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WHY DO TAX AND EXPENDITURE LIMITATIONS PASS IN STATE ELECTIONS?

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ABSTRACT

What factors affect the likelihood of tax and expenditure limitation (TEL) passage in state elections? Unlike much previous work, we use information on the *actual conditions* in *all states* over the extended period *1975 to 1990* to estimate the probability of limitation passage as a function of economic, fiscal, demographic, and political factors in the state, as well as the features of the TEL. Our estimation procedures use maximum likelihood techniques; a special feature of the estimation is correction for the sample selection bias that may occur with standard probit estimation because a threshold set of conditions must exist before any limitation is even placed on a statewide ballot and a voting outcome is actually observed. Our results show that economic conditions in the state have a major effect on passage, with states that have high and increasing levels of income being more likely to pass a TEL. In contrast to studies based on survey data, our results also suggest that the passage of limitations is not generally affected by the level and growth in taxes; if anything, TEL passage tends to be correlated with lower levels and/or growth of state tax burdens, perhaps because voter preferences for reduced taxation may act as a threat, thereby slowing growth in tax revenues immediately prior to TEL imposition. Although specific features of a limitation do not significantly affect passage probabilities, a state that has already imposed a limitation is less likely to do so again. The political features of the state and the state's demographic characteristics have little impact on the TEL outcomes.

I. INTRODUCTION

Tax revolts have been a part of politics for hundreds of years, especially in the United States. One impetus for the American colonies to declare independence from Great Britain was the perception of unfair taxation, with slogans like "No Taxation Without Representation" indicative of the colonists' feelings that they faced unreasonable taxes. Throughout the subsequent history of the United States, citizens have made attempts to reduce the powers wielded by government officials. One such attempt was the progressive movement reforms of the early 1900s, which led to the passage of most state initiative and referendum measures; twenty-six states now have some form of an initiative and/or a referendum process.[1] However, it has not been until recently that these processes have been widely used in an attempt to limit state and local governments' powers to tax and spend. Since the early 1970s more than sixty tax and expenditure limitation (TEL) measures have been voted upon in statewide elections in the United States, and more than 40 percent of these measures have passed. Table 1 lists all TELs on a statewide ballot from 1975 to 1990, and Table 2 contains more detailed information on each TEL.

These limitations have received much attention in the last twenty years, and this research has generated numerous valuable insights. Most research has focused on the subsequent effects of the limitations on state and local government tax and spending levels (Ladd 1978; Joyce and Mullins 1991; Preston and Ichniowski 1991; Joyce and Mullins 1995; Rueben 1996; Skidmore 1997). Some other work has examined whether TELs have had a positive or negative impact on the operation of governments (Ladd 1978; Brennan and Buchanan 1980). Of most relevance to this paper, there are numerous studies that have investigated why voters support tax limitations, using survey data on individual attitudes toward government in a particular state in a particular year (Levy 1975; Mariotti

1978; Courant, Gramlich, and Rubinfeld 1980; Gramlich, Rubinfeld, and Swift 1981; Ladd and Wilson 1982, 1983; Gramlich and Rubinfeld 1982; Stein, Hamm, and Freeman 1983).[2]

Surprisingly, however, no research has examined for all states over an extended period of time the actual statewide conditions that affect TEL passage.[3] This omission is particularly striking. Understanding the factors that increase the likelihood of TEL success, especially those like tax burdens and government spending that are under some government control, provides important information to policy makers on the conditions that encourage or discourage voter support of TELs. Do voters support a limitation largely to force a reduction in the amount of taxes they pay or in the expenditures they receive? Do they support a limitation to force reductions in specific government expenditure programs that they find objectionable or in specific tax instruments that they perceive unfair? Do economic and political conditions in the state foster support for or opposition to limitations? Are specific groups likely to vote for or against a TEL? What features of a TEL elicit support or opposition? Under what conditions is a TEL even placed on a statewide ballot? Answers to these and related questions are of critical importance to those who wish both to understand the recent tax revolts and to apply their lessons elsewhere. Although survey data on individual attitudes toward TELs from a single state at a single point in time has been usefully applied to many of these questions, it is also useful to examine TEL passage using data based on the *actual conditions* (rather than on individual attitudes toward government) in *all states* (rather than in a single state) over an *extended period* of time (rather than at a single point in time). However, this analysis has not been performed.

In this paper we examine why tax and expenditure limitations pass in statewide elections. We use information on the actual conditions in all states over the extended period 1975 to 1990 (a period

that covers the bulk of recent TEL activity in the United States) to estimate the probability of limitation passage of all statewide limitation elections over this period.[4] This probability is assumed to depend on the observed economic, fiscal, demographic, and political conditions in the state over the entire period of time, as well as the specific features of the TEL. Our estimation uses maximum likelihood techniques; a special feature of the estimation is correction for the sample selection bias that may occur with standard probit estimation because a threshold set of conditions must exist in the state before any limitation is even placed on a statewide ballot and a voting outcome is actually observed. This econometric approach provides new information on the factors that encourage inclusion of a TEL measure on a statewide ballot, and, importantly it also provides unbiased estimates of the factors that encourage TEL passage.

We test several hypotheses on why TELs are placed on ballots and why they subsequently pass. One hypothesis focuses upon the impact of economic conditions, measured by the level and the growth in state income. We also examine the role of taxation on TEL passage. A popular notion is that tax limitations arise because of high and/or increasing tax burdens; this notion has received some support from surveys of citizens, but it is largely untested with nonsurvey data.[5] Various measures of actual tax burdens for the combined state and local government sector are used, including the level of total per capita tax revenues, the share of tax revenues in personal income, and the percentage change in total tax revenues over a one-, three-, or five-year period; similar measures for the separate components of state and local revenues are also examined (e.g., property tax revenues, sales tax revenues, income tax revenues, and intergovernmental transfers from federal government). Other important considerations that we examine include the impact of TEL features (e.g., limitations on property taxes or on overall revenues), state government expenditures (e.g., the magnitude and the

composition of state spending), the political structure of the state (e.g., single-party versus two-party control), and demographic conditions (e.g., the age composition of the state).

Our results suggest that economic conditions within the state are the most important determinant of TEL passage: states with a high or an increasing income level are more likely to impose a TEL. Surprisingly, and in contrast to studies using survey data, our estimation results also suggest that a high or an increasing state tax burden is negatively correlated to TEL success in a statewide election. For example, a lower share of total tax revenues in income and a lower growth rate of total tax revenues are related to a lower probability of TEL passage; similarly, heavier reliance on property taxation and greater property tax growth reduce this probability. However, as expected, a greater share of federal transfers and a faster growth in transfers reduce the probability of TEL success. There is little evidence that specific features of the limitation significantly affect passage, but a state is less likely to impose a TEL if it has already imposed one. With the important exception of welfare expenditures, the pattern of state and local government expenditure does not seem to affect the outcome. Finally, state demographic characteristics are generally insignificant determinants of TEL passage. In short, our empirical results suggest that the passage of a tax and expenditure limitation is largely a response to the economic conditions within the state.

