The Political Economy of Taxes and the Vote

(version 1.1)

Brian G. Stults (Brian.Geoffrey.Stults.02@Alum.Dartmouth.ORG)

Richard F. Winters

(rfw@dartmouth.edu)

Dartmouth College

Abstract: Taxes are raised frequently enough in the American states so that increasing confidence should be vested in an answer to the query of when and under what conditions do gubernatorial candidates face electoral retribution for taxes that increased during their term of office? Our research pools exit poll data from forty-three states over eight years' worth of gubernatorial elections; our "Ns," therefore, are 116 elections with about 65,000 to 125,000 voters as respondents. This permits the addition of "fixed effects," or separate intercepts, for each state and for each election year. The result is that time-invariant, statewide factors are factored out, as are factors that are related to each electoral period. By pooling crosssectional data and adding key state- and time-controls, we reduce the probability of omitted variable bias, thereby obtaining superior estimates of the "true" effect of tax hikes on the vote for governor. Our model also contains a comprehensive set of control variables and a rich set of "contextual conditions" that allow for a better answers to more complex queries of when and under what conditions taxes electorally impact. At the individual level, we find strong negative effects of changes in the sales tax on vote choice, but no impact of income tax changes. Some other non-obvious findings of the paper include: nonincumbent candidates of the "taxing party" are more vulnerable than incumbents; voter retribution varies by party, tax, and incumbency; voter characteristics such as higher incomes or more years of education interact nonobviously with tax changes and the vote; party of voter seems not to enhance punitive behavior, and, finally, given our measure of the "fiscal health" of states, voters are more likely to punish "taxers" in economically hard times.

Prepared for presentation at the 2nd annual Conference on State Politics and Policy, University of Wisconsin, Milwaukee, May 26-27, 2002. An earlier version of this paper was presented at the annual meeting of the Midwest Political Science Association, Chicago, Illinois, April 25-28, 2002.

The Political Economy of Taxes and the Vote

Brian Stults and Richard F. Winters

I. Introduction:

Taxes are raised frequently enough in the American states so that increasing confidence should be vested in an answer to the query: when and under what conditions do gubernatorial candidates face electoral retribution for taxes that increased during the prior term of office? Over the past two decades, answers to this question have differed. Early and preliminary evidence based on imperfect, highly-aggregated measures of revenue changes suggested that the relationship was weak at best (e.g., Pomper 1968 and 1976, Hansen 1983). Better measures of changes in the actual taxes also suggested weak retribution (Eismeier 1983). Further elaboration of innovations and changes in legislation across taxes across time also indicated variable impact by type of tax and weak overall impact (Kone and Winters 1993). Niemi and colleagues (1995) argued that the impact of changed tax rates on individual voters as assessed in some thirty-five gubernatorial exit-polled elections in 1986 was significant. However, the net effect on the individual voter was quite small and the individual effects found in such a single election analysis could be substantially biased.¹

Our research pools exit poll data from forty-three states over eight years' worth of gubernatorial elections.² This permits the addition of "fixed effects," or separate intercepts, for each state and for each election year. The result is that time-invariant, statewide factors are factored out, as are factors that are related to each electoral period. Finally, compared to previous efforts, our model contains a more comprehensive set of control variables and a rich set of "contextual conditions" that allow for a better set of answers to a more complex queries of when and under what conditions do taxes electorally impact. By pooling cross-sectional data and adding key controls, we reduce the probability of omitted variable bias, thereby obtaining superior estimates of the "true" effect of tax hikes on the vote for governor.

Contextual analysis: We argue, along with others (e.g., Books and Prysby 1992, Conway 1989; Brace and Jewett 1995; Stonecash 1996) that the political context may be a key determinant of individual vote choice and election outcomes, yet many empirical studies fail to place the major results – typically couched as regression coefficients – within relevant contexts. Put more precisely, analysts ordinarily fail to examine context-specific effects within the regression

¹ Cross-sectional analysis of voters in a single election such as Niemi's and colleagues' (1995) are bawed on a cross-section of the political climate, and the resulting coefficients can be badly biased. Within a single time-period, it is impossible to distinguish what part of the vote can be explained by the tax increase from what part of the vote can be explained by other, unobserved state characteristics. Adding controls for political and economic variables help solve this problem, but ultimately there is always the criticism that omitted variable bias remains.

² Our three-way n then is of 127 elections and 126,000 voters in 43 states. We exclude Hawaii and Alaska because Voter News Service does not canvas their exiting voters, and we exclude the off-year elections in New Jersey, Virginia, Kentucky, Louisiana, and Mississippi.

framework by employing interactions between the independent variable of interest and other explanatory-contextual variables in the model. Powerful examples of hypothetical contextual effects arise at the aggregate level, e.g. the variable impact of electoral timing on voter retribution (recent tax hikes will be more severely punished at the polls), or at the individual level (e.g. high income voters are more sensitive to changes in the income tax). Many authors have discussed the role of context in the politics of taxation (e.g., Hansen 1983; Winters 1996), but these discussions were rarely accompanied by direct empirical investigation.³ The implication, then, is that the gubernatorial tax-vote relationship should be reexamined using an empirical model designed to ascertain whether the tax-vote relationship is conditional on the political and economic environment as well as on the characteristics of the voting population. To do so requires a data set that merges measures of individual-level voting behavior (that is to say, voters), and that also vary across electoral-setting contexts (states) and time (campaigns from 1990 to 1998).

Endogeneity issues: There is an additional *fundamental* problem associated with determining the effect of tax hikes on the vote -- that of endogeneity.⁴ Governors are interested in furthering their political careers and attaining reelection (if running) or helping to shape the electoral fate of their party's candidate -- his/her successor -- for office. As a result, governors' decisions on whether to raise taxes are related to the projected vote share in the upcoming election. If tax changes have the potential to dash or even render highly uncertain incumbents' hopes for reelection, then governors will likely seek alternative, non-tax solutions to their need for revenue, i.e. borrowing, cutting spending, and so on. This is especially true as the prospects for electoral victory shrink. If so, then the effect obtained from a basic linear regression will be biased: it will only take into account the effect *when a tax change is observed*. But the data on tax changes is severely truncated in electorally problematic/competitive conditions, precisely the most interesting situations of all. The effect of tax changes occurred exogenously, as if it were essentially unrelated to electoral consequences.⁵

The ordinary and usual solution to this problem, the "instrumental variables" approach (hereafter, IV) typically used to cope with endogeneity will not work in this situation because, we believe, no suitable instrument is readily available. However, putting regression results in context through interaction effects via a contextual-variables approach, as we will describe more fully shortly, offers a second-best alternative to IV estimation. Theory suggests what groups of governors might have the most to fear from raising taxes and, as such, would engage in the most strategic behavior. In an indirect way, the use of interactions permits the model to map out those situations that are characterized by a relatively high degree of endogeneity and thus to separate

³ We exclude Tom Carsey's excellent analysis of gubernatorial campaign dynamics (2000) from this generalization

⁴ Kone and Winters (1993, 25) discuss in passing how gubernatorial expectations about winning or losing likely affect their taxing plans.

⁵ This might even lead to the observation that tax increases will lead to gubernatorial success at the polls. In fact, the dynamic is that those who knew they were going to be successful in getting re-elected are also those who can pass new taxes -- precisely the opposite hypothesized.

out those situations in which endogeneity is most likely to plague the model from those situations in which it is least likely to be an issue.

