Community Homogeneity and Revealed Preferences for Environmental Goods

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Abstract

This paper examines the links between community homogeneity and the demand for environmental quality. Using data from California, this paper shows that communities that are more homogeneous in terms of race and educational attainment are more likely to support the public provision of environmental goods, after controlling for political ideology, voter turnout, and the distribution of benefits and costs across communities. The models also reveal non-monotonic relationships between racial and social groups and support for the public provision of environmental amenities. Support for environmental initiatives in a community typically increases at an increasing rate the greater the concentration of whites. On the other hand, support generally increases at a decreasing rate the greater the share of African-Americans and Asians in the population. Results for a proposal that would have imposed a tax on oil extraction to fund alternative energy projects suggest a different pattern of non-linear associations.

1. Introduction

Social scientists have examined election results to understand the demand for public goods. Deacon and Shapiro (1975), Fischel (1979), Matsusaka (1992), and Dubin et al. (1992) are among the seminal papers in this literature. The analysis of referendum data is particularly helpful to learn about the preferences for environmental quality (Kahn and Matsusaka, 1997; Kahn, 2002). The natural environment is a public good and we must infer willingness to pay through surveys or with indirect methods such as hedonic price and averting expenditures models. Examining voting on referenda is another approach. The election process allows voters to become informed about the income and price effects of their decision so that an individual will support a ballot proposition if her expected benefits from the proposal are equal to or greater than the cost.

Rather than observing individual voting choices, researchers typically have access to voting results aggregated at the county, city, or census-tract level. Because ballot proposals usually generate differential benefits and costs across communities according to the communities' socio-economic profile, researchers are able to exploit variability of both voting patterns and socio-economic factors to examine preferences for public goods. Researchers control for variables that reflect how a proposal might influence a community's welfare – variables such as median household income, shares of individuals in different occupations, and educational attainment. The models also include the share of the population of a given race or social class if the public good creates differences in well-being among groups, for example, if a proposal provides environmental amenities and minorities and the poor are disproportionally exposed to environmental hazards.

However, there is consistent evidence in the social sciences that there are factors beyond population shares that relate to the social structure of a community and that influence economic outcomes. In particular, research shows that racial and class heterogeneity can matter for the provision of public goods. In this literature, researchers divide a population into exclusive groups (based on race, ethnicity, educational attainment, etc.) and construct an index by adding the squared shares of the groups and subtracting the sum from one. If there is only one group, the population is perfectly homogeneous and the index of heterogeneity is equal to zero. On the other hand, a population of many small groups gets an index of heterogeneity that approaches one (Vigdor, 2002).[1] Using this measure, Alesina, Baqir, and Easterly (1999) show that the local provision of public goods is lower in more heterogeneous communities. Otken and Okonkwo-Osili (2004) find a negative relationship between ethnic diversity and participation in community groups. Alesina and La Ferrara (2000, 2002) find that racial diversity in American cities is negatively correlated with participation in social activities and with the propensity to trust other people. Costa and Kahn (2003) and Glaeser, Laibson, Scheinkman, and Soutter (2000) find that diversity influences levels of trust. Other papers examining the links between community composition and the provision of public goods include Sampson, Raudenbush, and Earls (1997), Vigdor (2004), and Alesina and La Ferrara (2005).

Of several non-excusive explanations for these results, three mechanisms are relevant for the public provision of environmental quality. First, different groups may have different spending priorities and preferences about which goods should be provided publicly. Second, heterogeneity can increase the costs of coordinating and defining common policy goals. Third, heterogeneity can reduce the provision of a public good if individuals are averse to mixing: even

[1] Alternatively, researchers can construct an index of homogeneity by adding the squared shares of groups, The homogeneity index is equal to one if there is only one group in the population. This paper uses the homogeneity index.

when different groups have the same preference for a given public good, greater heterogeneity can lower the provision of the good if its use requires contact and sharing across groups.

In the case of state-wide referenda, local heterogeneity might influence the provision of public goods through any of these mechanisms or a combination of them. For example, if individuals are averse to mixing and a proposal provides a public good such as a park which use implies sharing and mixing at the local level, then local homogeneity might matter. Another possibility is that different groups have different preferences and that a group's ability to coordinate support or opposition to a ballot proposal depends on how much of the community's population that group comprises. In this case, there might be differential homogeneity effects. For example, suppose that on average African-Americans prefer to allocate tax revenues on pollution prevention rather than on conservation projects – in that case, if homogeneity increases because there is a larger share of African-Americans in a community, support for conservation projects might eventually decrease in that community; the opposite would be true if on average whites were to prefer conservation projects over pollution prevention and a community becomes more homogeneously white. These effects can be estimated by including in the model group shares squared (Vigdor, 2002).

The goal of this paper is to bring a new perspective to the literature on revealed preferences for environmental goods by accounting for the role of community heterogeneity. In this way, this paper aims to bridge the gap between the literature on voting for environmental quality and research on the effects of racial and social class heterogeneity on economic outcomes. Using 2000 census-tract data from California, this paper shows that indices of racial and educational attainment homogeneity are correlated with support for the public provision of environmental goods, even after controlling for political ideology, voter turnout, and the distribution of benefits and costs across census tracts. The results also show differential homogeneity effects across groups. In particular, support for environmental initiatives in a community typically increases at an increasing rate the greater the concentration of whites. On the other hand, there is consistent evidence that support for several proposals increases at a decreasing rate the greater the share of African-Americans and Asians in the population. Results for an initiative that would have imposed a tax on oil extraction in California in order to fund alternative energy projects suggest a different pattern of associations.

There are two main reasons why accounting for community homogeneity may provide valuable insights about the demand for environmental quality. First, exploring the role of community homogeneity will contribute to our understanding of collective decision-making and how social structure and group preferences might facilitate or hinder the public provision of environmental goods. Second, estimating differential homogeneity effects can help us understand better the efficiency and distributional impacts of publicly provided public goods. The results of this paper indicate that communities that differ in their racial and educational-attainment composition support differently, and at different rates, environment-related propositions.

The paper is organized as follows. Section 2 briefly summarizes relevant papers in each literature. Section 3 presents the environmental initiatives that are the object of study. Section 4 discusses the conceptual framework and model specifications. Section 5 presents results and Section 6 concludes.

2. Related Literature

Although there is extensive work about community heterogeneity, this research program has not considered the public provision of environmental goods. The goal of this paper is to bridge the literature on environmental ballots and the research on the role of community heterogeneity on economic outcomes. Thus, this section first summarizes relevant papers in the literature on voting for environmental quality provision and then discusses some major contributions to the research on the effects of racial and social class heterogeneity on economic outcomes.

Deacon and Shapiro (1975) and Fischel (1979) are two seminal papers that have defined how researchers approach the analysis of environmental referenda. Deacon and Shapiro (1975) use city-level data to examine voting to conserve the California coastline and provide public financing for rapid transit. The authors find that education, political preference, and income were consistent determinants of support for the initiatives. Fischel (1979) is an early study of individual voter responses. Fischel finds that income, occupation, and education were significant predictors of support for a wood pulp processing mill locating in New Hampshire. More recently, Matsusaka and Kahn (1997) analyze county-level data from environmental ballot propositions in California between 1970 and 1994. The authors use employment in different industries and occupations, educational attainment, and urban population to control for the distribution of benefits and costs. Kahn (2002) expands this research by analyzing six California ballot proposals between 1994 and 1998 using census-tract data. Kahn finds that the more educated, the young, and those working in non-polluting industries are more likely to demand environmental quality. Communities with higher proportion of Hispanics and African-Americans are also more likely to vote pro-environment.

While these studies provide insights about the role of average community characteristics on the demand for public environmental goods, community heterogeneity can also influence support for environmental propositions. Among the relevant papers in the literature on diversity and economic outcomes, Alesina, Baqir, and Easterly (1999) show that the local provision of public goods such as education and roads is lower in more heterogeneous communities. The authors argue that this finding is not due to minorities having a lower demand for these goods. Rather, the authors hypothesize that individuals in any given group are unlikely to support using tax revenues to provide goods they would share with members of other groups. Consistent with this insight, Alesina and La Ferrara (2000) develop a model in which individuals prefer to interact with people from their same racial group. In their model, individuals' utility increases with the amount of the public good, however, as the number of different groups increases, the level of utility and the marginal utility from the public good decrease.[2] In a related paper, Otken and Okonkwo-Osili (2004) find a negative relationship between ethnic diversity and participation in community groups and argue that diversity can increase the costs of coordinating and defining common policy goals.

