# Do California's Greens Vote for Compact Cities? Evidence from Transportation and Housing Supply Policies

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March 2007

**Preliminary Draft**
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[1] I thank Liz Gerber, Steve Raphael and Jeff Zabel for kindly sharing data with me.

## Introduction

California is the nation's leading state in enacting environmental regulation and voting on direct environmental initiatives (Kahn and Matsusaka 1997). It was the first to pass new vehicle emissions standards in the early 1970s (Kahn 2006). As compared to other states, it is well known to be an innovative, regulatory leader as demonstrated by Gov. Arnold Schwarzenegger recently signing the first cap on greenhouse gas emissions. California Representatives' League of Conservation Voters scores, a measure of whether members of Congress vote the pro-environment position on key legislation, highlight that California's representatives are "green". In 2004, California Representatives voted the pro-environment position on 62% of the bills while the average non-Californian Representative voted the pro-environment position only on 46% of the bills.

Many environmentalists agree that compact cities are a worthy environmental goal. Compactness is the opposite of urban sprawl and almost all environmental activist groups are on record as opposing sprawl (see http://www.sierraclub.org/sprawl/).2 In cities with a compact urban form, people drive less, use public transit and walk more. Its residents are more likely to live in multifamily units rather than in single detached homes. The net result of these choices is that the city's per-capita ecological footprint and per-capita greenhouse gas production is lower (Kahn 2000, 2006, Bento et. al. 2005).

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[2] "By the most significant measures, New York is the greenest community in the United States, and one of the greenest cities in the world. The most devastating damage humans have done to the environment has arisen from the heedless burning of fossil fuels, a category in which New Yorkers are practically prehistoric. The average Manhattanite consumes gasoline at a rate that the country as a whole hasn't matched since the mid-nineteen-twenties, when the most widely owned car in the United States was the Ford Model T. Eighty-two per cent of Manhattan residents travel to work by public transit, by bicycle, or on foot. That's ten times the rate for Americans in general, and eight times the rate for residents of Los Angeles County. New York City is more populous than all but eleven states; if it were granted statehood, it would rank 51st in per-capita energy use." GREEN MANHATTAN Why New York is the greenest city in the U.S. By David Owen , Published in The New Yorker 10/18/04

This paper investigates whether California environmentalists are using the political process to enact policies that help to make cities more compact. In day to day life, environmentalists live a "greener" lifestyle than the average person (Kahn 2007, Kotchen and Moore 2007). As I will document below, environmentalist are more likely to use public transit, buy hybrid vehicles such as the Toyota Prius and void buying "brown" vehicles such as the Hummer.

In this paper, I will argue that California environmentalists vote for transportation policies that encourage urban compactness while they vote for land use policies that have the opposite effect. William Fischel offers a clear example of this second phenomena. Consider Marin County north of the Golden Gate Bridge in San Francisco. Fischel observes,

"It has large amounts of open space on which development could easily occur but does not. Tens of thousands of commuters from far away suburbs and exurbs pass through the Marin County corridor on U.S. Route 101 on their way to work in San Francisco. Marin's open space is an asset for those who live near it and it probably provides some pleasures for those who drive through it daily. But it also represents an enormous waste in the form of excessive commuting and displacement of economic activities to less productive areas."3

The voters in Marin County have chosen to have higher taxes in return for preserving open space. This "greens" the county and raises the environmental aesthetics for the people who live there. But as Fischel points out, an unintended consequence of such an open space policy is that new homeowners are pushed even further out into the fringe in pursuit of affordable housing. If these households commute to downtown San Francisco to work and shop, the ecological footprint of such sprawled suburbanites is much larger than it would have been had Marin County not preserved so much land as open space. In this sense Marin County's open space policy makes the Bay Area less, not more, green.

William Fischel is not alone in pointing a finger at environmentalists as a voting coalition who unintentionally contributes to deflecting development to the fringe and to other car friendly cities. Ed Glaeser offers time series evidence.

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[3]Fischel (1999 p 162).

"Through the 1970s, California was a typical growth region, generally accommodating developers and allowing new construction to meet demand. Starting in that decade, an alliance of homeowners and environmentalists made it increasingly difficult to build in the Golden State. While Los Angeles built 137,908 thousand new units in the 1960s, that city built only 37,743 thousand new units in the 1990s. As supply became constricted, prices rose and people who wanted to move to warm areas increasingly chose metropolitan areas that were friendlier to growth. California's move to restricting housing was a great boon to developers in Las Vegas, Phoenix and other sunbelt cities which boomed, providing a more affordable alternative to southern California." (Glaeser 2007)

Both quotes highlight the same idea. Growth controls due to Green NIMBY effects are deflecting activity to the suburban fringe and to car friendly city. In both cases, the net result is that environmental sustainability declines.

Glaeser's quote focuses on time series fact. He posits that a growth in environmentalism caused a contraction of housing supply. While intriguing, this is a difficult hypothesis to test because we do not have credible observable indicators of how a population's environmentalism evolves over time. An alternative way to test this claim is to use cross-sectional data. Using cross-sectional California data, I examine whether community environmentalism is an important determinant of housing supply regulation. California is the right setting for examining this issue due to its high home prices and its high levels of environmentalism and the spatial variation in where environmentalists do (i.e Berkeley) and do not live.

This paper argues that environmentalists vote "pro-green" on statewide pro-public transit infrastructure but lose on most of such votes because the median voter is a suburban vehicle driver. Thus, while environmentalists demonstrate a willingness to enact policies that would help to make cities more compact, their voting has little real effect on actual policy. In contrast, on local issues where greens are packed into specific jurisdictions, greens enact "slow growth" regulation. This matters for urban form because green communities tend to be in the center city and in high amenity parts of major metropolitan areas. This "slow growth" regulation deflects growth to the suburbs exacerbating leapfrog development and sprawl. I must acknowledge that I will not attempt to conduct a general equilibrium analysis of how much more compact would cities be if Green communities did not enact "slow growth" policies.

This paper contributes to research that examines environmentalists' choices in market and political settings (Kahn 2007, Kotchen and Moore 2007). A second literature this paper builds on is research examining the causes and consequences of housing supply regulation (Fischel 2000, Quigley and Raphael 2004, Glaeser, Gyourko and Saks 2005, Schill 2005, Gerber and Philips 2004, 2005). Some of this research has linked housing supply constraints to specific environmental issues such as protecting endangered species (Zabel and Peterson 2006) and guaranteeing access to water (Hanek and Chen 2007).

