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VOTING ON GROWTH CONTROL MEASURES: PREFERENCES AND STRATEGIES

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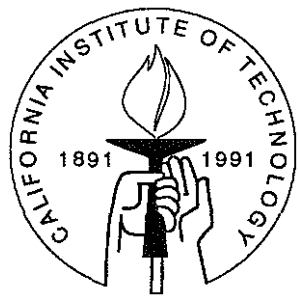

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Abstract

Citizens of many California cities and counties have sought to restrict the rate of population growth in their localities. In 1988, Citizens for Limited Growth used the initiative process to place a pair of growth control measures on the ballot in the City and County of San Diego, respectively. The City Council and Board of Supervisors responded by placing less stringent, competing measures on the same ballot. This paper analyzes voting data from this election to examine the nature of support for such measures. We find strong support for the hypotheses that whites, homeowners, liberal/environmentalists, and those exposed to high levels of traffic congestion are more likely to favor growth controls. This paper also investigates the behavior of voters when they confront competing propositions concerning the same issue on the same ballot, and finds strong evidence of strategic voting.

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California and the Rise of Growth Control

Population growth and economic development, by generating a larger tax base, allows cities to provide more goods and services at a given tax rate (Miller 1973). For this and for other reasons, growth has traditionally been viewed as highly desirable, making virtually everyone in a community better off (Thomas and Murray 1991). Molotch (1976) describes as a "growth machine" the potent coalition of citizens, government officials, and local elites united in the pursuit of new businesses, new jobs, and new residents. Municipal services are not pure public goods, however, and the cost of their provision can rise rapidly when populations grow larger and more heterogenous (Dubin and Navarro 1987). This is especially true of such things as sewage service, water treatment facilities, and schools, where major capital expenditures may be required to increase capacity. Moreover, as Glickfeld and Levine (1991) point out, the past decade has seen a major retrenchment in federal assistance for local infrastructure improvements. Population growth and and economic development can also produce negative externalities, including traffic congestion, environmental degradation, and a decline in the nexus of amenities that make up the overall quality of life (Rosenbaum 1978; Navarro and Carson 1991).

In recent years residents of an increasing number of communities have been opting out of the growth-machine coalition, pressuring local authorities to restrict the flow of newcomers to their community (Schneider 1990). "Growth control" or "growth management" regulations include limits on the number of new building permits, utility hookup fees, designation of rural/agricultural preserves, urban limit boundaries, and mandatory review of new construction by one or more local authorities. Critics of growth controls often charge that they are simply new versions of old exclusionary land use policies, such as restrictive zoning and minimum lot size requirements, that have long been part of the municipal codes of cities all over the country (Frieden 1979). Though in practice they may indeed have distributional consequences similar to those achieved by the previous generation of restrictions on land use, the newer growth control

measures would nevertheless seem to differ in intent. The older regulations obviously affect the size of a city's population, but they were intended primarily to exclude certain types of people, such as low-income families, immigrants, and minorities. The newer growth control regulations, on the other hand, are directed toward limiting newcomers regardless of their type.[1]

The vanguard of the growth control movement were the counties and cities of Northern California. By the end of the 1970s a variety of growth control measures had been adopted in San Francisco, Marin County, Petaluma, San Jose, the Napa Valley, and in several other cities in the area (Glickfeld, Graymer, and Morrison 1987). Opposition to continued rapid growth subsequently spread to traditionally pro-growth Southern California as well, and by 1988 nearly three-fourths of the cities and counties in the state had enacted at least one growth control measure (Glickfeld and Levine 1991).

In San Diego, as in other places throughout the state, popular sentiment for curbing growth appears to have been provoked by a sustained period of rapid growth that showed no sign of abating.[2] A poll taken by the *Los Angeles Times* in May 1988 found that a large majority (78 percent) of San Diegans supported restrictions on new commercial and residential construction even if it harmed the local economy (Bernstein 1988). Reflecting popular sentiment, the San Diego City Council adopted an Interim Development Ordinance (IDO) in July 1987. Scheduled to run through the end of 1988, it imposed, with exceptions in certain areas, an overall cap of 8000 residential building permits a year. By this time most other cities in the county, including Chula Vista, Del Mar, El Cajon, Encinitas, Oceanside, Poway, San Marcos, Solana Beach, Vista, Carlsbad, and Escondido, had also approved some type of growth management plan. Many San Diegans, however, doubted that these measures were placing any binding constraints on growth—an opinion shared by Glickfeld and Levine (1991).

In California, as in most other states, legislation can be enacted via ballot measures at the state, county or municipal levels (Magleby 1984; Cronin 1989). Such propositions may be placed on the ballot by governmental authorities, such as state legislatures,

city councils, or county boards, in which case they are usually referred to as referenda. Private citizens may also qualify propositions for the ballot through the initiative process by collecting a requisite number of signatures.[3] In 1988, growth control advocates in San Diego County, organized as Citizens for Limited Growth, collected over 90,000 signatures in qualifying the Rural Preservation and Traffic Control Initiative Ordinance for the November election. Appearing on the ballot as Proposition D, it called for the County to adopt specific quality-of-life standards with respect to traffic, air quality, and solid waste disposal, and stipulated that any proposed change in land use and zoning had to be put before the voters in a referendum. Proposition D proposed to limit new residential building permits in unincorporated areas of the County to 2 percent of the existing housing stock in 1989, with the cap dropping to 1 percent annually from 1990 through 2010.[4] Unincorporated areas of the County that were deemed to be environmentally sensitive, such as canyons, wetlands, and floodplains, would be subject to strict regulations on development and land use. New sewer extensions were also to be restricted. Citizens for Limited Growth also succeeded in placing a companion measure, Proposition J, on the ballot in the City of San Diego. J also called for the adoption of quality-of-life standards, tight limits on new construction within the city, and restrictions on development of environmentally sensitive lands.

