

# CONSERVATION THROUGH THE BALLOT BOX

## USING LOCAL REFERENDA TO PRESERVE OPEN SPACE

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**Residents of Beaufort County in South Carolina's Lowcountry approved taxpayer-financed bonds in 2000 (\$40 million) to acquire land and development rights on more than 10,000 acres, and in 2006 (\$50 million) to create parks, trails, and buffer areas.**

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**T**he conservation movement has used both private enterprises and public programs to preserve lands of ecological, aesthetic, and historical value. One notably successful effort has employed referenda for the conservation of open space. Between 1998 and 2006, some 1,550 referenda appeared on state, county, and municipal ballots across the United States, and their success rate was very high: nearly 80 percent of these measures passed, many by a wide margin.

These referenda encompass a broad range of conservation objectives: the preservation of farm land; the protection of ecologically sensitive wetlands, meadows, and forests; and the creation of new recreational sites, to name a few. Some of

these measures have been initiated at the grass-roots level and others by public officials.

The U.S. experience with referenda for conservation purposes, especially their striking success rate, raises some intriguing questions. What does this experience tell us about the preferences of the U.S. electorate for the conservation of open space? In particular, can we draw some generalizations from these local referenda concerning what people want in the way of open space preservation?

A second set of issues relates to the form and effectiveness of the referenda instruments themselves. Do certain kinds of referenda fare better than others? For example, are proposals that rely on local bond finance more likely to pass than those that are funded through increases in local property taxes (or other forms of local taxation)? What are the lessons for conservation advocates

in their efforts to promote the preservation of open space?

Our recent study, supported by the Lincoln Institute of Land Policy, has used the LandVote data set of all known U.S. open space referenda from 1998 to 2006 (Banzhaf, Oates, and Sanchirico 2007). LandVote is compiled by The Trust for Public Land; the Land Trust Alliance helped in this effort until 2001. These data indicate the number of yes and no votes cast in each referendum, and in most cases provide descriptive information concerning the referendum itself: the mechanism used to finance the proposed measure; the purpose of the preservation; and often the level of funding.

The data tell an interesting story. Figure 1 shows the number of open space referenda that were passed compared to those voted on in each state. We see that successful referenda are a nationwide phenomenon, although they are somewhat more prevalent in the Northeast. Figure 2 documents the high levels of support that these measures have received. Each bar in this histogram depicts the fraction of all elections in which the yes vote fell within the indicated 5 percent band.

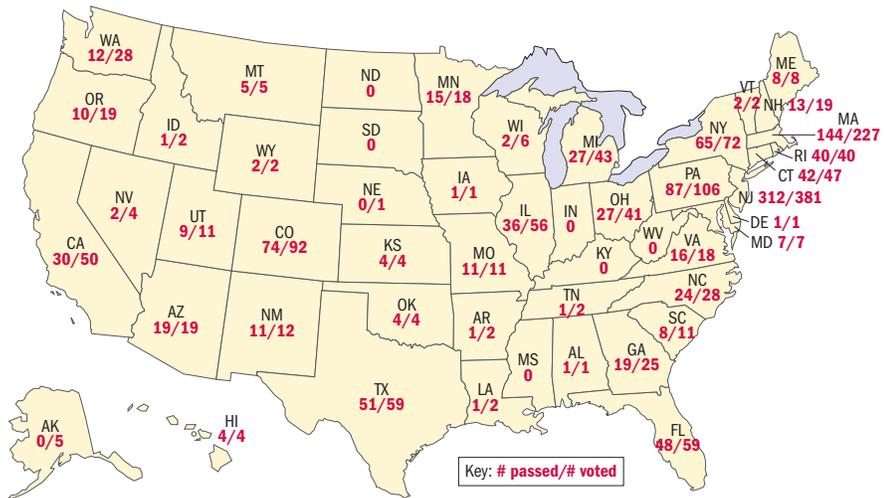
We have supplemented the basic LandVote data with a number of other variables (e.g., U.S. Census attributes of the community; county-level land use and agricultural data; information on the presence of endangered species; and a set of key political variables) to explore the characteristics of communities which are (or are not) protecting open space and the forms of referenda measures that receive the most support.