The next section outlines our theoretical framework. The empirical specification is presented in section III. Results are presented in section IV, and the final section summarizes our main conclusions.

II. THE MEDIAN VOTER AND VOTING ON TAX AND EXPENDITURE LIMITATIONS

Tax and expenditure limitations represent the outcome of a political process, as voted upon

in a political marketplace. As suggested by Borcherding and Deacon (1972) and Bergstrom and Goodman (1973), this process can be modeled via the standard "median voter model" of the demand of public expenditures. Under certain somewhat restrictive conditions, the median voter model indicates that a community's demand for public goods and services is the median of individual demands, or that preferred by the median voter. Consider the application of this model to voting on TELs.

Assume that each voter has a utility function defined over private goods and public output. The voter maximizes utility subject to a budget constraint that depends upon his or her income, the prices of private goods, and the tax price of the public output; this maximization generates a demand for the public output, which depends upon income, prices, and the tax price, as well as the underlying preferences of the individual. Self-interested politicians than choose public output, and, under some conditions, this outcome reflects the preferences of the median voter.[6]

Now under what circumstances will the median voter support a TEL? As suggested by Gramlich, Rubinfeld, and Swift (1981), the median voter's position on a proposed TEL depends on his or her net fiscal residual, or the difference (in utility) between the benefits from public output and the costs of taxes. This residual depends the underlying preferences of the median voter. The residual is also a function of the burden of taxation and the pattern of public services provided by the states, as well as upon the income of the individual and the way in which taxes and expenditures are related to income. If the median voter believes that the imposition of a TEL will lead to an increase in the net fiscal residual, then the voter will support the limitation, and the measure will pass in a statewide election; if the voter believes that the TEL will lead to a decrease in the residual, then the measure will fail. The outcome therefore depends primarily on those elements that reflect both the

impact of taxation and of public expenditures on the net fiscal residual of the median voter.

Note, however, that there are two stages in TEL passage: the measure must first be placed on a statewide ballot, and then a simple majority of votes must be cast in its favor. The median voter's support is not necessarily required for the first stage, in which a TEL proposal is included on the ballot. In fact, those individuals in the tail of the voter distribution (i.e., those who are most dissatisfied with the current state of affairs) are more likely to push for inclusion of a TEL measure on a statewide ballot. However, once the issue is placed on the ballot, the preferences of the median voter determine the outcome. Consequently, circumstances that lead to the inclusion of a TEL measure on a statewide ballot are not necessarily the same as those that lead to the ultimate success of a TEL in a statewide election. Since we focus primarily on the factors that lead to the success or failure of a TEL in a statewide election, we consider mainly the circumstances that lead to the median voter's support for a TEL should it be included a statewide ballot.

Aside from those considerations that reflect the preferences of the median voter (e.g., demographic variables), a first factor is income and the way in which income affects the total amount of taxes paid and the total amount of public services received by the median voter. There is much evidence that the average burden of state and local taxes tends to fall with income, while public services tend to be distributed in greater amounts to poorer individuals (Pechman 1985; Reynolds and Smolensky 1977); that is, higher-income individuals tend to receive less from government than they pay in taxes.[7] This suggests that TEL passage is more likely the higher is per capita state income and/or the greater is the recent (positive) percentage change in state personal income.

As for the impact of taxation itself, a high and increasing total tax burden seems likely to increase support for TELs, ceteris paribus, because higher taxes reduce the net fiscal residual of the

median voter. However, as discussed above, taxes and expenditures are necessarily linked, and high (and increasing) taxes may instead reflect an expressed desire for high (and increasing) public services; the demand for public services may also stem from altruistic motivations, not simply self-interested ones.[8] In such a setting, it could well happen that TEL passage becomes less likely with a greater observed burden of taxation.

Of course, the burden of state and local taxes can be lessened by transfers from the federal government. Intergovernmental transfers provide relief for state and local governments and help them to provide more services at little (or reduced) cost to the median voter and other taxpayers. Note, however, that matching funds are often required in order for states to receive funds from the federal government, and these matching funds may require state and local governments to generate higher level of own source revenues.

Of perhaps greater importance than the overall burden of taxation, support for TELs may stem from a desire to alter the tax structure because different tax mixes have different distributional effects. For instance, property owners may be more likely to support a TEL if the burden of property taxes is seen as high or has recently increased. In contrast, apartment dwellers seem less likely to support a property tax limitation because they may believe that they do not bear the burden of property taxes and so may see TEL passage as leading to an increase in other taxes that impose a more direct and obvious burden on them.[9] Unlike property taxes, sales taxes are indirect taxes and may be less visible to individuals, so that a state that relies more heavily on such "hidden" taxes may face less tax resistance from the median voter.

The size and growth of the public sector will also affect support for TELs. Limitations are often perceived as an attempt to limit government. If government is seen as excessively large and

inefficient, then Brennan and Buchanan (1980) argue that the only truly effective constraints on government in the long run are contained in constitutional rules limiting government's power to tax and issue debt. It follows that citizens must then seek to impose fiscal constraints on government, and the initiative process provides a means for citizens to impose constitutional limitations on the size and/or the growth of government. As with taxes, however, a large and growing government sector may reflect the expressed demand for greater public services, in which case there may be no connection between various measure of public sector size and the support for a TEL.

Aside from the effects of TELs on the overall government presence, limitations are also sometimes seen as a vehicle for forcing reductions in unwanted or wasteful expenditures. The primary expenditures of state and local government are education, social services and income maintenance, transportation, public safety, environment and housing, government administration, interest on debt, insurance trust, and other items. The median voter seems likely to benefit from expenditures on education, police protection, fire protection, and highways because these services are provided directly to the voter. However, the median voter may be dissatisfied with redistributional expenditures. Expenditures on public welfare directly benefit only lower-income voters, while the median voter is apt to be employed and insured.[10] Consequently, TEL passage seems more likely the greater are government programs that are seen to be targeted to the poor, such as welfare or heath care expenditures. However, this result may well depend on the economic climate. During a recession, it is more likely that an individual will rely on government transfers and so is less likely to support a TEL to limit or reduce these benefits.

Given the nature of the political marketplace, TEL passage will also depend upon the political characteristics of the state. Political leadership in the state may affect the outcome of a TEL measure,

although the effects are somewhat unclear. For example, the Republican Party is generally perceived to be more conservative in fiscal affairs and more suspicious of government activities than the Democratic Party. Therefore, if the governorship, house, and senate are controlled by the Republicans, there may be less need to impose a TEL. However, the TEL is also more likely to enjoy the support of the political establishment under these circumstances. Conversely, if the governorship, house, and senate are controlled by the Democrats, then the perceived necessity for a TEL may be greater, but the political establishment is more likely to be hostile to its passage. The effects on party control on passage are therefore unclear.[11]

Finally, the median voter's support for a limitation will depend upon the exact nature of the TEL. As indicated in the Table 2, TELs have taken numerous forms. Is voter approval necessary for a tax increase? Does the limitation impose an overall revenue or expenditure limit? Does the limitation apply to all taxes (expenditure programs) or to specific taxes (expenditure programs) like the property tax (welfare)? Does the previous enactment of a TEL affect the perceived need by the median voter for still another limitation? These considerations will clearly affect the voting outcome.