Political economy of the vote: Finally, our argument provides insights and evidence on a seemingly unrelated question. Since Gerald Kramer authored his seminal work (1971) relating national economic conditions to the outcomes of congressional contests, there has been a heated debate regarding the role of the government and economy in shaping electoral outcomes. Many time-series aggregate models that examined vote share found electoral effects variously due to inflation, real income growth, and unemployment (Kramer 1971, Bloom and Price 1975, Tufte 1975). Others using individual-level survey and cross-sectional data found weak effects of respondents' evaluations of the change in their personal financial situation on their vote (Fiorina 1978, 1981b; Wides 1976, 1979; Klorman 1978). This conflict in results between macro and micro models of congressional voting presents a curious puzzle explored by many (Erikson 1990a, b; Monroe 1978, 1981; Golden and Poterba 1980; Stambough and Thorson 1999; Weatherford 1983b; Hibbing and Alford 1981; Gough 1984; Radcliff 1988; Teixiera 1998). At least four rival explanations occur to us for the inconsistency between aggregate and individual-level models stand out to us in the literature.

1) Kramer initially conjectured (1983) that at any particular time, economic conditions, such as the *national* high unemployment rate, are traits that are the same for *all* voters, thus any change in an individual's personal financial situation results from "politically irrelevant" factors and cannot be attributed to government action. Absent within-year variation, the coefficient representing the effect of economic change on the vote cannot be identified. While crosssections can be and have been pooled in an effort to solve this problem (e.g., Markus 1988), omitted variable bias almost certainly results from the inability to account for all intertemporal factors that affect the vote. Indeed, pooling cross-sections in this manner permits situations in which the model attributes to the economy all of the effects of factors that vary with time but not within a cross-section and for which the model did not control.⁶ By contrast, in our study at any point in time, some states will change their tax structure while others will not, thereby introducing within-year variation. In addition, pooling observations from respondents from several states across years allows for the introduction of fixed effects for each state and time period. A fixed-effects model reduces the dangers of omitted variable bias.

2) Subsequent analyses and models of economic voting claimed to correct for implicit and flawed assumptions regarding the psychology of voting. One group of scholars posited that when deciding how to vote, citizens actually use prospective considerations rather than simply casting naïve, retrospective ballots (Kuklinski and West 1981; Chappell 1983; Lewis-Beck 1988; Lockerbie 1991; Bratton 1994; MacKuen et al. 1992, 1996). In our case, gubernatorial contests afford researchers an easy way to test for retrospective voting. If, after controlling for changes in

⁶ If, as in Markus (1988) the measure of the national economy is the only variable in the model that varies with time but not within each cross-section, then the entire omitted variable bias will be built into the coefficient on the economy, albeit adding more cross-sectionally-invariant variables would decrease the bias on the coefficient on the economy.

national and state economic conditions,⁷ individuals are shown to punish incumbents for tax rate hikes, then there is a strong, presumptive argument to be made in favor of retrospective behavior. There is, after all, little doubt that a tax hike implies, in Kramer's terms, a government-induced change in personal income.⁸

3) Another influential challenge to traditional assumptions regarding voter psychology is the argument that citizens vote based upon the condition of the national economy, or "sociotropically," rather than on their own pocketbooks (Kinder and Kiewiet 1979, 1981). Here again, state contests and the tax issue can provide important insights. Because tax increases are often visible and may come to dominate the public agenda, some citizens will likely vote on the issue. Some citizens may not even care about the effects of the tax on their pocketbooks; they may choose to vote on the issue for symbolic reasons, or because they believe the tax hike to be an omen of bad times or evidence of a rent-seeking governor. However, taxes *do* have direct and proximate effects upon the personal income of the population of the state, and the magnitude of these effects depends upon the incidence of the tax. Determining whether the likely incidence or burdens of the relative strengths of pocketbook and sociotropic considerations. An indirect tests assesses the impact of increases in the sales tax mobilize lower income voters vs. the impact of increasing income taxes on high income voters.

4) Finally, politicians and political parties strategically analyze the state of the economy and the political climate before deciding whether to mobilize resources so as to pose a challenge to the incumbent (Jacobson and Kernell 1983). The case of state taxation is not especially more informative on this issue than is the Congressional-level research, but there are nevertheless some ways to consider whether politicians evaluate the political environment before deciding to oppose a sitting governor. In particular, examining the "quality," or experience ratings of challengers provides an important tool in this regard. If higher quality challengers emerge in elections following tax increases, this would suggest that the parties put forth their best candidates when they perceive they have a good chance to exploit an incumbent's record in office. The influence of "quality of candidacy" on races may, in fact, be greater on executive-level races vs. legislative races.

⁷ It is the nature of economic conditions that researchers have cited as evidence of prospective voting.

⁸ Some might argue that even this conclusion is premature. This rival view suggests that voters may be acting as if they were employing Bayesian probabilities: allowing a tax increase by politicians in the past period will lead to a higher estimated probability of tax hikes in the next period. Unlike the research regarding the effect of the condition of the economy with respect to prospective and retrospective considerations, however, such a distinction on the tax issue would be largely, though not wholly a semantic one. If a voter does not want to see a tax increase at time t + 1 and casts his or her ballot accordingly, then he or she probably was not happy with a tax increase at time t - 1 either (although there may be threshold effects for some fraction of voters, e.g. government can be this large for these purposes (at time t), but no larger (at t + 1). This logic is not only intuitive, but it also does not imply that voters are quite as cognizant and sophisticated as the Bayesian model requires.

In summary, our examination of the relationship between tax increases and the vote for governor yields previously unrealized insights into voting. Careful analysis of gubernatorial contests may help explain the discrepancy between macro and micro models of voting; our study may clarify conditions for retrospective judgments on governments' impacts on personal income and may alternatively assess the impact of varying candidate traits on conditions for electability. Scholars have long recognized that the American states are a "laboratory" for testing hypotheses regarding political behavior (Brandeis 1932, Alvarez 1997). Because the fifty units of analysis have so many similarities in political structure, culture, and population, their variation in areas such as institutional characteristics yield a framework much like a "natural experiment" that is conducive for the exploration of causal relationships (Plotnick and Winters 1986). This framework allows us to explore the competing theories used to explain the still-remaining puzzling boundary between models of aggregate and individual-level voting.

Our paper is organized as follows. Section II reviews the literature on the impact of taxation issues and the nature of the economy of gubernatorial vote outcomes. Section III reviews the likely determinants of when and under what conditions governors are likely to propose and get taxes changed. These conditions generate the problem of "endogeneity," because proposing new taxes and getting them enacted must surely be related to the prospects of electoral victory, *a priori*. The endogeneity issue is described in Section IV, and our "second best" solution to it is proposed. Section V proposes a contextually-rich, across-state, across-time model of voter retribution for tax changes. Section VI describes our data and the operationalization of the model. Section VII describes a number of measurement and econometric issues in the study. Section VIII describes the results of the models' tests. We conclude in Section IX.

II. Assessing the impact of state taxation on gubernatorial voters:

While conventional wisdom among journalists and politicians is that tax increases can make or break a governor's reelection bid, scholars conclude with more mixed findings; there appears to be retribution, it probably varies by tax and the consequences are weaker than expected. The general wisdom is too broad in our estimation because it is simply not clear when and under what conditions voters find it wise to vote against a "taxer." Nevertheless, conventional wisdom is "more right" than is recognized, because taxes are likely to be increased only under favorable political conditions. Conventional wisdom rightly scares away weak governors from even the effort of taxing. The procedure that we adopt allows us to more finely estimate the impact of a tax change on the vote conditional on a number of factors. In linear regressions, these conditional probabilities are obtained simply through the use of interaction terms involving the tax and the contextual variable of interest.

Some of these contextual factors are specific to the voter, i.e. education, which may affect the amount and cost of being informed, or income, which may alert the voter to changes in taxes that fall on her. Other contextual factors are election-specific, including whether the incumbent is running for reelection and the party of the incumbent. Many studies (Kone and Winters 1990; Niemi et al. 1995) have implicitly assumed that the effects of the tax-vote relationship are symmetrical for both parties and/or that nominees for the governorship bear the burden for a tax increase just as much as the incumbent would if he or she sought reelection. Many researchers

have noted that times of poor fiscal health force states to raise taxes to maintain balanced budgets. Interaction terms make it possible to ascertain, after controlling for the health of the economy, whether poor economic health makes tax increases more or less palatable and whether Republicans or Democrats are more severely punished for changed taxes. However, the impact of taxation and context on the vote likely occurs within the bounds of an already largely agreedupon set of determinants of the vote.

