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ON FISCAL ILLUSION AND RICARDIAN EQUIVALENCE IN LOCAL PUBLIC FINANCE

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ABSTRACT

We re-evaluate two forms of fiscal illusion in local public finance: debt illusion and renter illusion. The Ricardian Equivalence Theorem for local governments suggests the form of finance of a public program (tax or debt finance) has no effects on substantive outcomes. For the local case, this results from the capitalization of local fiscal differentials into property values. We show that this version of the model is quite restrictive. In particular, in the U.S, context, where state and local interest is exempt from federal taxation, rational behavior may be inconsistent with Ricardian equivalence if local governments can borrow on more favorable terms than individuals. We also suggest a new test for renter illusion (or the renter effect). In particular, whether or not renters are more likely to support public investments in general, the renter effect suggests that renters are more likely to support them when financed with property taxes than with sales taxes. Using data from hundreds of open space referenda in the U.S. using a variety of finance mechanisms, we find evidence that households do prefer debt financing to tax financing, but find no evidence of the renter effect.

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Economists have suggested various reasons why voters may suffer from a fiscal illusion, in which they fail to recognize the true cost of public services (Buchanan 1967, Dell'Anno and Mourao 2012, Dollery and Worthington 1996, Oates 1988, 2005, Turnbull 1998, Wagner 1976). Important examples include debt illusion, in which residents myopically view debt more favorably than current taxes, and renter illusion, in which renters erroneously believe they do not bear the burden of the property tax.

Economists have sometimes puzzled over the notion that households would prefer debt to current taxes, since the Ricardian Equivalence Theorem suggests outcomes are independent of whether or not a public program is financed by current taxes or by bond issues. In his seminal paper, Robert Barro (1974) developed the argument in an intergenerational framework in which altruistic individuals offset the effects of debt finance on future generations through an increase in their saving to augment their bequests by a sum sufficient to pay the increase in future taxes needed to redeem the bonds. Thus, the intertemporal consumption and savings profiles of individuals are, in Barro's world, independent of the choice between tax and bond finance.

Barro's treatment of Ricardian equivalence has been addressed primarily in the setting of national government finance.[1] A similar equivalence between tax and bond finance has also

[1] In this setting, two elements of Barro's formulation deserve attention. First, the model requires altruistic behavior: the utility of future generations enters directly into the utility functions of the current generation. Second, the current generation must be fully aware of the magnitude of the current public deficit and its implications for the well-being of later generations. These are obviously strong assumptions, and they have been the source of considerable skepticism in the literature concerning the empirical relevance of the theorem. For two excellent treatments of the Ricardian equivalence proposition, see Andrew Abel (1987) and John Seater (1993). Empirical studies of Ricardian equivalence have produced mixed results. See, for example, Briotti (2005).

been hypothesized for local public finance. In fact, the local version of the hypothesis actually predates Barro's (1974) paper. The rationale for this equivalence is quite different in the local context than in the national one. Here the equivalence of tax and debt finance has its source in the normal operations of local land markets, which capitalize fiscal differentials into local property values. As first suggested by George Daly (1969) and proved formally by Nobuo Akai (1994), the equivalence arises inasmuch as the present discounted value of a proposed program is the same under either form of finance. For example, should a community select debt finance instead of current taxation, the present discounted value of the debt would be exactly capitalized into reduced current property values. Local residents thus pay for the program either through current taxes or an equivalent reduction in the market value of their property.[2] Note that this equivalence does not depend (as in the Barro framework) on altruistic bequests between overlapping generations; the equivalence of tax and bond finance in a local context results simply from standard utility maximization in a model with mobile and fiscally aware consumers in a multi-period setting.

Guided by this model, economists have tended to assert that residents should be indifferent between bond-financed and tax-financed investments in the local sector, or that if they are not it must be because of an irrational "debt illusion." Though we find the local version of Ricardian equivalence, with adjustments through land markets, more compelling than the national version, nevertheless there is a good reason why Ricardian equivalence might *not* hold in local public finance. In particular, when the model allows for the realistic possibility that municipal governments have better access to credit markets than individuals, individuals may prefer to use local government financing as a way to access lower interest rates. The consequent

[2] See also Oates (1972, pp. 153-161) for an early discussion of the theory of debt finance in a local context.

non-equivalence results from perfectly rational behavior and is fully consistent with the neoclassical economic model.

A related issue in the local finance literature is the pervasive finding in many empirical studies that communities with more renters appear to support higher levels of public expenditure (see Dollery and Worthington 1996 and Blom-Hansen 2005 for reviews of this literature). Drawing on these studies, Oates (2005) estimates the magnitude of this "renter effect." The estimate suggests that if all residents in the U.S. were homeowners, local public budgets would typically be around ten percent less than existing levels of expenditure.

One possible reason for this finding is that debt illusion may have a first cousin known as "renter illusion" (Oates 1988). The contention here is that since landlords have the legal liability for the payment of property taxes on their housing units, renters (who never see a tax bill) simply assume that they don't pay local property taxes. But just as we argue in this paper that preference for public debt may have a rational basis, so too may the renter effect. For example, renters may have a lower tax share because of smaller housing consumption (Martinez-Vazquez 1983). Moreover, if excessive spending gets negatively capitalized into land values which translate into lower rents, the burden actually may indeed fall on land owners rather than renters (Martinez-Vazquez and Sjoquist 1988, Epple and Romer 1991). In this second case, there may still be a renter effect, but one based on real, rather than illusory, grounds. Because of this ambiguity, in the remainder of the paper we will refer to a "renter effect" rather than to "renter illusion."

This paper contributes to the literature on fiscal illusion in three ways. First, we extend the standard model of Ricardian equivalence in local public finance to allow for differing access to credit markets for local governments than for individuals. The model suggests that preference

for local debt over current taxes may be perfectly rational.

Next, we test the hypothesis that voters prefer debt financing with an empirical analysis of voting patterns across hundreds of local referenda for open space protection in the United States. Such referenda provide an appealing test of the relevant hypotheses, since households reveal their preferences directly in an incentive-compatible context, rather than indirectly through elected officials. We find that households are more likely to support such referenda when they are financed through debt rather than through taxes, consistent with our hypothesis.

Finally, we test for a renter effect in these data. In fact, we find if anything the opposite: communities with a higher share of renters are less likely to support expenditures for open space. In the particular context of open space, this may be because homeowners have an incentive to restrict the supply of land, driving up housing values. This "homevoter" effect (Fischel 2001) may offset the renter effect. However, the renter effect applies only to expenditures financed with property taxes and perhaps to bonds that would be paid off with future property taxes. It should not apply to sales taxes. Our data, which includes otherwise similar open space referenda differing in the finance mechanisms, provides a unique opportunity to test whether communities with more renters are *differentially* more likely to support property tax and/or bond referenda relative to sales tax referenda. In fact, we find no such relationship. Our results thus do no support the existence of a renter effect.