III. EMPIRICAL SPECIFICATION

A. Data

We collect detailed information on all TELs for each year from 1975 to 1990 from *The State Tax Review* and *State Government News*. As shown in Tables 1 and 2, there were 62 TELs on statewide ballots during this period, and 26 of these measures passed.[12] Passage of these TELs is related to various economic, fiscal, political, demographic factors, and TEL features, as suggested in section II and as discussed in detail later. Information on these variables is collected for 25 states

that have an initiative and/or referendum process for this entire period,[13] and this information is summarized in Table 3.[14]

B. Estimation Method

There are several methods for estimating the impact of the various factors on the probability of TEL passage. The simplest approach is to estimate a standard probit equation, in which the probability of TEL passage is assumed to depend on the economic, demographic, political, and fiscal characteristics of the state.

However, it is easily seen that this simple probit approach will generate inconsistent estimates. Of the 480 state-years (or 30 states times 16 years) for which it is possible to observe statewide balloting on a TEL, only 62 TEL passage outcomes are actually observed. This latter sample is clearly nonrandom, truncated from below. If attention is limited to the 62 outcomes, a simple probit analysis of TEL passage will not yield consistent estimates. Put differently, in order for TEL passage in a statewide election, two sequential conditions must be met. First, the measure must be placed on a ballot (the "Ballot" issue). Second, the measure must receive the support of a majority of voters (the "Passage" issue). Consequently, a set of threshold conditions must first exist in a given state in a given year to place the TEL on the ballot; then a second set of conditions must exist for the TEL to pass. There are as a result two dependent variables in two separate but related equations: a dummy variable for whether or not a TEL is even included on a ballot in a given state and year, and a dummy variable for whether the TEL that is included on the ballot is then successful or not in that state and year. Estimation procedures must recognize that the Passage equation depends logically on the outcome of the prior, Ballot equation, and consistent estimation requires correction for any

potential sample selection bias.[15]

Several approaches are possible for dealing with sample selection bias. The Ballot equation can be estimated via probit analysis, and then the Passage equation can be estimated also via probit analysis, with the inverse Mill's ratio generated from the Ballot equation included as an additional explanatory variable. As discussed in Maddala (1983), this approach yields consistent but inefficient estimates. Another approach is to estimate the Ballot and the Passage equations simultaneously with maximum likelihood estimation (MLE) procedures. Unlike the other estimation methods, the MLE approach yields the correct asymptotic standard errors for the estimated coefficients, and this approach gives consistent and efficient parameter estimates.

In fact, we employ and contrast all three estimation procedures: simple probit estimation of the Passage equation with no correction for sample selection bias, probit estimation of the Ballot and Passage equations with correction for selection bias via the inverse Mill's ratio, and simultaneous maximum likelihood estimation of the two equations. Our discussion emphasizes the MLE procedure.

The maximum likelihood framework can be formalized. Let the propensity of a limitation being placed on a ballot in state i in year t be defined by the discrete variable B_{it} (the "Ballot" issue), equal to one when a TEL is on the ballot and zero when the measure is not on the ballot. This variable is assumed to be determined for each state i in each year t by a set of observable variables Z_{it} and a random component u_{it}. More precisely, B_{it} is defined as

$$(1) \qquad B_{it} = \begin{cases} 1 \text{ if } Z_{it}\tau + u_{it} \geq 0 \\ 0 \text{ if } Z_{it}\tau + u_{it} < 0, \end{cases}$$

where τ is a vector of coefficients.

Once the TEL is on the ballot, the measure may pass or fail (the "Passage" issue). This outcome is defined by the discrete variable P_{it}

$$(2) \qquad P_{it} = \begin{cases} 1 \text{ if } B_{it} = 1 \text{ and if } X_{it}\beta + e_{it} \geq 0 \\ 0 \text{ if } B_{it} = 1 \text{ and if } X_{it}\beta + e_{it} < 0, \end{cases}$$

where X_{it} is another set of independent variables that may contain or be contained in Z_{it}, e_{it} is a random component, and β is a vector of coefficients. When $P_{it}=1$, the TEL passes in the statewide ballot, and $P_{it}=0$ when the TEL fails. It is assumed that the expected value of e_{it}, or $E(e_{it})$, equals zero for the whole population but not for the observed sample. For the observed sample, the expectation is given by

$$(3) \qquad E(P_{it}/X_{it}, Z_{it}, \text{ and } B_{it}=1) = X_{it}\beta + E(e_{it}/X_{it}, Z_{it}, \text{ and } B_{it}=1)$$
$$= X_{it}\beta + b_{eu}E(u_{it}/Z_{it} \text{ and } B_{it}=1),$$

where u_{it} and e_{it} are assumed to have a bivariate normal distribution with means of zero, variances of σ_u^2 and σ_e^2, and correlation of ρ_{ue}, and where $b_{ue} = cov(u,e) = \rho_{ue}\sigma_e/\sigma_u$.[16] As long as there is a correlation between the random terms u_{it} and e_{it}, then ρ_{ue} is not equal to 0 and $E(u_{it}/B_{it}=1)$ is not equal to 0.

The likelihood function for this model is

$$(4) \qquad L(\tau,\beta,\rho_{ue}) = \prod_{i=1}^{n}\left[\int_{-\infty}^{-Z\tau}\phi_1(u_{it})du\right]^{N_1}\left[\int_{-Z\tau}^{\infty}\int_{-\infty}^{-X\beta}\phi_2(e_{it},u_{it})dude\right]^{N_2}\left[\int_{-Z\tau}^{\infty}\int_{-X\beta}^{\infty}\phi_2(e_{it},u_{it})dude\right]^{N_3},$$

where N_1 includes all the state-years for which a TEL measure is not on a ballot, N_2 includes all state-years for which a TEL is on the ballot and fails, N_3 includes all state-years for which a TEL is on a ballot and passes, ϕ_1 is the standard univariate normal density function, and ϕ_2 represents the bivariate normal density function.[17] It is this likelihood function that is maximized by the choice of τ, β, and ρ_{ue}.

C. Specification

As suggested by the earlier discussions, we include variables that measure the economic, fiscal, demographic, and political conditions in the state over the entire period of time, as well as variables that reflect the specific features of the TEL.

Economic conditions are represented by state personal income. We include two measures of income in different specifications: real per capita income, and the growth in income over the previous one-, three-, or five-year period.