The County Board of Supervisors and the San Diego City Council, while ostensibly maintaining their support for managing the rate of growth, viewed the two propositions as too extreme and decided to oppose them. The Board countered Proposition D at the county level by placing on the ballot a more moderate alternative, Proposition B. Its restrictions on new construction in unincorporated areas were less severe and were not to last as long. It also called upon the County to develop policies that would provide a balance between residential, commercial, and industrial uses of property, as well as a regional traffic plan. Proposals to intensify land use would require only an advisory vote of citizens in affected communities, and the only county-wide limit on the pace of new construction was that it was not to exceed SANDAG's five-year growth projections. The Board of Supervisors also stipulated that if both Propositions D and B received

over 50 percent of the vote, the one that received the higher percentage would prevail in its entirety. Proposition D stipulated that if both B and D received a majority both would be implemented, with the one receiving the higher vote total superceding the other only in instances where specific provisions of the two were in direct conflict. Given that virtually every provision of D was in conflict with the corresponding provision in B, however, for all practical purposes D would supercede B if it received more votes.[5]

This move by the Board of Supervisors was by no means unprecedented. Glickfeld, Graymer, and Morrison (1987) identify ten previous instances in California between 1972 and 1987 in which a city council or county board of supervisors countered a growth-control initiative qualified by a citizen's group with an alternative measure. They refer to this as the "tandem initiative" phenomenon. Not surprisingly, the San Diego City Council followed suit, placing a moderate alternative to J, Proposition H, on the city-wide ballot. It included a provision to protect environmentally sensitive areas, but its quality-of-life guidelines were weaker than those in J. It stipulated only that traffic generated by new development stay within roadway capacity, and that there be adequate public facilities and services at the time of development. Its building caps were higher than those in the measure sponsored by Citizens for Limited Growth, and did not apply to low income housing projects or to housing in designated Redevelopment Areas. As in the case of Propositions D and B at the county level, if both J and H received over 50 percent of the vote, the proposition receiving the most votes would, for all intents and purposes, supercede the other. The electoral regime that obtained here was thus tantamount to approval voting (Brams and Fishburn 1978); voters could vote for one, both, or neither propositions, but could not rank-order them.

In addition to Proposition B, the Board of Supervisors also placed Proposition C on the ballot. It was intended to serve as a way of officially registering public support for the principle that "certain impacts associated with growth should be resolved on a regional basis." To this end it called for creation of a Regional Planning and Growth Management Review Board to formulate a regional growth management plan. Although C was placed on the ballot as an advisory measure only, it did call upon the Regional

Board to be given the authority to require local jurisdictions to adopt whatever legislation was required to implement a regional growth management plan. It also called for the County and for each city in the County to adopt interim development constraints limiting population growth to 75 percent of SANDAG projections until the regional growth management plan was adopted and implemented.

Proposition C won easily, attracting 61 percent of the vote. As it turned out, however, it was the only one of the five growth control measures to be approved. Propositions D, B, J, and H all went down to defeat, receiving between 44 percent of the vote (Proposition H) and 41 percent (Proposition J). Nevertheless, votes on the growth control measures in the November 1988 election in the City and County of San Diego provide us with an excellent opportunity for investigating the nature of preferences for restricting growth. Which voters are most likely to opt out of the growth machine coalition? Previous research has examined several hypotheses, but a definitive picture has so far not emerged. Perhaps most remarkably, previous studies have uncovered little evidence to support the view that growth controls are favored primarily by affluent, white, suburban homeowners who benefit financially from their enactment (Frieden 1979). They have instead found little correlation between standard socioeconomic indicators and support for growth controls (Gottdeiner and Neiman 1981; Knapp 1987; Baldassare 1990). As Glickfeld and Levine (1991) put it, "It is clear that communities which are passing many growth control measures are not wealthy. While the popular conceptions about the growth control movement is that it is a white, middle-class group of homeowners who are resisting changes in land use, our data, and other research, do not support this interpretation" (pp. 37–8).

Voting data from the 1988 San Diego elections also allow us to investigate the strategic implications of having competing measures on the same ballot. Given the apparently strong support for growth control prior to the election, the sound defeat of all four substantive growth control measures came as something of a surprise. While many observers attributed the outcome to a $2.1 million media blitz underwritten by the construction industry and real estate developers, others surmised that the competing

measures may have pulled each other down to defeat (Bernstein 1988). Indeed, the San Diego County Board of Supervisors and San Diego City Council urged support for the measures they had sponsored (B and H, respectively) and rejection of the initiatives sponsored by Citizens for Limited Growth (D and J). Citizens for Limited Growth, in turn, expended a considerable amount of their limited resources to campaign against Propositions B and H, which they labeled "killer" propositions intended only to bring down D and J, respectively. If large number of voters followed the advice they were given to vote for one measure but against the other, it is clear that both could fail, even if either one would have passed if it had been the only measure on the ballot—a possibility we henceforth refer to as "fratricide." In recent years there has been a growing tendency, in California at least, for multiple measures concerning the same issue to appear simultaneously on the same ballot.[6] Our findings thus have important implications not only for voting on growth controls, but for direct democracy in general.

Hypotheses Concerning Preferences for Growth Control

Home Ownership

A major theme of the growth control opponents' campaign in the 1988 San Diego city and county elections was that rents and housing prices would increase dramatically in response to building restrictions, and that few people who did not already own a house would be able to afford one if Propositions D or J were approved. Indeed, there is a large literature in urban political economy that characterizes the driving up of housing prices not as an unavoidable side effect, but rather as the main point of such exercises (see Donovan and Nieman 1991). As indicated earlier, Frieden (1979), Danielson (1976) and others see building caps and restrictions on development in "environmentally sensitive" areas as new variations on an old exclusionary theme, little different from zoning, minimum lot size requirements, bans on multiple-unit housing, and other restrictions on land use.

This argument against growth controls is a simple appeal to the principles of supply and demand; if such a restriction does reduce the supply of housing in a particular area (or, more likely, the rate of increase in supply) and demand is unaffected, it surely will, all other things equal, drive up the price of housing.[7] This produces a windfall transfer of wealth from those who do not own existing housing property to those who do. To be sure, growth controls may tend only to displace new housing construction to neighboring jurisdictions which have not enacted controls, thus reducing the impact on housing prices. By simultaneously deterring new business and commercial development (either intentionally or unintentionally) growth controls might even suppress demand for housing and thus lower housing prices.