The United States, incidentally, is an appealing case for this study in part because of the sheer magnitude of the state and local public sector. Not only is the extent of fiscal decentralization relatively high in the United States, but state and local governments carry out the great bulk of infrastructure investment (with the local share the larger of the two); they finance these capital projects primarily by the issue of long-term bonds. The stock of

outstanding state and local debt is huge: $2.4 trillion in 2007. This is far and away the largest sub-national debt market in the world (Wallis 2000).

1. A Simple Model of Local Ricardian Equivalence[3]

In the typical proof of equivalence theorems, the strategy is a simple one: show that the budget constraints of the relevant decision-makers are identical under the regimes to be shown equivalent (see e.g. Akai 1994). This is what we shall do here.

Consider a setting in which there are two identical communities, A and B, which (to motivate our later empirical results) are located on an urban fringe. Each community contains houses of the same fixed and identical size, and each provides the same level of local public services at the same price to residents. Time is measured in discrete periods (years). Households have exogenous incomes in each period, y_t, and costless mobility among communities. Since individuals are indifferent between communities, it follows that in equilibrium the price of a house must be the same in A and B. Without loss of generality, we normalize the initial price of a house in either community to $P^0 = 0$.[4]

Now suppose that communities A and B have a surprise opportunity to purchase a public good such as parkland or open space, which will enhance the quality of life of their residents and differentiate the communities from the rest of the urban fringe. For now, we take the quantity of open space to be fixed at size K. We denote the per-capita size, K/n, as k and normalize the units

[3] We are grateful to Robert Schwab for his help on modeling Ricardian equivalence in the context of local public finance. After constructing this model, we learned that Nobuo Akai (1994) had previously provided a formal proof of Ricardian equivalence in a model of local finance. However, he does not point out the non-equivalence under different financing constraints, the contribution of the following section.

[4] Note that because house sizes are fixed, we can think of these prices as "admission tickets" to a community. In such a model, capitalization of debt (or other community differences) manifests itself in differentials in ticket prices as in Oates and Schwab (1996). This model is more restrictive than it need be. We could, for example, construct a model in the Hamilton-Tiebout spirit in which we have households sorting themselves among communities with differing amounts of housing and public services. However, the model we use here is sufficient for our purposes.

of open space such that $p_k = 1$.[5] But there is a basic difference between the two communities. Community A has the opportunity to purchase this open space using "equity financing" through the immediate payment of a one-time tax on its residents. In contrast, Community B must rely on debt finance in the form of an issue of perpetuity bonds (with payments made at the end of each period), which will entail a stream of future tax payments for the residents of B.

In subsequent periods, communities A and B remain identical in every respect except that residents of community B must pay current taxes of kr to finance their "open space" debt, while the residents of A are free and clear of any payments for the benefits they enjoy from the open space. With costless mobility of households, it is clear that in future periods, if $P_A = P_B$, there will be excess demand for residences in Community A. To equalize utility across the two communities, prices will adjust until

$$(1) \qquad P_A' = P_B' + kr\frac{1}{r} = P_B' + k.$$

The present value of the per-capita debt is thus fully capitalized into housing prices. Capitalization results simply from costless mobility: house prices must adjust so that new entrants are indifferent between the two communities.

We now make k (the amount of open space) a variable, such that the residents of each community must choose how much open space to purchase. To establish Ricardian equivalence in our model, we must show that the residents of A (using equity finance) will select exactly the same quantity of open space, k, as residents of B (using debt finance). We must show, in short, that the choice of the amount of open space (or, more generally, the level of local public services) is invariant with respect to the form of finance.

[5] We could obviously use K to denote any form of local infrastructure that yields a stream of public services in the future. We are calling K "open space" simply to put the model in the spirit of our empirical study.

There are two possibilities. Households either plan to remain in their current community of residence or move. Consider first those households who choose to stay forever in their community and hence do not sell their houses. The utility maximization problem for such households in community B is

$$(2) \qquad \max_{\{k,\, ct\}} \Sigma_t u(c_t,k)(1+r)^{-t} \text{ s.t. } \Sigma_t y_t(1+r)^{-t} = \Sigma_t c_t(1+r)^{-t} + kr\frac{1}{r},$$

whereas, for households in A, we have

$$(3) \qquad \max_{\{k,\, ct\}} \Sigma_t u(c_t,k)(1+r)^{-t} \text{ s.t. } \Sigma_t y_t(1+r)^{-t} = \Sigma_t c_t(1+r)^{-t} + k.$$

These are clearly identical problems inasmuch as the last terms in (2) and (3) are equal by virtue of the present value calculation. Households who continue to live in A and B will thus prefer exactly the same level of k.

Consider next current residents of A and B who plan to move out in the next period, back to the urban fringe. For those living in B, we have the maximization problem

$$(4) \qquad \max_{\{k,\, ct\}} \Sigma_t u(c_t,k)(1+r)^{-t} \text{ s.t. } \Sigma_t y_t(1+r)^{-t} = \Sigma_t c_t(1+r)^{-t} + k\frac{r}{(1+r)} - \frac{P_B}{(1+r)}.$$

On the right hand side of the budget constraint is the present value of the stream of consumption, one period of payment on open space capital (made before moving and discounted back one period) and the capitalized value of selling the property in the community (also discounted back one period).

In Community A, we have

$$(5) \qquad \max_{\{k,\, ct\}} \Sigma_t u(c_t,k)(1+r)^{-t} \text{ s.t. } \Sigma_t y_t(1+r)^{-t} = \Sigma_t c_t(1+r)^{-t} + k - \frac{P_A}{(1+r)}.$$

Substituting equation (1) into (5), we obtain

$$(6) \qquad \max_{\{k,\, ct\}} \Sigma_t u(c_t,k)(1+r)^{-t} \text{ s.t. } \Sigma_t y_t(1+r)^{-t} = \Sigma_t c_t(1+r)^{-t} + k - \frac{(P_B+k)}{(1+r)},$$

or

$$(7) \qquad \max_{\{k,\, ct\}} \Sigma_t u(c_t,k)(1+r)^{-t} \text{ s.t. } \Sigma_t y_t(1+r)^{-t} = \Sigma_t c_t(1+r)^{-t} + k\frac{r}{(1+r)} - \frac{P_B}{(1+r)}.$$

Equation (7) is the same as equation (4) so that we again find that residents of A and B will choose the same level of k.

Thus, we have full Ricardian equivalence in this model: levels of open space purchases (or, more generally, levels of local public services), private consumption, and the resulting utility levels are the same under tax and debt finance.

2. An Extension of the Model: The Case of Different Rates of Interest

A crucial assumption in the local version of Ricardian Equivalence derived in the previous section is that individuals can borrow and lend at the same rate as the government. There is good reason to question this assumption. In fact, interest rates on municipal debt are generally well below consumer rates on credit cards and automobile loans.