Fiscal conditions are represented by different measures of taxes and expenditures. We use various measures of the total tax burden: per capita total tax revenues, the share of total tax revenues in state personal income, and the percentage change in total tax revenues over a one-, three-, and five-year period. Similar measures for property, sales, and individual income taxes are also used in some specifications; using several measures of the tax burden also provides information on the impact of revenue structure on TEL passage. Because total tax revenues are closely tied to overall government

spending, these variables also test whether TELs are an attempt to limit the size and growth of government.

On the expenditure side, we include different measures of the composition of state spending. Transfer payments are measured by per capita welfare expenditures, per capita health care and hospital expenditures, the shares of these expenditures in total direct general revenues, and the percentage changes in these expenditures over a one-, three-, or five-year period.

Several variables describing the nature of TELs are tested. Included here are several dummy variables: a variable that is equal to one if the limitation requires voter approval for a tax increase and zero otherwise; a variable that is equal to one if the limitation is an overall revenue or expenditure limit and zero otherwise; a variable equal to one if the limitation applies in any way to property taxes and zero otherwise; and a variable equal to one the state has already passed a TEL measure and zero otherwise. We also examine numerous other TEL features in other unreported specifications, and we find that these features do not affect the success of TELs.[18]

Political characteristics include dummy variables for control of state institutions by Republicans or Democrats. Demographic characteristics include such variables as state population, population per square mile, and the proportion of the population over age 65. A more heavily and densely populated state is able to take advantage of economies of scale in government provision, thereby reducing per capita tax burden. However, the scope of problems faced by such states tends to be larger, increasing per capita tax burden. The two effects offset each other, and population and population density are predicted to be of ambiguous sign in TEL passage. Older citizens are typically retired and have a higher than average, fixed income level; they are also less likely to receive benefits from government in the way of education and other expenditures, and they are more likely to be fiscal

conservatives. TEL passage therefore seems more likely the larger is the proportion of the population that is over the age of 65.

We include the main economic and fiscal variables in several different basic specifications. Several models use the variables in real per capita terms (the *Per Capita Models*). Others test these variables in share terms (the *Share Models*). We also include the variables as measured in one-, three-, or five-year growth rates (the *Growth Models*). These and other results are presented in the next section.

IV. ESTIMATION RESULTS

Maximum likelihood estimates of the Ballot and Passage equations are reported in Tables 4 and 5, respectively. These specifications include a limited number of independent variables because of the small sample size in the second stage of the estimation procedure. In both tables, models 1 and 2 test the Per Capita Models, 3 and 4 test the Share Models, and 5 and 6 test the Growth Models, growth is measured over the previous five years; note that *B* denotes the Ballot models in Table 4, while *P* denotes the Passage models in Table 5.

Before considering the Ballot and Passage results, it is important to note that correction for sample selection bias has a significant impact on the estimation results. Table 6 presents the Passage equation estimation results using Model 5 for the three different estimation methods: the simple probit approach with no control for sample selection bias, the probit approach with the inverse Mill's ratio from the Ballot equation, and the MLE results for the same specification from Table 5. There are significant differences between the maximum likelihood estimates and the simple probit estimates; further, the percentage of correct passage predictions is roughly 80 percent in the various MLE

specifications, while the simple probit estimates with no control for sample selection bias have significantly less predictive power. As further evidence on the role of selection bias, recall that the probit equation with the inverse Mill's ratio corrects for selection bias. The results from this approach are similar to the MLE estimates, both in their coefficient estimates and in their predictive ability.[19]

On a related point, it is also important to note that estimates of ρ_{ue} (denoted RHO) in Table 5 are negative (though not significant) in all the models, so that the error term in the Ballot equation is negatively correlated with the error term in the Passage equation. It might be thought that RHO should be low because the Ballot equation sample essentially includes only the voters in the tail of the voter distribution who actively work to get the TEL on the ballot, while the entire distribution of voters is included when the TEL is voted upon in a statewide election in the Passage equation sample. A negative RHO indicates that the unobservable factors in the Ballot equation are negatively correlated with the unobservable factors in the Passage equation. Put differently, the unobservable factors that determine whether legislators or citizen organizations will place a TEL on the ballot are not necessarily the same as the unobservable factors that determine whether or not citizens will vote for the TEL in a statewide election.

A. Ballot Equation Estimates

Consider first the estimates of the Ballot equation in Table 4. Higher per capita income and income growth are significant, indicating that economic growth leads to a higher probability of a TEL being placed on a statewide ballot. However, the government fiscal variables, measuring tax burden and expenditure structure, are generally insignificant. We present in Table 4 results for total tax revenues, property tax revenues, welfare expenditures, and federal transfers. These variables are

generally not significant factors in the Ballot issue, with the exception that increases in welfare expenditures reduce the probability of a TEL being included on a statewide ballot. In other unreported specifications, we find that sales taxes, income taxes, and health care expenditures are also not statistically significant determinants of the Ballot equation. Table 4 indicates that population and political characteristics are insignificant. However, if a TEL has already been imposed, it is less likely that another TEL will be included on a statewide ballot.

In summary, the primary factors in the Ballot issue are high per capita income and growth in state income, while fiscal, political, and demographic influences are minimal. These findings foreshadow the main results in the TEL Passage estimates.

B. Passage Equation Estimates

As shown in Table 5, the major determinant of TEL passage is the level and growth in income in the state. The passage of limitations is clearly sensitive to state economic circumstances, as indicated by the positive and significant coefficients on per capita income and income growth in models 1P, 5P, and 6P; even when insignificant (models 2P, 3P, and 4P), the coefficient on the income variable is positive. Voters with high and increasing incomes may believe that they pay more taxes and receive fewer benefits from state government, and therefore become more likely to support TELs. Importantly, this result suggests that a side effect of economic prosperity is an increased resistance to paying taxes by the median voter, perhaps because more prosperous states tend to have higher property values and so higher tax payments for the median voter. Consider California as an example. California experienced a period of economic prosperity in the 1970s. Property values increased dramatically, as did local government revenues from property taxes. Local governments

in California could have reduced the effective property tax rate and still have maintained positive revenue growth. Rather, local governments maintained tax rates, and government revenues continued to grow at a rate some citizens judged excessive. Voters in California then passed Proposition 13 in 1978, the first major tax limitation measure to be successful in a statewide election.[20]

The maximum likelihood estimates in Table 5 yield little support for the role of greater tax burdens in TEL passage. The level and growth in taxes are not generally significant determinants of TEL passage. In fact, after controlling for income growth, the coefficient on the growth in tax revenues is actually negative and significant in one specification (5P), which suggests that TEL passage is more likely when tax revenue growth over the previous five years is relatively slow. Similarly, a greater share of property tax revenue in total general revenue (4P) is associated with a lower likelihood of TEL passage. These estimates contrast with studies using survey data, most of which indicate that a primary reason voters support TELs is because tax burdens are perceived as high and increasing. However, although voters may perceive that their state tax burden is excessive, actual data indicate that voters have imposed TELs in states during periods when state tax revenues have been low and growing slowly relative to other states. As further support for this result, calculations from our data show that total tax revenue growth in years in which there is no TEL on the ballot is about 15 percent, while revenue growth is only 11 percent for years in which a limitation is placed on the ballot; similarly, property tax growth is 7 percent in non-ballot years and only 5 percent in ballot years. These numbers suggest that, when the lagged annual rate of growth of taxes is used as an explanatory variable, the usual survey result is found. Remember also that, unlike previous studies, our work uses *actual* data, not *survey* data based on taxpayer perceptions. Sales and income tax revenues are similarly tested in other unreported estimations, and yield similar results.