These papers provide the motivation for the empirical analysis in this research. In addition to the typical controls for the differential distribution of benefits and costs across communities, the models in this paper control for racial and social class composition to account for the possibility that, everything else equal, greater community homogeneity can increase support for the public provision of environmental amenities if homogeneity facilitates coordination, agreeing upon common policy goals, civic involvement, and the sharing of public goods. In addition, this paper also examines whether there are differential homogeneity effects across racial and educational attainment groups.

[2] Diversity can also have positive effects. Alesina and La Ferrara (2005) discuss how diversity can increase innovation and productivity.

3. California Initiatives

Research has focused on ballot proposals in California because of the frequency of initiatives in the state. Although we might not be able to generalize the results to the U.S., substantial variability within California both in terms of voting results and socio-economic characteristics facilitates estimating the demand for environmental regulation. California voters have voted on environment-related proposals in the years 2000, 2002, 2006, and 2008.[3] This paper examines ballot proposals 12 and 13 from March 2000, proposals 50 and 51 from November 2002, and proposals 1B and 87 from November 2006.[4] These measures cover an array of issues (parks, wildlife, water quality issues, transportation, and alternative energy funding) and vary in their fiscal impacts. In addition, these proposals allow comparing results for similar initiatives across years (proposals 50 and 13 provide for water-related amenities and proposals 51 and 1B provide for transportation).[5]

Proposition 12 provides for a bond issue of $2,100 million dollars to buy, develop, and protect natural areas. Around 45 percent of the fund is allocated to local governments and nonprofits to fund recreational and cultural areas, environmental improvement projects, community centers, farmland preservation, and urban forestry programs. The rest is allocated to state projects (acquisition and improvement of recreational areas, natural areas, and wildlife habitat). Benefits from these projects might accrue to individuals who demand nature conservation and recreational opportunities. Some benefits might accrue to city dwellers since

[3] There were interesting measures related to environmental issues in the 2008 general election ballot. However, at this point, voting data for these proposals are not yet available. This paper does not analyze proposals in the March 2002 ballot because the data available only allows matching census data for approximately 4,500 tracts (out of almost 7,000 tracts).

[4] In California party members can vote only for their party's candidates but people can affiliate to any party during Election Day. In all other contests, registered voters can vote for any side.

[5] Results for all environment-related measures from November 2002 and November 2006 are available upon request.

funds are also used for recreational areas in urban areas.[6] On the other hand, in addition to individuals who oppose the potential tax implications of the measure, the acquisition of land and the development and protection of natural areas could affect the construction industry as well as forestry and farming workers. The proposition was controversial. The California Chamber of Commerce supported it citing its potential benefits for tourism. Opponents, including the Chairman of the Black Chamber of Commerce of Los Angeles County, argued that most of the funding would accrue to pork-barrel spending projects and land conservation rather than to improvements in air quality and recreational opportunities (Skeen, 2000). To the extent that different groups might have thought this proposition favors special interest projects, it is interesting to explore whether there are differential homogeneity effects across groups. Section 4 discusses how to account for this possibility.

Proposition 13 provides for a bond issue of $1,970 million dollars to drinking water facilities, flood and watershed protection, water pollution treatment and control, water conservation, and water supply reliability. Approximately 56 percent of the funds are allocated to groundwater storage, water quality improvements, and riparian habitat conservation in the San Francisco/Sacramento-San Joaquin Delta Estuary and the Santa Ana River and the Lake Elsinore and San Jacinto watersheds. Around 18 percent of the funds are allocated to water quality projects such as nonpoint source water pollution control and wastewater treatment. Benefits are likely to accrue to individuals who demand habitat conservation and to the consumers of the improved water sources. The acquisition and restoration of land for flood protection and

[6] Supporters included the National Audubon Society, Sierra Club, the National Parks and Conservation Association, the American Association of Retired Persons, and the League of Women Voters of California. Opponents included the National Tax-Limitation Committee and the Black Chamber of Commerce of Los Angeles County.

watershed protection could affect the construction industry.[7] Ballot proposal 12 passed with 63.2 percent of the total votes in favor and ballot proposal 13 with 64.8 percent of the votes. Support for proposal 12 is highly correlated with the votes in favor of proposal 13.

In November 2002, Californians voted again on a ballot proposal related to water-quality issues. Proposition 50 requires the state to borrow $3.44 billion of general obligation bonds with an estimated total cost of approximately $6.9 billion or about $230 million annually for about 30 years. Approximately 28 percent of the funds are allocated to coastal protection (wetlands and watershed acquisition and protection), 24 percent of the funds are for the restoration of wildlife habitat in the San Francisco/Sacramento-San Joaquin Delta Estuary, about 19 percent are allocated to regional water management, and 24 percent for safe drinking water and water quality projects.[8] The proposal passed with 55.4 percent of the votes. [9]

Proposition 51 would have had no direct fiscal impacts. It would have redirected 30 percent of revenues from taxes on the sale and lease of motor vehicles to transportation projects: around 48 percent of revenues would have been allocated to construction and improvements projects for passenger rail and bus transit, and 25 percent for traffic congestion and road safety. Historically, revenues from the state sales tax have been used for general purposes (education, health, corrections, and social services). Opponents claimed the measure would limit the state's ability to fund some services during budget crises and lock spending priorities. On the other

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[7] A diverse group of organizations supported the measure, including the Audubon Society, Sierra Club, the California Business Roundtable, the National Wildlife Association, the California State Council of Laborers, the Agricultural Council of California, and the California Manufacturers Association. Opponents included the director of the Tahoe City Public Utility District and the past chair of the Libertarian Party of California.

[8] Supporters included the National Audubon Society and the League of Women Voters of California. Opponents included the California Taxpayers Coalition and the United Organizations of Taxpayers.

[9] Although Proposition 13 and Proposition 50 have similar goals and therefore similar distributional effects, it is interesting to compare the results for these measures for two reasons. First, in 2000 the state had a budget surplus while in 2002 the economic situation was worsening. Second, estimating a model for Proposition 50 and comparing to the results for Proposition 13 also allows checking whether using 2000 census data for a 2002 measure generates reasonable results.

hand, individuals who use the highway system more often and those employed in the construction and transportation sectors would have benefited the most.[10] The proposal failed with 58.6 percent of the votes against it.

In November 2006, California voters consider another measure related to transportation. Under Proposition 1B the state borrows $19.9 billion of general obligation funds for a total estimated cost of $38.9 billion over 30 years. Almost 57 percent of the funds are allocated to congestion reduction and improvements of highways and local roads, and 20 percent to improve local transit and intercity rail services and improve transit safety. Opponents highlighted the effect on budget deficits and recommended funds would be allocated from the General Fund instead.[11] The proposal passed with 61.3 percent approval.

Finally, in November 2006 Californians voted for the first time on a proposal to fund alternative energy projects. Proposition 87 would have imposed a severance tax on oil extracted in California and directed the revenues to fund research and subsidies for alternative energy projects. The goal of the tax was to raise $4 billion to reduced petroleum consumption in California by 25 percent within ten years. Around 58 percent of the funds would have been used for incentives (alternative fuel vehicles credits, subsidies for producers, alternative fuel infrastructure, and research grants) and about 27 percent would have been dedicated to grants to California universities. The tax would have affected the oil production industry and reduced investment in expansion.[12] This proposal failed with 45.3 percent approval.

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[10] Supporters included the School Transportation Coalition, Partners for Highway Safety, and the American Lung Association of California. Opponents included the League of Women Voters of California and the California Tax Reform Association.

[11] Supporters included the Automobile Club of Southern California and the California Chamber of Commerce.

[12] Supporters included the American Lung Association of California, the California Farmers Union, the Natural Resources Defense Council, Sierra Club, and the Union of Concerned Scientists. Opponents included the Air Transport Association of America, the Association of Energy Service Companies, the California Black Chamber of Commerce, the California Chamber of Commerce, the California Hispanic Chamber of Commerce, and the California Trucking Association.