Municipalities may be able to borrow more cheaply than individuals for two reasons. First, lenders may believe that loans to governments are less risky than loans to individuals and hence may charge higher rates of interest to households than to the public sector. Such a perception may in turn arise for any of at least three reasons. First, like national governments, local governments have the power of taxation, so within limits they always have a ready source of revenue to access. Second, higher governments (states or the Federal Government) may bail out bankrupt local governments, honoring their debt. Third, governments may simply be more responsible than individuals.

In addition to the question of such risk premiums on individual consumer debt relative to municipal debt, there is a second reason municipalities may borrow at lower interest rates. In the U.S. interest income on state and local bonds is exempt from the federal income tax, whereas

consumer debt is not. As a result, state and local governments are typically able to borrow at rates several percentage points below private-sector rates.[6] Mortgage debt is an important exception in the US, a point we return to below, but for now we note that the fact that households regularly borrow at higher rates indicates housing debt is at best an imperfect tool for smoothing income shocks and that they must use higher cost instruments at the margin.

In such a setting, borrowers may have a powerful reason for preferring local debt finance to tax finance. Equity financing through current taxation to finance local infrastructure ("open space" purchases in our application) may require private borrowing to smooth consumption over time. If local government can borrow at a lower rate than individuals, it is no longer the case that households will necessarily be indifferent between tax and debt finance. Substituting borrowing through public sector debt issues for individual borrowing allows households to smooth their consumption over time on more favorable terms.[7]

Mathematically, the key difference between this case and the simple model of Ricardian Equivalence is that equation (1) must be adjusted to differentiate the two rates of borrowing. Denote r_m as the rate at which the municipality can borrow and r_i as the rate at which individuals can borrow. Assuming the individual is a borrower, r_i is also his rate of time preference (by the first order condition for his inter-temporal asset allocation problem). Then (1) must be modified

[6] One might argue that if households have such an arbitrage opportunity through their local governments, the local public sector would expand until rates are equilibrated. While such a factor is an intriguing source of pressure for larger governments, there are two important factors mitigating it. First, we are arguing only that, *conditional on new government expenditure*, households may prefer to finance it with debt than with immediate taxes. It does not follow that households prefer more government expenditures at the margin. Second, many states limit local debt issues, preventing debt from expanding in this way. In any case, lower rates on municipal debt are an empirical regularity.

[7] This result, proved below, parallels the famous results of Modigliani and Miller (1958). The Modigliani-Miller theorem states that, in a world without taxes, firms should be indifferent to equity and debt financing, a result echoed in the Ricardian equivalence theorem for government. However, when debt receives favorable tax treatment, firms will prefer debt financing (Modigliani and Miller 1958, Miller 1977).

to

$$(1') \qquad P_A' = P_B' + k\frac{r_m}{r_i}.$$

Note that if $r_m < r_i$, the value of P_A relative to P_B is not so high in this case. Debt financing is more attractive.

Figure 1 illustrates the point. The consumer begins at point *A*, along a kinked budget constraint with higher rates for borrowing than for lending, and on the borrowing portion of the constraint. A purchase of open space paid for with a current period tax would move him to point *B*, shifted left by the amount *k*. The consumer will adjust his consumption to point *C*, smoothing out the shock. If, however, the community can borrow at a lower rate r_m, it can do the smoothing for the individual on more favorable terms. Thus, the consumer can be at point *D*, on a higher indifference curve.

We illustrate the importance of this insight with some numerical simulations. Consider overlapping generations of households who live for three periods. Each household has utility that is additively separable in time periods, with Cobb-Douglas preferences for open space and consumption in each period. Households vote for a quantity of open space in period 1. In period 3, they "retire" to the urban fringe, cashing out the value of their house. Thus, households maximize

$$(8) \qquad u = \alpha\ln(c_1) + (1-\alpha)\ln(k) + \frac{\alpha\ln(c_2) + (1-\alpha)\ln(k)}{(1+r_i)} + \frac{\alpha\ln(c_3)}{(1+r_i)^2}$$

subject to

$$(9) \qquad \sum_{t=1}^{3}\frac{y_t}{(1+r_i)^{t-1}} + \frac{P}{(1+r_i)^2} = \sum_{t=1}^{3}\frac{c_t}{(1+r_i)^{t-1}} + k_e + k_b\frac{r_m}{(1+r_i)} + k_b\frac{r_m}{(1+r_i)^2},$$

where k_e is the amount of open space financed with equity and k_b is the amount financed with

bonds ($k = k_e + k_b$). The budget constraint shows that the present value of the stream of exogenous income plus the realized capital gain on the house (discounted back two periods) must equal the present value of the stream of consumption, immediate tax payments for any open space purchased with "equity," and the present value of two tax payments for debt-financed open space.

In our simulation, we set α=0.9, y_t=100, r_t=0.10, and r_m=0.05. The first two rows of Table 1 report the results. The first row is a city allowed to choose either bond or tax financing. Residents clearly prefer bond financing, voting for 163 units of k_b and achieving a utility value of 15.7. The second row summarizes the same model, but with the constraint that households are only allowed to finance with current taxes. Residents now are on a lower indifference curve, with a utility of 15.6, and acquire less open space, at 93 units. We see also that the value of housing is higher, since future generations buy into a community that has no debt obligations. Thus, future generations will not have to pay the debt, but they do have to pay a higher price to join the community.

To illustrate the importance of the different rates of borrowing, we re-run these two models with households who can privately borrow at the municipal level of 5%. Rows three and four of the Table 1 illustrate this case. Levels of utility are now higher than previously, because the households can borrow privately on more favorable terms, which has a wealth effect.[8] Nevertheless, the important point is that households now are indeed indifferent between debt and equity financing, since they can always negate the community's decision in private markets. Their indifference is indicated by the fact that they can split their financing in any way; row three illustrates an example of a 50/50 debt/equity split. In row four, households are constrained to use

[8] Alternatively, we could think of households with the same constraints, but with income pushed forward to the initial periods so that they are on the saving portion of the kinked budget constraint.

taxes, but they are no worse off, acquiring the same level of open space and achieving the same utility. Thus, the existence of Ricardian equivalence in local public finance is not a foregone conclusion. Its validity depends on households' debt positions and access to credit markets.

3. An Application to Land Conservation

We turn next to an empirical study of local preferences for the form of finance. We look to see if households do indeed prefer debt financing by directly observing their voting behavior in local referenda, comparing the support in the ballot box for initiatives financed with debt in comparison to tax-financed initiatives. Additionally, we test whether communities with more renters are more or less likely to support such investments, and whether the effect of renters differs by the type of finance mechanism. The hypothesis of a renter effect would be consistent with renters being more likely to support those investments financed with property taxes and perhaps debt, but not those financed with sales taxes.

Our application is to a major type of local public investment in the United States: open-space conservation. Over the period 1998 to 2006, 1,550 referenda for the conservation of open space appeared on state, county, and municipal ballots in the United States, with more than $29 billion approved for such purchases in 2006 alone. These measures address a wide range of conservation objectives: the preservation of wetlands, meadows and woodlands; the conservation of agricultural land; and the establishment of new recreational areas.