Several econometric analyses, however, indicate that as a practical matter restrictions of one form or another on housing construction make for higher housing prices. Positive effects on prices have been found for zoning restrictions (Ohls, Weisberg and Martin 1974), urban growth boundaries (Knapp 1985), and limits on new construction (Schwartz, Hansen, and Green 1981). The most common methodology used in these studies is the comparison of estimated hedonic price functions for housing in areas that are subject to restrictions versus nearby areas that are not. Problems with these analyses arise from the interdependence of adjacent housing markets and from the fact that it is hard to determine whether the statutory constraints imposed by particular growth limitation provision are actually binding. Using data from Davis, California, Schwartz *et al.* (1986) compare the effects of growth controls estimated with a number of different designs, e.g., pre-test post-test comparisons, post-test comparisons with a control group, pre-test post-test comparison with a control group, etc. They find wide disparities in the estimates, depending on the method used. Those models that they viewed to be theoretically superior, however, produced the strongest and most consistent evidence of growth controls causing housing prices to rise.

The hypothesis we examine, then, is that homeowners are more likely than renters to support growth controls. This is not to say that appreciation in housing values is the sole or even the primary reason why homeowners would favor adoption of growth

controls; indeed, if this were their only motive there are many more direct ways to accomplish this than the complex, multi-faceted measures put before San Diego voters in 1988. But all other things being equal, those who are the likely recipients of a wealth transfer generated by a growth control ordinance should be more supportive of it than those who are the source of the wealth transfer.

Despite the evidence linking restrictions on residential construction with higher home prices, previous studies have hardly yielded an unbroken pattern of support for this hypothesis. DeLeon and Powell (1989) report that renters were actually more supportive than homeowners of San Francisco's 1986 Proposition M, but its building caps applied to downtown office buildings instead of residential housing. Protash and Baldassare (1983) report a sizable correlation between local anti-growth sentiment and percent of owner-occupied housing, but Donovan and Neiman's (1991) regression analysis reveals no relationship between the amount of restrictions on residential development in a locality and levels of home ownership. Both studies, however, were based upon responses to questionnaires mailed out to city planning agencies. Our data on voting on growth control ballot measures should thus provide much more direct evidence as to the relationship between home ownership and anti-growth sentiment.

Traffic Congestion

In comparison to most other urban areas in this country, population densities in Southern California, including San Diego County, are not very high. The population growth that has occurred over the past several years, however, has meant substantial increases in traffic congestion. A major element of the campaign for Proposition D and J was the spectre of traffic congestion in San Diego approaching the levels of Los Angeles; indeed, the official name of Proposition D was the "San Diego County Rural Preservation and Traffic Control Initiative Ordinance." Opponents of growth control claimed that the measures would actually exacerbate traffic congestion. Passage of D, they argued, would lead to higher housing density within the City of San Diego and its environs and thus to greater traffic congestion; passage of J, on the other hand, would

simply displace development into outlying areas, increase commuting distances, and thus increase traffic. It is probably no accident that growth control opponents did not forecast what would happen to levels of traffic congestion if both the City and County measures sponsored by Citizens for Limited Growth were adopted.

Although the rapid increase in traffic in and around San Diego during the 1980s may have been one of the primary causes of widespread dissatisfaction with continued growth, the task we confront in this study is to account for cross-sectional variation in support for growth controls in a particular place at a particular point in time, i.e., San Diego in November 1988. The hypothesis to be tested here, then, is that people living in areas with high traffic congestion are more likely than residents of low-traffic areas to favor growth control measures.

Ideology

Siegan (1990) and other property-rights theorists typically reject growth controls or other restrictions on land use as inefficient and as an unwarranted intrusion of public authority into the rights of property owners. These views seem to be shared by conservative-minded individuals in the public at large. In a study of opinion data concerning local growth and development in Riverside, California, Gottdiener and Neiman (1981) report that support for the 1979 Proposition R growth control measure tended to line up along the conventional liberal vs. conservative, government intervention vs. laissez-faire dimension (support for such controls being the liberal position). We would thus expect to find that liberal voters are more supportive of growth control measures than are conservative voters.

Gottdiener and Neiman emphasize, though, that support for Proposition R in Riverside was linked not only to generally favorable attitudes about government intervention, but to the belief that, in particular, government should do more to protect the environment. There is plenty of reason to believe that environmental concerns were especially salient in voting on the 1988 San Diego growth control measures. Propositions D and

J, sponsored by Citizens for Limited Growth, both incorporated restrictions on new construction in canyons, wetlands, coastal areas, and other environmentally sensitive areas. Most of these provisions were included in the moderate countermeasures B and H as well.

Environmental concerns are a major component of "post-materialist" values identified originally by Inglehart (1977). By now, though, there is considerable evidence that in most countries environmental issues have been incorporated into the conventional, liberal-conservative dimension of political competition. Van Liere and Dunlap's (1980) examination of American survey data finds a relatively strong correlation between concern over the environment and a liberal political orientation. At the elite level, McCurdy (1989) similarly shows that over the past few decades congressional roll call voting scores calculated by the League of Conservation Voters have become highly correlated with commonly used indicators of liberalism-conservatism such as ADA scores. To the extent environmental concerns affected the voting decisions of San Diego voters in 1988, we would hypothesize that such concerns coincided with and reinforced the tendency of generally more liberal voters to be more supportive of growth controls.

Racial and Ethnic Differences

Blacks and Latinos are more dependent than whites upon jobs in the construction industry, so they may perceive that any loss of jobs and economic activity resulting from growth controls would be disproportionately injurious to them. They are also less likely to own their own homes, and would thus be more likely to be on the losing end of any wealth transfer from renters to homeowners. For these reasons we might find blacks and Latinos to be relatively unsupportive of growth controls. Any such differences would not be due to the distinctive preferences of blacks and Latinos *per se*, but would instead be an an artifact of background socioeconomic differences.

What is specific to blacks, however, and, to a lesser extent, Latinos, is a history of discrimination in the housing market. A key complaint in the lawsuit filed against

the growth control ordinance adopted in Pasadena, California in 1989 (the PRIDE initiative) is that restrictions on new housing "lock in" historical patterns of residential segregation. In either case, whether due to differences in occupation, employment, and homeownership, or to the existence of residential segregation along racial/ethnic lines, we hypothesize black and Latino voters to be less supportive than whites of growth controls.