Following Kahn (2002), this paper explores several non-environmental initiatives for comparison purposes: proposals 22 and 25 in March 2000 and proposals 46 and 49 in November 2002. Ballot proposal 22 added a provision to the California Family Code to the extent that the state only recognizes marriage between a man and a woman. Ballot proposition 25 proposed campaign reform.[13] Proposition 46 requires the state to borrow $2.1 billion of general obligation funds to fund rental and farm-worker housing and homeownership programs for low- and moderate-income buyers. The measure passed with a 57.6 approval rate. Proposition 49 increases funding and earmark funds permanently for the Before and After School Learning and Safe Neighborhoods Partnership Program. The proposal passed with 56.7 percent of the votes in favor. This paper does not attempt to test specific hypotheses about these non-environmental initiatives. Rather, the models that are used for the environmental proposals are estimated for these social and political issues. The goal of this exercise is to explore whether the independent variables have different effects across initiatives in expected ways.

The unit of analysis is census tracts.[14] Data on election results come from the Institute for Governmental Studies at the University of California Berkeley. Information about the initiatives comes from the California Ballot Measures Database (University of California, Hastings College of the Law). Data on socio-economic characteristics come from the Census 2000 Long Form files SF3. There are no data available at the census-tract level for 2002 and 2006. Although using 2000 socio-economic data for the 2002 proposals is reasonable, it might be problematic to

[13] Proposal 22 has no fiscal effect. The estimated cost of proposal 25 was $55 million annually as the state government would have provided larger public funds for campaigning. Proposal 22 passed with 61.4 percent of the vote. Proposal 25 failed.

[14] Tracts are defined by permanent boundaries (streets, roads, rivers) and contain between 2,500 and 8,000 residents.

estimate voting on 2006 proposals using census information from the year 2000.[15] Thus, the results for proposals 1B and 87 must be interpreted with caution.

4. The Empirical Model

The conceptual framework developed by Deacon and Shapiro (1975) motivates the empirical model. It is assumed that individuals maximize utility subject to a budget constraint. The indirect utility function (the highest attainable level of utility) depends on individual preferences, the levels of the public and private goods, prices, and income after taxes. A ballot proposition represents a potential change in public policy that might affect one or more arguments in the indirect utility function. Conditional on the fact that individuals have decided to go to the polls and assuming they know the consequences for their utility of voting in favor of the proposition, voters support the proposal if and only if the highest attainable level of utility if the proposition passes is higher than their level of utility if the proposition fails.

The empirical model includes proxies for the arguments of the indirect utility function in order to account for the distribution of benefits and costs due to changes in policy. The models include median household income and income squared to control for a possible non-linear relationship between the demand for environmental amenities and wealth along the lines of the Environmental Kuznets Curve hypothesis. The proportions of workers in manufacturing (PCTMANUF), agriculture, forestry, fishing, and hunting (PCTAGRI), mining (PCTMIN), and in finance, insurance, and real estate (PCTFIRE) measure how the potential economic benefit or loss for workers in these industries might influence voting. Population density (DENSITY) controls for differential benefits between rural and urban areas. Population density squared

[15] For the year 2000 proposals it is possible to match census and voting data for approximately 7,000 tracts; for the November 2002 proposals there is a match for about 6,353 tracts; finally, for November 2006 it is possible to match 6,040 tracts. Descriptive statistics for census data for the different samples are very similar.

controls for non-linear benefits of public goods due to congestion. The variable PCTPOP65 measures the percentage of the population at least 65 years old. Although younger people are usually believed to be more pro-environment, the elderly are likely to suffer more from environmental hazards than younger individuals do.[16] The shares of Hispanics, African-Americans, Asians or Pacific Islanders, Native Americans, and individuals from other races in the population of each tract (PCTHISPANIC, PCTBLACK, PCTASIAN, PCTNATIVE, PCTOTHER) might matter if minorities are more exposed to environmental problems than whites. The proportion of individuals over 25 years of age who have at least a college degree (PCTCOLLEGE) or at most a high-school degree (PCTHS) control for effects due to variability in skills within specific occupations and for the potential influence of greater knowledge of the ballot propositions. The proportion of high-school dropouts is the default category in terms of educational attainment.

The models include the percent of votes for Republican candidates in the 2000 primary election (in the models for proposition 12 and proposition 13) and percent votes for Republican candidate in the 2002 and 2006 general elections (for proposals 50 and 51, and proposals 1B and 87, respectively), PCTREP. Hispanics and African-Americans in California are less likely to vote Republican than whites are. If the models do not include political preference then the effect of being Hispanic might be confounded with the effect of voting Democrat. The models include voter turnout to account for a potential correlation between racial and class homogeneity and attitudes toward civic participation.[17] TURNOUT is calculated as total votes divided by voting-

[16] For example, the American Association of Retired Persons supported Proposition 12.

[17] Civic involvement might also depend on transiency. Including in the models percent of owner-occupied housing units or percent of population in same house sine 1995 barely changes point estimates or standard errors. These controls are statistically significant for proposition 12 but not for proposition 13.

age population.[18] Data for these two variables come from the Institute for Governmental Studies at the University of California Berkeley. The models for the 2002 and 2006 proposals also include an indicator variable that equals one if there are more registered voters in the tract (in 2002 or 2006) than voting-age population in the year 2000. This variable helps account for differences in voting due to demographic changes.

The expanded models add controls for community homogeneity. This paper considers six racial groups (non-Hispanic white, non-Hispanic black, non-Hispanic Asian, non-Hispanic Native American, Hispanic, and other race) and three education groups (high-school dropouts, high-school graduates, and college graduates).The measures of homogeneity are Herfindahl-based indices defined as the sum of group shares squared: $\sum_{i=1}^{I} s_i^2$, where I is the number of groups and s_i is the fraction of the population belonging to group *i*. For example, a community with six racial groups of equal size would have an index of approximately .1667.[19] The homogeneity index equals one in a perfectly homogenous community and approaches zero if the community is composed of many small groups. This variable, or the alternative fragmentation index defined as one minus the homogeneity index (Easterly and Levine, 1997), is the standard approach to measuring diversity. Despite its limitations[20], this variable provides a simple and widely-used measurement of racial and class composition.

[18] This measure underestimates actual voter turnout because voting-age population includes individuals who are illegible to vote. The results do not change if the models include the percent of non-naturalized foreign-born population. In addition, county fixed effect will capture some of the possible effects of differences in foreign-born population. The coefficient on voter turnout cannot be interpreted casually as it is possible that it is the decision to vote on a given ballot proposal that influences turnout.

[19] In the sample, the most heterogeneous tract along racial lines has an index of .205. Tracts at the bottom of the distribution are on average characterized by a fairly symmetric distribution of shares. As the index increases, on average the shares of whites and Hispanics increase while the shares of other groups decrease. Tracts in the 95 percentile of the distribution are on average 40 percent white and almost 55 percent Hispanic while tracts in the 99 percentile of the distribution are on average 92 percent Hispanic. Note that as the share of one group increases, and the shares of the other groups decrease, the homogeneity index approaches the value of one.

[20] Alesina and La Ferrara (2005) note that racial categories might not be objective or exogenous and in some countries ethnic identification is difficult, that the index treats all groups equally, and that the measure implies a

An alternative to the index is to include group shares squared. Using the index constraints the coefficients on all group shares squared to be equal while including the group shares squared separately allows the coefficients on these variables to differ. Thus, if all groups respond to homogeneity in the same way, then the index and the squared terms generate similar insights, but using the index has the advantages of increasing degrees of freedom and reducing potential collinearity. However, if there are differential homogeneity effects across groups, the index might obscure these effects. A second specification decomposes the homogeneity index into each of its components by estimating the coefficients on group shares squared. By decomposing the index, one allows for the effects of homogeneity to be group-specific (Vigdor, 2002). The controversy surrounding some of these propositions justifies exploring this approach. For example, opponents of initiative 12, including the Chairman of the Black Chamber of Commerce of Los Angeles County, claimed most of the money would go to special interests and land preservation rather than improvements in pollution and recreational opportunities. In this case, greater coordination and information within a group opposing the perceived allocation of tax revenues might have created different homogeneity effects.