### A Basic Issue in Statistical Inference

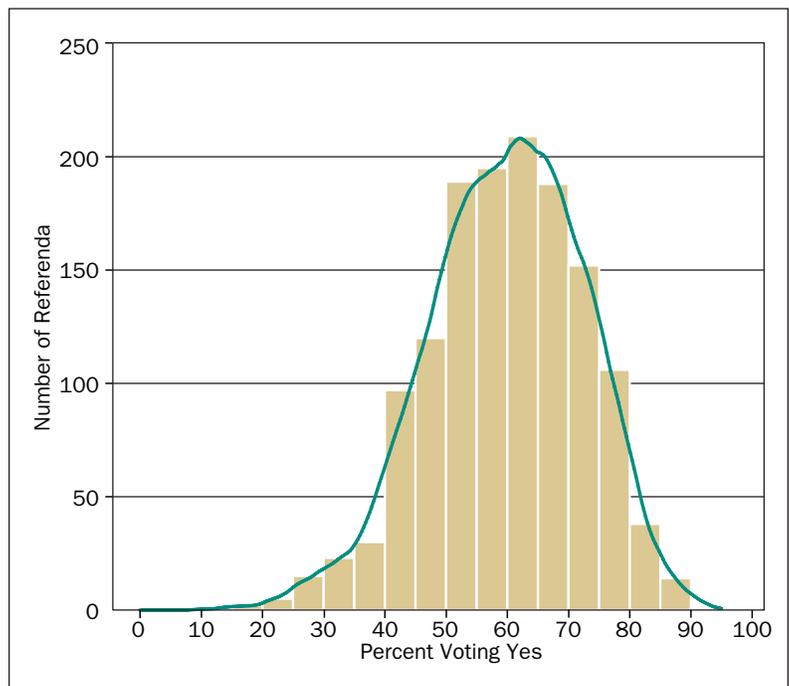
Before turning to our findings in more detail, we must address one especially challenging issue of statistical inference. The basic (and powerful) theorems of statistical analysis with which we can make inferences about whole populations from samples of observations typically depend upon the randomness of the sample. Otherwise, there may be systematic biases in the subpopulation being tested, resulting in erroneous inferences concerning the characteristics of the larger population. If we are interested in drawing broad inferences about the preferences of the U.S. population at large for open space preservation, we would ideally need a random sample of individuals or communities.

However, the communities that have held open space referenda are not a random sample of U.S. counties or municipalities. In fact, environmental

**FIGURE 1**  
Open Space Referenda Across the United States, 1998–2006



**FIGURE 2**  
Open Space Referenda Show High Levels of Support



organizations have selected, often with great care, those jurisdictions where there is evidence that such measures have a high likelihood of success. The Conservation Fund and The Trust for Public Land have even published handbooks that explain how to design referenda measures and where best to introduce them (Hopper and Cook 2004; McQueen and McMahon 2003). Our sample of

communities that have actually held open space referenda is surely not random, so we cannot take their characteristics and outcomes as representative of attitudes or preferences for the country as a whole.

Economists have devoted much attention to this selection bias problem, and have developed a set of statistical techniques to address it. These approaches typically involve the statistical estimation of a first-stage equation (called the selection equation) that explains the propensities or characteristics that lead individuals (or, in our case, communities) to behave in the prescribed way (for our purposes, to hold referenda). Using the results from this equation, we can proceed to a second-stage outcome equation, which explains the percentage of yes votes in our sample of local referenda in a way that controls for the self-selection of those communities that actually held referenda.

### Some Findings from the Selection and Outcome Equations

The first-stage equation, which allows us to control for self-selection in the outcome equation, also provides some interesting results concerning the characteristics of those communities that have chosen to hold open space referenda. For example, communities with higher levels of education and lower levels of support for President Bush in the 2000 election were more likely to hold conservation referenda.