One possible explanation for this result is that it is often the case that citizen organizations begin lobbying for new restrictions on government spending or taxes several years prior to the imposition of a TEL. It may be that the threat of TEL imposition and citizen activity in support of reduced taxation leads politicians to curtail revenue growth before the TEL is actually imposed. Perhaps strong voter discontent first serves to limit revenue and expenditure growth and then ultimately leads to the imposition of TELs. This notion suggests that studies on the effects of TELs on revenue or expenditure growth are biased if they do not control for these "threat" effects or if they do not use an estimation procedure that corrects for this potential bias.

Increases in intergovernmental transfers reduce the probability of TEL success (models 5P and 6P). The negative coefficient on transfers demonstrates that federal aid helps fund services and provides taxpayer relief. However, the coefficients on per capita intergovernmental transfers in the Per Capita Models (1P and 2P) and on the share of transfers in total general revenue in the Share Models (3P and 4P), while negative, are insignificant.

The composition of expenditures appears to play some role in TEL passage. Higher per capita welfare expenditures and a greater share of welfare spending in total general expenditures have a negative impact on TEL passage. Welfare expenditures may be an indication of state economic conditions, with higher welfare spending suggesting poorer economic health; consequently, the negative coefficient on welfare spending is consistent with the earlier finding that higher income increases the likelihood of TEL passage. Greater welfare expenditures may also be an indication of greater median voter demand for state redistributional efforts. In contrast, faster welfare spending growth increases the likelihood of TEL success. Taken together, the results on levels and shares versus growth suggest that the median voter is not resistant to welfare spending per se, but is

opposed to excessive growth in welfare spending. In unreported specifications, the levels, shares, and growth in health care and hospital expenditures are found to have no significant impact on TEL passage.

Demographic, political, and TEL description variables are also included in several specifications. With the exception of the negative and significant coefficient on population density in models 5P and 6P, the demographic variables (e.g., the percentage of the population over the age of 65, the state population) are not significant in any specifications. Coefficients on party control dummy variables are also generally insignificant, and are not included in the specifications presented.

The numerous TEL description variables do not play an important role in TEL passage. There is no general type of TEL that has a clear advantage or disadvantage in a statewide election, such as a TEL provision that requires voter approval for future tax increases beyond some specified limit is required; other TEL descriptors are included in some specifications, but they are not reported because they provide little additional information.[21] However, a state that has already successfully imposed a limitation is less likely to pass another one. Voters may perceive the new proposal as redundant or the current TEL as unsatisfactory.[22]

Consistent with these results, the Growth Models in Table 5 (5P and 6P) are clearly superior to the Per Capita Models (1P and 2P) and the Share Models (3P and 4P), as measured by the value of the log-likelihood. This result suggests that growth in economic and fiscal variables is the most important determinant of TEL passage. As previously noted, the Growth Models use the percent growth over a five-year period. We chose this longer period because we believe that the decision to impose a TEL develops over a course of several years. For example, a subgroup of voters may become increasingly discontented with government policies and form a citizen organization, but the

formation of such a group typically takes some time. Further, even once a citizen organization is established, it again takes time to decide upon and develop a TEL proposal. Finally, it may take several attempts before a TEL is actually included on a statewide ballot. We therefore believe that the outcome of this process depends on economic and fiscal activity over a period of time as opposed to an immediate response to, say, a one-time tax increase in the year prior to TEL election. Nevertheless, we present one-year, three-year, and five-year Growth Model estimates of the Passage equation in Table 7. The basic findings from these different time horizons are generally consistent.

The nonlinear nature of the maximum likelihood function makes the calculation of marginal changes of the unconditional probability of TEL success in response to changes in the independent variables somewhat difficult, and the coefficients in Table 5 do not directly represent these marginal effects. Calculating the change in the unconditional probability of TEL success in response to a change in a variable (and the corresponding elasticity of the probability) requires several steps. First, the initial level of the unconditional probability (UP_{it}) is calculated by substituting values for β, τ, ρ_{ue}, and the mean values of the independent variables in the estimated Ballot and Passage equations. Second, the new level of the unconditional probability that emerges with a change in the relevant independent variable is calculated, using a one standard deviation increase in the initial value of the relevant variable. For example, if one is interested in the impact of income growth, then the new UP_{it} is found by substituting the new value of income growth. Third, the difference between the initial probability and its new level is a measure of the marginal probability; the elasticity of the probability can then easily be calculated. Table 8 reports the initial and new levels of the unconditional probability of TEL passage and the respective elasticities of the fiscal variables, using the results from Model 5P of Table 5.

The unconditional probability of TEL success for the entire sample is equal to the 26 TEL successes divided by the 480 possible attempts, or 5.4 percent, so that the estimate for the initial UP_{it} (4.7 percent) seems reasonable. The probability is notably responsive to changes in income growth and welfare expenditure growth, while it is not very responsive to changes in federal transfers. Note also that the elasticity of UP_{it} with respect to tax revenue growth is negative. Recall that one possible interpretation is the threat effect of TEL activity; that is, politicians are responsive to citizen discontent, so that they begin reducing revenue growth prior to the imposition of the TEL. To summarize, TEL passage is heavily dependent on state economic circumstances.

V. CONCLUSIONS

This paper presents a comprehensive econometric analysis of why TELs are placed on state ballots and why they subsequently pass. This process is clearly a complex phenomenon, and the empirical models here are not able to capture all factors relevant to this decision. In particular, the Ballot and the Passage issues seem likely to depend in many cases on purely local events, and the aggregation necessary in the estimation is limited in its ability to capture these local considerations.

Still, the maximum likelihood estimation results suggest a number of significant elements in the passage of TELs. State economic characteristics are especially important determinants in TEL passage, with higher levels of per capita income and faster income growth significantly increasing the likelihood of TEL passage. A side effect of economic prosperity therefore seems to be an increased resistance to taxes and a greater willingness to set limits on taxation. Indeed, income seems to be the primary economic variable in the TEL passage equation. Growth in federal transfers and higher levels of welfare spending also reduce the likelihood of TEL success. Surprisingly, the level and growth

in taxes are not generally significant determinants of TEL passage; if anything, TEL passage tends to be associated with lower levels and growth in tax revenues. One possible explanation for this result is that voter preferences for reduced taxation may slow growth in tax revenues prior to TEL imposition and simultaneously lead to the passage of new limitation. Finally, TEL passage does not appear to depend in important ways on state demographic features, political factors, or the general characteristics of TELs, other than the previous enactment of a limitation.