This paper presents two sets of models. Table 2 presents the results of linear probability models. These base models are expanded to control for community homogeneity in terms of race and educational attainment in Tables 3a-3c and Tables 4a-4c. The tables present log-likelihoods and the Bayesian information criterion (BIC). All the models use population-tract weights and include county fixed effects (the tables do not report these coefficients). The results of robust regression, median regression, and grouped logit regression models are very similar

community with two groups of equal size is more homogeneous than a community with many groups of equal size. This paper does not intend to contribute to the literature on how to account and measure fragmentation, but to examine whether the most commonly approach to fragmentation provides new insights about the provision of public goods in referenda.

qualitatively. The dependent variable is the share of tract voters who voted in favor of a ballot proposition (Table 1 presents summary statistics).

5. Results

Section 5.1 reports the results of the base models. Section 5.2 discusses the results when the models include either the racial homogeneity index or group shares squared. Section 5.3 presents the results of the models that account for homogeneity in educational attainment. Section 5.4 discusses the results for the propositions on non-environmental issues. Finally, Section 5.5 presents the results of several robustness checks. All tables present parameter estimates of linear probability models.[21] Because the results for weighted least-square grouped logit estimations (that restrict predicted probabilities to the unit circle) are qualitatively very similar and the estimates of the linear probability model are easier to interpret, the latter are discussed here. To account for heterocedasticity, the models are weighted by the population of each tract and robust standard errors are computed.

Likelihood-ratio tests indicate that there is overwhelming statistical evidence that the specifications that include either group shares squared or indices of homogeneity fit the data better than the base models. For example, comparing the log-likelihood of column 1 in Table 3 to the log-likelihood of column 1 in Table 2, there is overwhelming statistical evidence that a model that includes the racial homogeneity index fits the data better than the base model (the chi-square statistic with 1 degree of freedom is 92.6 with a p-value below .1 percent). These results also hold when accounting for educational attainment homogeneity. The values of the BIC indicate

[21] The log-likelihood reaches a maximum when the density is greater than one, thus the log-likelihood is positive and the BIC is negative. For initiatives 12, 13, 22, 46, 49, 51, and 1B fewer than 1 percent of the predicted probabilities fall outside the range of 0 to 100 percent while all predicted probabilities fall within the 0 to 100 range for initiatives 25, 50, and 87.

that even after penalizing the model for the additional explanatory variables, models that include the indices or group shares squared are statistically better than the base models. Overall, models that account for the degree of homogeneity in a community produce results that are statistically better and substantively richer than the base models.

5.1 The Base Models

Table 2 presents the results of the base models for each of the six environmental proposals. For five of the six proposals, the coefficient on income is negative and statistically significant (insignificant for proposal 1B). This result is consistent with Kahn (2002) who argues that the public provision of environmental goods, rather than the goods themselves, might be considered an inferior good at higher levels of income. The coefficient on income squared reveals a convex relationship. For example, the coefficients in column 1 and column 2 indicate that the turning point occurs when median household income is approximately $80,000.[22] The proportion of the population 65 years of age and older is positively correlated with votes for initiatives 12, 13, 50, and 1B, indicating greater demand for conservation and amenities among older individuals. The coefficient estimate is negative and statistically significant for proposal 51 – the initiative that would have redirected General Fund monies to transportation projects. This result may be due to the fact that older individuals are less likely to be frequent users of the transportation network than younger individuals. The coefficient on density is positive and statistically significant in all the models while the negative signs of density squared for proposals 12, 50, 1B, and 87 indicate support for publicly provided goods decreases when the benefits are likely lower due to congestion. Interestingly, the coefficient estimate on density squared in the model for proposal

[22] The 90-percentile of the distribution of median household income is approximately $83,000.

51 is positive (although weakly significant). This result is reasonable as proposal 51 would have redirected funds to transportation projects.

Consistent with Kahn (2002) and Kahn and Matsusaka (1997), opposition to the environmental initiatives is stronger in tracts with more employment in farming and mining sectors that are more likely to be negatively influenced by the propositions. The coefficient estimates on employment in manufacturing are either statistically insignificant or negative (at the 10 percent and 5 percent level for proposals 1B and 51, respectively, and at the 1 percent level for the initiative that would have imposed a tax on oil extraction). Employment in industries where workers are likely to be more educated is positively correlated with support for the initiatives.

Communities that vote Republican are less likely to support the environmental initiatives than communities that vote Democrat. The importance of political preference stands in clear contrast to the minor impact that such factors have in Kahn and Matsusaka (1997). Besides the fact that the unit of analysis is different, these elections took place during a period of political polarization. It is also interesting to note that voter turnout is negatively correlated with votes in favor of ballot propositions 12, 13, 51, and 1B. Finally, the variable that equals one if there are more registered voters in the tract (in 2002 or 2006) than voting-age population in the year 2000 is statistically significant (at the five percent level) only in the model for proposal 51.

5.2 Racial Homogeneity

Tables 3a-3c report the results of models that include either the racial homogeneity index or group shares squared. For example, column 1 in Table 3a shows the coefficient estimates of the model for proposal 12 that includes the homogeneity index while column 2 shows the results when the group shares squared are included separately.

The coefficients on the homogeneity index are positive and significant at the 1 percent level for proposals 12, 13, 50, and 51. Thus, support for these proposals is expected to be greater in tracts that are more homogeneous along racial lines. Interpreting the magnitude of the estimate can be misleading because it is impossible to increase the index without changing the values of the group shares (on the other hand, excluding group shares would bias the estimate on the index). With this caveat in mind, the coefficient estimate on racial homogeneity is such that, for example, one standard deviation increase in the index increases the proportion of votes for initiative 12 by .043 standard deviations, everything else equal.[23] For comparison purposes, one standard deviation increase in PCTFIRE and PCTCOLLEGE increases support by .048 and .26 standard deviations respectively.

Decomposing the homogeneity index into group shares squared reveals non-monotonic relationships between support for the environmental ballots and group shares. For proposals 12, 13, 50, 51, and 1B, the results show a U-shaped relationship between percent of whites in a tract and support for these proposals. On the other hand, the results show an inverted U-shaped relationship between percent of African-Americans and Asians and support.

The results for initiative 87 - a tax on oil extraction to fund alternative energy projects – show a different pattern of non-linear effects: inverted U-shaped relationship between proportion of white and support, and U-shaped relationship between percent of African-Americans and support. That the pattern of associations differ from the other proposals might be due to the fact that proposal 87 is the only environment-related initiative Californians have voted on in the

[23] When the models in Table 3 do not include group shares, the estimates of the racial homogeneity index in the models predicting support for propositions 12 and 13 are very similar, .039 and .018 respectively.

2000-2006 period that would have relied on a new tax.[24] This proposal was also the first to appear in the ballots regarding energy-alternative projects. Future research may confirm or refute the findings in this paper and help understand whether the difference is due to the way the funding would be obtained or the nature of the public good.

While this paper documents that racial homogeneity matters for voting patterns and that there are differences in the rate of support according to which group's share increases, it cannot reveal which specific mechanisms drive these differences. Nonetheless, there is some evidence that different racial groups may have different spending priorities. For example, there was opposition to ballot proposal 12 among the African-American business community. The Black Chamber of Commerce of Los Angeles County was one of the signatories of the rebuttal to the argument in favor of ballot proposition 12. Opponents argued that most of the money would go to special interests and land preservation rather than improvements in pollution and recreational opportunities (Skeen, 2000). It is possible that greater within-group homogeneity facilitated coordination and agreement on spending priorities and reduced the support for environmental regulation in communities where some groups considered the public good the proposal provides for (such as protection of natural areas in proposals 12, 13, and 50, and transportation projects in proposal 51) to be less desirable than an alternative good (pollution control).

