

**DO TAX AND EXPENDITURE LIMITS LEAD
TO STATE LOTTERIES? EVIDENCE FROM
THE UNITED STATES: 1970-1992**

MARK M. GLICKMAN

U.S. General Accounting Office, San Francisco

GARY D. PAINTER

University of Southern California, Los Angeles

The past three decades have seen the widespread introduction of both state-level and local-level tax and expenditure limits (TEs). Over the same time period, 37 states have legalized state lotteries to raise revenues. The authors assert that the combination of TEs and lotteries may be an optimal strategy for a median voter attempting to lower his or her tax burden while lowering the cost of monitoring the behavior of government officials. They find consistent evidence that the existence of a limit on the increase of property assessments is a positive predictor of the adoption of a lottery, and they also find some evidence that state limits and limits on property tax revenues also influence states to pass lotteries. Other local TEs have a little estimated impact on the lottery decision.

Keywords: *tax and expenditure limits; lotteries; tax burden; states; fiscal stress*

The past three decades have seen dramatic changes in the fiscal structures of state and local government. Although many of these changes have evolved because of technological and economic forces, voters have also mandated certain shifts through legislation and referendum. Since 1970, citizens in 43 states have passed either state-level or local-level tax and expenditure limitation acts (TEs) to restrain taxation and spending in their jurisdictions. The popular belief has been that these laws are necessary because the conventional legislative process is not able to reign in spending sufficiently.

Over the same time period, states and localities in increasing numbers have turned to alternative revenue instruments to raise public funds. These new revenue streams often use a narrower base than

more traditional taxes such as income, sales, or property taxes. One of the most popular of these new sources is the lottery. Before 1970, only 2 states had lotteries, 28 states had a local TEL, and no state had a state-level limit. By 1997, 37 states operated lotteries, 46 had some form of local TEL, 24 had a state-level limit, and all 50 had at least one TEL of some kind. These simultaneous changes in fiscal structure suggest a possible relationship between the passage of TELs and the adoption of lotteries.

Previous literature, which has studied TELs and lotteries, has not tested for a link between the two. There are a number of studies of the impact of TELs and their effectiveness in reining in taxes and spending. Most of the literature finds a small impact of these limits on overall spending. Others have found that TELs have necessitated other changes in fiscal structure (e.g., Ladd 1978; Figlio and O'Sullivan 2001; Lowery 1983). Joyce and Mullins (1991) and Poterba and Rueben (1995) conclude that a TEL placed on either a local or state government has little impact, but the concurrent combination of TELs at both levels can lead to an effective decrease in spending. Poterba and Rueben also find that states with binding limits have public-sector wage premiums that are about 2% lower than states without binding TELs. Other studies (Rueben 1997; Dye and McGuire 1997) have found similar impacts of TELs on reducing spending. Finally, Mullins and Joyce (1996) expand the breadth of TEL studies to examine how TELs shift the responsibility for raising revenues between state and local governments. They find that TELs lead to greater dependence on narrow-based income sources for tax revenues.

A number of studies also have examined the factors leading to state lottery enactment. Some use panel data sets (Berry and Berry 1990; Filer, Moak, and Uze 1988; Winn and Whicker 1990), and two have used hazard models (Alm, McKee, and Skidmore 1993; Caudill et al. 1995). These studies test whether demographic factors, fiscal stress, neighboring states with lotteries, and revenue potential are predictors of lottery enactment. The consensus is that demographic factors, attitudes of the state's citizens toward gambling, and having neighboring states with a lottery influence states to implement their own lottery, but there is disagreement as to the importance of fiscal stress. The Alm, McKee, and Skidmore (1993) study finds that fiscal stress was important in the enactment of lotteries in the 1970s, but it is not as

good a predictor in the enactment of lotteries in the 1980s. Caudill et al. (1995) found no impact of fiscal stress.

The difficulty in modeling TEL and lottery passage by a state is positing why an electorate would optimally, at one time, decide to limit the power of government to tax and spend but, at a future date, authorize a new source of public revenue. This apparent contradiction of preferences would seem to eliminate a pure median voter model in which perfect information and perfect markets for public good allocations preclude the need or use for tax limits. If voters wanted lower taxes, they would simply vote for them, without the need for an explicit institutional limit.

In a simple theoretical framework, we propose two main reasons that a median voter may choose the combination of TELs and lotteries. First, the median voter may use this combination strategically to lower his or her tax burden while providing the same level of public goods. For example, the median voter may not play the lottery and therefore views the combination of TELs and lotteries as welfare improving. The second reason the median voter may optimally seek this combination is that it may strengthen his or her ability to monitor a government that seeks to maximize revenue. Asymmetric information regarding the budget process hinders the voters' ability to monitor their representatives. Therefore, voters may choose to limit the budget power of their representatives explicitly and then force them to present new taxes or other revenue instruments for voter approval if the need arises.

Given the theoretical justification for the relationship between TELs and lottery adoption, this analysis tests for this relationship in a discrete time hazard framework, which is the proper statistical method to evaluate decisions made over time. The results suggest that the presence of a limit on assessment increases the likelihood of a state passing a lottery. Parsing the full 23-year sample period into subperiods yields some evidence that state limits and limits on property tax revenues are connected with lottery passage in later years. However, we find no consistent evidence of a relationship between other local limits and lottery adoption. Fiscal stress, a possible mechanism by which TELs could trigger lotteries, does not appear to play a significant role in a state's decision to pass a lottery.

TAX AND EXPENDITURE LIMIT HISTORY

Twenty-four states have passed state-level TELs since 1970. Many tie spending or revenue caps to growth in the Consumer Price Index, population, and personal income or to some predetermined percentage. Although the limit formulas are similar across states, the actual effectiveness of the TELs varies. Some pass limits on expenditures and taxes that can be overridden with a simple majority vote, whereas others require supermajority votes, governor's permission, or popular referendum to circumvent.

More common than state limits are TELs on local spending. All states except for Connecticut, Maine, New Hampshire, and Vermont have some form of limit on local tax revenue or expenditures. Many of these laws have been on the books since the early 20th century or even the 1800s, but almost every state that has a local TEL (Pennsylvania, South Dakota, and Wyoming are exceptions) has passed new limiting legislation since 1970.¹

Local TELs limit one of the following categories of tax rates or revenues (Advisory Commission on Intergovernmental Relations 1995; Joyce and Mullins, 1991):

1. *Overall property tax rates*—a ceiling on the aggregate tax rate of all local governments
2. *Specific property tax rates*—applies to specific types of jurisdictions, such as counties or school districts
3. *Property tax levies*—limits the total revenue that can be collected on property
4. *General revenue or expenditure increases*—on all combined forms of taxation or spending in a locality
5. *Assessment increases*—constrains the growth in assessed value of property while not changing the tax rates

A sixth type of local limit, *full disclosure*, requires public approval or pronouncement of tax or spending increases.