With regard to ecological concerns, we find that communities with a relatively large number of endangered species and with more surface water exhibit a higher likelihood of holding open space referenda. In addition, communities with a larger percentage of their populations living in urbanized areas were more inclined to hold conservation referenda. This may reflect a desire to preserve what remains of more limited open space—the increased value of a scarce commodity.

Of greater interest are the results in our second-stage outcome equations, which tell us what determines the extent of the yes vote in our sample of referenda (after controlling for the selection problem). Here we see that the communities that chose to hold open space referenda in particular years are precisely those that are more likely to vote in favor of them at that time.

This finding offers two (not mutually exclusive) interpretations. First, it may reflect the astuteness of community leaders in responding to local preferences. Second, it could result from the effective targeting of jurisdictions by regional or national

land trusts; this interpretation is consistent with another study that found communities with more land trusts are more likely to support conservation at the polls (Sundberg 2006).

With respect to the characteristics of communities, we find that more educated populations and those with fewer children are more likely to vote in favor of open space referenda. More densely populated cities also tend to support these measures, which (as in the selection equations) may indicate a concern with the preservation of a relatively modest amount of remaining open space.

A particularly intriguing (and complex) issue is the role of home ownership in the support of open space measures. Studies of local fiscal behavior find that communities with a relatively large fraction of renters tend to spend more on local public programs (Oates 2005). Observers have suggested that this “renter effect” may result from renters’ perception that they do not have to pay for these services. Under local property taxation, the formal liability for the payment of the taxes rests with the landlord; the renter never sees a tax bill. Thus, there may be a kind of “renter illusion” under which renters are simply unaware of the extent to which local property taxes affect their rents. If it is true that renters think they get local public services for free, then they may be favorably disposed to support local open space preservation. (Renters also tend to support other forms of local public expenditure.)

Homeowners may have their own reasons to favor land conservation programs. Not only does preservation provide a wide range of amenities, but the associated restriction on land available for development can serve to limit the supply of housing in an area and thereby increase the value of existing homes. We might thus expect a “homeowner effect” that manifests itself in a finding that communities with a higher rate of home ownership have a higher probability of supporting open space referenda at the polls. Of course, homeowners must see the value of these gains as exceeding the increase in their taxes (either in the form of increased current property taxes or future tax liabilities under bond finance).

We have included in our equations a variable indicating the percentage of homeowners in the jurisdiction. As we have seen, the impact of this variable is unclear. The sign of this variable could be either positive (if the homeowner effect dominates the renter effect) or negative (if the renter effect



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is dominant). Unlike other studies of local public expenditure where the estimated sign of this variable is typically negative, we generally find in our outcome equations that the homeowner variable has a positive sign.

For the case of open space referenda, the homeowner effect thus seems to dominate the renter effect. In our sample of counties, for example, we find that a 10 percent increase in the percentage of homeowners in a county is associated with a 3 percent increase in the yes vote on the referendum. In our study of municipalities, we find a more modest 1 percent increase in support. Communities with a larger fraction of homeowners seem to be more favorably disposed to support conservation referenda.