**Tiebout Sorting and the Formation of Green and Brown Jurisdictions within a Metropolitan Area**

Due to Tiebout sorting, environmentalists are not uniformly distributed across a city. They are more likely to cluster near the city center in walking part of city, near public transit stations and in high environmental amenity areas such as Berkeley, Santa Monica and Santa Cruz. Small initial differences in exogenous spatial attributes such as proximity to the ocean can have a social multiplier effect. As environmentalists move to a nice community, green businesses such as organic restaurants would be more likely to locate near this community. Such "endogenous" green amenities would only further encourage environmentalists to move to this community. Such a green community would act as a club financing "green" infrastructure such as bike lines. Such green infrastructure could have a treatment effect such that community members become more dedicated environmentalists. Community social interactions would only reinforce this dynamic. The empirical payoff from accepting this logic is that an unobservable, a person's environmentalism, can now be proxied for with the observable local community's average environmentalism.

**Identifying Greens**

To test hypotheses concerning the impact of environmentalism on transportation politics and land use politics in California, I need an observable measure of

environmentalism. Other political studies have shown the explanatory power of using a jurisdiction's share of registered members of the Democratic Party (Gerber and Phillips 2004). My approach is related but instead focuses on spatial variation in a community's share of Green Party registered voters.

The Berkeley IGS (see http://swdb.berkeley.edu/) provides data for each California census tract on its count of registered Green Party Voters in the year 2000. Map One presents the spatial distribution of this variable across California. I use a Geocorr mapping of tracts to other levels of geography available in the micro data sets. This procedure allows me to merge to various data sets discussed below a measure of what share of local neighbors are registered Green Party members.4

The California Green Party provides the following description of itself.

"Because the Earth community is imperiled and the current political system has proved ineffective, Green politics has arisen worldwide through Green parties and kindred grassroots movements. The Green Party of California was formed in 1990-91 when more than 103,000 pragmatic visionaries changed their voter registration to "Green" and thereby qualified the new party for the state-level ballot in California. The Green Party of California stands on two legs: one in electoral work (initiatives, referenda and candidates), and one in community projects and grassroots social-change movements that are compatible with the Green vision. As Greens we understand humans are but one part of the ecosystem with a unique responsibility. That responsibility is to develop an understanding of environmental sustainability and to live and promote those practices which support it. Ecologically sound principles of living can guarantee protection for the Earth and all its people. Our commitment to ecological wisdom leads us to take natural systems as a model for human interaction. The interconnectedness of all things has helped us to realize that our practices of generating "waste" separate us from natural systems; in nature degraded matter is decomposed and returned to the web of life as nutrients. Our commitment to environmental justice has helped us to understand that in a closed system we all live downstream and downwind." (See http://cagreens.org/platform/ecology.htm)."

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[4] It is important to note that voting precincts and census tracts spatially overlap but they do not coincide. To translate the voting precinct data into census tract data, The Berkeley IGS takes the precinct data (there are over 1700 Precincts in Los Angeles county alone) and uses a statistical procedure based on ecological inference to create the tract data. In the transportation regression models I present below, I will assume that voter characteristics have an additively separable constant effect on voting propensities. This assumption allows me to learn about individual propensities using grouped data (see Freedman 1999, Goodman 1955).

The California Green Party Manifesto states that its priorities are: 1. Grassroots Democracy, 2. Social Justice and Equal Opportunity, 3. Ecological Wisdom, 4. Non-Violence, 5. Decentralization, 6. Community Based Economics, 7. Feminism and Gender Equality, 8. Respect for Diversity, 9. Personal and Global Responsibility, 10. Future Focus and Sustainability (http://www.gp.org/platform/2004/intro.html#998247).
In California, the Green Party has little political clout. Across 7002 California census tracts in the year 2000, the average tract's Green Part share is .009 and the median is .005. The 10th percentile is .0017 and the 90th percentile is .019.5 In California, members of this party lose the right to vote in another party's primary election. These facts suggest that Green Party membership offers little political clout thus its members must be expressing their own personal ideology. Green census tracts are spatially clumped together. An analysis of variance of 6522 census tracts using 792 places yields a R-squared of .58.

Table One provides some summary statistics. The results are weighted by tract population. I partition all census tracts into two groups; those whose Green Party share of registered voters is greater than 1.75 percentage points (high green) and all other tracts. Table One shows that public transit use for commuting is twice as high in Green tracts than in other communities. Perhaps surprisingly, average household income and poverty rates barely differ between the two types of communities. Green communities feature much lower shares of Hispanics and much higher shares of college graduates. Population density is roughly 20% higher in very green communities than in other communities. For census tracts within 30 miles of a central business district in California, the average distance to the CBD for very green tracts is 9.53 miles while for other tracts it is 10.85 miles.

This section presents two pieces of political evidence to establish that the communities that I am labeling as "environmentalists" are indeed "green" based on objective criteria. This is a key step for placating a skeptic's concern that a community's

[5] Across California, the correlation between a census tract's log of average household income and its Green Party share is 0 and the correlation between a tract's Green Party share and the share of the residents who are college graduates is .19.

Green Party share is a clever but irrelevant variable for a researcher interested in measuring environmentalism's consequences.

The Public Policy Institute of California conducts annual surveys of Californian public opinion. In the March 2005 poll there were 1400 Los Angeles county residents survey respondents.6 This micro data set includes neighborhood identifiers that allow me to identify 81 different communities within Los Angeles County. I use a geocorr spatial data base to assign census tracts to these places. This allows me to calculate each community's Green Party voter share. Using respondent level data, I estimated an ordered logit model where the dependent variable asks people to identify their political leanings as "Very liberal, Somewhat liberal, Middle of the Road, Somewhat Conservative, Very Conservative." In the ordered logit, I control for a person's age sex, education and ethnicity. In Table Two, I report predicted probabilities of political affiliation based on an ordered logit. I use the estimated regression coefficients to predict how survey respondent's political identification varies as a function of how "Green" is their greater community. I report the predicted probabilities for people who live in communities with 0% Green Party and 1.5% Green Party registered. The latter category is meant to capture the set of communities that I am labeling as "environmentalists". The key finding reported in Table Two is that controlling for a person's attributes the probability that a person identifies himself to be somewhat liberal or very liberal increases by 15 percentage points (from 29% to 44%) when this person lives in the "Green Community" relative to the "Brown Community".

All else equal Green Party community members are much more likely to say that they are liberals. Liberals are much more likely to be environmentalists than conservatives. When Vice President Chaney was a Wyoming Representative, the 1982 League of Conservation Voters Scorecard reveals that he voted the pro-environment position only once out of 24 key environmental votes. The annual League of Conservation Voters' (LCV) "Scorecard" determines which roll call votes are important pieces of environmental legislation and identifies what is the "pro-environment" vote on each specific issue (see www.lcv.org).