Governments can more easily circumvent certain limits than others. Localities with limits on tax rates can still increase revenue by broadening the tax base—in this case, the assessed value of property. Conversely, an assessment increase limit can be rendered inconsequential if rates on these assessments can expand without limit.

Hence, the combination of an assessment increase and a form of rate increase ceiling make a TEL more potentially binding. In fact, only Maryland passed an assessment increase without having a corresponding limit on property tax rates.

Table 1 displays each state and the years that each passed a particular TEL or a lottery. Table 2 shows the number of states that have passed a lottery or a particular TEL by the end of a certain year, through 1995. These tables show that most TELs have preceded lotteries and that most lottery states have passed at least one form of TEL prior to approving a lottery.

THEORETICAL FRAMEWORK

DISCUSSION

The predominant theories of public choice in the past 20 years have been variants of the median voter model, in which the allocation of public goods is determined by the preferences of the median voter, and the model of Leviathan (Buchanan 1980), in which politicians try to maximize revenue subject to a reelection constraint. A median voter justification for a TEL relies on the argument that current budget and policy outcomes cannot represent the preferences of the median voter through standard voting and budgeting procedures. If this were not the case, then voters could simply change tax and expenditure laws and hence adjust the allocation of public goods through the normal legislative process. A variant of the median voter model might suggest that TELs realign voter preferences and outcomes that exogenous forces or institutional rigidities of government have separated.

A Leviathan model would view TELs as a rational response by voters to rein in overspending politicians. This model might further posit lotteries as a response by budget-maximizing politicians to fiscal stress caused by limits, irrespective of how lotteries align with the desires of the median voter.

We propose a “strategic” median voter model, in which the median voter acts optimally given the institutional constraints and imperfect information inherent in the budgeting system. We assume that the

TABLE 1: Dates of Lottery and TEL Enactments, by State

State	Lottery	Tax and Expenditure Limits											
		State Level	Assessment Increase	Overall Property Tax Rate	Local Level						Full Disclosure		
					Specific Property Tax Rate	Property Tax Revenue	General Expenditure	General Revenue	Property Tax Revenue	Full Disclosure			
AL				1972	1875								
AK					1972			1972					
AZ			1980	1980				1913					
AR	1981							1981		1921			
AR					1883								
CA	1985	1979	1978	1978	1992			1992		1979	1972		
CO	1983	1977								1973			1983
CT		1991											
DE	1975												
FL	1988		1995		1968			1972					1976
GA	1993												1974
HI													1991
HI		1978											1977
ID	1989	1980		1978	1967								1991
ID					1961			1991					1977
IL	1974												1981
IN	1989												1973
IA	1985												1971
IA					1972					1971			1983
KS	1987		1978							1973			
KY	1989				1946			1970					1979
KY					1974			1979					
LA	1991	1979						1978					
ME	1974												
MD	1973		1957										1977
MA	1972	1986			1980			1980					1982
MI	1972	1978		1933	1949			1978					1988
MN										1971			
MN	1990												
MS								1980					

(continued)

TABLE 1 (continued)

State	Tax and Expenditure Limits										
	Lottery	State Level	Assessment Increase	Overall Property Tax Rate	Local Level					General Revenue	Full Disclosure
					Specific Property Tax Rate	Property Tax Revenue	General Expenditure	General Revenue	Full Disclosure		
MO	1986	1980			1875	1980					
MT	1987	1981				1987					1974
NE	1993				1957	1990		1991			1990
NV		1979		1936	1956	1983					1985
NH	1964										
NJ	1970	1976				1980					
NM	1996	1987	1979	1914	1973	1979		1976			
NY	1967		1981		1894						
NC		1991			1973						
ND					1929	1981					
OH	1974			1929		1976					
OK		1985		1933							
OR	1985	1979		1991	1991	1916					
PA	1972				1959	1940					
RI	1974	1977				1985					1979
SC		1980									1975
SD	1987				1915						
TN		1978									1979
TX	1992	1978			1883	1982					1982
UT		1979			1929						1986
VT	1978										
VA	1988										1976
WA	1982	1979		1944	1973	1971					1990
WV	1986			1939	1939	1990					
WI	1988				1994				1994		
WY					1911						

TABLE 2: Number of States Enacting Lotteries or TELs, by Year

State	Tax and Expenditure Limits									
	Lottery	State Level	Assessment Increase	Overall Property Tax Rate	Local Level			General Expenditure	General Revenue	Full Disclosure
					Specific Property Tax Rate	Property Tax Revenue	Property Tax Revenue			
Pre-World War II	0	0	0	7	11	3	0	0	0	0
1970	3	0	1	0	9	1	0	0	0	0
1971	3	0	1	0	10	2	2	0	0	0
1972	7	0	1	1	12	4	2	1	0	0
1973	8	0	1	1	15	5	4	1	0	0
1974	12	0	1	1	16	5	5	1	2	2
1975	13	0	1	1	16	5	5	1	3	3
1976	13	1	1	1	16	6	6	1	5	5
1977	13	3	1	1	16	6	6	1	7	7
1978	14	8	3	3	16	8	6	1	7	7
1979	14	13	4	3	16	10	7	1	10	10
1980	14	16	5	4	16	14	7	1	10	10
1981	15	17	6	4	16	16	7	1	11	11
1982	16	18	6	4	16	17	7	1	13	13
1983	17	18	6	4	16	18	7	1	15	15
1984	17	18	6	4	16	18	7	1	15	15
1985	20	19	6	4	16	19	7	1	16	16
1986	22	20	6	4	16	19	7	1	17	17
1987	25	21	6	4	16	20	7	1	17	17
1988	28	21	6	4	16	20	7	1	18	18
1989	31	21	6	4	16	20	7	1	18	18
1990	32	21	6	4	16	22	7	1	20	20
1991	33	23	6	5	17	23	8	1	22	22
1992	34	23	6	5	18	24	8	2	22	22
1993	36	23	6	5	18	24	8	2	22	22
1994	36	23	6	5	19	24	8	3	22	22
1995	36	23	7	5	19	24	8	3	22	22

strategic median voter desires to take advantage of the externalities inherent in government spending, where the costs and benefits of public goods are not perfectly matched across voters. Specifically, the strategic median voter seeks to minimize the negative spillovers associated with general-fund budgeting (the voter shares the cost of public goods that he or she does not value very highly) and take advantage of positive externalities (others share the cost of public goods that the voter does value highly). The combination of a TEL and a lottery may shift the tax burden away from the median voter without significantly lowering overall public spending from which the median voter reaps some benefit.