At the aggregate level, researchers have shown that national effects dominate gubernatorial contests. Peltzman (1987) used aggregate totals for the 269 postwar elections and concluded that state economic factors were relatively unimportant; he determined that voters respond to national economic conditions. Later studies (Kenney 1983; Holbrook (1987) confirmed that national economic factors are more important than state-level economic conditions. Chubb (1988) demonstrated that aggregate election outcomes for governors are affected by state economic conditions, but national forces – and particularly evaluations of the president's handling of the economy – are more important. He noted, "If gubernatorial elections turn on economic performance, it is generally the performance of the president in managing the national economy that really matters" (149).

At the individual level, Svoboda (1995) turned to exit poll data from 1982 and 1986 and found that voters' evaluations of the state economy proved to be significant factors affecting choice. He argues that the strong national-level findings resulted from the use of aggregate economic indicators rather than respondents' perceptions. Stein (1990), also using 1982 exit polls, demonstrated that responsibility for economic conditions is assigned to the president, and not to the governor, and that the effects are concentrated on incumbents of the president's party -- Republicans in Stein's case. However, personal financial situation was found to affect gubernatorial voting, regardless of the incumbent's partisan affiliation. Further, Stein claimed that voters "recognize that incumbent Republican governors are no more responsible for their state's economic conditions than their Democratic counterparts, but choose to send a message to the incumbent president's party concerning their satisfaction (dissatisfaction) with the president's and his party's economic policies" (51).

Hansen (1999) used time-series poll data from eight states from 1967-1997 and found that high unemployment resulted in higher disapproval of the governor's job approval ratings, but consistent with the asymmetric effects literature, lower unemployment did not seem to be rewarded. Howell and Vanderleeuw (1990) used individual-level data and also found a strong connection between individuals' state economic perceptions and evaluations of the governor.

Atkeson and Partin (1995) examined gubernatorial and senatorial elections for the years 1986 and 1990 and found that the electoral success of senators depends on the success of the president, following a national referendum hypothesis, while the success of governors depended on perceptions of state economic conditions, but not personal economic circumstances. With an incumbent Republican president, they claimed that Republican governors were punished more sharply (following Chubb 1988; Stein 1990). Interestingly, only incumbents are held responsible; those states without an incumbent governor running do not exhibit any effects.⁹

⁹ But note the methodological critiques of Carsey and Wright (1998a, b).

Governors may be punished by political context. Besley and Case (1995b) found that voter accountability is stronger for unified government. Republican candidates lose votes if their party is held responsible for increases in the size of the budget, but Democratic candidates do not. This matches the finding that voters have party-specific expectations that Democrats will raise and spend more than Republicans (Baumer and Gold 1995). MacDonald and Sigelman (1999) found that a governor is held responsible for tax increases and the health of the state economy only in an election year. Poterba (1992) found that voters penalize governors for spending growth, especially when it is used for redistributive purposes or occurs in an election year.

Because a critical aspects of the governor's job is to deal with taxes, a great deal of scholarly research has been devoted to ascertaining whether electoral retribution exists with regard to this issue separate from that which results from changes in economic conditions. Harris (1960), using poll data on the 1960 elections for governor, found that governors were "getting the daylights knocked out of them for simply trying to make ends meet." Cowart (1973) also argued that the governor has "borne the stigma of increased tax rates" (842). Pomper (1968, 1976) concluded that contrary to expectations from a model of electoral retribution, those governors who increase taxes are not significantly hurt at the polls. He noted, "Governors who lead in increasing taxes do not suffer at the polls significantly. Conversely, governors who are cautious in their revenue programs in fear of a 'tax revolt' are not particularly rewarded for their restraint" (133-134). However, Pomper observed that governors performed better if they taxed and spent earlier in their terms rather than later. Interestingly, Pomper also found that in more competitive states, voters were more likely to support tax increases and larger spending. Low-income states were seen as more amenable to tax hikes while high-income states were found to be more receptive to spending hikes.

Like Pomper's study, however, much of the early research on state taxation was descriptive and primarily bivariate in nature (Penniman 1976; Bingham et al. 1978; Hansen 1983). Eismeier (1983) analyzed elections from 1950 to 1980 and concluded that there are electoral risks associated with higher taxes, but these risks were not determined to be "overwhelming" (379). He further concluded that for the most part, governors who raise taxes also do not lose their party's nomination in their reelection bid.¹⁰ Similarly, Hansen (1983, 177) found that among survey respondents in 1980, 15% surveyed mentioned taxes as a criterion in their voting decisions; moreover, 31 percent of new sales taxes and 22 percent of new income taxes were followed by the defeat of the incumbent or the candidate of his or her party. However, Hansen concluded that while there is "some risk . . . involved in passing broad-based taxes . . . the imposition of [such] taxes does not constitute political suicide" (166).

Other studies have suggested that raising taxes does invite political suicide. In 1965, Ranney speculated that incumbent governors bore a liability: "...when the voters wish to express their annoyance with high taxes or inadequate services, the governor is the natural target" (91). Turett

¹⁰ In contrast to previous research, Eismeier chose to code his variable for taxation according to whether taxes were legislatively raised as opposed to the change in revenue collected. This technique more accurately taps into that for which the government can reasonably be held accountable.

(1971), noting that roughly two-thirds of incumbents have a decrease in their margin of victory upon seeking reelection, explained that increased public demand for services creates a double-edged sword for governors: they are expected to do more but also penalized for increasing taxes. Beyle (1983, 215) suggested that taxes were a key issue in terms of the defeat of 30 percent of incumbent governors in the 1950s and 20 percent in the 1970s. Ultimately, governors were often seen as lighting rods for dissent on important state issues (Tidmarch et al. 1984; Kirschten 1990).

Sabato (1983) noted that even though state legislators have passed the taxes, it is the governor who "accepted public responsibility for the actions" (108). Particularly in the 1960s, Sabato explained, several excellent governors were doomed by the tax issue. Sabato also noted that taxes followed regional patterns, being important in particular geographic locations (119). Further, governors can also face opposition to the addition of benefits, as doing so can make their states into "welfare magnets" (Peterson and Rom 1990, 29). Recent research reports (Jewell and Morehouse 2000) suggest that taxes are often listed as a major issue in gubernatorial contests (187), especially when the incumbent had promised not to raise taxes.

Still others have argued that whether the tax issue affects gubernatorial elections is conditional on a variety of factors. Sanders (1988) argued that the existing research is too simple: the public is not only interested in more benefits paid with less taxes, but rather may have more complex preferences. Further, some early research suggested that it was changes in tax rates that are more likely to be perceived by taxpayers than are nonlegislated increases in tax burdens (e.g., Buchanan 1968; Oates 1975; Wagner 1976). Jewell and Morehouse (2000) noted that in open races, non-incumbents are not usually held responsible for past events, thereby indicating correct attribution of functional responsibility (191). Finally, the issue of demographic groups may also be important. Some studies have also found that the elderly consistently push for greater services (and thus taxes) while younger groups want exactly the opposite (MacManus 1995, but c.f. Rhodebeck 1993).

Jewell and Morehouse (2000) argued that the most important factor determining the electoral fate of a governor raising taxes is whether or not the incumbent can defend the tax hike – "to prove that it was necessary, to show what was accomplished with the new revenue, and to mobilize interest groups' support of the governor's taxing and spending programs" (159). Even if the economy was in a downturn, however, whether the voters will accept this justification for a tax increase depends on the skill of the incumbent. They concluded, "Taking such action is not equivalent to signing a political death warrant. Almost four-fifths of governors in the most recent years have been reelected, and many have found it necessary to make some changes in taxes. A governor who is cautious and realistic about the tax changes he or she seeks, who has accomplished a lot in office, who is a skillful politician, and who has learned how to be an effective communicator has a good chance of being reelected" (195).