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[6] For 600 of the observations, I am not able to assign them a community share of Green Party voters.

"This Scorecard represents the consensus of experts from 19 respected environmental and conservation organizations who selected the key votes on which Members of Congress should be graded. LCV scores votes on the most important issues of the year, including environmental health and safety protections, resource conservation, and spending for environmental programs. … Except in rare circumstances, the Scorecard excludes consensus action on the environment and issues on which no recorded votes occurred. Dedicated environmentalists and national leaders volunteered their time to identify and research crucial votes."

Do representatives from Green Party districts vote pro-environment on Congressional Bills? To study this, I focus on the subset of California Representatives who served between 2001 and 2004, I can use the GEOCORR data base to create a geographical bridge file linking my political data by census tract to California's Congressional Districts. This mapping allows me to construct for each of these Congressional District's a measure of its share of registered voters who are in the Green Party. In Table Three, I investigate whether Representatives are more likely to vote the Green position on House legislation if their constituents are more "green". The unit of analysis is a Representative's vote on a piece of environmental legislation.

$$\textit{Pro-Environment Vote} = \textit{controls} + b_1 * \%\ \textit{District Green Party}_i + U_i \qquad (1)$$

In column (1) I do not control for any variables. A one percentage point increase in the share of constituents who are Green Party registered voters increases the share of pro-environment votes by 22 percentage points. This would appear to be a very large effect. In the second column, I control for the Representative's own political ideology using the Poole-Rosenthal measures to control for a politician's overall political ideology.7 Controlling for "own ideology", I find evidence of a concave relationship between Green Party share and Representative voting score.

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[7] My measure of Representative ideology is the standard Poole and Rosenthal two factors (see http://voteview.com/dwnomin.htm). In the political science literature, this is the most commonly used measure of legislator preference. It is important to note that Poole and Rosenthal (1997) use all Congressional Roll Call votes rather than the subset of environmental votes to create their indices.

In columns (3) and (4) I exploit the fact that Congressional redistricting took place in 2002 in the 108th Congress. As redistricting takes place, some Representatives now represent green tracts that have been added to their spatial constituency while other representatives have lost such tracts. This variation allows me to control for representative level fixed effects and exploit within Representative variation in the "greenness" of the district (which changes due to redistricting) to test whether Representatives increase their pro-environment voting in the Congress when they now represent more Greens. In column (3) of Table Three, I find a positive but statistically insignificant coefficient. In Column (4), I run the same specification but include an interaction of the dummy variable indicating whether the Representative is a Republican and the district's Green Party share. Note that this coefficient is positive and statistically significant. When a Republican Representative in California is redistricted and the Green Party share of constituents increases by 1 percentage point, his probability of voting pro-environment on a piece of legislation increases by 16 percentage points. As a whole this evidence presented in this Table supports the claim that Representatives do place some weight on constituent environmental preferences in determining how they vote.

**Transportation: Evidence from Markets and Politics**

Having established that a community's Green Party share is a viable proxy for its environmentalism, I now study private and public transportation choices in markets and in politics. Table Four presents four statistical models. In columns (1) and (2), I estimate negative binomial regressions where the unit of analysis is a census tract. The dependent variable represents the census tract's count of registered vehicles of a particular make in the year 2005. In column (1), I study the Prius (a green vehicle) and in column (2), I study the Hummer (a brown vehicle). The R.L Polk company uses street addresses from vehicle registrations to calculate the count of vehicles by make, by calendar year and by census tract. I have acquire this information for each census tract in Los Angeles County in 2005. Controlling for census tract population and income and demographics, the first two columns of Table Four document that greens purchase

hybrids and do not purchase Hummers (Kahn 2007). These results further encourage me that my measure of environmentalism has explanatory power. In the right two columns of Table Four, I examine the propensity to commute using public transit. The dependent variable is the share of the tract workers who commute using public transit. Controlling for tract income, education, ethnicity and population density, a one percentage point increase in the Green Party share for the tract increases public transit use by 1.9 percentage points. This is a very large effect given that the mean public transit use is 5.6 percentage points. In the fourth column, I include a dummy that equals one if the tract is within one mile of a rail transit station.[8] All else equal, public transit use is 10 percentage points higher in such communities. Even controlling for this variable, the Green Party variable continues to be positive and statistically significant. The coefficient does shrink in value but even controlling for population density and rail transit availability, a one percentage point increase in a tract's Green Party share increases public transit use by 1.3 percentage points. Even controlling for access, this subgroup is acting differently.

**Transport Political Evidence**

In California, voters have the opportunity to participate in lawmaking through ballot initiatives (see Matsusaka 2005). Many of these initiatives are related to environmental issues. Voting patterns based on these binding votes provides a test of whether Green Party registration measures a local community's environmental preferences.

Here is a brief summary of one relevant proposition I study.

Proposition 185 in 1994: This measure imposes a 4 percent sales tax on gasoline not diesel fuel beginning January 1, 1995. This new sales tax is in addition to the existing $.18 per gallon state tax on gasoline and diesel fuel and the average sales tax of approximately 8 percent imposed by the state and local governments on all goods, including gasoline. Revenues generated by the increased tax will be used to improve and operate passenger rail and mass transit bus services, and to make specific improvements to streets and highways. The measure also contains various provisions that generally place restrictions on the use of certain state and local revenues for transportation purposes. (www.calvoter.org/archive/94general/props/185.html)

[8] The data source for tract proximity to rail transit is Baum-Snow and Kahn (2005).

In Table Five, I report four tract level linear probability models. In each regression, the dependent variable is the share of the tract's voters who voted in favor of Proposition 185. In column (1), I document that people who live within a mile of rail transit station that existed in 1990 are 6.2 percentage points more likely to vote in favor of this Proposition. Controlling for proximity to rail transit, Green Party communities are more likely to vote in favor of the proposition. A one percentage point increase in a community's Green Party share is associated with a 5.4 percentage point increase in support for Proposition 185. In column (2), I document that the Green Party coefficient stays positive and statistically significant even after I control for a large number of demographic controls. The coefficient shrinks to 3.9.

I recognize that other political researchers have used alternative observable measures to quantify environmentalism. Gerber and Philips use a jurisdiction's percent democrat registered voters. In columns (3) and (4) of Table Five, I present a horse race between these various indicators. A one percentage point increase in a tract's share Democrat (the omitted category is share republican), increases support for proposition 185 by .3 percentage points while a one percentage point increase in Green Party increases support for proposition 185 by 2.4 percentage points. Column (4) highlights one puzzle that the coefficient for the radical "Peace and Freedom" party switches signs as demographic controls are included. I have used the results in column (4) to generate an environmentalism index using the OLS coefficients as index weights. The correlation between this index and the Green Party share is .65.