Some evidence suggests that the median voter might be motivated by the above reasons to enact both TELs and lotteries. Courant, Gramlich, and Rubinfeld (1981) conclude from their survey of Michigan voters that most people in favor of spending limits do not wish to lower the quantity of public goods provided by government. Instead, they ideally want to lower their tax burden while maintaining the current level of services. Other research on the motivation for TELs among voters (Citrin and Green 1985; Ladd and Wilson 1982; O'Sullivan, Sexton, and Sheffrin 1995) concludes that voters wish to lower the cost of services, not the quantity of public goods. Therefore, when funding falls because of a TEL and the level of a public good (or set of public goods) falls, a voter may wish to boost funding through "alternative tax" measures or through measures that do not increase his or her personal tax burden. Some researchers claim that rising taxes and expenditures are simply functions of economic and technological forces, and therefore spending should remain largely unchanged as the governments must respond to these forces (Baumol 1967; Ladd 1978). TELs would appear to be ineffective in this scenario but would still represent an attempt by the median voter to realign the allocation of public goods and preferences.

A Leviathan motivation might involve monitoring the actions of elected representatives, which can be quite costly for a voter. Limiting the broad taxing and spending discretion of representatives while authorizing revenue from a narrow, voluntary source such as a lottery may lower the need of the median voter to perform such monitoring. A similar motivation for a strategic median voter model is that individual

legislators often move to increase spending in their home districts, leading to overall tax burdens that are greater than the median voter desires for the level of public output.² In addition, representatives and constituents face uncertainty regarding funding sources for particular programs. Thus, government officials may attempt to maximize revenue for particular programs, resulting in overall spending levels that are higher than those desired by the median voter.

The theoretical and empirical models presented here are not designed specifically to distinguish between the median voter and Leviathan motivations for lottery passage. As in most analyses of government decisions, it is very difficult to distinguish empirically between competing mechanisms by observing outcomes, even if there is a strong link between the passage of TELs and eventual lottery enactment. However, the different models would yield different possible mechanisms of government response, even if outcomes were difficult to distinguish. One possible distinguishing factor involves fiscal stress. If we find evidence that the passage of a TEL causes fiscal stress and that governments respond to fiscal stress by enacting lotteries, this may provide evidence of a Leviathan motivation. If, alternatively, we observe that a TEL simply changes fiscal structure and causes governments to rely on alternative revenue instruments without evidence of fiscal stress, then the combination of TELs and lotteries is consistent with our strategic median voter model.

Finally, we note that in both the theoretical and empirical models, there is no distinction made between the likelihood of lottery adoption with the passage of a local TEL and a state-level TEL. Glickman (1998) notes that two thirds of the state lotteries earmark funds for traditionally local programs such as education, senior services, and economic development. The remainder of the lotteries uses proceeds to increase the general fund. Because lottery funds are so often used for local programs, we leave it to the empirical test to determine whether any of the TELs are connected to lottery adoption.³

MODEL

We derive our model from Chari, Jones, and Marimon (1997) and propose a model of government whereby the median voter acts strate-

gically to increase his or her utility. The authors use their model to explain why citizens often vote for a president and legislative representatives of different party affiliations. They conclude that such split-ticket voting helps monitor the budgetary choices of the legislature. In our model, the strategic median voter passes a TEL to lower his or her tax burden and lower the monitoring costs of a government that may be prone to Leviathan-type behavior.

We characterize a median voter who maximizes his or her utility over private consumption, represented by composite good Z , given an exogenous level of public good G . The individual utility function depends on the characteristics of the median voter (X_{MV}), and the optimal level G^* of public good is determined by the characteristics of the state in which the median voter lives (X_s):

$$U_{MV} = U(Z | X_{MV}, G | X_s).$$

Suppose that the median voter earns income Y_{MV} and pays taxes t_{MV} , which makes the private and public budget constraints, respectively,

$$Y_{MV} = P_Z \cdot Z_{MV} + t_{MV}$$

and

$$G_s = N \cdot t_i / P_G,$$

where N represents the population of state S , and P_Z and P_G represent the respective prices of goods Z and G , and we assume uniform tax shares t_i across the population. Suppose we start at an equilibrium consumption bundle for the median voter (Z^* , G^*). That is, with the government having already chosen an optimal level of public good G^* given the characteristics of the state population, the median voter chooses an optimal level of private good Z^* . He or she pays t_{MV}^0 in taxes to the government.

Suppose that externalities in the budgetary procedure provide a shock to the optimal equilibrium, raising the level of G to G^- .⁴ The new equilibrium consumption bundle becomes (Z^- , G^-), with the median voter's taxes rising to t_{MV}^- . His or her new share of total taxes T supporting public goods is now $t_{MV}^- < t_{MV}^0$.

The median voter realizes that there are other feasible combinations (Z, G) , such that $U_{MV}(Z, G) > U_{MV}(Z^-, G^-)$, because G is higher than the voter would like it to be. Because the budgeting process constrains his or her ability to change G through direct measures, the voter supports a tax and expenditure limit. The TEL serves the purpose of lowering G and, therefore, t_{MV} . The median voter's lower tax bill allows him or her to raise his or her private consumption of Z .

This serves as a justification for why a median voter may desire a TEL, but a median voter acting strategically may simply want to lower t_{MV} while maintaining an optimal level of public good G^* . This can be accomplished with a TEL, which lowers t_{MV} , combined with a narrow tax that is either regressive or progressive and shifts the tax burden away from the median voter. This explanation agrees with the evidence discussed earlier (e.g., Courant, Gramlich, and Rubinfeld 1981), which implies that voters simply want to lower the cost of the service, not lower G . Because the consensus is that the tax incidence of a lottery is regressive (Brinner and Clotfelter 1975; Clotfelter and Cook 1981), the use of the lottery would appeal to a median voter acting in this manner.⁵

On the other hand, the median voter may support a TEL simply to correct for the budgetary externality or rein in a budget-maximizing political system. The government, now that its ability to raise tax revenue has been constrained, looks for alternative sources of funding. Depending on the characteristics of the state (such as views toward gambling and income levels), it introduces a lottery. A lottery raises L dollars for the government, which is used to raise G by some L/P_G . The median voter approves the lottery measure if, depending on his or her taste or distaste for gambling, the benefits this individual derives from consumption of the lottery (i.e., the voter participates in the lottery) outweigh his or her view of the costs of introducing the lottery. Or, the voter may favor the lottery if the net proceeds raised by its operation will lower his or her taxes for a given level of public good G . The median voter prefers the combination of a TEL and a voter-approved alternative revenue instrument because it may be less costly than trying to monitor the budgeting process directly. Again, this is analogous to the model in Chari, Jones, and Marimon (1997), in which the median

voter elects a president and Congress of different parties to lower monitoring costs.