Most previous studies of growth controls have looked for class-based rather than racially-based differences in support. The findings of those that have, however, are quite mixed. Rolleson (1987) reports that communities with small minority populations relative to surrounding communities are more likely to adopt exclusionary zoning ordinances. She does not, however, present any evidence on growth controls. Glickfeld and Levine (1991) report that a community's racial and ethnic composition, at least in California, is of no value in predicting whether or not it has enacted growth control measures. DeLeon and Powell's (1989) finding that Proposition M in San Francisco fared especially well with blacks and Latinos obviously runs counter to our hypothesis, but as before we think this is due to the fact that M was concerned with the growth of the downtown business district rather than with residential housing.[8]

Data and Analysis

The voting data we use to test our hypotheses about the nature of preferences for growth control measures are the aggregate returns from the 1634 precincts in San Diego County and the subset of 782 precincts located within the City of San Diego. These data were made available to us by the San Diego County Registrar of Voters. All voters in the County were able to vote for or against Propositions B, D, and C, but only voters in the City of San Diego voted on Propositions J and H.

The measure we use to determine whether or not homeowners are more likely to support restrictions on growth is the percentage of owner-occupied homes in the census tract in which the voting precinct is located. This figure averaged 60 percent, and

ranged from less than 1 percent in some census tracts to over 90 percent in others. The census tract data are taken from the U.S. Census Department's 1987 update of the 1980 Census. In San Diego County there are about five precincts within each census tract; the number varies from one to as many as seventeen, but the vast majority of tracts contain between three and seven precincts.

We next need a measure of traffic congestion to test our hypothesis that people experiencing traffic-induced delay and inconvenience are more supportive of growth control. In many U.S. cities there is a single downtown business district which serves as an employment center for several surrounding communities. In such cases the amount of traffic usually varies inversely with distance from downtown. San Diego County contains many employment centers, however, so a simple distance measure of this type will not be a good measure of the extent to which people are inconvenienced by traffic congestion. Fortunately, the California Department of Transportation monitors the flow of traffic on freeways and other major traffic arteries during the morning and evening rush hours. Caltrans' congestion measure is the average number of vehicle-hours of delay experienced on a given segment of freeway during the worst month of the year, with delays defined as occurring whenever average speed falls below 35 miles per hour.[9] After adding figures from the morning and evening rush hours and normalizing for distance, we assign this value (expressed as thousands of vehicle-hours of delay per mile) to all precincts contained in communities located within four miles of the congestion site. If a community is located within four miles of two or more congestion sites, we assign the value of the nearest one. The communities which take on non-zero values on our congestion measure, listed in Table 1, contain 875 of the 1634 precincts in San Diego County.

Our measure of liberalism, used to test the hypothesis that liberals are more supportive of growth control, is the percentage of the two-party vote for president in 1988 garnered by the Democratic candidate, Michael Dukakis. Racial and ethnic characteristics are registered by the percentage of people in each precinct who are black and by the percentage who are Latino. San Diego County, like Southern California as a whole, has a

Table 1 Communities Experiencing Traffic Congestion in San Diego County, 1989

Route	Nearby Communities
I–15	Rancho Bernardo, Rancho Penesquitos, Mira Mesa, Pomerado, Tierrasanta, Poway
I–5	Del Mar, Del Mar Heights, Encinitas, Solana Beach, Del Mar, Rancho Santa Fe
I–8	San Carlos, Navajo, Linda Vista, Midway–Old Town, Mission Hills, Hillcrest, Montezuma, La Mesa, Mount Helix, El Cajon
94	Rolando–Redwood, City Heights, Middletown, Centre City, Golden Hill, S.E. San Diego, Encanto East, Encanto West, Chollas Park, Lemon Grove
163	South Park
I–805	Serra Mesa, North Park, Normal Heights

large Latino population but a relatively small black population; in terms of households, the average precinct figures were 14.2 percent and 4.8 percent, respectively. As indicated earlier, we have data on home ownership, but the 1987 census update does not provide data on employment and occupation. This means that our analyses cannot distinguish completely between racial/ethnic differences and other differences that are correlated with race.

Finally, we include a dummy variable for the 259 precincts located outside of incorporated cities. As indicated earlier, Propositions D and B were voted on by the entire county, but their building caps and other restrictive provisions applied only to unincorporated areas. We expect that people living in unincorporated areas would be less in favor of growth control, as they would be foregoing a disproportionate amount of the economic benefits that accompany population growth.

With data of this nature, i.e. individual discrete choice events (votes) aggregated to the level of voting precincts, the appropriate econometric approach is minimum chi square logit (Maddala 1983). The equations we estimate (for the county-level and city-level propositions, respectively) are thus of the following form:

$$log(\hat{p}_m/(1-\hat{p}_m)) = X_c\beta_c + \mu_c, \quad (1)$$

where $\hat{p}_m$, $m = B, C, D, H, J$, is the percentage of votes cast in favor of each growth control measure in each precinct. As we show in the Appendix, the variance of the equation disturbance μ_c depends on $\hat{p}_m$ as well as upon the number of observations in each precinct. The latter varies widely, from a low of 11 to a high of 1112. It is therefore necessary to weight the data according to the formula $w = (n\hat{p}(1-\hat{p}))^{1/2}$, where n is the number of votes cast in the precinct (see the the Appendix for a more detailed explanation).

At the county level, the matrix of right-hand-side variables X_c includes a constant term, the percentage of black households, the percentage of Latino households, the percentage of owner-occupied homes, the percentage of the two-party presidential vote received by Dukakis, the traffic congestion measure, and a dummy variable for precincts located in unincorporated areas. This dummy was necessarily dropped in the second set of equations pertaining to the measures on the city ballot, as there are obviously no unincorporated areas in the City of San Diego. Results are reported in Tables 2 and 3 below. The top number in each entry is the estimated coefficient, the number in parentheses below is the standard error.