Carsey (2000) has argued that the 1993 campaign in New Jersey hinged on the tax issue. In particular, it was the combination of the tax and the nature of the campaigns that led to a shift in public opinion very close to the election that gave Whitman the edge. However, Carsey's also notes that early in the election year, before the campaign cycle was in full swing, Whitman had a lead particularly among key independents and moderates. One possible interpretation of the 1993 election was that the tax issue did initially hurt Florio. However, as he attacked "early and

often" while Whitman "ran a stumbling campaign plagued by internal disagreement and a lack of focus," Florio was able to overcome his initial disadvantage. In the end, Whitman was able to re-focus the debate on the tax issue and thereby eke out a victory.

Others have focused on the fact that different taxes may have differing levels of visibility and electoral punishment associated with them. The personal income tax is often seen as the most fair of taxes (Burnori 1998, 191-192), and that the personal income tax is one of the least controversial sources of revenue, especially when measured against other taxes such as the sales and corporate income tax (199). Downs (1960) more even-handed argument is that a progressive income tax will be punished because it places the burden on "well-educated, informed, politically responsive, upper- and middle-class citizens" (Kone and Winters 1993, 28), yet he also notes that the sales tax is opposed by well-organized commercial, retail interests.

The sales tax may have a unique ability to inspire voter ire. Mikesell (1998) noted that "the consumer sees the tax being levied on each purchase and thus is aware of its cost to him or her. The calculation of that cost is not a mystery that is fathomable only to trained tax accountants. The tax can be starkly transparent" (17). In addition, low-income earners have been shown to be resistant to the regressive sales tax (Phares 1980). In modern times, excise taxes may provide a way for governors to raise revenue with less public attention. Consumers are often not even aware of "selective sales taxes" on alcohol, gasoline, and cigarettes (Winters 1996, 335-336) and are more likely to be galvanized by the personal income and sales taxes (339). Jewell and Morehouse (2000) asserted that increases in the gasoline tax are often accepted, especially if those taxes result in improvement of highways (194).

Three articles central to the debate appeared over the past ten years. Kone and Winters (1993) studied the aggregate results from 407 gubernatorial elections from 1957-1985. Introducing controls for national economic well-being, state economic well-being, partisan strength, and electoral and office "tides," they found that enacting brand-new income or sales tax program indeed harmed the incumbent's party in the subsequent election, although this effect was not significant. However, incremental changes in existing sales tax programs were found to have a significant impact. They conclude by noting that there seems to be considerable variation in the results, indicating that some governors can tax and prosper at the polls while others tax and suffer defeat. There are several problems with the study. First, incumbents would likely be held more liable for taxation than his or her successor, it would make sense to run a separate model for incumbents running for re-election. Further, a governor who raises taxes substantially might not run again, resulting in a selection bias problem. Third, Kone and Winters use an aggregate time-series model with the dependent variable being gubernatorial election percentage. If, however, gubernatorial popularity follows a unit root, then first-differencing would be necessary. Finally, their technique of weighting relevant variables by "party-in-power," standard in the research, actually may be a specification error.

Niemi and colleagues (1995) took a different tack by analyzing ABC/*Washington Post* exit polls for 34 gubernatorial elections in 1986. State and national economic factors were found to be significant predictors of the personal vote – including taxation. Indeed, there was punishment associated with each increment of taxation. Additionally, there was some evidence of pocketbook voting. They also address whether the effects depend upon whether or not

incumbent governors seek reelection. They find compelling evidence indicating that bad economic conditions and more tax increases are correlated with governors' decisions not to run for reelection. However, while they do find systematic differences between races with an incumbent and races without, they do not find that these differences affect the magnitude of the effect of taxation on the vote.

This study, however, also suffers serious limits, many of which originate because a single crosssection is employed. They measure change in the national economy not with objective indicators but rather with subjective evaluations by the respondent; they interacted an evaluation of the state of the economy with whether the voter judged the economy to be a "salient" issue. Unlike over-time changes in unemployment or real disposable income, these are subjective questions that are surely influenced by partisan predispositions or already-determined vote choice or other factors, thereby making them poor proxies for economic change. In fact, in a single crosssection, there is no national economic change at all. Making matters worse, the voter's opinions can be influenced by state and local economic conditions and perceptions, even after introducing seemingly appropriate controls (Books and Prysby 1999). Finally, using a single cross-section meant that Niemi et al. could not use state fixed effects because of collinearity with the tax variable. This fact can be used to reconcile some of the discrepancy between their results and others who failed to find effects of taxation on the vote.¹¹

Besley and Case (1995a) are the first to explicitly recognize that the relationship between taxation and vote choice is an endogenous one, determined simultaneously, and that the effects of a tax may differ depending on circumstances. Using various income groups and their respective average tax liabilities, they craft models that control for change in state income, change in state unemployment rate, and change in state debt (although they do *not* include many of the relevant political controls used in previous studies of taxation and voting behavior). They find that an increase in taxes diminishes the probability of voting for an incumbent, but if neighboring states raise taxes at the same time, the effect is offset. To account for possible endogeneity problems, tax effects are instrumented with year effects and demographics (changes in the proportion of elderly and the young), but the original results stood.¹² Predictably, in states with lame duck governors, there is no sensitivity to neighboring states' tax behavior, and because

¹¹ Other problems, we believe, also plague the study. Our analysis reveals a discrepancy in sample size with the results they reported, leading us to believe that missing values for the variables for "liberal or conservative" and "union member" were likely improperly coded as zeroes. Also, they introduce a single variable for "liberal or conservative" when two should have been introduced (their methodology would have to treat a non-respondent either as missing data or group them incorrectly into one of those two categories). Finally, we worry about their coding of the tax variables. Rather than delineating among the various types of taxes, they combine them all and note how many times taxes in general were increased. Because some types of taxes are more frequently raised than other types, and because the extent of electoral retribution will likely depend upon the type of tax being raised, such a system inevitably lumps like and unlike acts.

¹² The lack of political controls creates a potentially serious problem here: demographic instruments might be correlated with the error term in vote choice, making them poor instruments.

one would expect sensitivity among states sharing similar shocks, they find this to be compelling evidence of political calculations on the part of incumbents.

While their attempt to resolve the endogeneity problem is admirable, their success is questionable. Their instruments fundamentally proxy for a tax *when it must be enacted to maintain balanced budgets* and not for when a tax is voluntary. The difference may be thought of a fiscal health in the former situation as opposed to increased services, as a political preference of the incumbent administration, in the latter. Obtaining instruments pertaining to increased services paid for by taxes is a formidable and perhaps impossible task, possibly why Besley and Case did not undertake such a venture. Additionally, it seems suspect to argue that the public has information on tax increases in other states. Bowler and Donovan (1995) show that Tiebout competition is not a necessary prerequisite for citizen information on taxation, suggesting that electoral retribution may arise from tax increases themselves, regardless of what neighboring states do.

III. If taxes "impact," when are governors *likely* to tax?

In any analysis of the politics of changing taxes, information asymmetries exist at the leader and voter levels. Leaders, governors, and their advisers will be uncertain of the impact of a proposed tax change. Public opinion polls (Hansen 1999), elite consultation, party caucusing, media trial balloons, and so on are actions undertaken to diminish uncertainties. Information on electoral consequences is ultimately imperfect, so there is an incentive to choose an option that affords officeholders the opportunity to obfuscate or hedge. This is particularly so because voters, too, are imperfectly informed – perhaps more so than candidates because voters are "rationally ignorant" (Downs 1957). Opportunistic politicians (Brennan and Buchanan 1980; Hansen 1983; Levi 1988) will structure taxes in such a way so as to acquire the greatest impact with the least visibility. In essence, fiscal illusion may characterize the formation of tax policy (Bowler and Donovan 1995).