### Financing Open Space Referenda

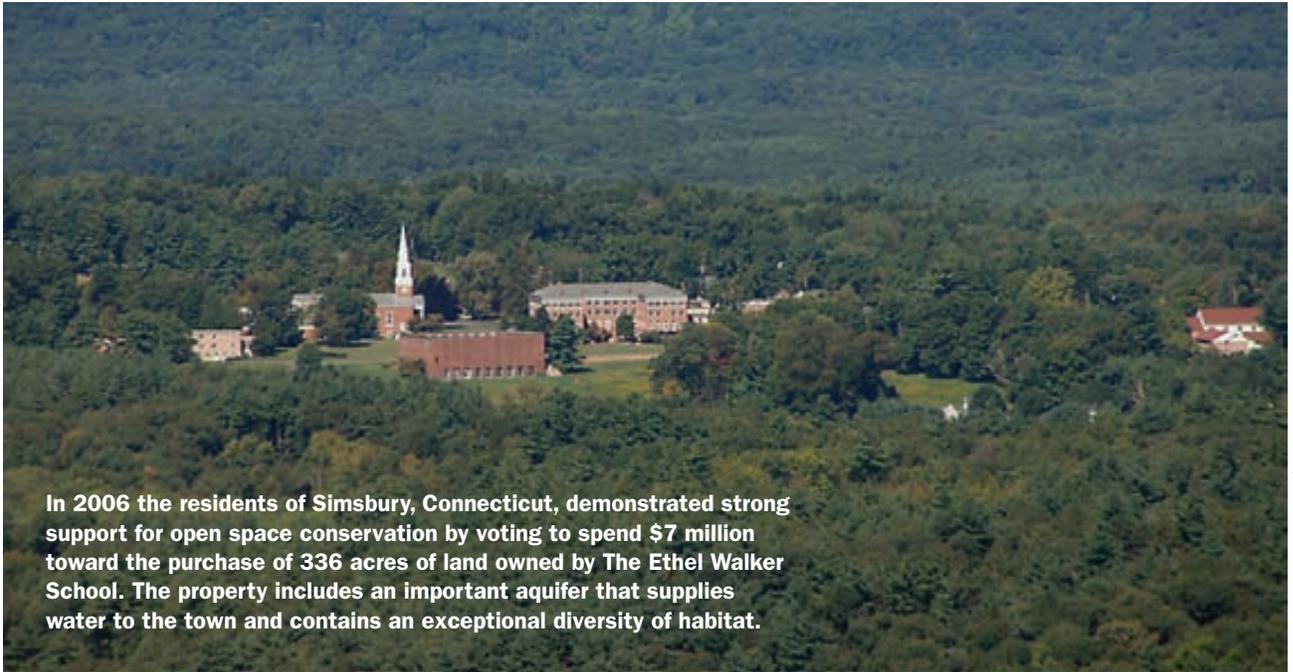
One of the major policy results emerging from this study is that referenda proposals involving bond financing obtain significantly greater voter support than those that rely on local property taxation. Local residents seem to have a decided preference for debt finance over tax finance.

The choice between bond and tax finance is an issue of great interest to public finance scholars.

In the nineteenth century, the famous British economist, David Ricardo, pointed out that there is a formal equivalence between financing a measure by current taxation or by issuing debt. In one case, individuals (or a group of individuals in a community) pay for a project now by taxing themselves in the current period; in the other, they delay payment until some future time by issuing what are effectively IOUs. But in a perfectly functioning credit market, the present value of the future payments to redeem the IOUs (or bonds), which are discounted at the market rate of interest, will be the same as the current tax payments. Thus, so long as individuals have costless access to credit markets, they really should be indifferent to the alternatives of tax and debt finance.

This proposition has become enshrined as the Ricardian Equivalence Theorem, which implies that the mix between tax and debt finance in the public budget is essentially irrelevant. If the government chooses to cut taxes by issuing bonds and increasing future tax liabilities, individuals will simply respond by increasing their current savings in order to maintain their planned profile of consumption over time. In such a setting, deficit finance has no impact whatsoever on the level of aggregate

**In both 2000 and 2004, voters in Gallatin County, Montana, overwhelmingly passed a \$10 million open space bond to help conserve more than 40 square miles of important farmland and wildlife habitat throughout the county.**



**In 2006 the residents of Simsbury, Connecticut, demonstrated strong support for open space conservation by voting to spend \$7 million toward the purchase of 336 acres of land owned by The Ethel Walker School. The property includes an important aquifer that supplies water to the town and contains an exceptional diversity of habitat.**

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spending and the economy. This result is hedged by a number of important conditions, but it is a very strong and controversial proposition. It has given rise to a substantial body of empirical testing with quite mixed findings.

The case for Ricardian equivalence is much more compelling in the context of local public finance than in a national setting because the source for this equivalence is the normal operation of local land markets. A wide body of empirical literature has shown that all kinds of local features, including the quality of local schools, accessibility to jobs, environmental amenities, and levels of local taxes, are capitalized into local property values. People are willing to pay more to live in communities with superior levels of amenities and lower taxes (Fischel 2001).