The results of the county-level equations, reported in Table 2, strongly support our hypotheses concerning the nature of preferences for growth control. The percent Dukakis term, our indicator of liberal/environmental attitudes, is large and significant in all three equations, and thus consistent with Gottdiener and Nieman's findings. Larger still are the coefficients of the percent black term, which range from -0.92 in the Proposition C equation to -0.68 in the Proposition B equation. Given the logit transformation of the data, a coefficient of $-.92$ implies that black voters, everything else equal, were as much as 23 percent less likely than whites to support growth control. Latinos were apparently less opposed to the growth control measures than were blacks, as the coefficients for this term were considerably smaller and significant in only two of the three equations. We also find strong evidence of the home-owner effect that appears to have been so elusive in previous studies, in that the coefficient of the percent owner-occupied term is positive and significant in all three equations. Coefficients of the

Table 2 Voting on Growth Control Propositions in San Diego County

Proposition	C	D	B
Constant	−.07	−.68*	−.60*
	(.05)	(.04)	(.04)
Pct. Owner-occupied	.32*	.19*	.07*
	(.04)	(.03)	(.03)
Pct. Black	−.92*	−.89*	−.68*
	(.10)	(.09)	(.08)
Pct. Latino	−.44*	−.02	−.19*
	(.06)	(.05)	(.05)
Pct. Dukakis	.81*	.57*	.68*
	(.08)	(.08)	(.06)
Traffic Congestion	.39*	.49*	.10*
	(.04)	(.03)	(.03)
Unincorporated Area	−.37*	−.18*	−.31*
	(.02)	(.02)	(.02)

$n = 1634$, $*p < .05$

traffic congestion measure and the unincorporated area dummy are also in the direction predicted by our hypotheses and statistically significant.

There are, however, some important differences in the results for the various propositions. In particular, several of the coefficients in the Propositions B equation are much smaller than the corresponding coefficients in the equations for Propositions C and D. This is true of the percent owner-occupied term, the percent black term, and the traffic congestion measure. The equation we estimated performs thus better in accounting for voting on the advisory measure C and on the relatively extreme measure D than it did on the more moderate alternative B. This same pattern of inter-equation differences is even starker in the city-level results reported in Table 3. *All* coefficients in the equations for Propositions C and J are in the hypothesized direction and many times larger than their respective standard errors. In the equation estimated for the moderate alternative

Table 3 Voting on Growth Control Propositions in the City of San Diego

Proposition	C	J	H
Constant	−.20*	−.75*	−.29*
	(.05)	(.06)	(.04)
Pct. Owner-occupied	.26*	.23*	.01
	(.04)	(.04)	(.03)
Pct. Black	−.91*	−.96*	−.10*
	(.09)	(.10)	(.06)
Pct. Latino	−.41*	−.43*	.29*
	(.06)	(.07)	(.04)
Pct. Dukakis	.54*	.57*	−.01
	(.09)	(.10)	(.07)
Traffic Congestion	.19*	.44*	−.02
	(.04)	(.04)	(.02)

$n = 782$, $*p < .05$

H, in contrast, the only coefficient that is in the correct direction and statistically significant is that of the percent black term. Even this coefficient, though, is barely one tenth the size of the corresponding coefficients in the C and J equations. All the others are either indistinguishable from zero or, in the case of the percent Latino term, in the direction opposite to that hypothesized.

Strategic Voting

Why do our equations do a poorer job of accounting for voting on Propositions B and H than on the more extreme measures D and J—or on the advisory measure C, for that matter? We think that this pattern of results primarily reflects the presence of strategic voting by growth control advocates against the moderate alternatives. If those who strongly opposed growth control voted against B and H, and large numbers of those who favored J and D heeded the call of Citizens for Limited Growth and also voted against B and H, then the resulting relationship between underlying preferences

on growth control and voting on these moderate measures would be curvilinear. A linear equation of the type we specified would thus be misspecified.

To investigate this possibility further, it makes sense to explicitly model the ballot choices confronting San Diego voters in 1988 (for the sake of brevity we confine our analysis to the city-wide measures only). Let us begin by assuming that the status quo rate of growth S is greater than that allowed under the moderate counter-proposal H, which in turn allows for a more rapid pace of growth than Proposition J. Let us further assume that voters' preferences concerning growth can be mapped into a one-dimensional issue space, and that their preferences are single-peaked with utility strictly decreasing from their ideal point. Under this configuration of status quo and two alternatives, voters may have one of four possible strong preference orderings: $S\ P_i\ H\ P_i\ J$; $H\ P_i\ S\ P_i\ J$; $H\ P_i\ J\ P_i\ S$; $J\ P_i\ H\ P_i\ S$. This situation is portrayed in Figure 1, which also shows that if voters cast their ballots sincerely, they would simply vote for whatever measure or measures they prefer to the status quo. Given that the measures are competing, however, sincere voting would necessarily condemn the more extreme alternative J to certain defeat. Even if it garnered more than 50 percent of the vote, the moderate alternative would necessarily win an even higher percentage of the vote. Specifically, J and H would both receive the support of all those who preferred both measures to the status quo ($J\ P_i\ H\ P_i\ S$ and $H\ P_i\ J\ P_i\ S$), but H would also garner the votes of those for whom $H\ P_i\ S\ P_i\ J$.

Citizens for Limited Growth obviously knew this, and it is presumably for that reason that they urged their supporters—those for whom J was the most-preferred alternative—to vote strategically against their second-most preferred alternative H. This is referred to as the "first order" strategy in Figure 1. The only way in which J could have garnered more votes than H was for a sufficient number of its supporters to have adopted this strategy. This strategy, however, necessarily runs the risk of fratricide; by defeating H but failing to pick up a majority for J, the J supporters would achieve their least-preferred outcome, the status quo.