Our basic data on the referenda themselves come from the large "Land Vote" data set, assembled by the Land Trust Alliance and the Trust for Public Lands.[9] These data encompass all known U.S. open-space referenda from 1998 to 2006 and include information not only on

[9] Other peer-reviewed studies have used these data in the context of studying conservation policies. See Banzhaf et al. (2010), Kotchen and Powers (2006), Nelson et al. (2007), and Sundberg (2006). These studies also find that bond-financed initiatives gather more support than tax-financed initiatives, but this finding is not a focus of the studies.

jurisdictions and outcomes, but on the financing mechanism as well. The data include local referenda that are financed by bonds, property taxes, and sales taxes, and are reported separately for counties and municipalities. Table 2 provides summary statistics on the finance mechanisms of the referenda by jurisdiction type. The raw data are consistent with the notion that people prefer bond financing: on average, debt-financed referenda garner 65% support, compared to 57% for property-tax referenda and 58% for sales-tax referenda, both differences from debt being statistically significant.

To control for other characteristics of the jurisdictions voting on the referenda, we have extended this data base through the collection of U.S. Census data on community demographics, USDA data on county-level land uses and agricultural values, and data on county-level Presidential voting (purchased from USElectionAtlas.org). Finally, we obtained data on outstanding debt, interest payments, and per-capita tax revenues for all counties from the Tax Foundation and the U.S. Census of Governments. Such variables may influence a jurisdiction's support of new expenditures as well as its relative preference for bond or tax financing. Unfortunately, similar data were not available for U.S. municipalities. Finally, we make use of an index, created by Geon and Turnbull (2006), of the extent to which jurisdictions in a state are granted "home rule," authorizing greater freedom to pass laws and ordinances (in contrast to "Dillon's rule," which restricts such authority). Table 3 provides summary statistics of these data.

To examine household preferences for methods of local finance, we regress the log-odds ratio (i.e. ln(pctyes/pctno)) of the vote in each referendum on these variables. The regressions are of the following form:

$$(10) \quad \ln(pctyes/pctno)_{rjt} = \alpha + \beta_B*BOND_{rjt} + \beta_{ST}*SALESTAX_{rjt} + \mathbf{D}_j'\boldsymbol{\delta} + \mathbf{F}_j'\boldsymbol{\varphi} + \mathbf{D}_j'\boldsymbol{\eta}_B*BOND_{rjt}$$

$$+ \mathbf{D}_j'\boldsymbol{\eta}_{\mathbf{ST}}*\text{SALESTAX}_{rjt} + \mathbf{F}_j'\boldsymbol{\theta}*\text{BOND}_{rjt} + \boldsymbol{\mu}_t + \varepsilon_{jt},$$

where r indexes referendum, j indexes jurisdiction, and t indexes year. BOND_{rjt} is a dummy variable for whether referendum r uses bond financing, and similarly SALESTAX_{rjt} is a dummy variable for whether it uses a sales tax; the property tax is the omitted category. $\mathbf{D}_j$ is a vector of demographic characteristics in community j, including most saliently the proportion of renters. $\mathbf{F}_j$ is a vector, available for the county-level models, of financial and political characteristics (such as tax and debt levels), which might affect preferences for debt. $\boldsymbol{\mu}_t$ is a vector of year-specific effects, and ε_{jt} is a random error term.

Table 4 presents the results of these regressions. Models 1A-4A are for county-level referenda, and Models 1B-3B are for municipality-level referenda. Models 1A and 1B are the most parsimonious specifications; they estimate the level effects for the finance mechanisms (β) and for homeownership and other demographics ($\boldsymbol{\delta}$), but not the interaction effects. Models 2A and 2B add interactions between the finance mechanisms and homeownership ($\boldsymbol{\eta}$). Models 3A and 3B control for additional community characteristics that might affect the preference for debt financing, including age, income, and education, by interacting them with BOND_{rjt}. Finally, Model 4A also controls for the vector of fiscal and political variables ($\mathbf{F}$), as both level effects and interactions with BOND_{rjt}. $\mathbf{F}$ includes pre-existing debt and tax levels, the Geon-Turnbull index of home rule, and an indicator for communities that have previously authorized a tax stream to finance future open space purchases, which they might then borrow against by issuing a revenue bond. Because the tax and interest data were unavailable for the municipalities, there is no corresponding Model 4B. (Including only the controls for revenue bonds and the index of home rule in the municipality model has little effect on the results.)

Is there a debt effect?

The model of fiscal federalism presented in Section 2 suggests that households may prefer debt to tax financing. Thus, the most straightforward hypothesis to test is whether bonds have a positive effect on referenda outcomes. As noted previously, the raw data indicate that this may be the case, with bond-financed referenda achieving a 65% average yes vote and tax referenda obtaining only 57% support on average, or a difference of about 8 percentage points. These results continue to hold when controlling for other factors using multivariate regression.

As the interaction terms in some of these models make the hypotheses of interest difficult to derive from the regression coefficients, Table 5 reports our main hypothesis tests. Panel A shows the results of a test that bonds are more likely to garner support relative to the other finance mechanisms. Bonds are clearly preferred to property taxes. For the "average community" (with all characteristics held at their mean values), a bond referendum gathers 5-7 additional percentage points in support over a property tax referendum in the county models and about 10 percentage points in the municipality models, an effect that is statistically significant in all models. Similarly, bonds appear to be preferred to sales taxes. For the average community, a bond referendum gathers 8-10 additional percentage points in support over a sales tax referendum in the county models and 2-4 percentage points in the municipality models. The effect is statistically significant for the county models and the most parsimonious municipality model (1B).

These results are robust to other statistical approaches. For example, we considered weighting the observations in the regressions by the propensity score, or probability (based on observable characteristics) that a referendum would use bond financing (Imbens 2004). This approach makes the bond and finance samples more comparable in terms of their observed

characteristics, while controlling for remaining differences with linear regression. The results are very similar using this approach. Additionally, we considered a matching approach, in which each bond-financed referendum is compared to a set of tax-financed referenda with similar propensity scores, and vice versa. We considered matching to the nearest neighbor, four nearest neighbors, and matching based on local linear regression (Heckman et al. 1997). The results continue to be quite similar to those reported in Table 5, with average treatment effects on the order of 9 to 10 percentage points higher approval for bond referenda over property tax referenda as well as over sales taxes in the county models (and all statistically significant), but smaller and sometimes insignificant effects relative to sales taxes in the municipality models. These results are available upon request.

Finally, we also considered the potential for selection bias in these referenda. Intuitively, the set of jurisdictions holding referenda may not be a representative sample of all jurisdictions. In fact, though, previous studies in the conservation literature have found little evidence of bias caused by the sample selection of those jurisdictions holding these referenda (Banzhaf et al. 2010, Kotchen and Powers 2006, and Nelson et al. 2007) or transportation referenda (Dixit et al. 2010). But in addition to this form of selection, we might also be concerned about the selection on the choice of finance mechanism. For example, if communities that are more likely to choose bonds for finance are also more likely to support referenda, for unobserved reasons, the above estimation strategy would be biased. Similarly, if communities where bond financing is likely to be particularly successful are the ones that choose bond financing for their referenda, our results would be inapplicable to the larger sample.