Given either scenario, the model implies that we should observe a shift in tax burden from taxpayers affected by the TEL to lottery participants. We could expect to observe some delay between the passage of the TEL and the introduction of the lottery, but there is no reason to rule out a quick succession of the two tax movements (perhaps even a simultaneous substitution of lottery revenue for tax revenue). Also, one can imagine a plausible scenario in which the order of the events is reversed: first, governments or voters decide to boost public revenue via a lottery, and later voters (or vote-seeking politicians) decide that tax revenue can optimally be lowered because of the new source of revenue.

EMPIRICAL MODEL

Lotteries have been adopted in different fashions. Some states have passed lotteries by citizen initiatives, some have been passed by legislative initiative, and other legislatures have directly passed lotteries into law. As in previous work, we choose to treat all lotteries the same, irrespective of the legislative process that legalized them. This is not likely to cloud the results because it is likely that, even in those cases in which lotteries were passed directly by the legislature, voters had substantial input in the decision because the lottery laws were not part of a larger budget passage.⁶

We use a discrete time hazard model to analyze the impact of the independent variables on lottery adoption. Event history analyses such as these posit that there are a pool of risk factors for “failure” of the dependent variable—in this case, adoption of the state lottery. States that do not yet operate a lottery are “at risk” to begin one. States that begin a lottery drop out of the data set because they no longer are at risk. This last assumption, which is also made by Alm, McKee, and Skidmore (1993) and Caudill et al. (1995), simplifies the analysis because the hazard model becomes a survival model. The justification for the assumption lies in the fact that no state rescinded a lottery in the 20th century.

This allows us to focus on the factors that lead a state to pass a lottery initially. Once the state has a lottery in place, we assume that the state renews operations automatically, as opposed to debating and re-enacting the lottery based on current state characteristics. A state that passes a lottery in 1982 has certain characteristics that lead it to make that decision; in 1992, we would still observe that state, probably with different characteristics, operating a lottery. By eliminating observations for that state from 1983 onward, we avoid the bias inherent with equating the existence of a lottery and the decision to have a lottery.

Let y_{it} be defined as 1 if a state enacts a lottery in period t and defined as 0 if the state does not have a lottery in period t . Note that lottery enactment is assumed to occur at the end of the year of passage, even though lotteries commence operations at different times of year. The probability P_{it} that state i introduces a lottery in year t after $t - 1$ periods without a lottery is then

$$P(T_i = t_i) = P_{it} \prod_{j=1}^{t-1} (1 - P_{ij}). \quad (1)$$

The probability of state i adopting a lottery in time t is the product of the probability that the lottery is not adopted in periods 1 through $t - 1$, multiplied by the probability that the lottery is adopted in period t .

The probability that a state has not adopted a lottery by a certain period is

$$P(T_i > T) = \prod_{j=1}^T (1 - P_{ij}), \quad (2)$$

where T is the number of time periods that a state remains in the sample.

The likelihood function for the entire sample is a product of the probabilities given in (1) and (2) and is written as

$$L = \prod_{i=1}^N [(P(T_i = t_i))]^{y_i} [P(T_i > T)]^{1 - y_i}, \quad (3)$$

where $y_i = 1$ if state i adopted a lottery during the sample period. It is assumed that P_{it} is specified as in the logistic distribution. Forming the log of the likelihood function and maximizing with respect to the vec-

tor of coefficients of the independent variables yields consistent estimates of the coefficients.

We estimate the model using state-level panel data from 1970 to 1992.⁷ A dummy variable equal to 1 in years when a state operates a lottery serves as the dependent variable. The data contain state-year observations up to and including the first year that a particular state enacts a lottery; after this year, we drop all future observations for that state for the reasons described above. We use dummies for each of the six categories of local TELs plus one for binding state-level limits, on the right-hand side, in addition to economic, demographic, and political factors. Any TEL passed prior to World War II we consider nonbinding, simply because it is hard to imagine that a TEL that has been on the books for several decades would continue to have a measurable influence over a state's decision to introduce a fiscal innovation such as a lottery.

Finally, we include state-level economic variables (income per capita, income distribution, unemployment rate, tax capacity, and debt and deficit variables), state-level political variables (political party in control of governorship and house, balanced budget rules, governors' line-item vetoes, and the presence of a neighboring state with a lottery), and demographic variables (age distribution of population, total population, population density, and percentage Catholic) that past research suggests might be important in influencing lottery adoption. These variables are intended to capture local economic conditions, fiscal stress, or demographic preferences that would positively or negatively affect lottery adoption.

RESULTS

MEANS

Table 3 displays the means of the variables used in the analysis (see the appendix for sources of the variables). We present three different columns. The first contains only those observations up until the state passes a lottery. The second includes only observations for years when a state passes a lottery. The third has numbers for every observation in the sample.

TABLE 3: Means of Variables, by Lottery Status

	<i>Nonlottery</i>	<i>Lottery</i>	<i>Full Sample</i>
Tax and expenditure limit (TEL) variables (% of states with TEL)			
State level	14.63	25.00	24.56
Specific property tax rate	52.88	40.63	48.01
Overall property tax	20.47	21.88	20.38
Property tax rate	29.94	40.63	35.14
Assessment increase	4.95	12.50	8.33
General revenue/expenditure	12.09	18.75	13.32
Full disclosure	16.62	21.88	21.01
Economic variables			
Unemployment rate	6.25	6.49	6.37
Income per capita	8525.90	10964.81	10386.31
Distribution of income	17.67	16.74	17.30
Long-term debt per capita	1348.15	1696.40	1577.90
Deficit dummy	12.50	15.63	13.04
Lagged deficit dummy	12.77	18.75	13.50
Revenue centralization	53.85	52.09	54.69
Tax capacity	97.07	96.64	98.30
Political variables			
Line-item veto dummy	89.15	87.50	85.42
Split-party government dummy	44.51	59.38	48.82
Referendum process dummy	53.30	50.00	50.00
Election year dummy	26.24	21.88	25.91
Balanced-budget rule dummy	65.93	53.13	58.33
Democratic governor dummy	65.11	53.13	60.42
% of lower house Democrat	62.19	55.23	60.68
% of population bureaucrats	1.37	1.24	1.34
% of population prisoners	0.16	0.17	0.17
Neighboring state has lottery dummy	30.36	59.38	50.72
Demographic variables			
% Black	10.93	8.23	10.70
% ≥ 65 years old	10.96	11.58	11.37
% 5-17 years old	22.52	21.16	21.52
% Catholic	13.89	21.66	18.45
Population (in thousands)	3990.40	5591.84	4736.00
Population density	79.24	200.16	159.21

NOTE: A state is classified as a non-lottery state in years prior to lottery enactment and as a lottery state in subsequent years.