Figure 1 Voting on Two Competing Growth Control Measures

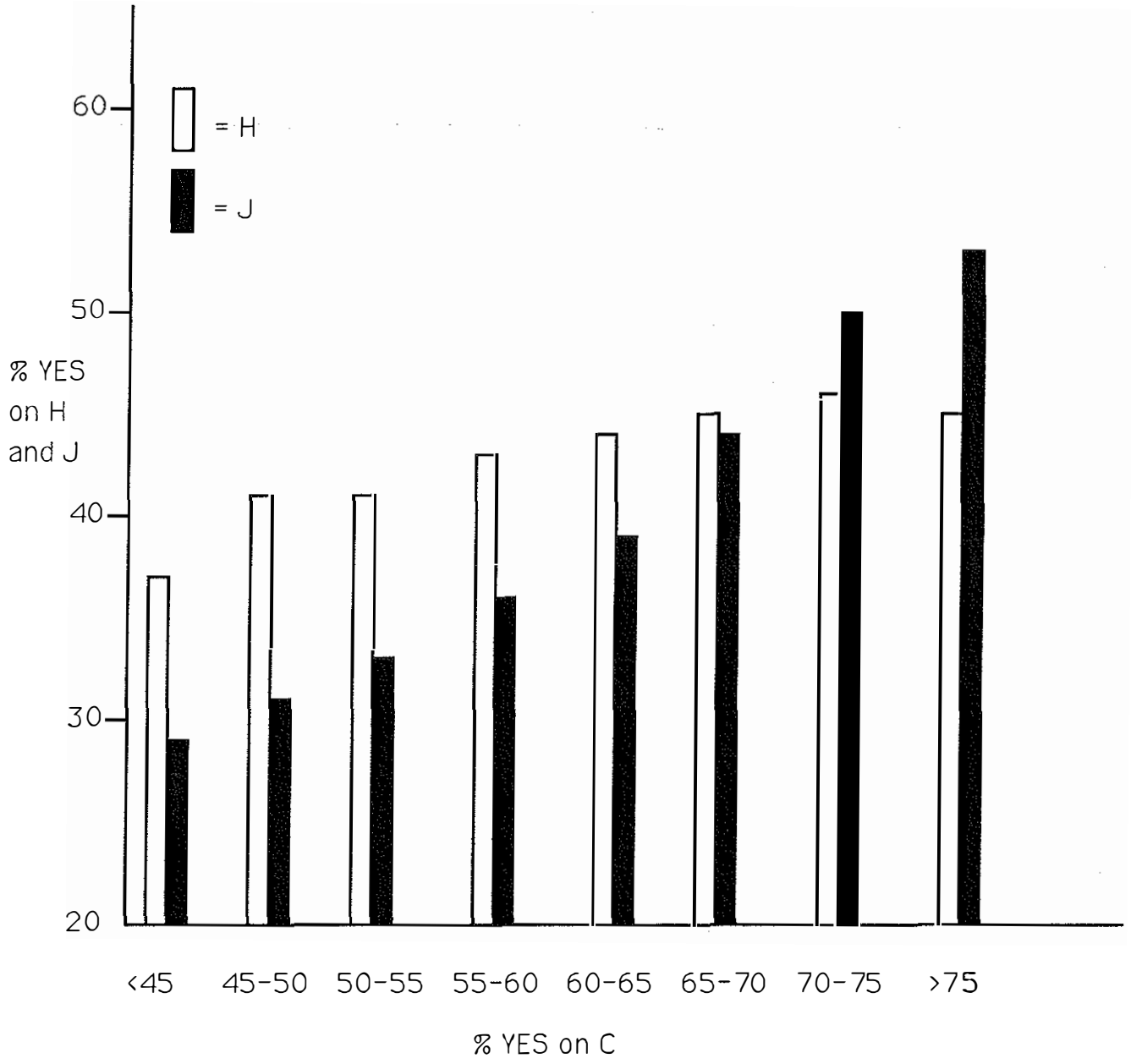
		Pro-Growth ← S — H — J → Anti-Growth			
Preference Ordering		S H J	H S J	H J S	J H S
Sincere Voting	H	N	Y	Y	Y
	J	N	N	Y	Y
First Order Strategy	H	N	Y	Y	N
	J	N	N	Y	Y
Second Order Strategies	H	Y	Y	Y	N
	J	N	N	N	Y

With individual-level data, the detection of this type of strategic voting would be simple; as Figure 1 makes clear, anyone who voted for J but against H would presumably be acting strategically. The aggregate-level data we have, however, permits us to only observe the number of votes cast for each proposition in each precinct.[10] This requires us to proceed in a more roundabout fashion on the basis of a couple of additional assumptions. First, we assume that within each precinct the distribution of support for growth controls is unimodal. This means that the proportion of voters in a precinct who are favorably disposed to growth control increases steadily as we move right on the issue dimension portrayed in Figure 1, and correspondingly falls as we move left. Secondly, we assume that voting on the advisory Proposition C was sincere; C was not competitive with the other measures, and one of its stated purposes was to measure general sentiment concerning growth control.

On the basis of these assumptions, we use the percentage of voters who voted yes on C as an indicator of the underlying level of support for growth control in each precinct. Consequently we can judge whether or not voting on the moderate alternative H was "distorted" by strategic considerations by looking at how voting on H covaries with voting on C. Specifically, if voting on H were sincere, we would expect support for H to increase directly with support for C. If first-order strategic voting against H occurred we would instead observe a different pattern. In the anti-growth-control region of the issue space support for H would still increase along with support for C, as these precincts should contain relatively few voters with preference ordering ($J\ P_i\ H\ P_i\ S$). As we move right, however, the proportion of these voters, who might choose to vote strategically against H, would steadily increase. As a consequence, support for H would cease to increase along with support for C, and in extreme pro-growth-control precincts support for H could even vary inversely with support for C.

Figure 2, which displays levels of support for both H and J as a function of C, shows evidence of just this pattern. The percentage of voters voting yes on H increases in the anti-growth-control region (as indicated by low levels of support for C), levels off in the middle, and eventually falls in strongly pro-growth-control precincts. Support for

Figure 2 Support for J and H as a Function of Support for C



Proposition J, in contrast, increases along with support C across the entire distribution of precincts.

Figure 1 also portrays "second-order" strategies that other types of voters might have employed to counter strategic voting by J supporters against H. First, those who favor both measures but prefer H to J ($H \ P_i \ J \ P_i \ S$) could strategically vote against their second-preferred alternative J. This strategy, too, runs the risk of fratricide, i.e. backfire and yield one's least-preferred outcome. Secondly, voters who most prefer the status quo growth rate and thus have preference ordering $S \ P_i \ H \ P_i \ J$ may decide to vote for their second-preferred alternative H in order to avoid their least-preferred outcome. The downside risk of this strategy is getting one's second-preferred alternative instead of one's most-preferred. The only voters who are completely devoid of incentives to strategize are those for whom $H \ P_i \ S \ P_i \ J$.[11]

Although we cannot completely discount the presence of second-order strategic voting, it appears that it occurred far less frequently than the first-order strategizing discussed above. First, the results from the regression equations, as well as the results displayed in Figure 2, indicate that it was only the pattern of voting on H that was distorted by strategic considerations. And, as noted above, Figure 2 shows that support for J rose monotonically along with support for C across the entire range of precincts. There is then, no visible sign of strategic voting against J by voters with preference ordering ($H \ P_i \ J \ P_i \ S$). There is also little reason to believe that H received many strategic votes from those with preference ordering $S \ P_i \ H \ P_i \ J$. There certainly was no organized campaign advising pro-growth voters to hold their nose and vote strategically for Proposition H in order to prevent passage of the more extreme measure J. On the contrary, developers and their allies spent over $2 million trying to persuade San Diegans to vote against all growth-control measures.