We considered both Heckman-type selection models and instrumental variables regressions to control for such selection effects, using various financial and policy variables as

additional regressors that affect the probability of holding a bond referendum but not the probability of supporting the referenda. In particular, we re-estimated the outcome equation in Model 1, controlling for selection by using as exclusion restrictions: per capita interest payments, per capita tax payments, and state-level rules on whether local governments are required to seek citizen approval for bond and/or tax financing.[10] We found no evidence of selection bias and continue to recover similar effects for bond financing. Again, these results are available upon request.[11] We conclude that the debt effect is substantial and robust, with households preferring debt to up-front taxes. This result is consistent with similar findings in Banzhaf et al. (2010), Dixit et al. (2010), and Kotchen and Powers (2006).

Is there a "Renter Effect?"

The most straightforward way to test for a renter effect is to evaluate the effect of the proportion of a community's population owning their homes on the support for a referendum. This approach is by far the most common in previous work (see e.g. Dollery and Worthington 1996 for a review). Unfortunately, this approach may confound the causal effect of owning or renting per se with unobserved differences between renters and owners in tastes, wealth, or demographics. Moreover, in our particular application to open space, there is an alternative possibility. Open-space referenda not only provide amenities in a variety of forms, but they also typically restrict the amount of land available for development, thereby restricting the local supply of land (Fischel 2001). In this way, they may result in an increase in the value of existing local residences. Thus, we may have here an offsetting "homeowner effect," applicable specifically to programs that preserve open space. Any of these unobservable factors may be

[10] These data were collected from Krane, Rigos, and Hill (2001).

[11] In other work with these data exploring the planning process of conservation organizations, we have also considered selection on the joint decision of whether to hold a referendum and, if so, which type of financing mechanisms, again finding little evidence of selection effects. See Banzhaf et al. (2010).

confounded with estimates of the renter effect expressed as a *level* of support.

Panel B of Table 5 shows the results of the standard hypothesis tests related to the renter effect. The effect is most straightforward in Models 1A and 1B. In Model 1A, we find that increasing the share of renters by 10 percentage points actually *decreases* the yes vote in the average county by about 5 percentage points. The effect is smaller in the municipality model, with an effect of one 1 percentage points on the yes vote and with a p-value of only 0.14. This is a striking finding in view of the extensive empirical literature that has found a pervasive and positive renter effect for nearly all kinds of local public expenditure programs. Our sense, as mentioned earlier, is that this result most likely reflects the predominance of a kind of "homeowner effect" for programs that preserve local open space. Such programs enhance the value of local homes by restricting the supply of local land (and perhaps also by improving local environmental quality). The strong support of homeowners for these programs thus is not surprising.

Nevertheless, because our data include a variety of finance mechanisms, we have a unique opportunity to test the renter effect in a new and cleaner way. In particular, the renter effect should manifest itself for property-tax financed programs or bond-financed programs, but *not* for programs financed by sales taxes. Renters would presumably realize that they must share the burden of financing local programs supported through sales taxes (in contrast to those using property-tax finance or bond finance where the bonds will ultimately be redeemed with revenues from property taxation). On the other hand, the homeowner effect is based in the restriction of land supply and applies equally to referenda financed with any mechanism.

Consequently, we can test for whether the effect of increasing the proportion of renters in a community is smaller for sales taxes than other finance mechanisms. With this test, any

differences between renters and owners in their general preferences for conservation—whether driven by taste differences, wealth differences, or a strategic desire to restrict land supply—cancel out in the comparison, as those differences would be constant across finance mechanisms. In this way, the renter effect can be identified by comparing differential effects across finance mechanisms, rather than merely through level effects.

The second through fourth rows of Panel B show the effect of more renters in a community, by finance mechanism. If there is a renter effect, we would expect the smallest effect for sales taxes. The final two rows of Panel B directly test this hypothesis, first comparing the effect of renters in sales tax-financed referenda relative to debt-financed referenda, then comparing the effect in sales tax referenda relative to property-tax-financed referenda. The effect is sometimes smaller and sometimes greater for sales taxes, but there is no consistent pattern and in no model can we reject the hypothesis that the effect of renters is homogeneous across finance mechanisms. These results are clearly inconsistent with the presence of a renter effect.

4. Discussion and Conclusion

As noted previously, our finding that households prefer borrowing to up-front payment for large public investments is consistent with either of two explanations. The traditional interpretation of such empirical findings is that households suffer from a form of fiscal illusion. And such an interpretation is not unreasonable. Even if purchasers of homes have a good sense of the levels of public services and property taxes, the outstanding debt of a local government is not information of a kind that is normally available to potential buyers. This could easily result in a kind of debt illusion such that local debt issues do not get (fully) capitalized into local property values (Oates 1988) and Ricardian equivalence fails to hold.

Our model offers a second possible interpretation. It demonstrates that capitalization is only a necessary, but not a sufficient, condition for Ricardian equivalence. Even if households are aware of future fiscal liabilities and even if these liabilities are fully capitalized into local property values, residents may still prefer bond to tax finance because state and local governments are able to borrow at lower rates of interest than can private individuals. State and local debt finance effectively allows residents to access the lower rates available through their governments.

Indeed, our theoretical model also predicts that, even if their present value is lower than the cost of up-front-equity financing, future public debt liabilities still would be fully capitalized into the value of the residents' property. (Note for example that in Table 1, housing values are lower in line 1 than line 2 and lower in line 3 than 4.) By the same token, Martinez-Vazquez and Sjoquist (1988) have argued that the so-called renter illusion may not be an illusion at all, if excess public spending is capitalized into lower land values. These capitalization results, however, depend critically on a strong information assumption: residents of a community (and potential residents as well) must have full knowledge of the outstanding debt of the jurisdiction.

Our theoretical and empirical results are closely connected to a large literature which has found that a variety of local amenities and fiscal attributes are capitalized into property values. For example, Chay and Greenstone (2005) and Smith and Huang (1995) find that air pollution is capitalized into housing prices. The list could be extended on and on to include the quality of schools, crime rates, and other environmental and fiscal attributes. Indeed, as William Fischel (2001) has put it, "Everything seems to be capitalized" (p. 45).

However, as we noted earlier, the capitalization of outstanding local public debt is especially challenging. Local residents are likely to have a good sense of the levels of local

services and their property tax liabilities, but knowledge of levels of outstanding local debt and the associated future tax liabilities is much more problematic. This has given rise to a small literature on the so-called "debt illusion hypothesis," the proposition that individuals are not aware of the future tax liabilities associated with existing local public debt (Oates 1988, pp. 76-7). If these future tax liabilities are not capitalized into housing values, it would suggest that our more direct evidence of households' preference for debt financing may result from such fiscal illusion. On the other hand, if debt is capitalized into housing values, as occurs in the simulations of our theoretical model in Section 2, then our findings are more likely due to governments' more favorable access to credit markets, a violation of one of the key premises of the Ricardian equivalence model.