The difference in the means of the three columns comes from two sources. One is the difference in lottery status between the groups. The

second is the difference in the years comprised by each grouping. The column for lottery-state observations will, on average, draw from later years than the nonlottery column because no state has rescinded a lottery. Therefore, for a state that passes a lottery in 1980, the first column will contain years 1970-1979, whereas the lottery column will contain observations for that state in 1980 only. In other words, for the purposes of this table, a state that eventually passes a lottery is considered a “nonlottery” state in years before it implements the lottery. The “lottery” column, therefore, contains observations that tend to be from later years, which will raise the means in this column for variables whose levels grow nominally. The third column contains all years, 1970-1992.

The means demonstrate some rough differences between lottery and nonlottery states. Lottery states, during each one’s enactment year, employ a higher percentage of TELs of every category, with the exception of specific property tax rates, than states that do not operate lotteries. In fact, TELs are more prevalent in lottery enactment years than for the sample overall, suggesting that limits are correlated with states’ lottery decisions.

Several other characteristics stand out as dividing lottery states from nonlottery states, all of which conform to predictions. States that pass lotteries are much more likely to have a neighboring state with a lottery than states without lotteries. They are also more likely to have run a deficit, either concurrently or the year before passing a lottery. On average, they have a larger Catholic population, a characteristic sometimes used as a measure of a greater taste for gambling.⁸ Lottery states also have significantly larger overall populations, as well as a higher population density.

The table reports that states with Democratic governors or a higher percentage of Democratic assemblymen are less likely to enact lotteries, perhaps because Democrats have traditionally been more accepting of more progressive forms of taxation for which lotteries may substitute. Surprisingly, lottery states are less likely to have balanced budget amendments than nonlottery states. We might expect the opposite if such legislation might lead to a higher likelihood of fiscal crisis and hence the need for new sources of public revenues.

SURVIVOR MODEL RESULTS

Table 4 displays the coefficients from the survival analysis on states' decisions to pass lotteries. The estimates presented in the table represent the relative importance of that variable in affecting the probability of a state passing a lottery, conditional on it not having passed a lottery to date. Coefficients close to zero have little effect on the baseline conditional probability, whereas those more strongly negative or positive have larger effects.

Full Sample Period

Using the full sample period from 1970 to 1992, the results demonstrate some evidence of a relationship between the onset of TELs and of lotteries. The most robust finding concerning this relationship is that limits on increases of property assessment are most consistently related to lottery passage. Other TELs, both at the state level or local level, do not consistently appear to affect states' decisions to pass a lottery, although in later years, state limits are positively related to lottery adoption. Regardless of how the various TELs are grouped together and regardless of the presence or absence of interaction terms between limits on assessment increases and limits on property taxes, only the limits on assessment increases are consistently associated with lottery adoption.

These findings suggest that limits on assessment increases place more of an effective budget constraint on local and state government than do other limits. Because assessment increases affect homeowners more directly, it is also plausible that voters are more aware of the impact of this type of limit than those, such as a general or specific property tax limit, that operate through budget mechanisms more removed from the voter. This would especially be the case in states with large increases in real estate values.

A variety of demographic and economic factors are found to influence states' decisions on lotteries. The positive coefficient on per capita income indicates that wealthier states are more likely to pass a lottery, perhaps because lotteries in these states are more likely to reduce the tax burden of the median voter. This is consistent with research

TABLE 4: Regression Statistics

<i>Sample Period</i>	<i>1970-1992</i>	<i>1970-1985</i>	<i>1970-1989</i>	<i>1975-1992</i>
Tax and expenditure limit (TEL) variables				
State level	0.62 (0.73)	0.13 (1.05)	0.68 (0.75)	1.74* (0.93)
Specific property tax rate	-0.16 (0.58)	0.70 (0.81)	-0.12 (0.60)	0.19 (0.87)
Overall property tax	-0.48 (0.81)	0.27 (0.95)	-0.11 (0.82)	-2.49 (1.52)
Property tax revenue	0.79 (0.51)	0.83 (0.79)	0.99 (0.59)	1.72** (0.87)
Assessment increase	1.65* (0.99)	2.21* (1.24)	1.89* (1.03)	2.51 (1.55)
General revenue/ expenditure	-0.84 (0.85)	-0.58 (1.41)	-1.40 (0.95)	0.72 (1.20)
Full disclosure	0.18 (0.65)	-1.14 (1.52)	0.11 (0.75)	-0.77 (1.00)
Economic variables				
Unemployment rate	0.35 (0.19)	0.29 (0.26)	0.15 (0.22)	0.62 (0.34)
Income per capita	1.00** (0.43)	0.49 (0.55)	0.83** (0.46)	1.15** (0.75)
Distribution of income	-0.03 (0.06)	-0.03 (0.08)	-0.04 (0.06)	0.05 (0.08)
Short-term debt per capita	-1.51 (0.98)	5.54 (5.95)	5.75 (5.46)	-2.81* (1.43)
Long-term debt per capita	0.13 (0.36)	0.31 (0.50)	0.18 (0.39)	-1.09* (0.6)
Deficit dummy	0.25 (0.79)	-0.02 (1.01)	0.37 (0.88)	-0.10 (2.00)
Lagged deficit dummy	-0.06 (0.79)	-0.31 (0.99)	-0.15 (0.83)	-1.31 (1.73)
Tax capacity	-0.08* (0.04)	-0.05 (0.04)	-0.06* (0.04)	-0.13* (0.07)
Political variables				
Line-item veto	1.45 (0.92)	0.52 (1.07)	1.48 (0.90)	4.04* (2.11)
Split-party government	0.42 (0.49)	1.15 (0.73)	0.54 (0.53)	-0.23 (0.65)
Election year	0.01 (0.64)	0.66 (0.84)	0.21 (0.72)	-0.85 (1.07)
Balanced-budget rule	0.24 (0.69)	-0.10 (0.97)	0.43 (0.73)	-0.34 (1.13)
Democratic governor	0.37 (0.50)	0.33 (0.75)	0.34 (0.53)	-0.66 (0.69)
% of lower house Democrat	-0.05** (0.02)	-0.03 (-0.03)	-0.05** (0.02)	-0.03 (0.04)
Neighboring state has lottery	0.30 (0.56)	1.33* (0.83)	0.62 (0.61)	-3.16** (1.19)
Demographic variables				
% Black	0.01 (0.05)	0.05 (0.07)	-0.02 (0.06)	-0.23** (0.11)
% ≥ 65 years old	0.11 (0.22)	-0.01 (0.39)	0.05 (0.26)	-0.28 (0.31)
% 5-17 years old	-0.05 (0.33)	-0.19 (0.49)	-0.28 (0.42)	-0.19 (0.49)
% Catholic	0.02 (0.03)	0.01 (0.04)	-0.01 (0.03)	0.01 (0.04)
Population	0.04 (0.06)	-0.01 (0.09)	0.03 (0.07)	-0.28** (0.11)
Population density	0.01* (0.00)	0.03 (0.03)	0.01* (0.00)	0.04** (0.01)
Number of new states enacting lotteries	32	20	29	21
Log likelihood	-78.46	-39.80	-70.25	-32.04
P^2 statistic	57.3	50.05	57.93	52.8
Prob > P^2	0.0009	0.0064	0.0007	0.0031

NOTE: Dependent variable = lottery enactment. State included in sample for each year up to and including lottery enactment year.