We assume that governors will attempt to satisfy their personal preferences, the most notable of which is future electoral success. However, state executives generally act as though raising rates represents a serious political risk (Berry and Berry 1992). As such, governors attempt to enact taxes only at times when a "political opportunity" presents itself, represented by either a relatively low level of electoral retribution or a situation in which exogenous factors leave the governor no choice but to raise taxes. The situation is further complicated by the political and economic climate within a state that can affect a governor's ability to pass legislation, including tax increases. In general then, tax rate increases are a likely product of the interaction of three types of factors: a governor's personal preferences, exogenous economic and legal factors, and the political climate. Each of these sets of factors is explained in detail below.

<u>Personal Preferences</u>: Personal preferences are concerns that are idiosyncratic to each particular governor. Chiefly, these factors include his or her reelection concerns, his or her desire to pursue higher office, and the governor's ideology – all of which combine to form a spatial "ideal point" for each governor that can be mapped as a vector in an n-dimensional space. Empirically sorting out these factors is nearly impossible. The relative weights that each governor places on ideology, reelection, and other personal preferences are unknown; they cannot be directly

observed, would be devilishly difficult to measure, even in proxy, and only can, at best, be inferred from gubernatorial actions. However, it is still reasonable to argue that concerns over ideology and future political success are the two dominant personal considerations for any governor considering policy options.

Ideological questions appear relevant to us. Governors may have a preference between tax programs, and in our case, the choice is between changing the sales or income taxes. The incidence or burdens of these two taxes vary by income class, for example, so that we might expect that the likely electoral reactions to the tax choices of a governor by class will be reflected in the chosen tax instrument of change. Individuals who are lower on the socioeconomic ladder devote more resources to consumption and less of their income to savings and investment (Fisher 1988), thus more sensitive to changes in sales taxes. The same logic suggests that higher income citizens should be more likely to oppose an income tax; because these individuals save and invest more and thus are "taxed twice" on their income (first on the actual personal income and second on the interest and dividends). Further, because income tax systems are often graduated into brackets, higher income individuals may also face higher average rates.

Further, tax increases result in resources that "purchase" public goods. Some public goods that are highly valued by some governors, e.g. roads and highways or a balanced budget, may be ideologically different from governors with a taste for redistributive policies. A governor is thus setting both expenditures and revenue collections so as to maximize the chances of winning the next election (Downs 1957, 1960), and several models have been designed to estimate the taxation and spending functions simultaneously (e.g., Merrifield 1991, 2000). Incumbents seek to maximize a weighted sum of expected votes, where those weights are determined by voter characteristics (Hettich and Winer 1988). Collectively, this strategic behavior on the part of incumbents is designed to facilitate the ultimate political objective of reelection.

Winning elections, either one's own reelection, or a future office or increasing the likelihood of the election of the successor of his/her party is a well-established motive (Downs 1957, 1960; Fenno 1966; Mayhew 1974). As a result, whether taxes are created or increased likely depends, perhaps more than anything, on how those taxes will affect a sitting governor's bid for reelection (or his or her quest for higher office). The impacts of taxes on elections are related to the nature of the tax change: a new program or a change in existing rates. Further, voter retribution is likely linked to timing of the tax change. Berry and Berry (1992) found strong support for an election cycle hypothesis for timing of tax changes, particularly in contrast to competing explanations of tax increases. Mikesell (1978) found that minor and less visible taxes, such as excise taxes, are more likely to be used as revenue sources in an election year, which implies that governors believe that increases in the major taxes in these years would be particularly devastating (but, see Hansen 1983). It is probably easier for a governor to engage in "bracket creep"(Davies 1986) than to institute a brand new income or sales tax (Penniman 1976, 431; Kone and Winters 1990). Governors expect that small, incremental rate increases in existing taxes will not carry the same level of electoral retribution as the imposition of new taxes or large rate hikes in existing taxes. On the other hand, having a larger than average number of rate

increases, even if each of those increases were small in magnitude, would make then the incumbent governor becomes vulnerable to charges that he or she is a "taxer" as well.¹³

Exogenous economic and legal factors: The most common explanation for tax increases – and the one with the most empirical support – is that they are enacted in response to economic downturns. The *fiscal health* explanation (Berry and Berry 1992) argues that short-term phenomena, such as fiscal crises, require tax increases to raise the necessary funds to address the problem (Howe and Reeb 1997). The existence of a fiscal crisis, particularly if such a crisis is unrelated to the governor's stewardship of the state's economy, may make it more politically palatable for a sitting governor to raise taxes (Hansen 1983, 150-157). The empirical evidence supporting such a hypothesis is quite strong. Allen and Campbell (1994) found similar evidence, particularly as compared to hypotheses concerning state imperatives, social class strength, and party control. Poterba (1996) examined state taxation and spending for the late 1980s and early 1990s and obtained similar results.

There are directional effects here, which may be asymmetrical: if a state is experiencing great economic growth or *development*, then it may increase taxes, particularly those that are progressive (Berch 1995). The hypothesis posits that as a state's economic well-being increases, taxation will increase as a function of an increased ability to raise revenue through taxes (Barro 1986, 53) Further, development leads to increased demand for public services (Mann 1980; Berry and Lowery 1987) and for public services needed to manage new and changing interdependencies, especially those spawned by urbanization (Berry and Berry 1992). However, during periods of economic expansion the same tax rate will raise more revenues with more services provided without taking the politically risky move of increasing taxes.

Every state except Vermont has some form of *constitutional or statutory balanced budget provisions*. Most states have constitutional constraints and super-majority requirements that govern tax increases (Penniman 1976; ACIR 1987; Crain and Miller 1990; Poterba 1996; Jewell and Morehouse 2000), and some states have formal provisions limiting debt as well (von Hagen 1991). Sixteen states mandate balanced budgets at all three stages in the budgetary process – the governor's budget, the legislature's budget, and the final bill with the governor's approval (Winters 1996, 330). As a result of these formal constraints, raising taxes may be as the only way for a governor to balance the budget by the end of the fiscal year.

<u>The Political Climate:</u> Finally, there is a set of factors that may best be described as the political climate. Predominantly, these factors involve the interaction of political agents. *Unified party government* makes it easier for programs to be enacted because the barriers created by partisanship are eroded. Poterba (1994) found that states with divided governments had more difficulty adjusting to fiscal problems. Alt and Lowry (1994) discovered that divided party

¹³ There is another problem associated with rate increases of the same tax. If the demand for the good or goods being taxed is elastic, the marginal gains in revenue will decline as the rate increases. As a result, when considering policy options, politicians must consider how voters will react to the tax not just politically but economically as well. For example, an income tax might lead workers to work fewer hours during the year because the marginal cost of each hour of leisure is decreased.

control reduces a government's ability to respond to shocks, and that more stringent deficit provisions under unified government translate to faster government reaction, while Hansen (1983) asserted that unified governments are more likely to raise taxes.

Additionally, it may matter *which party* is in control. Gilligan and Matsusaka (1995) found that party control in the states indeed affected expenditures and what is purchased with tax dollars. One theory argues that the more liberal the governing party is, the more likely it is for spending programs to be initiated. Plotnick and Winters (1990) discovered that more liberal states were more likely to have substantial welfare benefits, particularly when the party in control was strong. Berch (1995) maintained that Democratic administrations are more likely to raise taxes. However, Roemer (1999) found that both parties tend to propose progressive income taxes.

Finally, there are considerations of *party strength*, which is distinct from party control. Certainly, whether the government is unified, the percentage of seats held by each party in the legislature, and the quality of the candidates all proxy for party strength, but they do not measure the influence of the state party apparatus on policymaking. At the senatorial level, party influences have proven to be an important determinant in roll call voting (e.g., Rohde 1991; Kiewiet and McCubbins 1991; Cox and McCubbins 1993; Levitt 1996). At the gubernatorial level, Morehouse (1997) also discovered that a strong party system and gubernatorial control of the legislature contributed to greater ease for the governor to pass his agenda.