There is much controversy on the normative consequences of tax and expenditure limitations, and our paper does not address these difficult issues.[23] However, on a purely positive level, our results provide new evidence on the factors that affect the likelihood that a TEL appears on a ballot and that the TEL is subsequently passed. In particular, our findings suggest that economic prosperity is the most important factor that leads to voter support for TELs.

TABLE 1
STATE EXPERIENCES WITH TAX AND EXPENDITURE LIMITATIONS

Year	Total TELs	Successes	Failures
1975	0	0	0
1976	4	1	3
1977	0	0	0
1978	17	12	5
1979	2	2	0
1980	13	4	9
1981	1	1	0
1982	4	2	2
1983	0	0	0
1984	5	0	5
1985	0	0	0
1986	7	3	4
1987	1	0	1
1988	5	1	4
1989	0	0	0
1990	3	0	3
Total	**62**	**26**	**36**

TABLE 3
VARIABLE DEFINITIONS, MEANS, AND STANDARD DEVIATIONS

Variable	Mean	Standard Deviation
Real per capita property tax revenues*	0.3813	0.1749
Share of property taxes in total general revenues	0.2989	0.1030
Percent growth in real property taxes over 5 years	0.0695	0.2062
Real per capita total tax revenues*	1.2477	0.2917
Share of total tax revenues in state personal income	0.2005	0.1384
Percent growth in real total tax revenues over 5 years	0.1514	0.1602
Real per capita total general revenues*	2.2323	0.5142
Real per capita intergovernmental transfers from federal government*	0.4574	0.1272
Share of federal transfers in total general revenues	0.2069	0.0419
Percent growth in real intergovernmental transfers from federal government over 5 years	0.1301	0.2426
Real per capita state income*	11.692	1.9977
Percent growth in real state income	0.1579	0.1182
Real per capita welfare expenditures*	0.2210	0.0835
Share of welfare expenditures in total direct general expenditures		
Percent growth in real welfare expenditures expenditures	0.2129	0.2372
Dummy variable equal to 1 if the state government is controlled by Republicans and 0 otherwise	0.0784	0.2690
Dummy variable equal to 1 if the state government is controlled by Democrats and 0 otherwise	0.3670	0.4825
Population of the state in thousands	4699.4	5338.3
Population per square mile	0.1057	0.1658
Proportion of population over age 65	0.1135	0.0212

* Real per capita variables are denominated in thousands of dollars.

TABLE 4
MAXIMUM LIKELIHOOD ESTIMATES: BALLOT EQUATION
(Absolute value of t-statistics in parentheses)

	Per Capita Models[1]		Share Models[2]		Growth Models[3]	
Variable	Model 1B	Model 2B	Model 3B	Model 4B	Model 5B	Model 6B
Constant	-3.375**	-2.564**	-4.663**	-4.769**	-1.500**	-1.359**
	(6.148)	(4.821)	(3.635)	(4.445)	(8.152)	(6.097)
Personal Income	0.166**	0.037	0.169**	0.150**	2.482**	0.411
	(2.139)	(0.768)	(3.938)	(3.306)	(2.233)	(0.354)
Tax Revenue	-0.560		0.207		-1.032	
	(0.711)		(0.003)		(1.009)	
Property Tax		0.942		1.570		0.156
		(1.572)		(1.474)		(0.288)
Welfare	0.860	1.300	0.817	0.533	-1.941**	-1.808**
	(0.700)	(1.304)	(0.322)	(0.184)	(3.505)	(3.734)
Federal Transfers	1.188	0.526	5.415*	5.168	0.465	0.128
	(1.237)	(0.674)	(1.794)	(1.600)	(0.773)	(0.223)
Population Density	-0.001	-0.024	-0.661	-0.021	-0.054	-0.027
	(0.002)	(0.121)	(0.284)	(0.081)	(0.253)	(0.107)
TEL Already Imposed	-0.472**	-0.009	-0.285	-0.159	-0.478**	-0.469**
	(2.334)	(0.054)	(1.487)	(0.678)	(1.995)	(2.032)
Republican Control	0.477	0.349	0.488	0.378	0.437	0.507
	(1.526)	(1.251)	(1.593)	(1.143)	(1.325)	(1.487)
Log-Likelihood	-301.3	-207.3	-265.6	-307.3	-452.0	-400.9

[1] Personal income, total tax revenue, property tax revenue, welfare expenditures, and federal transfers are expressed in per capita terms.
[2] Personal income is expressed in per capita terms. Total tax revenue, property tax revenue and federal transfers are expressed as a share of total general revenues, and welfare is expressed as a share of total general expenditure.
[3] Personal income, total tax revenue, property tax revenue, welfare expenditures, and federal transfers are expressed as the percent growth over a five year period.

* Significant at the .10 level for a two-tailed test.
** Significant at the .05 level for a two-tailed test.

TABLE 5
MAXIMUM LIKELIHOOD ESTIMATES: PASSAGE EQUATION
(Absolute value of asymptotic t-statistics in parentheses)

	Per Capita Models[1]		Share Models[2]		Growth Models[3]	
Variable	Model 1P	Model 2P	Model 3P	Model 4P	Model 5P	Model 6P
Constant	0.980	-3.651	4.967	6.235*	5.420**	4.550**
	(0.372)	(0.383)	(1.556)	(1.910)	(8.887)	(6.697)
Personal Income	0.371*	0.478	0.229	0.216	11.262**	7.004**
	(1.865)	(0.870)	(1.146)	(1.273)	(4.566)	(4.668)
Tax Revenue	0.486		-18.622		-6.311**	
	(0.493)		(1.439)		(3.841)	
Property Tax		-3.032		-8.400**		-0.618
		(1.372)		(6.151)		(1.494)
Welfare	-10.371**	-6.229	-17.927**	-16.729**	0.922**	0.611
	(4.571)	(1.365)	(3.112)	(3.713)	(3.300)	(1.317)
Federal Transfers	-0.507	-3.559	-3.573	-2.679	-3.940**	-2.876**
	(0.389)	(0.662)	(0.652)	(0.491)	(6.541)	(4.896)
Population Density	0.135	0.119	1.959	0.041	-0.388**	-0.379**
	(0.534)	(0.249)	(0.681)	(0.180)	(3.291)	(2.822)
TEL Already Imposed	-1.622**	-1.234	-1.882**	-1.670**	-1.927**	-1.710**
	(2.360)	(0.893)	(2.250)	(2.943)	(4.901)	(4.331)
TEL Requires Voter Approval	-0.383	-0.344	-0.420	-0.487*	-0.230	-0.014
	(1.506)	(0.498)	(1.306)	(1.959)	(1.590)	(0.092)
Rho	-0.446	-0.466	-0.494	-0.437	-2.188	-1.491
	(0.468)	(0.272)	(0.503)	(0.373)	(0.878)	(0.897)
Log-Likelihood	-301.3	-207.3	-265.6	-307.3	-452.0	-400.9

[1] Personal income, total tax revenue, property tax revenue, welfare expenditures, and federal transfers are expressed in real per capita terms.
[2] Personal income is expressed in real per capita terms. Total tax revenue, property tax revenue, and federal transfers are expressed as a share of total general revenues, and welfare is expressed as a share of total general expenditure.
[3] Personal income, total tax revenue, property tax revenue, welfare expenditures, and federal transfers are expressed as the percent growth over a five-year period.