* $p = .05$. ** $p = .01$.

that suggests that the tax incidence of lotteries is regressive (Brinner and Clotfelter 1975; Clotfelter and Cook 1981)

. Population density also varies positively with lottery passage, an expected result considering that operating costs per capita are lower in cities because of greater ticket sales per outlet. The possible relationship of lotteries and fiscal stress is not supported by the insignificant coefficients on other economic variables related to the fiscal health of the state: short-term debt per capita, long-term debt per capita, and the deficit and lagged deficit dummies.

The state's tax capacity is negatively associated with lottery adoption, implying that states with larger tax bases are more likely to employ more traditional taxes before turning to lotteries. Having more Democrats in the lower state legislative house also is a negative indicator of lotteries, although throughout each of the samples, other political variables have little explanatory power regarding the states' decisions to pass or not pass lotteries.

One factor that, surprisingly, had little explanatory power in the lottery decision is the presence of a neighboring state with a lottery. Previous research has found this to be an important factor either due to a "copy-cat" effect or because nonlottery states grew tired of losing revenues to a neighboring lottery state (Alm, McKee, and Skidmore 1993). The neighboring state effect may become less important as more states choose lotteries and, therefore, as more states are neighbored by states with lotteries.

Subsample Periods

We break the sample into subperiods to examine the robustness of the full sample findings and to examine if different factors have different impacts across subperiods. These period breaks were also chosen because they represent the year in which there was a substantial increase in the number of lotteries that were passed.⁹ In Table 4, we examine the period from 1970 to 1985 in column 2. During these years, 20 states passed lotteries, and we find that limits on local assessment increases continue to be positive predictors of lottery adoption over the period. Tax capacity and income are not significant lottery indicators in this sample. In this sample, having a neighboring state with a

lottery increases the probability of lottery adoption and is significant at the 10% level, but as mentioned previously, this is not robust in later samples.

The 1970 to 1989 sample, which includes the enactment of lotteries for nine additional states from 1986 to 1989, produces similar results to those of the full sample. Again, limits on assessment increases are still the only TEL making an impact on states' lottery decisions. A Democratic assembly is a strong deterrent to lottery passage over these years, as is tax capacity. Population density is also a positive indicator.

Last, we eliminate the earliest years of the sample and compute the likelihood equation for 1975 to 1992. The significance of the limits on assessment increases diminishes (significantly different from zero at the 11% level), although the coefficient is similar. Here, state limits and limits on property tax revenue are significant positive factors for lottery adoption. This is plausible because the first state limit was not passed until 1976, and most limits on property tax revenue were passed after 1974 as well. This suggests that although assessment increase TELs were more influential in early lottery years, these other limits may play a relatively more important role in the later years.

Greater tax capacity remains negatively correlated with lottery passage. This result lends evidence to the notion that lotteries are more attractive to states with fewer tax alternatives. Unlike in the other samples, the coefficients on population and the Black percentage of the population become significant and negative, which might simply reflect the relatively high population and Black population of the early lottery-enacting states. Population density, as in the full sample, is positively and significantly correlated with lottery passage.

We find that long-term debt per capita had a negative impact on lottery adoption in the 1975-1992 sample. This contradicts the intuition that greater quantities of debt, along with the fiscal stress it could create, might create a greater impetus for states to tap into a new revenue source such as lotteries. Finally, there is a negative sign on the dummy for having a neighboring state with a lottery. This piece of evidence contradicts the Alm, McKee, and Skidmore (1993) finding that neighboring states are more likely to pass lotteries and implies that this effect is no longer present in the later years.

Fiscal Stress

The mechanism by which TELs are connected to lottery adoption is important to the interpretation of the results. If fiscal stress is the mechanism by which TELs lead to lotteries, this would lend support to a Leviathan interpretation of lottery enactment, in which voters use TELs to lower their monitoring costs and then require legislators to turn to new revenue sources in times of need. If no link is found between fiscal stress and lotteries, then this may lead us to a conclusion that the (strategic) median voter simply desires to lower his or her tax burden. To proxy for fiscal stress, we use the existence of a budget deficit, short-term debt per capita, and long-term debt per capita. We estimate models with these different measures as the dependent variable and with the different TEL categories on the right-hand side, along with other state-level variables. In these models, we find a link between TELs and fiscal stress. Limits on assessment increases are positively correlated with both budget deficits and greater quantities of long-term per capita debt. Overall property tax limits are surprisingly negatively associated with deficit and debt measures but do not factor into the states' lottery decisions. Other TELs do not have significant effects on measures of fiscal stress. These results confirm the findings of recent TEL researchers (e.g., Rueben 1997; Dye and McGuire 1997) that limits can lead to fiscal stress in states that pass them.

However, we find that fiscal stress has little impact on states' choosing to enact lotteries. None of the debt or deficit measures consistently shows up as a significant indicator, either positive or negative, of lottery passage. This would indicate that lotteries are not necessarily a government-expanding response by legislators in times of need. Rather, lotteries may simply appeal to voters for purposes of tax substitution and shifting, as posited by our strategic median voter model.

SIMULTANEITY AND ROBUSTNESS CHECKS

A lottery may simply be one piece of fiscal restructuring that includes tax and expenditure limits. Although there seems to be more of a theoretical causal link from TELs to lotteries, it is possible that states may simply be substituting a lottery tax base for other previously used tax bases. The econometric concern is that lotteries may allow for

states to introduce limits more easily, and hence there may be some reverse causality between TEL and lottery enactment.

Two tests are conducted to determine the importance of the potential endogeneity bias in affecting previous estimates of the relationship between a TEL and lottery adoption. We first test for the likelihood that lotteries can lead to later passage of a TEL using a survivor model. In this framework, the model includes tests for which factors are important factors in the passage of a TEL. In results not shown, we find that lotteries are negative predictors of a state passing a state-level TEL. However, this would mean that our estimate of the effect of state limits on lottery passage should, if anything, be downwardly biased. This strengthens our finding that state limits have influenced states in their decision to pass lotteries over the 1975-1992 period. Limits on assessment increases, which are a significant factor in the empirical model, do not exhibit any signs of reverse causality regarding lotteries.