In fact, there is an interesting (if small) empirical literature looking at the capitalization of local public debt. In one recent study, Stadelmann and Eichenberger (2010) compare property values across local jurisdictions in Switzerland. They find that areas with greater public debt have lower land values, suggesting capitalization. One challenge with such work is that it is difficult to disentangle debt with unobserved public goods that may have been purchased with such debt.

To our knowledge, four other papers have attempted to address this issue by focusing on exogenous sources of variation in debt. Palmon and Smith (1998) focus on the differences in the interest rates that prevailed at the time that otherwise very similar neighborhoods in Houston, TX invested in new water and sewer infrastructure. These liabilities are a particularly attractive form of local debt for this purpose, inasmuch as there are no corresponding benefits that accrue simply from the different interest rates. Palmon and Smith find striking evidence of the capitalization of higher tax payments.

Similarly, two papers have considered the underfunded liability (UFL) of municipal pensions. UFL of pensions generates a future tax liability with no compensating benefits; it thus gives us a clean test of the capitalization hypothesis.[12] Epple and Schipper (1981) undertook the first of these studies. Using a sample of jurisdictions in the Pittsburgh metropolitan area, they find evidence of capitalization of the unfunded liabilities. There are, however, some tricky issues involved in getting good measures of the actual level of unfunded liabilities; in particular, the actuarial assumptions can vary so that it is often difficult to determine the precise level of these pension obligations. In light of this, we should probably regard the Epple-Schipper results as indicating the presence of some, but not necessarily full, capitalization.

In a second study, Leeds (1985) has examined the capitalization of UFLs into property values in a sample of 67 cities in the Chicago SMSA. Leeds uses, as his measure of UFL, the ratio of the payments by the pension fund to the assets held in the fund, a measure that gets around some of the problems inherent in the Epple-Schipper variable. Leeds can find no evidence of any capitalization of UFLs into local property values and suggests that UFLs represent a form of "hidden taxation" that is politically motivated.[13]

In the most recent of these studies, Robert MacKay (2011) presents some intriguing evidence from an event study in San Diego. In 2004, a public announcement indicated that rising levels of unfunded pension liabilities in the San Diego City Employees' Retirement System

[12] There is also an interesting literature on the rationale for underfunding. The underfunding of public pensions can have a legitimate economic rationale or simply be the result of politically motivated actions to shift largely hidden liabilities to future periods. On this, see, for example, Mumy (1978), Inman (1982), and Leeds (1985). Whatever the reason for underfunding of pensions, as Inman showed some time ago, the extent of such underfunding in the state and local sector in the U.S. is quite large.

[13] Using an alternative approach, Robert Inman (1982) looks to public employee labor markets for evidence on the impact of UFL's. Rather than testing for capitalization into local property values, Inman examines the impact of UFLs on public-sector wages; the idea here is that without capitalization, current taxpayers can pass the costs of large labor contracts on to future taxpayers via underfunding of pension liabilities. Inman finds some evidence in support of such behavior.

were much higher than had been previously indicated. MacKay investigates housing prices in San Diego City relative to housing prices in nearby communities over the three-year period following this announcement. MacKay tentatively finds that the news of this underfunding of pensions led a differential fall in housing prices within San Diego City of 3.5 to 4.5 percent. The Mackay study is interesting, not only in terms of its finding of the capitalization of the outstanding local debt, but also because of the role of information in this outcome. It was the announcement of this unrecognized debt that appears to have initiated the capitalization, although further research may be needed to pin down the timing of this effect. This calls attention to one of the conditions for Ricardian Equivalence: full knowledge among residents (potential or existing) of the levels of outstanding debt, at least in the short-term.

At any rate, the empirical findings we present here (both our own and others) indicate a pervasive preference at the local level for debt over tax financing. In addition, based on the other papers we have summarized here, there seems to be fairly widespread evidence of the capitalization of local debt. Of the studies we have been able to find, four out of five find capitalization of outstanding debt. Only Leeds' study several decades ago found no evidence of capitalization. If capitalization is the norm, then the preference for local debt over tax finance does not have its source in debt illusion. Instead, one interpretation of these results (as suggested by our extended model) is that local residents prefer debt finance because it gives them access to lower interest rates than they can obtain privately. Indeed, because of favorable tax treatment, interest rates on municipal bonds, as we have noted, are typically several percentage points

below private market rates. Debt finance enables local residents to take advantage of these lower rates.[14]

In conclusion, we want to call attention to a further, more pragmatic argument against Ricardian equivalence that is based on fiscal institutions and general practices, at least in the United States. A fairly general principle in U.S. local finance (in some cases actually imbedded in the law) is that (1) Current expenditures are financed by current tax revenues, and (2) Capital expenditures are financed by debt issues. The basic rationale for the latter condition is that since capital projects typically involve large current expenditures which produce a lengthy stream of future services, it makes sense to spread out the payment for these services in line with the stream of benefits. This saves current residents from making a large current expenditure for which they might have to issue their own private debt. From this more pragmatic perspective, debt finance serves the purpose of smoothing out tax liabilities over time. It may well be that, for this reason, local electorates prefer bond finance to current taxation for capital projects.

[14] These findings, incidentally, do not represent an empirical rejection of the Ricardian Equivalence Theorem. One of the assumptions of the Theorem is that private individuals and government have equal access to credit markets at the same rates of interest. This assumption is clearly violated in the case of local public finance in the United States so that the failure to find Ricardian Equivalence can be traced to the absence of a key condition. This finding is thus fully consistent with rational behavior and the standard neoclassical model.

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Figure 1. Utility Maximization for Borrowers with Lower Public Interest Rates

