side. Local service demand is proxied by the pre–Proposition 13 crime rate. Residents of high crime cities may have recognized that the passing of Proposition 13 may entail drastic cuts in policing and public safety,[24] and public authorities may respond by encouraging private institutions providing public safety.

The results are shown in the Model C section of Table 3. The left–hand side confirms that cities with high pre–Proposition 13 crime rates exhibit higher rates of HOA membership. The coefficients in column 1 suggest that Proposition 13 is associated with a 0.8 percentage point increase in the HOA membership rate, relative to pre–1979 levels, for a city in the 80th percentile of 1976 crime rate. It is associated with a 0.4 percentage point decrease in the membership rate for a city in the 20th percentile of 1976 crime rate.[25] Compared to a mean HOA membership rate of eight percent, this represents a significant difference in the impact of Proposition 13 between high– and low–crime cities.

The inclusion of the three–way interaction term, reported in column 3, allows the Proposition 13 effect to vary with the year. The magnitude of the positive coef-

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[23] $e^{.916} - 1 = 1.50$, which is a 150 percent increase in the number of incorporations.

[24] During the campaign period leading up to the vote, opponents of Proposition 13 used the threat of police cuts to try to convince voters to vote against the proposition.

[25] Calculations available upon request.

ficient of the (*Year × Proposition 13 × crime*) term is large enough to suggest that the post–Proposition 13 slope is higher than the pre–Proposition 13 slope. For example, a city with a pre–limit crime rate in the 80th percentile, Proposition 13 is associated with a 0.8 percentage point increase in HOA membership rate in 1979 and a 2.3 percentage point increase in 1982.[26] This suggests that after Proposition 13, the rise in popularity of HOAs spurred greater yearly increases in the HOA membership rate.[27]

The Poisson regressions on the right–hand side of Table 3 show that cities with high pre–limit crime rates experience more HOA incorporations after Proposition 13, as columns 5 and 6 show. This strengthens the argument that Proposition 13 encouraged constrained municipalities to turn to private providers of public goods. The magnitudes from column 5 suggest that for a city with the mean 4.8 yearly HOA incorporations, Proposition 13 would increase that number to 9.2 if it were a high–crime city (80th percentile), versus 6.5 if it were a low–crime city (20th percentile). This is consistent with the view suggesting that high crime cities, which are likely to feel budgetary pressures from Proposition 13, turn more readily to private governments after the limitation. Finally, column 7 includes an additional variable that interacts a year with (*Proposition 13 × crime rate*). The negative sign on this three–way interaction suggests that, regardless of whether cities have high or low crime, the effect of Proposition 13 on incorporations is strongest immediately following the passage of the proposition, and the effect diminishes as time elapses.

This result may stem from the possibility that cities gradually adapted to Proposition 13's constraints by turning to other revenue sources.

However, while these coefficient estimates are consistent with high crime cities being those most likely constrained by Proposition 13, leading to more private government, an alternative interpretation of the results is that high crime cities are likely cities that would demand more private governments anyway.[28] This is a valid concern, as there is evidence that the within–city heterogeneity in the demand for public services can be a direct motivation for private government formation (e.g., Brooks (2007)).

A way around this is to try to remove the direct correlation between crime rates and private government. Specifications were run that included the yearly FBI crime rate as an additional time–varying covariate. Then the (*Proposition 13 × Crime rate in 1976*) interaction term measures the additional impact that the pre–13 crime rate had on HOA growth after Proposition 13, controlling for the already existing impact of the crime rate on HOA growth. The crime rate variable enters significantly as anticipated; cities with high crime rates experience high HOA rates or incorporation. Even so, the (*Proposition 13 × Crime rate in 1976*) and (*Year × Proposition 13 × Crime rate in 1976*) interaction variables are significant, with no change in sign and hardly any change in magnitude.[29] Thus even controlling for the effect that high crime rates are associated with high HOA membership, I do see that cities with high crime rates pre–Proposition 13 experience an additional upward shock to their

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[26] For a city in the 20th percentile of crime rate, the corresponding percentage point increases are 0.1 in 1979 and 1.0 in 1982.

[27] This seems to be consistent with the finding in Helsley and Strange (1999) that membership in gated communities in one area of a city induces a "contagion effect" on other areas, as gating expenditures of neighborhoods are strategic complements.

[28] This comment was noted by an anonymous referee.

[29] Estimation results are available on request.

HOA membership rates/incorporations post–Proposition 13.[30]

## CONCLUSION

This paper proposed an avenue by which local governments can respond to state–imposed TELs. In addition to increasing fees and attempting to garner more intergovernmental revenues, a city can offload the responsibility of providing public services to private governments in the form of HOAs.

After arguing why property tax limitation may affect the level and growth of private governments, I examined the pattern of California HOA growth in the years surrounding Proposition 13. The analysis combines novel data on HOAs in California with property tax data to see whether cities that faced stronger property tax constraints were more likely to encourage private government growth. In most specifications, Proposition 13 had a positive and significant effect on the level of HOA membership. There is also evidence that Proposition 13 spurred an increase in the number of new HOA incorporations. To introduce an element of heterogeneity among cities in California, I included interaction terms between Proposition 13 and pre–Proposition 13 local conditions. Proposition 13's legislated revenue sharing rule provided a useful way to classify cities into high– and low–constraint groups. An alternative measure classifies cities according to their pre–Proposition 13 crime rate, which proxies demand for public services. The classification procedures suggested cities that faced high constraints from Proposition 13 were more

likely to have higher membership rates in and more incorporation of HOAs after Proposition 13.

The empirical evidence presented in this paper suggested that local governments can respond to state–imposed tax limitations, not only by cutting expenditures and increasing other taxes as others have found, but also by spurring faster growth and membership in private alternatives to public governance. As local budgets continue to be constrained, cities have learned to find opportunities to offload the responsibility of providing public services to private associations. The results in this paper, therefore, contribute further to the understanding of the blurring line between public and private authority.

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[30] A final check on the validity of the event analysis framework is to perform a falsification exercise. Instead of Proposition 13 taking effect after fiscal year 1979, the exercise assumes that it took place after fiscal year 1977. In general, the Proposition 13 coefficients tend not to be statistically significant. In the specifications with pre–limit heterogeneity, the falsification exercise renders almost all the estimated coefficients insignificant. The strongest pre–limit variables, the tax–to–county average, and the crime rate, perform markedly worse here. Therefore, the results from this exercise reinforce that it is the imposition of Proposition 13 in fiscal year 1978–1979 that had a significant impact on private membership rates and growth. Results are available from the author.

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