Greens are voting pro-transit but there is little evidence that they wield political clout in determining transportation policy. In Table Six, I identify census tracts in Los Angeles, San Diego and San Francisco that are within fifteen miles of one of these city's Central Business District. In the left column of Table Six, I focus on census tracts that were more than one mile from the nearest rail transit station in 1990. For this subset of tracts, I create a dummy variable that equals one if a tract was "treated" with increased access to a rail transit station by the year 2000 (the data source is Baum-Snow and Kahn 2005). Treatment means that a tract was more than one mile from the closest rail transit station in 1990 but by the year 2000 is now within one mile from the closest station due

to rail transit expansions such as the construction of the Los Angeles Blue Line. In Table Six, I test whether Green Party tracts were more likely to be treated. Controlling for a host of characteristics, I reject the hypothesis that they were more likely to be treated.

While Green Party communities are not more likely to be treated with increased access to transit, Green Party registered voters are clustering near rail transit stations. In the right columns of Table Six, the dependent variable is a census tract's share of Green Party registered voters in 1992 and in 2000. The key explanatory variable in these regressions is a dummy variable indicating whether the tract is within one mile of a rail transit station. In both 1992 and 2000, this coefficient is positive and statistically significant. Relative to the average share of Green Party members in a tract (roughly 1%), the coefficient estimates are quite large.

In addition to rail transit, active bus transit systems are another policy tool for discouraging vehicle use. Santa Monica's Big Blue Bus is one example of an environmentalist place having a fine bus system (see http://www.bigbluebus.com/aboutus/index.asp#funding). This web page boasts that "The Big Blue Bus has won the American Transportation Association's Outstanding Achievement Award for the 4th time since 1983, and continues to be one of the most efficient, customer-friendly transportation systems in the world." It is subsidized by the rest of the state. "The Big Blue Bus is a line department of the City Of Santa Monica, reporting directly to the Santa Monica City Council. The agency does not receive general funds from the City budget and is funded entirely through farebox revenues and a variety of county, state and federal subsidies." While people traveling to and from Santa Monica are subsidized for using this transit, its scale is relatively small and unlikely to influence overall urban form. It serves a population of 460,000 with 210 buses and makes 20.5 million trips per year. This represents only twenty round trips per person per year.

**Housing Regulation in Green Jurisdictions**

Local governments determine how many and what kinds of housing units can be built. Many experts on land use control have emphasized that suburban home owners engage in fiscal zoning to limit entry of poorer people (Levine 2005, Fischel 2000). "Almost all suburban governments are politically dominated by homeowners, who

comprise 70% of suburban voters, according to PPIC surveys. Homeowners are driven by two key goals: (1) maximizing or at least maintaining the values of their own homes, which are their major financial assets in most cases, and (2) preventing any worsening of traffic congestion in their areas. Traffic congestion worsens because of rising population and economic prosperity. The first goal is served by not permitting any more lower-cost housing to be built nearby. The second goal is served by preventing as much growth as possible." (Downs 2005)

A recent large housing supply literature has examined the consequences of regulation on housing construction and market prices (Glaeser, Gyourko and Saks 2005, Schill 2005, Quigley and Raphael). A major challenge this literature faces is that there are so many ways to regulate housing that it is difficult for researchers to code up large numbers of dummy variables (i.e does the jurisdiction have a growth control boundary) and include all of them in an outcome regression. The Levine and Glickfeld (1992) survey documents over 40 different types of housing regulations. Even if one bothered to code up all of these variables, it would be difficult to claim that these are exogenous regressors in a cross-sectional regression of housing outcome measures regressed on these regulatory measures.[9]

A structural research approach would attempt to estimate a selection equation; how do a community's exogenous attributes affect the probability of enacting a specific piece of land use regulation and then a treatment outcome equation; how does this piece of regulation affect housing outcomes such as construction and market prices?[10]

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[9] For example, suppose that housing supply regulation has different outcome effects for different communities. In this "heterogeneous treatment effects" case, if community incumbent home owners know their own community's treatment effect then those communities that would gain the most home price appreciation by slowing development would be most likely to enact the regulation. In this case, OLS estimates would over-estimate the outcome effect of adopting regulation for a random community (Heckman, Urzua and Vylacil 2006).

[10] "California's local regulatory process is often frustrating to builders and developers, yet it is difficult to assess what exact effect it has had on housing costs and production levels. Part of the difficulty is that the approvals process is administered differently in every city and county. It is, moreover, constantly changing in response to shifting fiscal conditions and popular concerns over growth. Never overtly friendly to housing, the process has in recent years become even less accommodating. In theory, the development approvals process in California is supposed to be plan driven. In fact, the over-riding

The algebra of the selection equation would take the form: Regulation = H(Z, environmental ideology) and the treatment equation would look like: Housing outcomes = G(X, regulation). Given the multiple dimensions for coding up different housing regulations, I view it as too ambitious to estimate this two equation system. Instead, I adopt a reduced form approach and substitute the selection equation into the outcome equation and estimate at the place level:

Housing outcome = f(X, Z, environmental ideology)

This strategy allows me to directly test whether communities with a larger Green Party share have more stringent housing supply regulation. The first data set I examine is annual building permits for each Californian city are based on Zabel and Peterson (2006) data obtained from the California Industry Research Board (CIRB). The largest FIPS in this analysis is Los Angeles, which is 303,000 acres with a population in 1990 of 3.5 million. The smallest FIPS is Amador City (approximately 30 miles south-east of Sacramento), which is 209 acres with a population in 1990 of 196. The dataset includes the total number of permits granted each year for different types of housing structures for more than 400 FIPS places over the period 1990-2004, as recorded by the CIRB. This represents the incorporated subset (with minor exceptions) of all California FIPS places and encompasses the majority of all land within FIPS boundaries.

I use these data to test whether environmentalist cities (measured by the City's share of Green Party registered voters in 1992) engage in more housing supply limitations. Why would an environmentalist community engage in "extra" zoning? The median voter may believe that growth threatens the area's natural capital and overall quality of life. Environmentalist areas may be like religious communities and as such

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importance of the California Environmental Quality Act (CEQA), the ease with which general plans may be amended, and the widespread adoption of various growth management programs and alternative planning structures have all increased the discretion local governments—and thus indirectly, citizens and neighborhood groups—can exercise over private development proposals. The effect of these supplemental measures has been to elevate the importance of short-term fiscal, traffic, and environmental issues in the development approval process and to reduce the importance of long-term planning. None of these changes has favored housing." (Landis 2002)

are club goods. Iannaccone (1992) and Berman (2000) have argued that club member utility is higher if the size of the group is larger and if the average devotion to the cause is higher. Housing supply limitation measures may help to self-select only those environmentalists who are committed to the cause and this raises the average devotion to the group.