The data indicate, then, that support for Proposition J was largely unaffected by strategic considerations, and that it would have failed had it been the only growth-control proposition on the ballot. But what about H? Would it have won had it not

been for strategic voting against it by supporters of J? At first glance this would not seem to be a difficult question to answer even in the absence of individual-level data. Suppose the percentage of yes votes for H in each precinct is a simple linear function of the percentage of yes votes for C (the sincere component), while strategic voting by J supporters would exert a downward effect on support for H. Thus, in the following equation,

$$\%H = \alpha + \beta_1 \%C + \beta_2 \%J, \tag{2}$$

β_1 should be positive, β_2 negative, and the magnitude of β_2 would register the extent of strategic voting by J supporters against H. The problem with this formulation is that if voters voted sincerely on both C and J (which we believe to have been the case), they would both be measures of the same underlying preferences concerning growth-control. Given the resultant high degree of collinearity between $\%C$ and $\%J$, we cannot estimate equation 2 without some restrictions on one or both of the parameters. If we can place an upper and lower bound on β_1, though, this would put an upper and lower bound on β_2 as well, and thus on our estimates of strategic voting.

Fortunately, this is something we can do with a large degree of confidence. Given the location of the various propositions relative to the status quo, it is safe to assume that the percentage of votes for the advisory measure C would have exceeded the percentage cast for H even under the the limiting case of purely sincere voting on H. As we move left along the dimension portrayed in Figure 1, furthermore, we would expect sincere support for H to rise less rapidly than support for C. This means that β_1 in equation 2 should be no larger than 1. Given its greater distance from the status quo, J, in turn, would also receive a lower percentage than C, as well as a lower percentage than H. As we move left along the dimension portrayed in Figure 1, support for J should also rise less rapidly than support for C, but also less rapidly than the sincere component of support for H. This means that if we were to regress $\%J$ onto $\%C$, the slope coefficient should be less than β_1 in equation 2.

Because voting on J does not appear to have been significantly affected by strategic considerations, we can in fact run this regression and find that $\%J = -.12 + .83\%C$

(both coefficients are significant at $p < .05$). Knowing that β_1 should therefore be between .83 and 1, we next estimate the following two versions of equation 2:

$$\%H - 1.0\%C = \alpha + \beta_2 \%J, \tag{3}$$

$$\%H - .83\%C = \alpha + \beta_2 \%J. \tag{4}$$

In equation 3 β_2 equals $-.50$, and in 4 it equals $-.39$, implying that between 39 percent and 50 percent of the voters who voted for Proposition J voted strategically against Proposition H. Given that J received 41 percent of the vote, we calculate that strategic voting by J supporters against H cost H at least 16 percent of the vote and thus prevented its adoption. Although fratricide was not responsible for the defeat of J, it was responsible for the defeat of H.

Discussion

Our analyses of voting on growth controls in the City and County of San Diego County in 1988 confirm the findings of previous studies that voters with liberal/environmentalist political leanings are more supportive of such measures. In contrast to previous research efforts, however, we also find support for the view that preferences over growth control are a function of material interests. Whites were much more supportive of the various growth control propositions than were blacks and Latinos, and homeowners were considerably more likely to favor them than were renters. To be sure, one reason why many previous studies in these area failed to find these differences is that they simply did not look for them. Another major reason for our more positive findings, however, is that we were investigating variations in support within a single county or city jurisdiction. Most previous studies, in contrast, were seeking to determine whether or not socioeconomic differences among cities accounted for their differential propensity to enact growth control measures. In short, they were looking for interjurisdictional variation, while what we find is intrajurisdictional variation. As indicated earlier, we do not interpret our findings to imply that growth controls are only the latest in a long line of ploys homeowners have favored as a way of fostering appreciation in housing

values. What we think it does mean is that individuals who receive a wealth transfer as a consequence of some policy, whatever else they might think about the policy, are more likely to support it.

Our findings also demonstrate that voting on ballot measures can be dramatically affected by the presence of another, competing proposition concerning the same issue. In particular, the defeat of Proposition H, the less stringent alternative sponsored by the City Council, resulted from supporters of Proposition J voting strategically against it. Although this may seem to be merely another example of a group stubbornly refusing to settle for half a loaf and so getting none, such a judgment is much too facile. First, as our analysis has demonstrated, the supporters of J were in a strategic bind; opposing H ran the risk of being stuck with the status quo, but *not* opposing H absolutely guaranteed the failure of J. There was also plenty of reason a priori to believe that their strategy would be successful. As indicated earlier, public opinion polls in San Diego in 1988 were evincing strong anti-growth sentiment. The history of previous cases of competing growth control measures also suggested they had a good chance; in five of ten cases of "tandem propositions" identified by Glickfeld, Graymer, and Morrison (1987), the measure favored by the citizen's group had won while the alternative backed by the city council had failed (in one case both measures passed). If J had been a bit more popular with the voters, the strategy of opposing H would have been successful as well.

For growth-control supporters, the failure to pass any of the binding growth control ordinances in 1988 has also been made more palatable by a subsequent decline in construction activity in San Diego County. Although it was probably not anticipated, this slowdown has substantially reduced the status quo rate of growth—at least for the time being. In contrast to the nearly 45,000 permits for new housing units issued in San Diego County in 1986, less than 16,000 were issued in 1990. According to Caltrans, completion of some key highway projects has also reduced traffic delays on some of the major downtown arteries. Finally, and probably most importantly, failure to pass growth-control measures in 1988 in no way precluded efforts to do so in the future, while passage of H might well have compromised them badly. Indeed, a successor to

Citizens for Limited Growth, PLAN (Prevent Los Angelization Now), has qualified a new initiative for the June 1992 ballot.[12]

Endnotes

1. See Cooley and LaCivita (1982) for a comprehensive microeconomic analysis of growth controls, including their relationship to municipal service provision, congestion effects, taxation, and optimal population size.