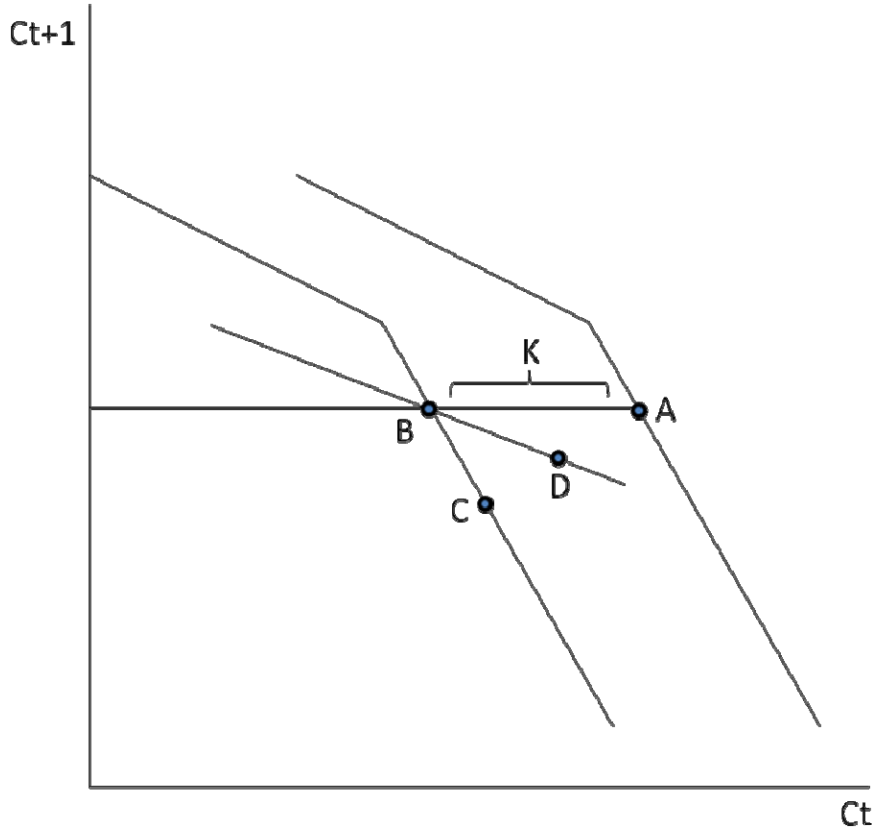

Table 1. Endogenous Open Space Purchases under different financing opportunities

Interest Rates	Public Finance Options	Realized utility	Choice of k_e	Choice of k_b	Housing Price
$r_m < r_i$	Bond or tax	15.708	0	163.398	1003.40
$r_m < r_i$	Tax only	15.584	93.435	--	1088.22
$r_m = r_i$	Bond or tax	15.931	94.667	94.667	796.91
$r_m = r_i$	Tax only	15.931	189.333	--	927.28

Table 2. Percent Voting Yes by Finance Mechanism and Jurisdiction

	Jurisdiction		
	County	**Municipal**	**Total**
Bond	65.2%	64.6%	64.8%
	N=108	N=372	N=480
Property Tax	57.1%	56.8%	56.9%
	N=84	N=600	N=684
Sales Tax	60.5%	55.6%	57.7%
	N=44	N=60	N=104
Total	60.2%	59.9%	59.9%
	N=252	N=1016	1,268

Table 3. Demographic, Land Use, Elections, and Finance Data (Mean Values)

Variable	Counties		Municipalities	
Demographic Data	Mean	Std. Dev.	Mean	Std. Dev.
Proportion Renter-occupied	0.29	0.09	0.23	0.14
Median House Value (1000s $)	151.87	64.84	215.10	108.65
Median Household Income (1000s $)	50.89	11.83	66.12	21.45
Proportion Households in Poverty	0.31	0.17	0.06	0.05
Proportion no H.S. Degree	0.15	0.06	0.17	0.06
Proportion Bachelor's Degree	0.31	0.11	0.39	0.15
Proportion population White	0.81	0.12	0.89	0.10
Proportion population >65	0.12	0.06	0.13	0.06
Proportion population <18	0.25	0.03	0.25	0.05
Land use Data				
Pct Pop Urbanizd Area	0.79	0.23	0.80	0.31
Square Miles	984.94	1571.80	33.98	57.49
Density (Pop / sq mi)	844.10	1435.86	1495.97	1671.19
Value of Farmland (1000$/acre)	4.26	6.71	8.24	12.39
Change proportion farmland 97-02	-0.14	0.47	-0.10	0.33
Proportion land in Farming	0.31	0.23	0.11	0.57
Political variables				
Proportion Vote Bush 2000	0.50	0.11	0.43	0.10
Geon-Turnbull Index	2.84	1.04	1.53	1.27
Finance variables				
Per-capita interest payments	44.84	55.45	N/A	N/A
Per-capita taxes	455.63	426.82	N/A	N/A
Tax info unavailable (0/1)	0.05	--	N/A	N/A
Int. info unavailable (0/1)	0.02	--	N/A	N/A

Table 4. Regression Results of Log-Odds of Voter Approval of Referenda

	County Models				Municipality Models		
	Model 1A	**Model 2A**	**Model 3A**	**Model 4A**	**Model 1B**	**Model 2B**	**Model 3B**
Bond	0.27627***	0.09162	-0.19587	0.06957	0.42148***	0.61281***	0.70701***
	(0.085)	(0.700)	(0.816)	(0.813)	(0.046)	(0.223)	(0.271)
Bond x Proportion Renting Home		-0.25399	-1.77773	-1.49168		0.24271	0.72552*
		(0.973)	(1.236)	(1.354)		(0.281)	(0.404)
Bond x Income			-0.02061**	-0.02361**			0.00565
			(0.009)	(0.011)			(0.004)
Bond x Proportion above 65			-0.57256	-1.62737			-0.34021
			(1.474)	(1.615)			(0.660)
Bond x Proportion with Bachelor Degree			0.97679	0.79118			-0.12748
			(0.902)	(0.878)			(0.372)
Bond x Prior Tax Referendum				0.14276			
				(0.181)			
Bond x Per Capita Interest Payments				0.004215**			
				(0.0017)			
Bond X Per Capita Taxes				-0.00061**			
				(0.000)			
Bond X Geon-Turnbull Index				0.11261			
				(0.070)			
Sales Tax	-0.12616	-0.52693	-0.39329	0.18166	0.24690**	0.19677	0.18015
	(0.115)	(0.865)	(0.870)	(0.844)	(0.110)	(0.457)	(0.458)
Sales Tax x Proportion Renting Home		-0.56501	-0.38155	0.39386		-0.12944	-0.18113
		(1.233)	(1.234)	(1.198)		(0.682)	(0.677)
Proportion Renting Home	-2.19648**	-1.92909	-1.25582	-1.65980	-0.37867	-0.48143*	-0.60643**
	(1.108)	(1.254)	(1.307)	(1.332)	(0.257)	(0.278)	(0.297)
Median House Value ($1000s)	-0.00081	-0.00081	-0.00142	-0.00247*	-0.00012	-0.00010	-0.00011
	(0.001)	(0.001)	(0.001)	(0.001)	(0.000)	(0.000)	(0.000)
Median Household Income ($1000s)	-0.00591	-0.00673	0.00591	0.01327	-0.00218	-0.00241	-0.00372
	(0.010)	(0.011)	(0.013)	(0.013)	(0.002)	(0.002)	(0.003)
Proportion in Poverty	-0.31380	-0.28110	-0.27536	-0.75141*	-38.45588	-47.90711	-39.49300
	(0.325)	(0.330)	(0.327)	(0.424)	(64.488)	(68.562)	(68.273)
Proportion No High School Degree	0.18513	0.11317	0.18110	0.29417	-0.03698	-0.08744	-0.03564
	(1.294)	(1.347)	(1.323)	(1.372)	(0.778)	(0.778)	(0.789)
Proportion Bachelor Degree	1.67036**	1.68497**	1.28109	1.51247*	0.82303**	0.80831**	0.85026**
	(0.762)	(0.780)	(0.901)	(0.887)	(0.320)	(0.321)	(0.333)