In Table Seven, I report California housing permit regressions. The unit of analysis is a place/year. The Table reports three OLS regressions. In each regression the dependent variable = log(1+x). Explanatory variables are all from the year 1990. The unit of analysis is a place/year in California. Calendar year fixed effects are included in each regression. The data cover the years 1990 to 2004. Standard errors are clustered by place. In each of these regressions, I control for the place's share of housing units that are owner occupied, and the place's population size, average income and population density. Green Party communities issue fewer single family new housing permits. A one percentage point increase in Green Party reduces single family permits by 14%, increases multifamily permits by 6.2% (this result is not statistically significant) and reduces total units by 10.6%. This evidence is consistent with the Fischel and Glaeser arguments quoted in this paper's introduction that Greens are engaging in NIMBYism to slow growth.

To further investigate this claim, I turn to a second data set based on data from Gerber and Phillips (2004). The unit of analysis is a California place. The dependent variable is a dummy that equals one if the place has a urban growth boundary in place. Table Eight presents the results. Green Party places are 6.2 percentage points more likely to have such boundaries.

The final piece of housing supply regulation data I present is based on the California place level survey data of Levine and Glickfeld (see Quigley and Raphael's description of this data). Each row of Table Nine reports a separate OLS regression of a linear probability model. The table reports the results from eighteen separate regressions. I suppress all the regression coefficients except for the coefficient on the Place's Green Party share. Greens places are not engaging in many forms of housing supply regulation. They are enacting rules to protect agriculture and open space rules and to down zone. These results are consistent with Fischel's quote about environmentalist activity in

suburban Marin County. Both the results in Tables Eight and Nine indicate that suburban greens are allocating land away from residential development.

My final goal in this section is to look at outcome variables such as population growth and house price growth to see if Green communities are experiencing different outcomes than other "control" communities. Ed Glaeser documents an important cross-county time series fact.

"The slowdown of population growth in Santa Clara County is not unique in California since 1980. In many of the state's most desirable areas, population growth started to slow down in the 1970s. Santa Barbara county's population grew by 50 percent in the 1960s, but has experienced almost no growth between 1990 and 2005. Marin County grew by a third in the 1970s, but has grew by less than 15 percent between 1980 and 2005. The population of San Mateo County had risen from 112,000 in 1940 to 556,000 in 1970. Between 1970 and 2005, its population grew only 23 percent. In 1970, California's climactic advantages and growing productivity seemed poised to remake America as a Pacific coast nation, but suddenly population growth, especially in the state's most attractive areas slowed dramatically (Glaeser 2008)."

I use census tract level data to further examine the implicit hypothesis embedded in this quote. In Table Ten, I examine census tract changes between the years 1990 and 2000 in average tract home prices and population levels. In column (1), I show that a one percentage point increase in the place's Green Party share is associated with 10% less population growth over the decade. In column (2), I focus only on census tracts located in California metropolitan areas. The Green Party coefficient is still statistically significant but the coefficient shrinks to -6.8%. The home price results are reported in columns (3) and (4). All else equal, Green Party communities have experienced greater home price appreciation. As shown in column (3), a one percentage point increase in the 1992 Green Party share is associated with an extra 8% home price appreciation between 1990 and 2000. One possible, but hard to test, explanation for this finding is that Green Party communities are able to internalize neighborhood externalities and are able to build communities with higher local quality of life and this is capitalized into rising home prices.

## Conclusion

This paper has investigated environmentalists' voting patterns on transportation policy and housing supply regulation in California's cities. In statewide elections, environmentalist communities lose out in enacting "pro-public transit" policies that would green city economic activity. Through local political decisions involving land use and housing regulation, green communities are enacting "slow growth" policies that limit new housing permits and allocate land to open space protection initiatives. Thus, the net effect of environmentalist voting patterns actually has the unintended consequence of making California's cities less compact.

While it would be cute, it would be a mistake to conclude based on this paper's analysis that "green voters cause sprawl". Without a general equilibrium analysis of where "deflected" households move to, it is difficult to make the jump from my cross-sectional reduced form regressions to determine how much more compact would California's cities be without environmentalists enacting local land use controls.[11] Such general equilibrium analyses of the migration effects induced by policies are only in their infancy (see Sieg et. al. 2004).

Despite these caveats, it remains an important issue to measure how large are local NIMBY effects and what types of people engage in such activities. Glaeser offers a provocative thesis that the impact of environmentalists on urban form and housing supply will grow over time and spread to other states as they learn from California's experience.

"I suspect that the big story in housing supply over the next twenty years is that more areas will begin to follow California and slow new construction. There are many factors which should lead to contagion of this phenomenon. Activist groups learn from each other and the techniques that served the self-proclaimed saviors of the San Francisco Bay can be readily adopted from Montana to Maryland. Judges look at other states when making decisions and pro-conservation decisions will surely spread. The environmentalist movement is not losing steam and its ideology provides a respectable basis for opposing construction in your back yard."

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[11] In addition, many other factors play an important role in determining urban form. Given the durability of the housing stock and basic infrastructure, many long run trends influence urban form and overall city compactness. For example, job suburbanization and faster roads cause more sprawl (Baum-Snow 2007, Glaeser and Kahn 2001). Crime reduction facilitates urban rejuvenation (Berry-Cullen and Levitt 1999).