5.3 Educational Attainment Homogeneity

Tables 4a-4c report the parameter estimates of the models that control for diversity in educational attainment. In Table 4a, columns 1 and 3, the coefficient estimates on the index for proposals 12 and 13 indicate that the more homogenous the community is in terms of educational

[24] Kotchen and Powers (2006) and Nelson, Uwasu, and Polasky (2007) find that voters are less likely to support tax-based open-space conservation than conservation financed with bonds.

attainment, the greater the support for the environmental initiatives. As the index increases by one standard deviation, the proportion of votes for the environmental initiatives 12 and 13 increases by approximately .06 standard deviations, everything else equal. The models with group shares squared suggest that positive homogeneity effects in the high-school dropout group drive these results. The coefficients on group shares squared for the high-school dropout group share squared are positive and significant at the 1 percent level. Thus, after controlling for household income, occupation, and race, communities are more likely to support the public provision of environmental goods as the share of this low-attainment group increases. If more homogeneity is necessary to encourage participation in referenda, homogeneity might facilitate and encourage the demand for environmental quality among low-income households that are more likely to be exposed to environmental hazards.[25]

For propositions 50, 51, and 1B the results are more complex. The coefficient estimates on the education homogeneity index are statistically insignificant. However, the models that include group shares squared separately reveal that this is the result of the effects for the college group canceling out the effects for the high-school dropout group: the relationship between proportion of high-school dropouts and support for proposals 50 and 1B is again U-shaped (and negative and linear for proposal 51), however, between the share of individuals with a bachelor degree and support for proposals 50 and 51 there is an inverted U-shaped relationship.

The results between educational attainment groups and support change when estimating support for proposal 87. For proposal 87 the homogeneity index of educational attainment is negative (statistically significant at the 1 percent level) and the model with group shares squared

[25] The paper by Grineski, Bolin, and Boone (2007) is a recent examination of environmental equality. The authors find that low-income communities suffer an unequal distribution of air pollution in metropolitan Phoenix.

shows this negative coefficient is driven by the impact of homogeneity among the college and high-school dropout groups.

5.4 Non-Environmental Proposals

Table A.1 in the Appendix presents the results for four proposals that are not related to the public provision of environmental goods. The purpose of this exercise is to verify that the independent variables correlate with different initiatives in expected ways. For example, the proportion of residents 65 years old or older is positively related to support for the initiative that imposes limits on marriage but is negatively related to votes in favor of the proposal that increases funds for after-school programs. Higher educational attainment correlates with more votes in favor of the environmental initiatives but with fewer votes for the limit-on-marriage proposal. Those who vote for a Republican candidate and those employed in farming or mining are more likely to vote for the limit-on-marriage initiative and against the proposal that provides for housing projects. These results suggest that the estimated coefficients do not represent spurious correlations.

Table A.2 and Table A.3 present selected results when the models include the index of racial homogeneity or the index of education homogeneity. The coefficient estimates are statistically significant at the 5 percent level or better in seven of the eight models. In results not presented here, there are statistically significant coefficients on group shares squared. These findings indicate that the effects of homogeneity are not exclusive to environment-related ballots.

5.5 Robustness Checks

A common limitation of studies that explore heterogeneity effects is the possibility that the demographic composition of the unit of analysis is not random because individuals endogenously sort into communities.[26] It is possible to sign the direction of the bias if the following two points hold: (1) individuals with a stronger preference for mixing with people from other groups are more likely to live in less homogeneous communities and (2) individuals with a stronger preference for mixing are less likely to suffer a loss of utility from interacting and sharing goods with people from other groups. In this case, sorting bias would decrease point estimates of the homogeneity index and group shares squared relative to the true effects (Vigdor, 2004).

The finer the unit of aggregation, the more likely sorting is and the more severe sorting bias should be. Thus, the coefficient estimates when using block-level data should be smaller than point estimates when using tract-level data. The results for the year 2000 initiatives in Table A.4 confirm this argument when estimating the effects of racial homogeneity at the census-block level. The estimates of the index and group shares squared are smaller. The exception is the estimate for Hispanic share squared that takes on higher values using block data. Table A.5 presents the results when the models control for educational homogeneity. The estimates of high-school dropout share squared are marginally lower using block data. The estimates on the index barely change and the marginal effects of college share squared are now positive. Overall, the results from models using census block data suggest the point estimates of the controls for homogeneity might be lower bounds of the true effects, in particular for racial homogeneity.[27]

Multicollinearity is another potential problem in models using census data. To explore whether multicollinearity is affecting the results, the models were estimated dropping those variables that are more likely to cause the problem. First, models omitting income squared and density squared produce point estimates and standard errors that are very similar to the original

[26] Alesina, Baqir, and Easterly (1999) argue that community heterogeneity is likely to persist due to legal constraints, economies of scale in the provision of public goods, limited mobility, and the multidimensional nature of many public goods.
[27] The data available do not allow merging block census data with voting data for 2002 and 2006.

results. Other high pair-wise correlation coefficients occur between PCTCOLLEGE and PCTHISPANIC (-.68) and HINCOME and PCTCOLLEGE (.72). Variance inflation factors can identify more complex linear relationships. The variables with relatively large variance inflation factors are PCTCOLLEGE and HINCOME. Omitting PCTCOLLEGE does not affect the signs and statistical significance of the racial and education indices, but biases downwards the estimates of racial group shares. Omitting HINCOME does not affect the signs and statistical significance of the racial and education indices and there are minor changes in the estimates of racial group shares. Thus, dropping relevant variables does not affect standard errors, biases down the estimates of racial group shares, and does not affect much other estimates. Overall, there is no evidence that multicollinearity influences the results.

Another potential issue when using tract-level data is the logical error known as the ecological fallacy. When the target of inference is the individual but researchers use aggregate data, correlations that hold for the group might not hold for individuals. Multivariate regression analysis that accounts for relevant variables and interaction effects can be used to approximate the associations for individuals given associations for the group. Although the models discussed above include a large array of controls, a potential omitted factor is the interaction effect between income and race. The results of models that include these effects show that there are statistically significant interactions between race and income and the coefficients are typically negative. Importantly, the coefficient estimates on the racial homogeneity index maintain the same sign and very similar magnitudes; similarly, the results show the same non-linear relationships between votes and population shares for different groups.[28] These results suggest that the findings in Section 5.2 are robust to adding these interaction effects. It is not possible to guarantee that the relationships at the tract level the paper discusses are to be found at the

[28] These results are available upon request.

individual level as well. Nonetheless, the results are valid if we narrow the target of inference to the community as defined by census tracts.

6. Summary

This paper examines the links between community homogeneity along the lines of race and educational attainment and the public provision of environmental goods. Analysis of election results in California shows that racial homogeneity is correlated with the degree of support for environmental initiatives. This paper finds that decomposing homogeneity indices provides new insights on the links between socio-demographic characteristics and the demand for environmental goods. For five of the six proposals that this paper examines the results show a U-shaped relationship between percent of whites and support for the proposals, and inverted-U relationships between percent of African-Americans and Asians and support for the proposals. For the proposal that would have imposed a tax on oil extraction to fund alternative energy projects, the patterns of relationships change.

Although this paper cannot explain why the direction and rate of support differ across groups, there is evidence that one reason for the decreasing rate of support as the share of African-Americans increase might be differences in spending priorities. In particular, the Black Chamber of Commerce of Los Angeles County opposed ballot proposition 12. Opponents argued that most of the money would go to special interests and land preservation rather than improvements in pollution and recreational opportunities (Skeen, 2000). As there is evidence that on average African-Americans might be more concerned about local pollution problems than about nature conservation (Mohai and Bryant, 1998), within-group homogeneity might have lead to greater coordination and overcoming of structural barriers that inhibit participation in the political process to reduce the demand for a relatively less desirable public good (Mohai, 1990).

Regarding education, the models with group shares squared show strong homogeneity effects in the high-school dropout group. Low-income households are more likely to be exposed to environmental hazards and more likely to benefit from the provision of the public good. If more homogeneity is necessary to encourage participation in referenda, homogeneity might facilitate and encourage the demand for environmental quality among individuals in this class.

The finding that homogeneity matters for environmental demand adds to our understanding of how collective decision-making and group preferences influence the public provision of environmental quality. Including measures of diversity that allow for the estimation of group-specific effects show that there is a non-linear relationship between environmental demand and the socio-economic make-up of communities. These results can help us understand better the efficiency and distributional impacts of publicly provided public goods as groups defined along racial and social class lines might value the public provision of environmental quality differently according to the extent of community homogeneity.