* Significant at the .10 level for a two-tailed test.
** Significant at the .05 level for a two-tailed test.

TABLE 6
ALTERNATIVE SELECTION CONTROL ESTIMATES: PASSAGE EQUATION
(Absolute value of t-statistics in parentheses)

Variable	Simple Probit	Probit with Inverse Mill's Ratio	MLE (5P)
Constant	0.066	5.589	5.420**
	(0.174)	(1.233) (8.887)	
Income Growth	7.680**	8.541**	11.262**
	(2.680)	(2.991) (4.566)	
Tax Revenue Growth	-4.046	-4.830	-6.311**
	(1.596)	(1.854) (3.841)	
Welfare Expenditure Growth	-1.920	0.326	0.922**
	(-1.765)	(0.153)	((3.300)
Federal Transfer Growth	-0.765	-2.624	-3.940**
	(0.686)	(1.374) (6.541)	
Population Density	-0.087	-0.216	-0.388**
	(0.194)	(0.462) (3.291)	
TEL Already Imposed	-1.289**	-1.494**	-1.927**
	(2.813)	(3.032)	(4.901)
TEL Requires Voter Approval	0.044	0.175	-0.230
	(0.070)	(0.268)	(1.590)
Inverse Mill's Ratio		-3.447	
		(1.224)	
RHO			-2.188
			(0.878)
Log-Likelihood	-31.333	-30.578	-452.0
Percent Correct Predictions	70.5%	77.0%	80.4%

* Significant at the .10 level for a two-tailed test.
** Significant at the .05 level for a two-tailed test.

TABLE 7
ALTERNATIVE GROWTH ESTIMATES: PASSAGE EQUATION
(Absolute value of t-statistics in parentheses)

Variable	One-year Growth Models[1]			Three-year Growth Models[2]			Five-year Growth Models[3] (Model 5P)	(Model 6P)
Constant	-1.648	-1.331		1.184**	0.282		5.420**	4.550**
	(0.826)	(0.829)		(2.012)	(0.052)		(8.887)	(6.697)
Personal Income	17.92**	13.321*		5.510**	2.400		11.262**	7.004**
	(2.679)	(1.826)		(2.297)	(0.394)		(4.566)	(4.668)
Tax Revenue	-4.347			-3.887*			-6.311**	
	(1.326)			(1.662)			(3.841)	
Property Tax		0.0385			-1.297			-0.618
		(0.011)			(0.378)			(1.494)
Welfare	-3.044	-3.274	2.492**	-1.026		0.922**	-0.611	
	(1.392)	(1.424)		(2.049)	(0.528)		(3.300)	(1.317)
Federal Transfers	-3.282	-4.189		0.124	0.442		-3.940**	-2.876**
	(0.625)	(0.665)		(0.076)	(0.090)		(6.541)	(4.896)
Population Density	0.167	0.278		0.278	0.114		-0.388**	-0.379**
	(0.358)	(0.565)		(0.755)	(0.241)		(3.291)	(2.822)
TEL Already Imposed	-0.579	-0.786		-1.693**	-0.707		-1.927**	-1.710**
	(1.035)	(0.961)		(5.264)	(1.350)		(4.901)	(4.331)
TEL Requires Voter Approval	0.011	0.589		-0.014	-0.117		0.230	-0.014
	(0.185)	(0.538)		(0.014)	(0.663)		(1.590)	(0.092)
RHO	0.819	0.651		-0.631*	-0.359		-2.188	-1.491
	(0.502)	(0.669)		(1.907)	(0.127)		(0.878)	(0.897)
Log-Likelihood	-210.0	-219.1		-218.2	-307.3		-452.0	-400.9

[1] Personal income, total tax revenue, property tax revenue, welfare expenditures, and federal transfers are expressed as the percent growth over a one-year period.
[2] Personal income, total tax revenue, property tax revenue, welfare expenditures, and federal transfers are expressed as the percent growth over a three-year period.
[3] Personal income, total tax revenue, property tax revenue, welfare expenditures, and federal transfers are expressed as the percent growth over a five-year period.
* Significant at the .10 level for a two-tailed test.
** Significant at the .05 level for a two-tailed test.

Growth Federal Welfare Spending Tax Revenue Income Variable

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TABLE 2

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Year	State		Outcome
1976	Colorado	[illegible]	
1976	Michigan	[illegible]	
1976	Montana	[illegible]	
1976	North Dakota	[illegible]	
1978	Alabama	[illegible]	
1978	Arizona	[illegible]	
1978	Colorado	[illegible]	
1978	California	[illegible]	
1978	Hawaii	[illegible]	
1978	Idaho	[illegible]	
1978	Illinois	[illegible]	
1978	Michigan	[illegible]	
1978	Michigan	[illegible]	
1978	Michigan	[illegible]	
1978	Missouri	[illegible]	
1978	Nebraska	[illegible]	
1978	North Dakota	[illegible]	
1978	Nevada	[illegible]	
1978	Oregon	[illegible]	
1978	South Dakota	[illegible]	
1978	Texas	[illegible]	
1979	California	population [illegible]	