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Figure One

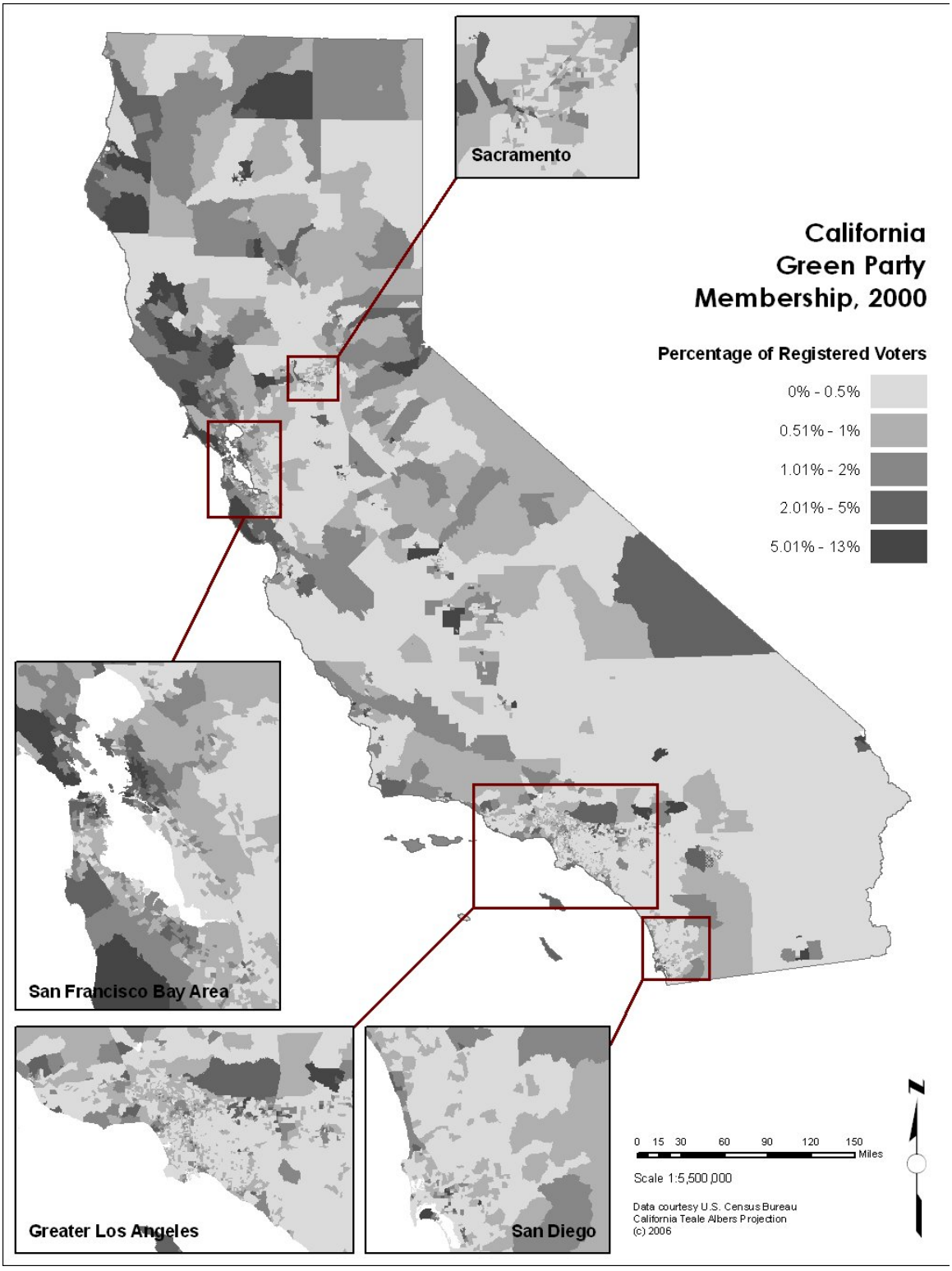
Sacramento
California
Green Party
Membership, 2000
Percentage of Registered Voters
0% - 0.5%
0.51% - 1%
1.01% - 2%
2.01% - 5%
5.01% - 13%
San Francisco Bay Area
Greater Los Angeles
San Diego
0 15 30 60 90 120 150
Miles
Scale 1:5,500,000
Data courtesy U.S. Census Bureau
California Teale Albers Projection
(c) 2006
N

Table One: Summary Statistics in 2000

| | All | High Green Tracts | Other Tracts |
|---|---|---|---|
| % Commuting Using Public Transit | 0.0539 | 0.0987 | 0.0491 |
| Miles from the Central Business District | 10.7276 | 9.5316 | 10.8527 |
| Average household income | 63913.5800 | 62149.5700 | 64103.1100 |
| % Black | 0.0732 | 0.0675 | 0.0739 |
| % Hispanic | 0.3239 | 0.2491 | 0.3319 |
| % College Graduate | 0.2489 | 0.3335 | 0.2398 |
| % in Poverty | 0.1390 | 0.1488 | 0.1379 |
| People Per Square Mile | 8372.4840 | 9913.9340 | 8207.0330 |

High Green Tracts are the subset of census tracts where the share of Green Party Registered voters is greater than 1.75%.

Table Two: Los Angeles County Survey Respondent Political Identification

| | Community Share Registered Green Party | |
|---|---|---|
| Predicted Probability of Political Category | 0% | 1.50% |
| Very Liberal | 0.0974 | 0.1511 |
| Somewhat Liberal | 0.1928 | 0.2497 |
| Middle of the Road | 0.3123 | 0.3119 |
| Somewhat Conservative | 0.2688 | 0.2052 |
| Very Conservative | 0.1288 | 0.0822 |

This table reports predicted probabilities of survey respondents' identification with a political ideology. Using individual level data from the March 2005 PPIC survey from Los Angeles county, an ordered logit is estimated. Individual level controls include age, sex, education dummies, ethnicity dummies. Controlling for these variables, this table reports the predicted probability that a person identifies himself as a function of the average Green Party Share of registered voters in the community he lives in in Los Angeles county. The PPIC micro data identifies 82 different communities.

Table Three: California Representative Voting on Environmental Legislation

| | Coef. | Std. Err. | Coef. | Std. Err. | Coef. | Std. Err. | Coef. | Std. Err. |
|---|---|---|---|---|---|---|---|---|
| District Share Green Party Registered | 21.7723 | 3.6376 | 17.8700 | 5.0248 | 5.2908 | 4.1109 | -0.0897 | 2.6253 |
| District Share Green Party Registered Squared | | | -565.1421 | 157.9534 | | | | |
| District Green Party*Representative is a Republican | | | | | | | 16.4122 | 8.0601 |
| Constant | 0.4391 | 0.0651 | 0.4526 | 0.0267 | 0.5588 | 0.0359 | 0.5716 | 0.0247 |
| | | | | | | | | |
| Year Fixed Effects | Yes | | Yes | | Yes | | Yes | |
| Representative Overal Ideology Controls | No | | Yes | | No | | No | |
| Representative Fixed Effects | No | | No | | Yes | | Yes | |
| Observations | 2449 | | 2449 | | 2449 | | 2449 | |
| R2 | 0.1094 | | 0.7128 | | 0.756 | | 0.756 | |

The unit of analysis is a Representative's vote on a Congressional Bill pertaining to the environment as defined by the League of Conservation Voters Scorecards. The dependent variable is a dummy that equals one if a Representative voted the pro-environment position as defined by the League of Conservation Voters. The sample includes all California Representatives who served over the years 2001 to 2004. The Representative Ideology Measures are discussed in the text.
A larger Representative ideology factor #1 is associated with a conservative ideology.
District Share Green Party Registered has a mean of .0082 and a standard deviation of .0073.
Representative Ideology Factor #1 has a mean of -.0553 and a standard deviation of .4889
Representative Ideology Factor #2 has a mean of -.1448 and a standard deviation of .3206.