The overall effect of all of these considerations on the formulation of tax policy is somewhat unclear. On the one hand, a party that is strong and controls the governorship and the legislature bears complete responsibility for any tax increase. There would be a decided advantage in not raising taxes because to do so would give the opposition a clear issue on which to criticize and allocate blame. On the other hand, a great deal of control can give parties and elected officials the strength and political will to push through tax hikes even in the face of massive unpopularity. If the party is sufficiently strong, then a tax hike will not dramatically alter the balance of power in the next election. The tension between both of these seemingly logical explanations may explain why some (e.g., Berry and Berry 1992, 1994) have concluded that party-level explanations of tax policy are relatively weak as compared to other hypotheses.

Collectively, scholars have referred to the litany of explanations for taxation as "political opportunity" hypotheses (Howe and Reeb 1997). Berry and Berry (1992) concluded that governors increase taxes at times when the politicians can shield themselves from the political costs (737). They noted that, "Our multivariate model of tax innovation suggests that even if the adoption of a new tax does not guarantee electoral defeat for a governor, politicians act as if such an adoption will spell defeat" (736, emphasis added). It is a combination of internal and external, political and economic conditions that combine to form such windows.

IV. The endogeneity problem:

One hundred twenty-seven elections were held in the 43 American states that we examined in the electoral period between 1990 and 1998. However, in only 50 of these elections in the sample were the income tax rates and/or sales tax rates raised during the governors' term preceding the

election. Furthermore, a number of states, for example, at the limit those like New Hampshire with neither a sales nor income tax, observed no tax changes at all during the decade.

From an econometric standpoint, this represents a serious and perhaps non-obvious problem that is best illustrated through an example. If a state increased tax rates in some electoral periods but did not do so in others, the observations for all periods for that state could be pooled. A basic regression could then obtain a coefficient on the tax variable that would reflect, on average, the penalty on the incumbent governor in that particular state for increasing taxes relative to keeping the tax rates constant. By contrast, if a state never increased tax rates in any of its electoral periods, pooling those observations across periods would be useless; the tax variable, without variation, would simply drop out of any regression.

Our model pools observations both across states and across time. However, those states that have no variation in the tax variable, *cannot contribute directly to estimation of the tax coefficient*. The simple explanation for this fact is that there would be no way to disentangle the "effect from no tax increases" in the state from the state fixed effect.¹⁴ In essence, the coefficient on the tax variable is really the effect of tax increases on the vote *only for a particular "marginal" group: i.e., voters in those states where a tax increase occurred at some point during the decade.*¹⁵

Sometimes, measuring the effect for a marginal group is not really a problem. If the researcher believes that the correlation between the variable of interest and the unobserved error term is zero, then the effect for the marginal group *is* the overall effect. This is the classical assumption of the exogeneity of the right-hand side variables. But, as the model of changes in tax policy presented earlier illustrates, assuming that the vote and changes in tax policy are uncorrelated is almost certainly wrong. And, as a result, the tax coefficient may seriously suffer from simultaneity bias introduced by the endogeneity.

Another example illustrates the point. Suppose that in half the states, an incumbent running for reelection would expect to take a 5 percent hit for increasing tax rates. Some governors are willing to bear this burden because they are extremely strong candidates; while others have no choice but to increase taxes for fiscal reasons. Suppose that in the other half of the states, voters are extremely tax-averse and, as a result, a tax increase would cause an incumbent to take a 10 percent hit in a reelection bid. Relative to the previous set of states, the proportion of governors willing to undertake tax hikes in these states should be considerably smaller. Governors whose states are in the midst of fiscal crisis might try to cut expenditures before passing an unpopular rate hike. Governors in this second group will be less likely to increase tax rates, and therein lies the problem. Because of the added fear of electoral retribution in the electorally-sensitive states, some governors who otherwise would have raised taxes at one point in time will chose not to do

¹⁴ There is, however, an indirect effect that occurs. Observations from states in which taxes are not increased still affect the coefficients on other controls in the model. Because there is almost always some non-zero correlation between the control variables and the tax variable, the result is that the tax coefficient must adjust until a least squares solution is obtained.

¹⁵ For a study that includes a detailed discussion of the role of "marginal" groups, see Gruber et al. (1999).

so. At the limit where taxes scared off all such governors, the electoral retribution effect in these states cannot be estimated because the tax measure has no variability. As a result, the regression fails to reveal the increased punishment in these states which would have occurred if taxed, and the coefficient is attenuated away from its "true" value. Strategic behavior on the part of reelection-minded incumbents introduces this serious problem.

The usual approach to deal with an endogeneity problem is with an instrumental variables (IV) or two-stage least squares (2SLS) approach.¹⁶ The IV/2SLS approach, while theoretically and mathematically appealing, is not a reasonable solution. The IV method has three key assumptions, all of which are stringent: the existence of endogeneity; that the instrumental variables are strong; and the exogeneity of the instruments themselves.

Because IV is a less efficient estimator than OLS, failure to satisfy these key assumptions will yield results that are both biased and inefficient – an even worse outcome than that would have been obtained with OLS. Furthermore, analysts have failed to test their data to ensure that each of these assumptions is met.¹⁷ Others have used instruments that are clearly correlated with the main dependent variable as was the case with Markus (1988), who estimated a model of vote choice and wanted to resolve the measurement error within the variable for the respondent's personal financial situation. Markus instrumented for financial situation with the respondent's age, sex, and education, as well as information regarding the respondent's experience with unemployment and income. In fact, our model employs as control variables (as do most vote models) some variant of all of Markus's alleged "instruments" and finds them all to be significant. As such, Markus's instruments were inappropriate.

Finding a valid instrument for tax increases is problematic. In Besley and Case (1995a) state tax changes were instrumented with state demographic variables (changes in the proportions of elderly and young individuals in the state's population) and year effects. While Besley and Case employed overidentification tests and determined that the demographic variables should not be eliminated from the second stage, there are several problems with their approach. First, their failure to reject the null hypothesis may have been a function of the small number of observations -- 85 observations with 13 independent variables in the structural model. Second, they reported no tests of the *strength* of their instruments. For the reasons explained above, if the joint *F*-statistic on these instruments is less than 10, then while they may be significant in the

¹⁶ The IV and 2SLS estimators are essentially the same. The only difference is that 2SLS will underestimate the coefficient standard errors. The reason is that IV takes into account the fact that the endogeneity correction (the predicted values for the first stage regression) is being *estimated* while 2SLS treats it as if it were *known*. Contemporary statistical programs will do the IV calculation and obtain the correct standard errors. In both cases, the coefficients will be identical; only the standard errors will differ.

¹⁷ In particular, papers employing weak instruments have come under fire within the last decade as some of their key results have been replicated using random numbers. For example, when the first-stage *F*-statistic is less than ten, the asymptotic properties of IV do not hold. A well-known example of this problem was a paper by Angrist and Krueger (1991), where the first-stage *F*statistic was often under 10 and had borderline significance. Bound et al. (1995) reproduced Agrist and Krueger's results using random numbers as instruments.

conventional sense, they would not be sufficiently so to obtain consistent parameter estimates. Third, their model is sparing in its use of control variables; while they controlled for changes in income, debt, and unemployment for the state and the state's neighbors, *no political controls* were included. Omitted variable bias is a real possibility. Had the model included a comprehensive set of political controls as well as national economic variables, then it may indeed have been the case that age changes would have appeared to be significant predictors of the gubernatorial vote.

A more serious problem comes from considering what the IV estimates really are measuring. As noted earlier, the IV estimator determines the effect for a particular marginal population or group. In the case of Besley and Case's model, there are really two marginal groups – one for each set of instruments. The first group is all of the states clumped together at a particular time; this aggregation arises out of the use of the year effects. The second group is those states undergoing major demographic changes in terms of the age of the population. In the first group, tax changes are a response to national conditions and tides; in the second group, the tax changes are a response to changes in the services that the electorate demands or the electoral preferences of different age groups. In essence, the effect of tax changes on the vote is probably being measured for the *marginal groups where taxes are a fiscal necessity*. This is very different from an exogenous increase in tax rates.