This research also raises questions that it cannot answer given the focus of the paper and data availability. First, the paper cannot explain which specific factors drive the links between homogeneity and voting patterns, whether it might be preferences, collective action, or aversion to mixing (or a combination of these factors). It might be interesting to document at a more disaggregated level through case studies the reasons why different racial and educational attainment groups may hold different priorities regarding the public provision of environmental goods. Second, while the results are consistent across five of the six proposals the paper analyzes, the pattern of relationships differs for a proposal in the 2006 ballot that would have imposed a tax on oil extraction in order to fund alternative energy projects. Once more recent voting data and census data for 2010 become available, it will be possible to examine preferences for the public provision of alternative energy projects and confirm or refute the evidence this paper presents.

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Table 1: Summary Statistics, Dependent Variables

Variable	Description	N	Mean (Standard Dev.)
Environment-related Proposals			
yes12	Percent votes in favor of proposition 12, parks, clean water, clean air, and coastal protection (2000)	6972	.66 (.133)
yes13	Percent votes in favor of proposition 13, drinking water, clean water, watershed and flood protection (2000)	6968	.68 (.125)
yes50	Percent votes in favor of proposition 50, drinking water, clean water, watershed and flood protection (2002)	6352	.58 (.14)
yes51	Percent votes in favor of proposition 51, redirect funds for transportation projects (2002)	6353	.42 (.07)
yes1B	Percent votes in favor of proposition 1B, congestion reduction, highways improvement (2006)	6040	.62 (.08)
yes87	Percent votes in favor of proposition 87, tax on oil extraction to fund alternative energy projects (2006)	6039	.47 (.13)
Other Proposals			
yes22	Percent votes in favor of proposition 22, limits on marriage (2000)	6956	.61 (.150)
yes25	Percent votes in favor of proposition 25, campaign reform (2000)	6961	.35 (.059)
yes46	Percent votes in favor of proposition 46, housing projects (2002)	6353	.60 (.14)
yes49	Percent votes in favor of proposition 49, after school programs (2002)	6352	.60 (.11)

Table 1 (continued): Summary Statistics, Independent Variables

Variable	Description	N	Mean (Standard Dev.)
POPULATION	Population	7000	4813.1 (2136.5)
DENSITY	People per square meter	7000	.003 (.0036)
HINCOME	Median Household Income ($10,000)	7000	51.41 (24.75)
PCTWHITE	White Population (percent of total)	6995	.48 (.28)
PCTBLACK	African-American Population (percent of total)	6995	.064 (.114)
PCTNATIVE	Native American Population (percent of total)	6995	.006 (.016)
PCTASIAN	Asian and Pacific Population (percent of total)	6995	.11 (.131)
PCTHISPANIC	Hispanic Population (percent of total)	6995	.31 (.257)
PCTOTHER	Other Race Population (percent of total)	6995	.031 (.021)
RACE	Race Homogeneity Index (five racial groups)	6995	.62 (.171)
PCTPOP65	Population age 65 or above (percent of total)	6995	.15 (.081)
PCTCOLLEGE	Population with college degree (percent of population 25 years old or older)	6995	.26 (.189)
PCTHS	Population with high-school degree or equivalent (percent of population 25 years old or older)	6995	.50 (.193)
PCTHSDROP	High-school dropouts (percent of population 25 years old or older)	6995	.24 (.193)
EDUCATION	Education Homogeneity Index (three education groups)	6995	.36 (.059)
PCTAGRI	Population employed in agriculture (percent of population 16 years old or older)	7000	.021 (.059)
PCTMIN	Population employed in mining (percent of population 16 years old or older)	7000	.0017 (.0084)
PCTMANUF	Population employed in manufacturing (percent of population 16 years old or older)	7000	.131 (.079)
PCTFIRE	Population employed in finance, insurance, and real estate (percent of population 16 years old or older)	7000	.066 (.039)
PCTREP	Votes for Republican candidates in 2000 primary elections (percent of total)	6989	.496 (.199)
TURNOUT	Voting-age turnout rate: total votes divided by voting-age population	6992	.28 (.132)

Table 2: Base Models

	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	yes12	yes13	yes50	yes51	yes1b	yes87
PCTMANUF	-0.010	-0.002	-0.007	-0.032*	-0.046**	-0.114***
	(0.012)	(0.012)	(0.016)	(0.018)	(0.019)	(0.020)
PCTAGRI	-0.105***	-0.082***	-0.090***	-0.045*	-0.088***	-0.083***
	(0.017)	(0.017)	(0.018)	(0.026)	(0.031)	(0.020)
PCTMIN	-0.426***	-0.265***	-0.446***	-0.149	-0.199	-0.357***
	(0.105)	(0.101)	(0.111)	(0.146)	(0.189)	(0.112)
PCTFIRE	0.055**	0.058**	0.104***	0.141***	0.247***	-0.052
	(0.023)	(0.025)	(0.024)	(0.029)	(0.032)	(0.033)
PCTPOP65	0.071***	0.138***	0.025**	-0.062***	0.126***	-0.011
	(0.010)	(0.010)	(0.011)	(0.011)	(0.013)	(0.016)
PCTREP	-0.561***	-0.505***	-0.617***	-0.189***	-0.230***	-0.495***
	(0.008)	(0.008)	(0.014)	(0.013)	(0.019)	(0.017)
HINCOME	-0.016***	-0.013***	-0.007***	-0.007***	0.000	-0.015***
	(0.001)	(0.002)	(0.001)	(0.001)	(0.002)	(0.002)
HINCOME* HINCOME	0.001***	0.001***	0.000***	0.000***	0.000	0.000***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
DENSITY	0.002***	0.001***	0.002***	0.001**	0.001***	0.001***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
DENSITY* DENSITY	-0.000***	-0.000	-0.000***	0.000*	-0.000**	-0.000**
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
TURNOUT	-0.078***	-0.069***	0.001	-0.015***	-0.003*	0.003
	(0.015)	(0.014)	(0.003)	(0.004)	(0.002)	(0.002)
PCTBLACK	-0.028***	0.017**	0.041***	-0.135***	-0.039***	-0.050***
	(0.007)	(0.007)	(0.009)	(0.012)	(0.013)	(0.011)
PCTNATIVE	-0.073*	0.027	-0.068	0.032	-0.041	-0.011
	(0.042)	(0.065)	(0.061)	(0.040)	(0.066)	(0.053)
PCTASIAN	-0.010*	0.016***	-0.008	0.086***	0.074***	0.022***
	(0.006)	(0.006)	(0.006)	(0.007)	(0.007)	(0.008)
PCTHISPANIC	0.041***	0.060***	0.017**	0.065***	0.073***	0.014
	(0.007)	(0.007)	(0.008)	(0.010)	(0.011)	(0.011)
PCTOTHER	-0.067**	-0.042	0.006	0.308***	0.118**	0.168***
	(0.033)	(0.036)	(0.043)	(0.044)	(0.047)	(0.045)
PCTCOLLEGE	0.247***	0.223***	0.031***	-0.015	-0.003	0.274***
	(0.013)	(0.014)	(0.012)	(0.014)	(0.016)	(0.015)
PCTHS	-0.005	-0.012	-0.090***	0.006	-0.105***	0.002
	(0.014)	(0.014)	(0.013)	(0.015)	(0.018)	(0.016)
Constant	0.815***	0.917***	0.760***	0.477***	0.709***	0.770***
	(0.009)	(0.014)	(0.011)	(0.013)	(0.019)	(0.018)
Observations	6968	6964	6290	6290	6037	6037
LL	13544.03	13028.71	11080.65	10093.1	9534.29	9813.08
BIC	-26433.22	-25384.93	-21505.3	-19512.71	-18406.97	-18964.53
R-squared	0.926	0.904	0.910	0.531	0.624	0.860

Robust Standard errors in parentheses. All models are weighted by the population of each tract and include county dummies; columns (3)-(6) include a dummy variable that equals one if there are more registered voters in 2002 or 2006 than voting-age population in the year 2000. * significant at 10%; ** significant at 5%; *** significant at 1%.