A second test assumes that passage of a TEL is endogenous with respect to the passage of a lottery. Here, we use an instrumental variables technique to predict the passage of a TEL and its influence on lottery adoption. Following Rueben (1997), we use whether a state has a referendum as an instrument for the passage of a TEL. In these specifications, a single TEL rather than all six types of TELs is evaluated in each model. Although the results are slightly stronger, the instrumental variables results are consistent with those described in Table 4.

We conduct two other robustness checks. First, we interact the assessment limit dummy with the number of years it has been in effect to test if the effect of assessment increase limits on lottery passage changes with the age of the limit. The coefficient is insignificantly different from zero, indicating that there is no perceivable decay in the effects of an assessment TEL on lotteries, nor do the effects of such a limit grow with time. Second, we include a duration variable to account for the effects of state dependence that are independent of heterogeneity among states. In other words, we check to see if states become less likely to pass a lottery the longer they wait, independent of state characteristics. We measure this variable as the number of years since the introduction of the first lottery in the 20th century, which

took place in New Hampshire in 1964. Thus, we interpret the time since 1964 as the period that a nonlottery state is at risk of passing a lottery. We find that the inclusion of this duration term adds nothing to our estimated results, and therefore lottery passage can be explained exclusively by state characteristics.

Both the Alm, McKee, and Skidmore (1993) and Caudill et al. (1995) studies find that having a neighboring lottery-operating state increases the likelihood of a state having a lottery. In contrast, we find no impact on the probability of lottery passage. We conducted a test of the equality of the slopes of the survival functions, which are differentiated by whether a state has a neighboring lottery-operating state. We could not reject the hypothesis that the slopes are equal, which coincides with our survivor model results. There is a difference in the slopes during the early years, but it is not significantly different over the sample. This is likely because of the geographic clustering of early lottery state; from 1970 to 1975, 11 states passed lotteries, all in the Northeast or in the upper Midwest. During the 1980s, lotteries began to spread over the entire country, and the likelihood of having a neighboring state with a lottery increased. Thus, results from Caudill et al. and Alm, McKee, and Skidmore could stem from having fewer later-year observations than our data set.

CONCLUSIONS

Our analysis finds a relationship between the existence of tax and expenditure limits and states' decisions to enact lotteries. From the survival model results, we conclude that the limit on assessment increases is the TEL that shows the strongest positive link to states' decisions to implement lotteries. State TELs and limits on property tax revenue also have had an influence on state lottery adoption, especially in the more recent years of our sample.

Although our empirical tests do not prove the strategic median voter model, the empirical links that we find between TELs and lotteries are nevertheless consistent with such a model. Our finding that fiscal stress does not play a significant role in lottery enactment indicates that lotteries are not simply a short-term fiscal fix in time of need. In-

stead, lotteries serve to substitute for other taxes rather than supplement them in times of revenue shortfalls. Furthermore, because the decision to implement lotteries consistently varies positively with per capita income, this suggests more than lotteries having greater attractiveness in states with greater potential lottery sales. Because lotteries have been found to be regressive revenue instruments (Brinner and Clotfelter 1975; Clotfelter and Cook 1981), it is also possible that the median-income person in wealthier states would desire to shift the tax burden away from himself or herself and onto lottery participants, a mechanism that would be consistent with our strategic median voter model.

Our results differ from selected past studies in that we find no evidence of the importance of a fiscal stress effect in determining whether a state would pass a lottery. Although we do find that TELs may cause fiscal stress, we can find no connection between stress and lottery passage.

We conclude that although most TELs do not provide a definitive causal link to states' lottery adoption policies, there is enough evidence to suggest that some state and local limits have influenced states to legalize lotteries. More broadly, it is likely that TELs and lotteries both have played concurrent and intertwined roles in changing fiscal structure and policy (Mullins and Joyce 1996) and that each has complemented the other as political and fiscal innovations over the past three decades. The combination of limits and lotteries may best be described as methods by which taxpayers are attempting to decentralize the tax process and gain more control over how much and what type of taxes they pay. Further research is needed to test for the relationship between TELs and other alternative revenue instruments to provide a more detailed picture of the changing fiscal structures in state and local finance.

APPENDIX

The regression equation and table of means include the following state-level variables (sources in parentheses):

unemployment rate (U.S. Bureau of Labor Statistics, *Geographic Profile of Employment and Unemployment*, various years),
 tax capacity index (Advisory Commission on Intergovernmental Relations 1995),
 income per capita (U.S. Bureau of the Census, *Current Population Survey*, various years),
 income distribution in the state (U.S. Bureau of the Census, *Current Population Survey*, various years),
 per capita long-term debt (U.S. Bureau of the Census, *State Government Finances*, various years),
 dummies for concurrent year and lagged deficit (National Association of State Budget Officers, *State Expenditure Report*, various years),
 line-item veto dummy (U.S. Department of Commerce, *Statistical Abstract of the United States*, various years),
 split-party government dummy, with the governor and the legislative majority being from different parties (U.S. Department of Commerce, *Statistical Abstract of the United States*, various years),
 balanced-budget rule dummy (National Association of State Budget Officers, *State Expenditure Report*, various years),
 neighboring lottery state dummy (La Fleur and La Fleur 1995),
 percentage Catholic population (U.S. Department of Commerce, *Statistical Abstract of the United States*, various years),
 population density (U.S. Department of Commerce, *Statistical Abstract of the United States*, various years),
 percentage Black population (U.S. Bureau of the Census, *Current Population Reports*, series P25-1111, various years),
 percentage of population aged 65 or older (U.S. Bureau of the Census, *Current Population Reports*, series P25-1111, various years),
 percentage of population ages 5 to 17 (U.S. Bureau of the Census, *Current Population Reports*, series P25-1111, various years),
 percentage of Democrats in lower house of state legislature (Council of State Governments, *The Book of the States*),
 Democratic governor dummy (U.S. Department of Commerce, *Statistical Abstract of the United States*, various years), and
 gubernatorial election year dummy (U.S. Department of Commerce, *Statistical Abstract of the United States*, various years).

NOTES

1. For the purposes of our analysis, we eliminate all tax and expenditure limits (TEs) enacted before World War II from our data set.

2. Anecdotal evidence suggests that voters are often dissatisfied with the legislative body as a whole, but they continue to reelect their own representatives (Chari, Jones, and Marimon 1997). This dichotomy could give rise to the passage of laws (e.g., TEs and term limits) that are intended to tame the overall Leviathan as well as lower the monitoring costs of the public.