Ultimately, we claim there does not appear to be an immediately apparent, appropriate instrument for tax increases. The closest possible option would likely be a set of institutional and legal variables, such as the relative stringency of state balanced budget provisions (Poterba 1996) or court decisions that impose a tax onto a state (e.g., the *Claremont* case that the state of New Hampshire has faced for the last several years). However, even these variables may be indirectly correlated with the vote as the governor will behave strategically, determining expenditures and services offered so as to maximize his or her utility.

This does not mean, however, that analysts must simply accept endogeneity on the tax issue as a given and leave the issue at that. As we explain in the introduction, there need not be a single effect of a tax change on the vote; rather, one can imagine a set of effects conditional on other explanatory variables. Providing enough such conditional results can map out the endogenous and the exogenous space indirectly, allowing researchers to make interesting inferences without relying on the IV estimator.

A final example: one conditional effect would have to do with the previous margin of victory for the governor. While a "rational expectations" paradigm would paint taxes at time *t* and the election at time t + 1 as endogenous and simultaneously determined, that same level of endogeneity does not exist with regard to taxes at time *t* and the vote for governor at time t - 1. Certainly, a governor who comes in with a mandate might be more likely to raise taxes, but this would be predominantly because the previous margin of victory is a sign of electoral strength and ability to win reelection; the governor does not care directly about his or her margin in the previous election because it does not affect his or her utility. Thus, analyzing the effect of tax increases in the vote for the two groups – governors with an electoral mandate and governors without such a mandate – can provide different coefficients that ultimately attack the endogeneity problem in an indirect way.

V. A model of voter retribution:

The public has shown a great deal of sophistication with respect to its assignment of functional responsibility in holding governors responsible for changes in state economic conditions (e.g., Stein 1990). In fact, the governor's main responsibility is usually seen to be the management of the purse strings. As the single chief executive, the governor receives more publicity and media attention than other elected officials in the state. Dye (1981) observed that the expectations of the governor are second only to those of the president. Gubernatorial accountability has likely been augmented in recent decades as presidential and gubernatorial contests have become decoupled, with the latter occurring in midterm or off-years in roughly 80% of the states.

Further, there should be little voter confusion as to whether state-level taxes are state or federal matters. While an individual's perceptions of local and state economic conditions may be affected and contaminated by the health of the national economy, the same effect would not be expected to occur with respect to taxes. Sales taxes are quite clearly imposed by states and localities, and individuals must separately file federal income and state income taxes.

Finally, changes in state tax rates are relatively rare (Berry and Berry 1992), and when increases do occur, they are often quite visible and sometimes climactic (Kone and Winters 1993; Niemi et al. 1995). While voters are usually interested in the results of economic policies rather than the nuances of the actual policies themselves (Kiewiet and Rivers 1985, 370), the case of taxation may be an important exception to this rule. The saliency of the issue, combined with the media coverage that it often receives, ensures tax increases a prominent place in the public discourse. Further, the opposing party and its candidates may have a powerful incentive to publicly expose the taxing actions of the incumbent.

There are compelling reasons to believe that increases in taxation will harm the sitting governor or the nominee from his or her party. However, some might take issue with this hypothesis for two reasons. First, as is noted earlier, taxes are also the mechanism through which the governor provides programs that garner votes and support. However, Kone and Winters (1993) evaluate the claim: "[e]ven when benefits funded by tax increases do become visible, the distributions are demographically selective or spatially limited leading taxpayers to perceive that many of their tax dollars are being used to finance programs which assist other constituencies. In any case, because the benefits of many expenditure policies are remote in time, preventative in nature, and collective in consequence, they are not properly appreciated by voters when compared to the immediacy of tax burdens." (27)

In short, while taxes may help particular segments of the population and thus garner votes within that group, a disproportionate backlash from the remainder of the population would be expected. This is precisely because tax increases are so visible to the electorate; were they not, a governor could curry favor with each group and "hide" these actions from the rest of the public. Furthermore, there is inefficiency associated with any governmental action: the nature of bureaucracy mandates that the value of inputs will be greater than the value of program outputs.

The second reason that some might believe that tax hikes would not be punished is a contextual explanation. There are clearly cases in which a governor's hand is forced into taxation. Rarely does a governor raise one of these major taxes because he or she wants to provide some particular program or policy. Indeed, a superior strategy for a governor would be to determine what existing programs garner the least political support and eliminate them, thereby freeing up resources. More often, it is the case that a tax increase is seen as a no-win situation, but a fiscal necessity. The political opportunity hypotheses developed earlier provide a range of ways in which a governor may be able to raise taxes without incurring electoral costs. For example, substantial economic growth might afford the governor the opportunity to raise tax rates; after-tax real disposable income for the electorate could simultaneously increase in a period of growth. Thus, it is not altogether clear that tax increases will always carry with them punishment on election day. Nevertheless, given the logic above, we hypothesize:

H1: There is overall negative effect of an increase in taxation on the vote for the incumbent or the nominee from the incumbent's party.

Electoral retribution should also be examined as conditional on sets of contextual factors. If the public properly assigns electoral responsibility to political agents, then it follows that an incumbent governor would be held liable for presiding over a tax increase to a much greater extent than would the successor candidate of the incumbent's party. Therefore:

H2: An incumbent suffers a greater electoral penalty for tax increases than do nominees of the incumbent's party who run for the office of governor.

Previous models have implicitly assumed that the effect of tax hikes on the vote is symmetrical for Republicans and Democrats – a proposition which can explicitly be tested. Additionally, the fact that Republican voters are traditionally associated with higher incomes while Democratic voters are associated with lower incomes yields another interesting prediction: an increase in the income tax should alienate a key Republican voting bloc, while an increase in the sales tax should alienate a key Democratic bloc. If so,

H3: (a) the effects of tax increases on the vote for Republican incumbent governors and Democratic incumbent governors are not symmetrical.

(b) Republican governors are penalized more than Democratic governors for enacting an income tax increase.

(c) Democratic governors are penalized more than Republican governors for enacting a sales tax increase.

This hypothesis, however, has a rival: As partisanship is the most predictive factor in the gubernatorial vote, it may be the case that a voter's partisan predispositions affect whether he or she will punish the incumbent. Specifically, if the voter is Republican and his or her Republican incumbent governor raises taxes, the voter's partisanship may overwhelm his or her disgruntlement. Thus, strong partisans may not jump to support the candidate of the other party, even if the face of taxation that they dislike. This poses the following hypotheses:

H4: (a) Voters who consider themselves to be Republicans are less likely to punish Republican governors and more likely to punish Democratic governors for a tax increase.(b) Voters who consider themselves to be Democrats are less likely to punish Democratic governors and more likely to punish Republican governors for a tax increase.

Voters are likely to be differently affected by changes in different taxes and their vote should reflect impact. The income and sales taxes are widely thought to be two taxes with quite different impacts on income classes. Therefore, we argue:

H5: (a) Higher income individuals are more likely to punish an incumbent administration (or the nominee from the incumbent's party) for an income tax increase than are lower income individuals.

(b) Lower income individuals are more likely to punish an incumbent administration (or the nominee from the incumbent's party) for a sales tax increase than are higher income individuals.

There are also likely to be differences in voting behavior between "sophisticated and unsophisticated" voters. Education serves as our proxy for sophistication. After controlling for income (which will be highly correlated with education), voters with more education will be less likely to punish the governor for an income tax. Sophisticated voters likely better understand the dynamics of fiscal policy and the political, economic, and institutional constraints that governors face. This added understanding would should lead to less electoral retribution. Thus:

H6: After controlling for income, voters with more education are less likely to punish the governor for an income tax increase and are more likely to punish the governor for a sales tax increase.