Cont'd

Table 4 Cont'd

Proportion White	-0.52903	-0.55970	-0.52996	-0.42371	-0.80245***	-0.80663***	-0.80537***
	(0.407)	(0.420)	(0.435)	(0.444)	(0.254)	(0.254)	(0.253)
Proportion Age > 65	-2.02424	-1.97846	-1.64179	-0.81554	0.08359	0.07919	0.20181
	(1.661)	(1.641)	(1.774)	(1.766)	(0.478)	(0.479)	(0.539)
Proportion Age < 18	-4.89390**	-4.69392**	-4.67607**	-4.91692**	-1.34874*	-1.33166*	-1.25153*
	(2.182)	(2.199)	(2.261)	(2.231)	(0.735)	(0.732)	(0.738)
Proportion Living in Urbanized Area	0.58750**	0.58491**	0.53359**	0.60726**	-0.01892	-0.01602	-0.02277
	(0.240)	(0.239)	(0.245)	(0.264)	(0.065)	(0.066)	(0.066)
Land Area (sq mi)	0.00004**	0.00004**	0.00004**	0.00003	0.00020	0.00019	0.00014
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Pop Density	0.00006	0.00006	0.00009	0.00005	-0.00003**	-0.00003**	-0.00003**
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Value of Farmland ($1000s)	0.00382	0.00371	0.00289	0.00063	0.00076	0.00089	0.00062
	(0.008)	(0.008)	(0.008)	(0.009)	(0.001)	(0.001)	(0.001)
Δ Proportion farmland	0.17004**	0.17098**	0.19103***	0.18950***	0.02467	0.02962	0.01240
	(0.071)	(0.071)	(0.071)	(0.068)	(0.062)	(0.063)	(0.064)
Proportion area farmland	0.10373	0.09730	0.10103	0.17046	-0.01737	-0.01739	-0.01913
	(0.200)	(0.202)	(0.206)	(0.209)	(0.020)	(0.020)	(0.020)
Proportion Voting Bush in 2000	0.20050	0.21459	0.15140	0.01083	0.47067**	0.48148**	0.49490**
	(0.423)	(0.421)	(0.430)	(0.479)	(0.231)	(0.230)	(0.232)
Geon-Turnbull Index of Home Rule	0.05989*	0.06003*	0.06389*	0.02386	-0.00990	-0.00949	-0.00401
	(0.035)	(0.036)	(0.036)	(0.060)	(0.022)	(0.022)	(0.023)
Prior Referendum	0.00610	0.00771	0.03329	0.00030	0.06891*	0.06885*	0.07331**
	(0.059)	(0.059)	(0.061)	(0.064)	(0.036)	(0.036)	(0.036)
Prior tax referendum	0.22022**	0.21693**	0.16638	0.16888	0.09017	0.09092	0.08927
	(0.099)	(0.100)	(0.102)	(0.107)	(0.071)	(0.071)	(0.071)
Per capita Interest Payments				-0.00108			
				(0.001)			
Per capita Tax Payments				0.00054**			
				(0.000)			
Dummy for per capita interest missing				0.02371			
				(0.208)			
Dummy for per capita taxes missing				0.74333*			
				(0.383)			
N	242	242	242	242	1,000	1,000	1,000
R^2	0.41	0.41	0.43	0.48	0.25	0.25	0.25

Standard Errors in parentheses. ***Significant at 1% Level; ** 5% level, *10% level.
Quadratic function of latitude and longitude and year-specific dummy variables included, but omitted from table.

Table 5. Hypothesis Tests

Hypothesis	Parameter	Model 1A	Model 2A	Model 3A	Model 4A	Model 1B	Model 2B	Model 3B
Panel A. Preference for bonds								
Are bonds preferred to property taxes? $\beta_B+\bar{\boldsymbol{D}}'\boldsymbol{\eta_B}+\bar{\boldsymbol{F}}'\boldsymbol{\theta_B}$	Coefficient SE pct points at mean	0.276*** 0.085 6.69	0.271*** 0.084 6.57	0.242*** 0.086 5.86	0.2216** 0.089 5.36	0.421*** 0.046 9.77	0.426*** 0.046 9.89	0.430*** 0.046 9.97
Are bonds preferred to sales taxes? $\beta_B - \beta_{ST} + \bar{\boldsymbol{D}}'(\boldsymbol{\eta_B}-\boldsymbol{\eta_{ST}}) + \bar{\boldsymbol{F}}'\boldsymbol{\theta_B}$	Coefficient SE pct points at mean	0.402*** 0.090 9.82	0.399*** 0.090 9.75	0.366*** 0.092 8.93	0.318*** 0.096 7.75	0.175* 0.104 3.91	0.130 0.140 2.89	0.110 0.141 2.45
Panel B. Are communities with more renters more likely to support referenda?								
—in general $\delta_{pctrent}$	Coefficient SE pct points at mean	-2.196** 1.108 -5.35	N/A	N/A	N/A	-0.379† 0.257 -0.92	N/A	N/A
—with sales taxes $\delta_{pctrent}+\eta_{pctrent}$	Coefficient SE pct points at mean	N/A	-2.494* 1.387 -6.06	-1.637 1.455 -3.995	-1.266 1.404 -3.09	N/A	-0.611 0.720 -1.48	-0.788 0.738 -1.91
—with bonds $\delta_{pctrent}+\eta_{pctrent}$	Coefficient SE pct points at mean	N/A	-2.183* 1.142 -5.32	-3.034** 1.216 -7.306	-3.151** 1.260 -7.55	N/A	-0.239 0.310 -0.58	0.119 0.363 0.29
—with property taxes $\delta_{pctrent}$	Coefficient SE pct points at mean	N/A	-1.929† 1.254 -4.71	-1.256 1.307 -3.074	-1.660 1.332 -4.04	N/A	-0.481* 0.278 -1.17	-0.606** 0.297 -1.47
—Effect for sales taxes minus effect for bonds	Coefficient SE pct points at mean	N/A	-0.311 0.972 -0.74	1.396 1.257 3.31	1.886 1.441 4.46	N/A	-0.372 0.667 -0.90	-0.907 0.759 -2.20
—Effect for sales taxes minus effect for property taxes	Coefficient SE pct points at mean	N/A	-0.565 1.233 -1.35	-0.382 1.234 -0.92	0.394 1.198 0.95	N/A	-0.129 0.682 -0.31	-0.181 0.677 -0.44

Each cell shows first, the coefficient from the hypothesis test, second the robust standard error of the test, and third the predicted effect on the support for the referenda, in percentage points, from switching the finance mechanism (Panel A) or from increasing the share of renters by 10 percentage points (Panel B).

***Significant at 1%; **Significant at 5%; *Significant at 10%; †Significant at 15%.