Thus, if a community opts for debt finance (rather than current taxation), it is encumbering itself with an equivalent level of future tax liabilities that will tend to become capitalized into local property values. Residents can effectively choose to finance their public expenditures through current taxes or an equivalent reduction in the market value of their homes. It is straightforward, in a simple model of local finance, to demonstrate this equivalence—to show that rational individuals should be indifferent between tax and debt finance at the local level.

Using our unique data set, we are able to undertake a direct test of Ricardian equivalence, and we

find a clear preference for debt over tax finance in our second-stage outcome equations. Around the mean values of our data, a municipal referendum making use of bond finance is likely to gain 8 to 9 percentage points of yes votes at the polls as compared to a proposal relying on local property taxes. A county referendum is likely to gain 3 percentage points. Other studies of these referenda have found the same result (Nelson et al. 2006). Kotchen and Powers (2006) claim that these findings constitute a clear rejection of Ricardian equivalence.

On closer inspection, we find that this conclusion is not necessarily true—and for an interesting and important reason. In order for Ricardian equivalence to hold, individuals must be able to borrow on the same terms as their governments. But this is clearly not the case in the context of state and local finance in the United States. The interest income on state and municipal bonds is exempt from taxation under the federal income tax, which makes them very appealing to potential buyers. As a result, state and local governments find that they can typically borrow at rates of interest substantially (several percentage points) below the rates available to other borrowers, including both private borrowers and the federal government.

Under such conditions it makes perfect sense for individual borrowers to try to make use of the leverage available to their state and local governments. Rational borrowers would want to shift their portfolios of debt toward issues by their state

and local governments; this would effectively allow them to substitute lower-priced public debt issues for their own private debt. Thus, the finding that local residents prefer bond financing to current property taxation does not represent a rejection of Ricardian equivalence. We would expect this finding in any setting where public borrowing takes place on more favorable terms (i.e., lower interest rates) than private borrowing.

In sum, although this observed preference for bond finance cannot be taken at face value as a rejection of Ricardian equivalence, it nonetheless has quite significant implications for the design of local referenda for the preservation of open space. Such referenda stand a better chance of passage if they are funded through local bond issues than if they rely on current property taxation.

### Local Referenda and the Conservation Movement

The widespread use and success of local referenda for the preservation of open space provide some *prima facie* support for the conservation movement's effectiveness in using this instrument to pursue its objectives. Our estimated models indicate, for example, that communities that have held these referenda are predicted to have relatively higher levels of support, averaging some 5 to 7 percentage points, than communities that have not held conservation referenda. These communities also tend to be located in areas with more endangered species and with more surface water resources to protect. All these findings are consistent with the view that the conservation movement has successfully identified communities where referenda have a relatively high likelihood of passage, although many local referenda are still approved without outside support.

This success does not mean that there is no room for improvement, however. Consider the following conceptual exercise. For the 240 county referenda between 1998 and 2006, we identify the top one-third (80), which our selection model tells us were the most likely to hold an open space referendum. We might think of this group as the set of communities most likely to be selected for referenda under current practices of the conservation movement. Then, using our outcome equation, we identify the 80 communities most likely to be successful in passing such measures. This set of communities would presumably be the top priority if our model were used as a planning tool.

The two sets do not fully coincide. We find that the set chosen by "current selection practices" receives an average "yes" vote of 62 percent, with 64 jurisdictions receiving more than 50 percent. In contrast, the 80 communities that our model predicts to have the most successful outcomes receive an average "yes" vote of 68 percent, with 79 of the 80 receiving more than 50 percent. This model thus identifies several jurisdictions with high predicted support for referenda, but where such measures were not actually introduced.

Our research not only provides some helpful description of historic patterns and experience with conservation referenda; it also can help to inform and guide land trusts and other conservation organizations in their efforts to help communities preserve open space in the United States. 

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