Table 3a: Effects of Race Homogeneity (2000)

	(1)	(2)	(3)	(4)
VARIABLES	yes12	yes12	yes13	yes13
PCTBLACK	-0.004	0.156***	0.036***	0.201***
	(0.009)	(0.023)	(0.009)	(0.022)
PCTNATIVE	-0.041	0.106	0.053	0.140
	(0.042)	(0.075)	(0.065)	(0.099)
PCTASIAN	0.016**	0.194***	0.037***	0.203***
	(0.007)	(0.021)	(0.007)	(0.021)
PCTHISPANIC	0.056***	0.209***	0.072***	0.202***
	(0.008)	(0.020)	(0.008)	(0.020)
PCTOTHER	0.044	-0.029	0.048	-0.146*
	(0.035)	(0.082)	(0.037)	(0.083)
Race Homogeneity Index	0.043***		0.034***	
	(0.007)		(0.007)	
White share squared		0.159***		0.139***
		(0.014)		(0.014)
Black share squared		-0.051***		-0.082***
		(0.019)		(0.019)
Native share squared		0.044		0.149
		(0.095)		(0.128)
Asian share squared		-0.078***		-0.083***
		(0.023)		(0.023)
Other race share squared		2.671***		3.793***
		(0.751)		(0.748)
Hispanic share squared		0.005		0.010
		(0.014)		(0.015)
Constant	0.758***	0.622***	0.875***	0.766***
	(0.015)	(0.022)	(0.017)	(0.026)
Observations	6968	6968	6964	6964
LL	13590.33	13677.27	13054.67	13133.94
BIC	-26516.98	-26646.61	-25445.71	-25542.29
R-squared	0.927	0.929	0.905	0.907

Robust Standard errors in parentheses. All models are weighted by the population of each tract and include county dummies and controls in Table 2. * significant at 10%; ** significant at 5%; *** significant at 1%.

Table 3b: Effects of Race Homogeneity (2002)

	(1)	(2)	(3)	(4)
VARIABLES	Yes50	Yes50	Yes51	Yes51
PCTBLACK	0.056***	0.222***	-0.120***	0.063**
	(0.010)	(0.024)	(0.013)	(0.032)
PCTNATIVE	-0.043	0.097	0.058	0.156*
	(0.056)	(0.088)	(0.039)	(0.087)
PCTASIAN	0.015*	0.256***	0.109***	0.269***
	(0.008)	(0.027)	(0.009)	(0.029)
PCTHISPANIC	0.030***	0.319***	0.079***	0.044
	(0.009)	(0.024)	(0.010)	(0.030)
PCTOTHER	0.099**	0.170*	0.406***	0.359***
	(0.046)	(0.101)	(0.049)	(0.118)
Race Homogeneity Index	0.034***		0.036***	
	(0.006)		(0.007)	
White share squared		0.216***		0.082***
		(0.016)		(0.019)
Black share squared		0.000		-0.189***
		(0.021)		(0.036)
Native share squared		0.211**		-0.017
		(0.105)		(0.103)
Asian share squared		-0.093***		-0.160***
		(0.031)		(0.032)
Other race share squared		2.342**		0.784
		(0.966)		(1.094)
Hispanic share squared		-0.090***		0.131***
		(0.015)		(0.018)
Constant	0.715***	0.519***	0.431***	0.366***
	(0.014)	(0.022)	(0.017)	(0.025)
Observations	6290	6290	6290	6290
LL	11099.42	11208.96	10108.08	10187.72
BIC	-21516.59	-21700.69	-19551.42	-19658.21
R-squared	0.911	0.914	0.533	0.545

Robust Standard errors in parentheses. All models are weighted by the population of each tract and include county dummies and controls in Table 2. * significant at 10%; ** significant at 5%; *** significant at 1%.

Table 3c: Effects of Race Homogeneity (2006)

	(1)	(2)	(3)	(4)
VARIABLES	Yes1b	Yes1b	Yes87	Yes87
PCTBLACK	-0.041***	0.243***	-0.054***	-0.171***
	(0.014)	(0.029)	(0.012)	(0.029)
PCTNATIVE	-0.044	0.063	-0.019	-0.051
	(0.067)	(0.097)	(0.052)	(0.088)
PCTASIAN	0.071***	0.308***	0.014	-0.039
	(0.009)	(0.029)	(0.010)	(0.030)
PCTHISPANIC	0.071***	0.234***	0.009	0.025
	(0.012)	(0.029)	(0.012)	(0.031)
PCTOTHER	0.106**	0.162	0.136***	0.171
	(0.050)	(0.124)	(0.048)	(0.115)
Race Homogeneity Index	-0.004		-0.012	
	(0.008)		(0.008)	
White share squared		0.147***		-0.034*
		(0.018)		(0.019)
Black share squared		-0.264***		0.146***
		(0.031)		(0.028)
Native share squared		0.200*		-0.026
		(0.115)		(0.102)
Asian share squared		-0.169***		0.040
		(0.034)		(0.035)
Other race share squared		1.618		-0.587
		(1.144)		(0.967)
Hispanic share squared		-0.014		-0.058***
		(0.018)		(0.019)
Constant	0.715***	0.553***	0.785***	0.817***
	(0.022)	(0.029)	(0.021)	(0.030)
Observations	6037	6037	6037	6037
LL	9534.50	9630.92	9814.73	9838.36
BIC	-18398.67	-18539.26	-18967.83	-18971.57
R-squared	0.624	0.636	0.860	0.861

Robust Standard errors in parentheses. All models are weighted by the population of each tract and include county dummies and controls in Table 2. * significant at 10%; ** significant at 5%; *** significant at 1%.

Table 4a: Effects of Educational Attainment Homogeneity (2000)

	(1)	(2)	(3)	(4)
VARIABLES	yes12	yes12	yes13	yes13
PCTCOLLEGE	0.251***	0.363***	0.227***	0.347***
	(0.014)	(0.034)	(0.014)	(0.035)
PCTHS	0.000	0.095*	-0.007	0.184***
	(0.015)	(0.056)	(0.015)	(0.060)
Education Homogeneity Index	0.064***		0.060***	
	(0.019)		(0.019)	
College share squared		-0.009		0.009
		(0.023)		(0.025)
High-school share squared		0.036		-0.035
		(0.055)		(0.055)
High-school dropout share squared		0.157***		0.187***
		(0.030)		(0.030)
Constant	0.771***	0.703***	0.879***	0.769***
	(0.018)	(0.026)	(0.019)	(0.030)
Observations	6968	6968	6964	6964
LL	13573.86	13600.34	13051.09	13079.88
BIC	-26484.04	-26519.29	-25438.55	-25478.42
R-squared	0.927	0.928	0.905	0.905

Robust Standard errors in parentheses. All models are weighted by the population of each tract and include county dummies and controls in Table 2. * significant at 10%; ** significant at 5%; *** significant at 1%.

Table 4b: Effects of Educational Attainment Homogeneity (2002)

	(1)	(2)	(3)	(4)
VARIABLES	Yes50	Yes50	Yes51	Yes51
PCTCOLLEGE	0.030**	0.159***	-0.015	0.169***
	(0.012)	(0.026)	(0.014)	(0.027)
PCTHS	-0.091***	0.049	0.006	0.139
	(0.014)	(0.063)	(0.015)	(0.088)
Education Homogeneity Index	-0.014		-0.004	
	(0.014)		(0.013)	
College share squared		-0.087***		-0.130***
		(0.028)		(0.038)
High-school share squared		-0.066		-0.032
		(0.050)		(0.063)
High-school dropout share squared		0.107***		0.148***
		(0.028)		(0.034)
Constant	0.768***	0.679***	0.479***	0.376***
	(0.015)	(0.027)	(0.014)	(0.034)
Observations	6290	6290	6290	6290
LL	11081.47	11103.75	10093.15	10125.54
BIC	-21489.41	-21525.26	-19521.55	-19568.84
R-squared	0.910	0.911	0.531	0.536

Robust Standard errors in parentheses. All models are weighted by the population of each tract and include county dummies and controls in Table 2. * significant at 10%; ** significant at 5%; *** significant at 1%.