**Table Four  Private Transportation Choices and Environmentalism**

| | Hybrid | | Hummer | | % using Public Transit | | | |
|---|---|---|---|---|---|---|---|---|
| Column | (1) | | (2) | | (3) | | (4) | |
| | Coeff | s.e | Coeff | s.e | Coeff | s.e | Coeff | s.e |
| Share of Tract Green Party Registered | 76.0889 | 4.4700 | -19.8748 | 6.0638 | 1.8552 | 0.0675 | 1.3411 | 0.0614 |
| Within One Mile from Rail Transit Station | | | | | | | 0.1006 | 0.0024 |
| log(average household income) | 1.2027 | 0.0684 | 0.6672 | 0.0798 | -0.0292 | 0.0031 | -0.0180 | 0.0028 |
| Share of Tract Black | | | | | 0.1142 | 0.0076 | 0.0855 | 0.0068 |
| Share Hispanic | -2.5967 | 0.1205 | -0.6140 | 0.1237 | 0.0801 | 0.0047 | 0.0746 | 0.0042 |
| Share College Graduates | | | | | 0.1025 | 0.0081 | 0.0806 | 0.0073 |
| log(Population Density) | 0.0653 | 0.0229 | -0.1162 | 0.0246 | 0.0147 | 0.0005 | 0.0109 | 0.0005 |
| Constant | -13.3410 | 0.8750 | -6.7757 | 1.0096 | 0.1771 | 0.0339 | 0.0896 | 0.0303 |
| observations | 2041 | | 2041 | | 7010 | | 7010 | |
| R2 | 0.1910 | | 0.0870 | | 0.3430 | | 0.4760 | |

Columns (1) and (2) report negative binomial regressions.  In each of these four statistical models the unit of analysis is a census tract.  The demographic data is from the year 2000.  The vehicle count data represents the count of registered vehicles in a census tract in 2005.  In columns (1) and (2), the tract's total population is included as an explanatory variable but its coefficient estimate is suppressed. In columns (1) and (2), the data set covers all census tracts in Los Angeles county. In columns (3) and (4), the sample includes all census tracts in California.

Table Five: Voting on Public Transit Investments

| | Proposition 185 in 1994 | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Coef. | Std. Err. | Coef. | Std. Err. | Coef. | Std. Err. | Coef. | Std. Err. |
| Green | 5.4569 | 0.1066 | 3.8777 | 0.1138 | 4.3134 | 0.1085 | 2.4045 | 0.1193 |
| Democratic | | | | | 0.1546 | 0.0088 | 0.3039 | 0.0110 |
| American Independent Party | | | | | -3.7007 | 0.1839 | -0.6100 | 0.2077 |
| Peace and Freedom Party | | | | | -0.7012 | 0.3485 | 2.5159 | 0.3466 |
| Miscellaneous | | | | | 1.0597 | 0.0731 | 0.6348 | 0.0687 |
| Libertarian Party | | | | | -0.0887 | 0.2999 | 0.0920 | 0.2780 |
| Declined to State Registration | | | | | 1.1211 | 0.0406 | 0.4866 | 0.0421 |
| Within One Mile of a Rail Transit Station | 0.0628 | 0.0048 | 0.0539 | 0.0045 | 0.0348 | 0.0045 | 0.0434 | 0.0042 |
| log(Average Household Income) | | | -0.0459 | 0.0041 | | | -0.0187 | 0.0042 |
| % Black | | | 0.0780 | 0.0075 | | | -0.0780 | 0.0092 |
| % Hispanic | | | 0.0712 | 0.0069 | | | -0.0256 | 0.0073 |
| % College Graduates | | | 0.3527 | 0.0117 | | | 0.3206 | 0.0116 |
| log(Population Density) | | | 0.0033 | 0.0006 | | | -0.0008 | 0.0006 |
| Constant | 0.1557 | 0.0012 | 0.5358 | 0.0449 | 0.0345 | 0.0069 | 0.1135 | 0.0480 |
| Observations | 6892 | | 6825 | | 6892 | | 6825 | |
| R2 | 0.37 | | 0.4800 | | 0.463 | | 0.5500 | |

The demographic data is from the 1990 census and the political registration data is from 1992.

Table Six: Environmentalists' Influence on Transit Siting and Green Clustering Near Rail Transit Stations

| | Dummy =1 if Tract not "treated" in 1990 but "treated" by 2000 | | Green Party Share | | | |
|---|---|---|---|---|---|---|
| | | | 1992 | | 2000 | |
| | beta | s.e | beta | s.e | beta | s.e |
| 1992 % Green Party Registered Voter Share | -1.1697 | 1.1634 | | | | |
| Census Tract Centroid Within 1 Mile of Rail Transit Station | | | 0.0109 | 0.0008 | 0.0068 | 0.0007 |
| % Black | -0.1210 | 0.0463 | 0.0016 | 0.0014 | 0.0023 | 0.0016 |
| % Hispanic | -0.2088 | 0.0522 | 0.0089 | 0.0017 | 0.0057 | 0.0017 |
| % College Graduates | -0.1494 | 0.0730 | 0.0371 | 0.0020 | 0.0300 | 0.0020 |
| % Poverty | 0.8444 | 0.1049 | 0.0167 | 0.0034 | 0.0221 | 0.0033 |
| log(Population Density) | 0.0042 | 0.0094 | 0.0020 | 0.0003 | 0.0016 | 0.0003 |
| log(Distance to the CBD) | -0.1793 | 0.0149 | 0.0021 | 0.0004 | 0.0010 | 0.0004 |
| Constant | 1.7851 | 0.1901 | -0.0300 | 0.0035 | -0.0223 | 0.0037 |
| Demographic Controls are from the Year | 1990 | | 1990 | | 2000 | |
| Observations | 1811 | | 2126 | | 2136 | |
| R2 | 0.222 | | 0.465 | | 0.4 | |
| Metropolitan Area Fixed Effects | Yes | | Yes | | Yes | |

The unit of analysis is a census tract. The sample includes all California census tracts that are within fifteen miles of either the Los Angeles CBD or the San Francisco CBD or the San Diego CBD.

The sample in the left regression are all census tracts in metropolitan areas that were more than one mile from a rail transit station in 1990.