3. We tested for the importance of the earmarking of funds and found none. This result is analogous to the finding by Glickman (1998), who found no impact on education spending when states earmarked lottery spending for education.

4. We use a budgetary externality in the sense that Chari, Jones, and Marimon (1997) have developed in Assumption 3 of their model. Because the residents of one particular district in a state do not pay for the full cost of the public good provision in that district, overall spending in the state becomes too high.

5. This assumes that we represent voter preferences by income, with the median-income voter playing the lottery infrequently enough such that his or her overall tax share falls after the introduction of the lottery.

6. Gerber (1991) has done research in California showing that different legislative processes can yield different outcomes for the same distribution of preferences over an electorate. Because of the need to compare across states, we do not distinguish lottery passages by legislative process. However, we run sensitivity tests showing that having a referendum process in the state does not affect the state's likelihood of enacting a lottery.

7. From 1964 to 1969, only New Hampshire and New York enacted lotteries. These were not included because data were not available for some of the variables used in the analysis.

8. This has been hypothesized in the literature for two reasons. First, Catholic churches use bingo and such games as a form of fund-raising. Second, a larger percentage of Catholics in a state may signal lower percentages of members in fundamentalist religions, whose members would presumably oppose all forms of legalized gambling.

9. We also tested the year before the increase in the number of lotteries nationwide, but results were robust across the choice of cutoff dates. Results are available upon request.

REFERENCES

- Advisory Commission on Intergovernmental Relations. 1995. *Tax and expenditure limits on local governments*. Volume M-194. Washington, DC: Advisory Commission on Intergovernmental Relations.
- Alm, James, Michael McKee, and Mark Skidmore. 1993. Fiscal pressure, tax competition, and the introduction of state lotteries. *National Tax Journal* 46:463-76.
- Baumol, William J. 1967. Macroeconomics of unbalanced growth: The anatomy of urban crises. *American Economic Review* 57:415-26.
- Berry, Frances S., and William D. Berry. 1990. State lottery adoptions as policy innovations: An event history analysis. *American Political Science Review* 84 (2): 395-415.
- Brinner, Roger E., and Charles T. Clotfelter. 1975. An economic appraisal of state lotteries. *National Tax Journal* 28 (4): 395-404.

- Buchanan, James, M. 1980. Procedural and quantitative constitutional constraints on fiscal authority. In *The Constitution and the budget*, edited by W. S. Morre and Rudolph G. Penner. Washington, DC: American Enterprise Institute.
- Caudill, Steven B., Jon M. Ford, Franklin G. Mixon Jr., and Ter Chao Peng. 1995. A discrete-time hazard model of lottery adoption. *Applied Economics* 27:555-61.
- Chari, V. V., Larry E. Jones, and Ramon Marimon. 1997. The economics of split-ticket voting in representative democracies. *American Economic Review* 87 (5): 957-76.
- Citrin, Jack, and D. P. Green. 1985. Policy and opinion in California after Proposition 13. *National Tax Journal* 38 (1): 15-35.
- Clotfelter, Charles T., and Philip J. Cook. 1981. Implicit taxation in lottery finance. *National Tax Journal* 40 (4): 533-46.
- Courant, Paul N., Edward M. Gramlich, and Daniel L. Rubinfeld. 1981. Why voters support tax limitation amendments: The Michigan case. *National Tax Journal* 33 (1): 1-20.
- Dye, Richard F., and Therese J. McGuire. 1997. The effect of property tax limitation measures on local government fiscal behavior. *Journal of Public Economics* 66:469-87.
- Figlio, D. N., and A. O'Sullivan. 2001. The local response to tax limitation measures: Do local governments manipulate voters to increase revenues? *Journal of Law and Economics* 44:233-57.
- Filer, John E., Donald L. Moak, and Barry Uze. 1988. Why some states adopt lotteries and others don't. *Public Finance Quarterly* 16 (3): 259-83.
- Gerber, Elisabeth R. 1991. Legislative politics and the direct ballot: Comparing Policy Outcomes Across Institutional Arrangements. Ph.D. diss., University of California, Berkeley.
- Glickman, Mark. 1998. Public finance and political economy issues in state lotteries. Ph.D. diss., University of California, Berkeley.
- Joyce, Philip G., and Daniel R. Mullins. 1991. The changing fiscal structure of the state and local public sector: The impact of tax and expenditure limitations. *Public Administration Review* 51 (3): 240-53.
- La Fleur, Teresa, and Bruce La Fleur. 1995. *La Fleur's '95 world lottery almanac*. Boyds, MD: TLF Publications, Inc.
- Ladd, Helen. 1978. An economic evaluation of state limitations on local taxing and spending powers. *National Tax Journal* 31 (1): 1-18.
- Ladd, Helen, and Julie B. Wilson. 1982. Why voter support tax limitations: Evidence from Massachusetts' Proposition two 1/2. *National Tax Journal* 35 (2): 121-47.
- Lowery, David. 1983. Limitations on taxing and spending powers: An assessment of their effectiveness. *Social Science Quarterly* 64 (2): 247-63.
- Mullins, Daniel R., and Philip G. Joyce. 1996. Tax and expenditure limitation and state and local fiscal structure: An empirical assessment. *Public Budgeting & Finance* 16 (1): 75-101.
- O'Sullivan, Arthur, Terri Sexton, and Steven Sheffrin. 1995. *Property taxes and tax revolts*. Cambridge, UK: Cambridge University Press.
- Poterba, James M., and Kim S. Rueben. 1995. The effect of property-tax limits on wages and employment in the local public sector. *American Economic Review* 85 (2): 384-89.
- Rueben, Kim S. 1997. The effect of tax and expenditure limits on state and local governments. Ph.D. diss., MIT.
- Winn, Beth M., and Marcia L. Whicker. 1990. Indicators of state lottery adoptions. *Policy Studies Journal* 18 (2): 293-304.

Mark M. Glickman is an economist in the Education, Workforce, and Income Security division at the U.S. General Accounting Office (GAO) in San Francisco. His current work focuses on retirement income and pension reform, and he has coauthored several GAO reports and testimonies in the area. His previous work has covered areas in environmental economics, energy, and lottery taxation. He received his Ph.D. in economics from the University of California at Berkeley in 1998.

Gary D. Painter is an associate professor in the School of Policy, Planning, and Development at the University of Southern California. His research interests focus on education, housing, and urban economics. His most recent work has been on the determinants of homeownership among racial and ethnic minorities. He has published articles in journals such as the Review of Economics and Statistics, Journal of Urban Economics, Journal of Housing Economics, Journal of Real Estate Finance and Economics, Journal of Human Resources, and Industrial Relations.