Table 4c: Effects of Educational Attainment Homogeneity (2006)

	(1)	(2)	(3)	(4)
VARIABLES	Yes1b	Yes1b	Yes87	Yes87
PCTCOLLEGE	-0.001	0.038	0.269***	0.184***
	(0.016)	(0.036)	(0.015)	(0.030)
PCTHS	-0.102***	0.305***	-0.006	-0.717***
	(0.018)	(0.091)	(0.016)	(0.097)
Education Homogeneity Index	0.029		-0.101***	
	(0.019)		(0.016)	
College share squared		0.118***		-0.240***
		(0.039)		(0.040)
High-school share squared		-0.248***		0.377***
		(0.077)		(0.070)
High-school dropout share squared		0.177***		-0.368***
		(0.036)		(0.037)
Constant	0.692***	0.529***	0.830***	1.119***
	(0.023)	(0.038)	(0.021)	(0.043)
Observations	6037	6037	6037	6037
LL	9536.69	9551.58	9844.61	9896.49
BIC	-18411.75	-18415.4	-19027.59	-19113.94
R-squared	0.624	0.626	0.861	0.863

Robust Standard errors in parentheses. All models are weighted by the population of each tract and include county dummies and controls in Table 2. * significant at 10%; ** significant at 5%; *** significant at 1%.

Appendix

Table A.1: Non-Environment Related Proposals

	(1)	(2)	(3)	(4)
VARIABLES	yes22	yes25	yes46	yes49
PCTMANUF	0.216***	-0.099***	-0.029*	0.092***
	(0.029)	(0.016)	(0.016)	(0.021)
PCTAGRI	0.084***	-0.101***	-0.083***	-0.144***
	(0.023)	(0.015)	(0.025)	(0.030)
PCTMIN	0.191*	-0.125*	-0.267*	-0.858***
	(0.099)	(0.068)	(0.161)	(0.271)
PCTFIRE	0.137***	-0.022	0.061**	0.359***
	(0.042)	(0.027)	(0.024)	(0.041)
PCTPOP65	0.185***	0.009	0.023**	-0.107***
	(0.013)	(0.010)	(0.011)	(0.015)
PCTREP	0.593***	-0.097***	-0.617***	-0.350***
	(0.014)	(0.010)	(0.019)	(0.020)
HINCOME	0.024***	-0.010***	-0.013***	0.004**
	(0.002)	(0.002)	(0.001)	(0.002)
HINCOME* HINCOME	-0.001***	0.001***	0.001***	-0.000
	(0.000)	(0.000)	(0.000)	(0.000)
DENSITY	-0.001**	-0.001***	0.002***	0.001***
	(0.000)	(0.000)	(0.000)	(0.000)
DENSITY* DENSITY	0.000	0.000***	-0.000***	-0.000**
	(0.000)	(0.000)	(0.000)	(0.000)
TURNOUT	0.092***	-0.171***	-0.008**	-0.018***
	(0.021)	(0.013)	(0.004)	(0.005)
PCTBLACK	0.334***	-0.134***	0.124***	0.128***
	(0.011)	(0.008)	(0.010)	(0.012)
PCTNATIVE	0.377*	-0.032	-0.017	-0.115
	(0.193)	(0.099)	(0.054)	(0.108)
PCTASIAN	0.275***	0.040***	0.004	0.058***
	(0.010)	(0.006)	(0.007)	(0.007)
PCTHISPANIC	0.195***	-0.019*	0.059***	0.055***
	(0.015)	(0.010)	(0.009)	(0.010)
PCTOTHER	0.175***	0.117***	0.077	0.122**
	(0.063)	(0.039)	(0.047)	(0.050)
PCTCOLLEGE	-0.469***	0.136***	0.026**	-0.204***
	(0.018)	(0.013)	(0.013)	(0.016)
PCTHS	-0.021	0.034***	-0.073***	-0.098***
	(0.016)	(0.012)	(0.014)	(0.019)
Constant	0.157***	0.474***	0.855***	0.765***
	(0.041)	(0.014)	(0.012)	(0.014)
Observations	6952	6957	6290	6290
R-squared	0.861	0.497	0.894	0.777

Robust Standard errors in parentheses. All models are weighted by the population of each tract and include county dummies; columns (3)-(6) include a dummy variable that equals one if there are more registered voters in 2002 or 2006 than voting-age population in the year 2000. * significant at 10%; ** significant at 5%; *** significant at 1%.

Table A.2: Effects of Race Homogeneity, Non-Environment Proposals

	(1)	(2)	(3)	(4)
VARIABLES	yes22	yes25	Yes46	Yes49
Race Homogeneity Index	0.121***	-0.016**	0.034***	0.085***
	(0.009)	(0.006)	(0.007)	(0.008)
Constant	0.011	0.495***	0.811***	0.654***
	(0.042)	(0.019)	(0.018)	(0.019)
Observations	6952	6957	6290	6290
R-squared	0.867	0.498	0.895	0.782

Robust Standard errors in parentheses. All models are weighted by the population of each tract and include county dummies and controls in Table 2. * significant at 10%; ** significant at 5%; *** significant at 1%.

Table A.3: Effects of Education Homogeneity, Non-Environment Proposals

	(1)	(2)	(3)	(4)
VARIABLES	yes22	yes25	Yes46	Yes49
Education Homogeneity Index	0.175***	0.001	0.039**	0.059***
	(0.015)	(0.014)	(0.016)	(0.020)
Constant	0.047	0.474***	0.830***	0.727***
	(0.042)	(0.017)	(0.017)	(0.021)
Observations	6952	6957	6290	6290
R-squared	0.865	0.497	0.894	0.777

Robust Standard errors in parentheses. All models are weighted by the population of each tract and include county dummies and controls in Table 2. * significant at 10%; ** significant at 5%; *** significant at 1%.

Table A.4: Effects of Race Homogeneity using Census Blocks Data

	(1)	(2)	(3)	(4)
VARIABLES	yes12	yes12	yes13	yes13
PCTBLACK	-0.012*	0.110***	0.024***	0.147***
	(0.006)	(0.015)	(0.006)	(0.014)
PCTNATIVE	0.003	0.083**	0.046	0.091**
	(0.027)	(0.035)	(0.031)	(0.039)
PCTASIAN	0.016***	0.150***	0.038***	0.162***
	(0.005)	(0.014)	(0.004)	(0.013)
PCTHISPANIC	0.044***	0.138***	0.058***	0.132***
	(0.005)	(0.013)	(0.005)	(0.013)
PCTOTHER	0.048***	0.108***	0.045***	0.053*
	(0.015)	(0.031)	(0.016)	(0.031)
Race Homogeneity Index	0.035***		0.032***	
	(0.004)		(0.004)	
White share squared		0.116***		0.103***
		(0.009)		(0.009)
Black share squared		-0.047***		-0.065***
		(0.013)		(0.013)
Native share squared		0.113		0.187*
		(0.093)		(0.108)
Asian share squared		-0.065***		-0.067***
		(0.015)		(0.014)
Other race share squared		0.398*		0.755***
		(0.219)		(0.222)
Hispanic share squared		0.020**		0.028***
		(0.010)		(0.010)
Constant	0.917***	0.832***	0.731***	0.651***
	(0.033)	(0.036)	(0.014)	(0.017)
Observations	21677	21677	21646	21646
R-squared	0.897	0.898	0.877	0.879

Robust Standard errors in parentheses. All models are weighted by the population of each tract and include county dummies and controls in Table 2. * significant at 10%; ** significant at 5%; *** significant at 1%.

Table A.5: Effects of Education Homogeneity using Census Blocks Data

	(1)	(2)	(3)	(4)
VARIABLES	yes12	yes12	yes13	yes13
PCTCOLLEGE	0.213***	0.283***	0.191***	0.267***
	(0.008)	(0.022)	(0.008)	(0.021)
PCTHS	-0.003	0.122***	-0.008	0.176***
	(0.008)	(0.035)	(0.008)	(0.036)
Education Homogeneity Index	0.064***		0.061***	
	(0.012)		(0.011)	
College share squared		0.037**		0.048***
		(0.016)		(0.016)
High-school share squared		-0.001		-0.044
		(0.036)		(0.035)
High-school dropout share squared		0.142***		0.161***
		(0.018)		(0.018)
Constant	0.921***	0.852***	0.733***	0.644***
	(0.034)	(0.036)	(0.015)	(0.019)
Observations	21677	21677	21646	21646
R-squared	0.897	0.897	0.877	0.878

Robust Standard errors in parentheses. All models are weighted by the population of each tract and include county dummies and controls in Table 2. * significant at 10%; ** significant at 5%; *** significant at 1%.