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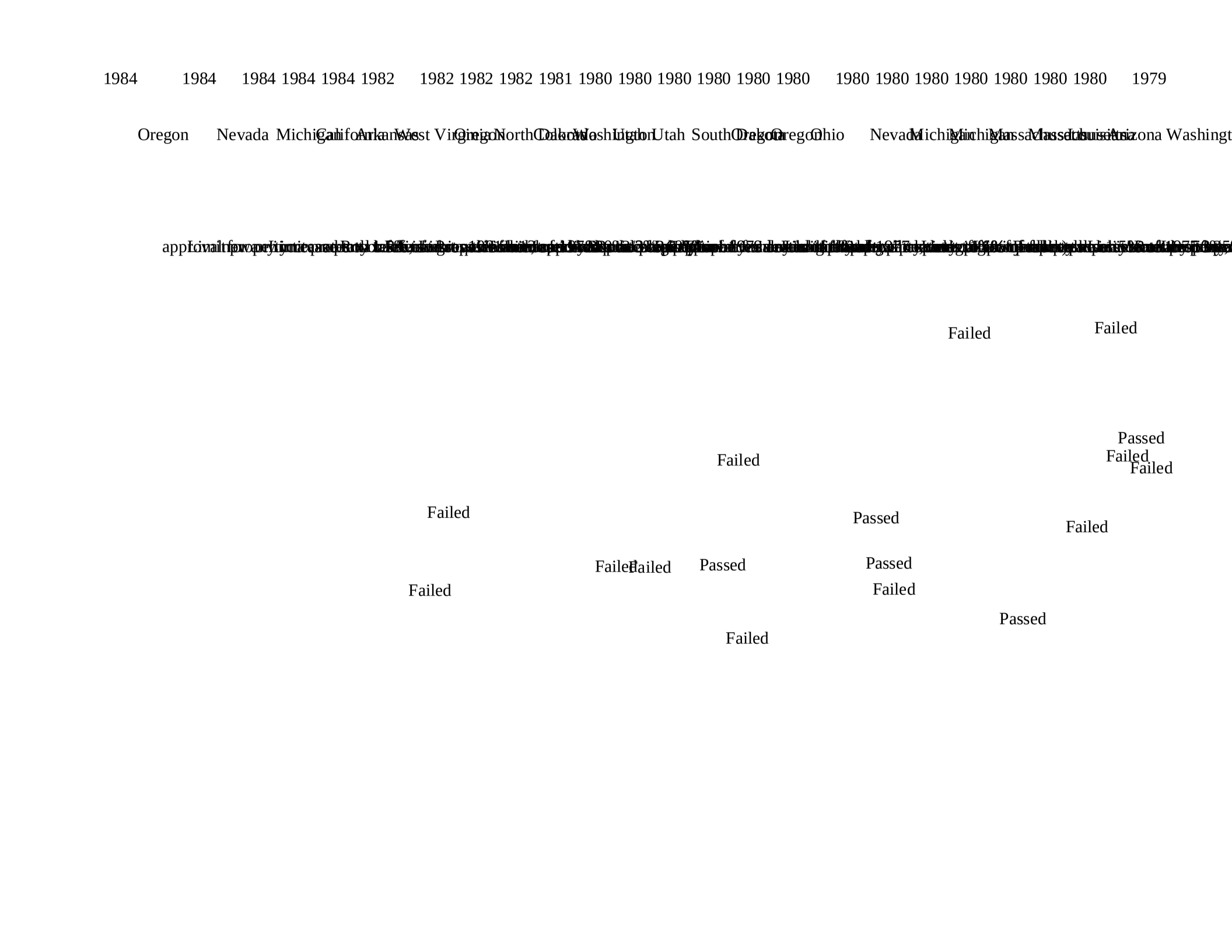
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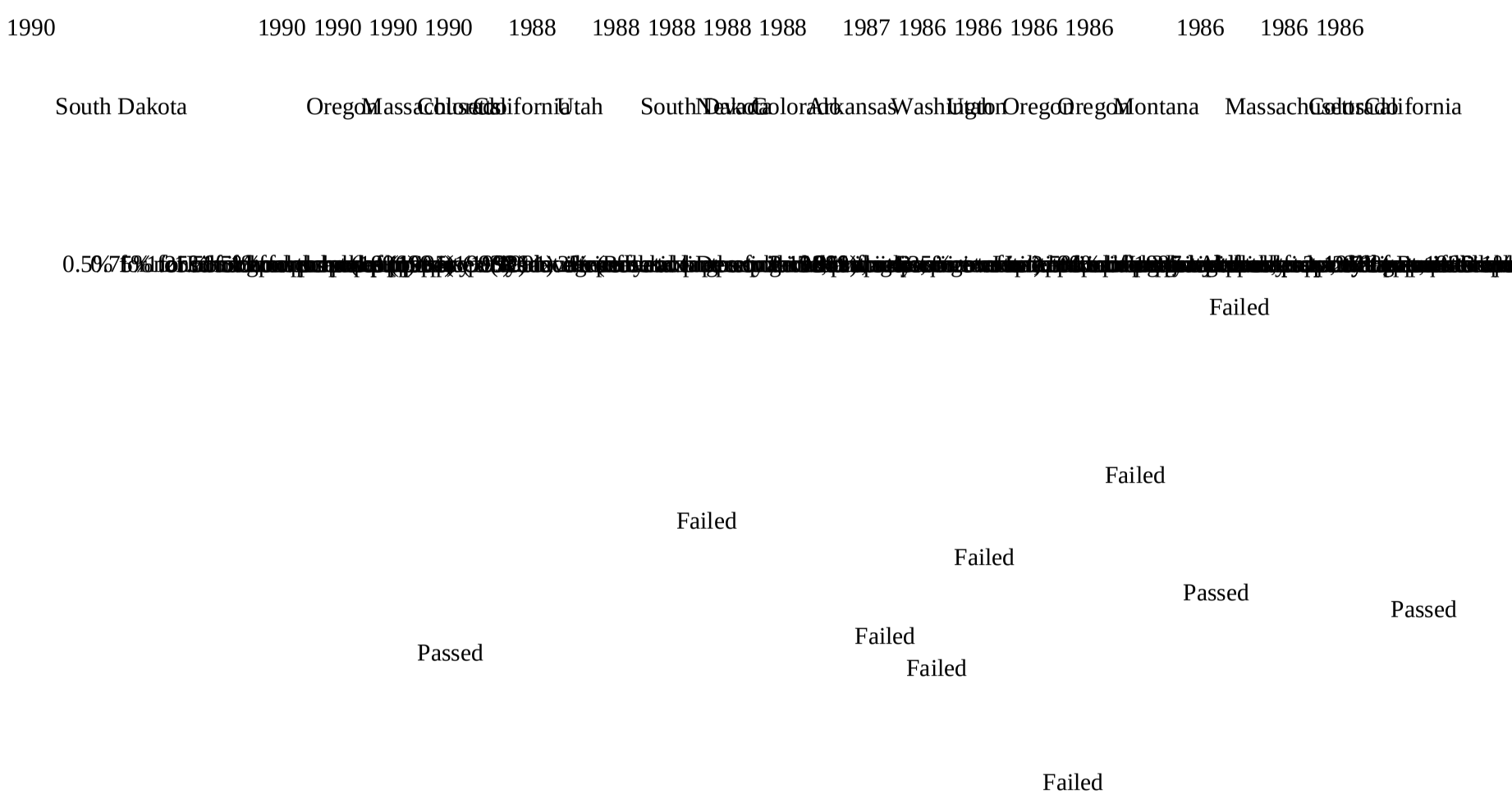
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Economic Journal

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The Journal of Political

The American Economic Review

The State Tax Review

State Government News

American Economic Review

National Tax Journal

The Book of The States

Fiscal Constitution

Public Administration Review

National Tax Journal

Economy

Annales De L'Insee

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