2. Between 1980 and 1987 the population of San Diego County grew from 1.86 million to 2.29 million between 1980 and 1987, and nearly 180,000 new homes were built. According to a report issued by the San Diego Association of Governments (1987), the County could expect the annual rate of population growth to exceed 4 percent through 1995.

3. In the City of San Diego the number of signatures required to put a measure on the ballot is 10 percent of the total number of registered voters in the previous general election. In the County the minimum required is 10 percent of the total number of votes cast in the previous general election.

4. Although there are a few state and regional agencies in California that may regulate certain aspects of local land use, county governments are not allowed to interfere with land use policies of cities located within the county. Provisions of B and D could thus apply only to unincorporated areas.

5. The actual language of D was "that if both measures should pass . . . both measures shall be put into effect except to the extent that specific provisions of such measures are in direct conflict, in which event as to the conflicting provisions only, the measure which obtained more votes shall control."

6. In November 1988 (the same election that the growth control measures appeared in San Diego) the California statewide ballot contained five alternative measures pertaining to insurance reform. In June 1990 the state ballot contained several pairs of competing propositions: Propositions 130 and 138 on the fate of old-stand redwoods; 126 and 134 on raising alcohol taxes; 128 and 135 on agricultural pesticides regulation; and 131 and 140, imposing term limits on office-holders in the state government. The

only one of these to win passage was one of the term-limitation measures.

7. Navarro and Carson (1991) point out that housing price increases associated with growth controls may also reflect higher "amenity" values brought about by the controls, due to such things as less traffic congestion, less degradation in municipal services, and lower housing density. The price increases thus arise from an upward shift in the demand curve instead of a downward shift in the supply curve.

8. The 1986 San Francisco initiative also mandated job training program for city residents and made the provision of more affordable housing a key to the approval of future downtown development projects.

9. The formula Caltrans uses is $V \times D \times Q \times (\frac{1}{ave.speed} - \frac{1}{35})$, where V equals the total number of vehicles traversing the affected portion of freeway, D the duration of the delay period, and Q the length of the freeway segment experiencing delay. Because Caltrans chooses the length of freeway on an ad hoc basis, we divide their measure by Q to create a per-mile measure of vehicle-hour delay. See Wilson (1991) for an analysis of the relationship between highway speed, volume, and congestion.

10. Rothstein (1991) develops a theoretical framework for estimating the preferences of setters (those who place referenda on the ballot) and voters with aggregate data. His method, however, requires interjurisdictional data, and assumes that one setter in each jurisdiction places one proposal on the ballot. Rothstein's approach is thus far more suited to the type of situations modeled by Romer and Rosenthal (1979) than to the situation analyzed in this paper. Lupia (1990) examines situations in which voters face multiple competing proposals on the same ballot, but does not examine the strategic consequences of this situation.

11. These various strategies all reduce to a decision whether or not to cast a vote for one's second-preferred alternative. Besides depending upon beliefs about what strategies other voters are following and the consequent likelihood of different outcomes, this decision also depends upon the voter's utility over the three alternatives. For example, if there is a large gap between the utility a voter receives from a most-preferred

alternative but little utility difference between the remaining, inferior alternatives, it will be very unlikely that the voter will cast a strategic vote for a (barely) second-preferred alternative. Solving for equilibrium strategies in this situation—essentially a three-alternative election under approval voting—is beyond the scope of this paper. For results concerning voting equilibria in three-alternative elections under plurality rule see Palfrey (1984) and Lian (1990). See Brams and Fishburn (1991) for further discussion of strategic considerations under approval voting.

12. Unlike Proposition J, which would have imposed numerical ceilings on new construction permits, the new measure sponsored by PLAN calls for developers to pay impact fees, to pay prevailing wages to construction workers, and to undertake whatever mitigation measures the City determines are necessary to offset increases in traffic and water use. According to Gyourko (1991), impact fees reduce the incentive for communities to engage in exclusionary zoning and most likely increase the density of new development.

Appendix

Under the assumption of random utility maximization, we can write $U_j = V_j(X_j) + \epsilon_j$, where X_j is the vector of attributes for the jth choice. Here $j = 0, 1$, where 0 indicates a no vote and 1 indicates a yes vote. ϵ_j is an unobservable error, capturing effects that are specific to the alternative. A voter votes yes ($Y = 1$) if the utility from doing so exceeds the utility form voting no ($Y = 0$). That is,

$$Prob(Y = 1) = Prob[V_1(X_1) + \epsilon_1 > V_0(X_0) + \epsilon_0)]$$

$$= Prob[\epsilon_1 - \epsilon_0 < V_1(X_1) - V_0(X_0)] \qquad A1$$

McFadden (1973) has shown that if the residuals are independent and identically distributed, then

$$p_1 = Prob(Y = 1|X) = e^{V_1(X_1)}/[e^{V_1(X_1)} + e^{V_0(X_0)}] \qquad A2$$

In our data, aggregated to the precinct level, we do not observe individual choices. However, for large N a reasonable approximation of $Prob(Y = 1|X)$ is $\hat{p_1} = 1/N \sum Y_k$ where $k = 1, \ldots, N$ indexes observations. From equation A2 we can see that

$$log(p_1/p_0) = V_1(X_1) - V_0(X_0). \qquad A3$$

Under the assumption that $V_j(X_j)$ is linear in the parameters, with $V_j(X_j) = X\beta_j$, the log of the ratio of the probabilities is a linear function of the variables affecting the voter's choice. In the binary case with $p = p_1$ and $(1 - p) = p_0$, equation A3 implies

$$log(p/1 - p) = \beta' X, \qquad A4$$

where β is a vector of coefficient differences $(\beta_1 - \beta_0)$. The regression model we estimate is thus

$$log(\hat{p}/1 - \hat{p}) = \beta' X + u, \qquad A5$$

where

$$u = log(\hat{p}/1 - \hat{p}) - log(p/1 - p). \qquad A6$$

Using a Taylor's expansion,

$$u \doteq (\hat{p} - p)(1/p + 1/(1-p)) = [1/p(1-p)](\hat{p} - p) \qquad A7$$

Hence, in large samples,

$$E(u) = 0;$$

$$Var(u) = 1/Np(1-p).$$

This means that we can use $1/N\hat{p}(1-\hat{p})$, where N is the number of votes cast in the district, as an estimate of the variance. We therefore estimate our equations using the weight $w = (n\hat{p}(1-\hat{p}))^{1/2}$.

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