The mean of the Green Party share in 1992 is .007 and in 2000 it is .01.

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Table Seven: Place Level Estimates of Housing Supply Limitations

| | Unit Type | | | | | |
|---|---|---|---|---|---|---|
| | Single Family | | Multifamily | | Total Units | |
| | Coef. | Std. Err. | Coef. | Std. Err. | Coef. | Std. Err. |
| 1992 Place Share Green Party Registered Voters | -13.7539 | 4.6150 | 6.2026 | 4.7479 | -10.6499 | 5.0843 |
| % Owner Occupied | 2.2308 | 0.5283 | -1.9343 | 0.4749 | 1.2442 | 0.5237 |
| log(Place Population) | 0.9982 | 0.0543 | 0.9943 | 0.0606 | 1.0749 | 0.0516 |
| log(Place Population Density) | -0.1332 | 0.0543 | -0.0964 | 0.0396 | -0.1203 | 0.0508 |
| Big MSA dummy | -1.0255 | 0.1427 | -0.4353 | 0.1159 | -0.9283 | 0.1341 |
| Log(average household income) | -0.0327 | 0.1865 | 0.5062 | 0.1673 | 0.0584 | 0.1791 |
| latitude | 0.1497 | 0.0841 | 0.1498 | 0.0523 | 0.1413 | 0.0790 |
| longitude | -0.1009 | 0.0769 | -0.0607 | 0.0521 | -0.0784 | 0.0734 |
| constant | 0.8030 | 5.7764 | -9.8973 | 4.1893 | -2.5927 | 5.5413 |
| Observations | 6538 | | 6538 | | 6538 | |
| R2 | 0.3890 | | 0.2970 | | 0.4160 | |
| Year Fixed Effects | Yes | | Yes | | Yes | |

In each regression, the dependent variable is the log(1+Permit Type). The unif of analysis is a place/year.

Table Eight: Urban Growth Boundary Adoption as a Function of Place Attributes

| | Coeff | s.e | Coeff | s.e |
|---|---|---|---|---|
| Place Share Green Party Registered Voters in 1992 | 6.2727 | 3.0741 | 6.4370 | 3.2584 |
| Place Share Democratic Party Registered Voters in 1992 | | | -0.0005 | 0.0032 |
| Central City Dummy | 0.1556 | 0.0887 | 0.1556 | 0.0889 |
| Percent Hispanic | 0.0024 | 0.0017 | 0.0025 | 0.0019 |
| Percent in Poverty | -0.0026 | 0.0047 | -0.0027 | 0.0047 |
| Sample Mean | 0.3070 | | 0.3070 | |
| observations | 278 | | 277 | |
| pseudo R2 | 0.0286 | | 0.0287 | |

The dependent variable equals one if the place has adopted a urban growth boundary.
The coefficients represent the marginal change in the probability of enacting a UGB for a one unit change in the explanatory variable.

Table Nine: Housing Restrictions Enacted by California Places

| Dependent Variable is a Dummy Indicator | beta | s.e |
|---|---|---|
| Measure Restricting Residential Building Permits | 0.3027 | 1.5164 |
| Measure Limiting Population Growth | 0.5355 | 1.3502 |
| Measure Requiring Adequate Service Level for Approval of Residential Development | -5.5540 | 2.2575 |
| Measure Rezoning Residential Land to Agriculture and Open Space | 5.2972 | 1.3069 |
| Measure Reducing Permitted Density by General Plan or Rezoning | 3.9915 | 2.1649 |
| Measure Requiring Voter Approval for Residential Upzoning | 0.0013 | 1.0329 |
| Measure Requiring Super Majority Council vote for Residential Upzoning | 0.7413 | 0.6540 |
| Measure Requiring Adequate Service Levels for Approval of Commercial/ Industrial Development | -3.2788 | 2.1912 |
| Measure Restricting Commerical Square Footage that can be built | 1.2124 | 1.0801 |
| Measure Restricting Industrial Square Footage that can be built | 0.3409 | 0.9602 |
| Measure Rezoning Commericial/Industrial Land to less intensive use | 1.1170 | 1.7742 |
| Measure Reducing Permitted Height of Commerical/Office Buildings | -0.7487 | 2.0668 |
| Adopted Growth Management Element in General Plan | -2.0632 | 1.6776 |
| Measure Establishing Urban Limit Line Beyond | 0.1421 | 1.4642 |
| Other Measure to Control Development | 0.2882 | 1.6104 |
| Building Moratoria Implemented | 4.4015 | 2.1987 |

The unit of analysis a place. Each row of this table reports results from a separate regression. Each regression has 394 observations. The dependent variable in each regression is a dummy variable. The suppressed controls include the place's log(population density), log(average household income), percent Hispanic, latitude and longitude based on 1990 Census data. Controlling for these variables, this table reports the regression estimates on the coefficient "% Green Party Registered Share in 1992".

Table Ten: 1990 to 2000 Changes in Population and Home Prices in Green and Brown Cities

| | Change in Population | | | | Change in Home Price | | | |
|---|---|---|---|---|---|---|---|---|
| Column | (1) | | (2) | | (3) | | (4) | |
| | Coef. | Std. Err. | Coef. | Std. Err. | Coef. | Std. Err. | Coef. | Std. Err. |
| 1992 Place Share Green Party Registered Voters | -10.1276 | 2.3720 | -6.8156 | 2.9378 | 8.0706 | 1.1575 | 3.8662 | 0.9095 |
| Population in 1990 | -0.2280 | 0.0508 | -0.2420 | 0.0572 | | | | |
| Home Price in 1990 | | | | | -0.0325 | 0.0154 | -0.0492 | 0.0276 |
| Miles from the Central Business District | | | 0.0269 | 0.0107 | | | 0.0027 | 0.0027 |
| Constant | 1.3568 | 0.2737 | 1.1190 | 0.2089 | 0.2094 | 0.1874 | 0.4184 | 0.3240 |
| Sample | All | | MSA | | All | | MSA | |
| MSA Fixed Effects | No | | Yes | | No | | Yes | |
| feb24.do | | | | | | | | |
| Obs | 6431 | | 5569 | | 6292 | | 5441 | |
| R2 | 0.026 | | 0.034 | | 0.071 | | 0.32 | |

The unit of analysis is a census tract. In columns (1) and (2), the dependent variable is the 1990 to 2000 percent change in a census tract's population count. In columns (1) and (3), the sample includes all California census tracts. In columns (2) and (4), the sample includes all census tracts within 25 miles of a central business district. In columns (3) and (4) the dependent variable is the 1990 to 2000 percent c in average home prices in the census tract. The standard errors are clustered by place.