Finally, there are other factors that may affect the extent to which governors are punished for raising taxes. These factors are particularly relevant to the endogeneity problem discussed below and that manifestly haunts the analyses of all the preceding questions. All coefficients up to this point represent the effect of a tax hike conditional on the fact that such an increase occurs. However, the governor's decision as to whether or not to increase taxes depends on his or her reelection projections. In essence, whenever governors have any choice in the matter, they make a political calculation to increase taxes only when the risk of electoral defeat is not substantial. In general, this should lead to the attenuation of the coefficients of electoral retribution and could even lead the coefficients to suggest that taxes have a positive effect on the vote; this would be possible if the taxes occur only when they purchase valuable services or other things upon which the governor can campaign. This endogeneity problem is explained in more detail in the next section.

One way in which the endogeneity problem manifests itself is that tax increases are more likely when the economy is in poor shape. Because much empirical research suggests that governors are held responsible for economic conditions, regardless of whether those conditions are within their control, it is possible that governors would be held liable even more for tax increases in years of fiscal crisis. If the economy is doing poorly, then people can ill afford to give up more of their income. Furthermore, the tax hike would serve as a symbolic reminder of the failure of the governor. Thus,

H7: those governors who raise taxes when the economy is in poor shape will be punished more than those governors who raise taxes when the economy is satisfactory or good.

VI. Data and Operationalization of the Model::

Our study exploits exit poll data that is collected biennially at polling sites across the nation.¹⁸ For the period from 1990 to 1998 we employ the Voter news Service (VNS) polls, the result of Election Day collaboration of ABC News, CNN, CBS News, Fox News, NBC News, and the Associated Press. The VNS exit poll data is, so far as we know, the only systematic data that satisfies conditions of large numbers of voters per state (usually from 750 to 2000 voters) and sampled serially across the period with an appropriate sampling model.¹⁹ Actual VNS procedures elicit two kinds of voter "ballots," a "long" or national form and the "short," forms for the states that include many of the questions from the national forms as well as some questions specific to the politics of that state. Aggregating the data from the state and national forms yields about 125,000 observations of gubernatorial voters. However, because potentially relevant control variables such as respondent ideology, education, and income only appear on some versions of the questionnaires, only about half of those observations are used in parts of this study.

We are particularly interested in exploiting the interactions between state-level contextual variables and individual-level survey variables. Our contextual conditions, such as State and national economic data predominantly come from the Census Bureau's *Statistical Abstracts* as well as volumes of *Book of the States*. Estimates of state-level unemployment figures are derived from data sets from the Current Population Survey (CPS). The data on tax increases is derived from relevant volumes of *Book of the States* as well as the Tax Foundation's annual publication *Facts and Figures of Government Finance*.²⁰

The general model is of the following form:

$$v_{ist} = \alpha \boldsymbol{T}_{st} + \beta \boldsymbol{E}_{st} + \gamma \boldsymbol{P}_{st} + \lambda \boldsymbol{X}_{it} + \boldsymbol{d}_{s} + \boldsymbol{f}_{t} + \varepsilon_{ist}$$

where v_{ist} is the vote choice of individual *i* in state *s* at time *t*, T_{st} is a vector of relevant tax variables (including interactions with other variables in some specifications), E_{st} is a vector of economic conditions at the state and national levels, P_{st} is a vector of political conditions at the state and national levels, P_{st} is a vector of the individual voter, d_s is a vector of state fixed effects, f_t is a vector of year fixed effects, and $_{-ist}$ is the error term.

¹⁸ States that were not included in this study were Hawaii and Alaska, and those with odd-year elections, New Jersey, Virginia, Kentucky, Louisiana, and Mississippi. For 1996 and 1998, some telephone surveys to account for absentee and early voters in California, Oregon, and Washington were conducted.

¹⁹ VNS chose a probability sample of voting precincts to represent different geographic areas across the state and the vote by party. Precincts were chosen with a probability proportionate to the population size in each however, in some states with large minority populations, some precincts were sampled at a higher rate than others. The procedure was such that each voter in a state had an equal likelihood of having his or her precinct chosen, and the exit polling was conducted throughout the day so as to give all voters an equal probability of being interviewed. ²⁰ Some contextual data was collected as a by-product of earlier studies, see Kone and Winters, 1995 and Delano and Winters, 2002.

Dependent Variable: The dependent variable is the respondent's <u>vote for governor</u>, coded 1 if he or she voted for the Democratic candidate and 0 if he or she voted for the Republican candidate.²¹

Independent Variables: The five sets of independent variables are the fixed effects, tax variables, economic conditions, political conditions, and individual characteristics. Because the individual characteristics are derived from categorical variables, those control variables are incorporated through the addition of dummy variables.²²

<u>Fixed Effects</u>: To account for over-time national trends in the vote for governor, year fixed effect dummies for each of the election years are included. Additionally, for the forty-three states in the sample, state fixed-effect dummies are incorporated. These account for time-invariant but state-constant aspects of the political culture in the American states (see Elazar 1972, 1984; Gray 1996) that give one party a natural edge. Stimson (1985) provides a detailed discussion on the need for fixed effects in pooled cross-sectional models.

<u>Tax Variables</u>: The primary independent variable of interest is that of increases in the rates of taxation. Extrapolating from various sources, a database was created that noted whether, in the electoral term for each governor, the state had an <u>increase in the personal income tax</u> rate or an <u>increase in the sales tax rate</u>. Unlike Niemi et al. (1995), who aggregated these and a number of other excise tax increases into a single composite variable, the income and sales tax variables were coded separately for this study, thereby examining the electoral effects specific to each type of taxation.²³ All politicians calculate both rates of return to the state for revenue changes, as well as the expected economic and "electoral" incidence of tax changes via changes in individual taxes. All revenue bills are written for changes in specific taxes, there is no composite tax change.²⁴ The number of increases in the tax during the electoral period was multiplied by +1 if the incumbent is Democratic and –1 if the incumbent is Republican. Weighting the tax variable by party of the governor provides directionality. In our case, an increase in the sales tax, weighted as it is positively with a Democratic governor in office, will have a negative impact on the dependent variable of the individual Democratic vote.

²¹ Votes for third party candidates were excluded from the analysis. All votes cast in the 1998 Maine and 1994 Connecticut elections (incumbent governors Angus King and Lowell P. Weicker, respectively) were excluded as well because the incumbents themselves were third-party candidates. With a dependent variable coded by party rather than incumbency, there is no simple and straightforward way to map electoral retribution against third party incumbents.

²² The coding schemes for these dummies are explained in an appendix. Additionally, some other variables such as the quality ratings for the candidates have measurement and coding schemes that are non-obvious. These, too, are detailed in the appendix.

²³ Changes in excise taxes, such as alcohol, gasoline, and tobacco were not examined.

²⁴ One of the most often-referred to documents in the fifty state capitols is the schedule of "returns to state treasury" of various sized increases in state taxes, charges, and fees. These are usually ranked by size of return. Changes in sales and income taxes invariably lead the lists in those states with these taxes.

Following Eismeier (1983), most of the existing research (Kone and Winters, 1993, Niemi et al, 1995) measures the tax variables by the number of times the tax was increased rather than the increase in per capita tax revenues. Measuring the tax variables by the number of rate increases ensures that only those effects that are due to governmental action are being picked up by the model. By contrast, tax revenues may change in response to changes in state and national economic conditions. The problem with doing so, however, is that it does not discriminate between a small and a large rate increase. Further, it also forces the researcher to make distinctions regarding what a "legislated" tax change is. For example, states often pass tax laws that are designed to take effect in the next fiscal year, so the researcher is confronted with the important question of whether to code the tax hike as occurring at the time of passage or the time when it took effect. For the purposes of this thesis, all of the tax variables were coded according to the date when they took effect. This is because it is expected that the most proximate effects of tax increases on voters will begin to occur at that time.

<u>Economic Conditions</u>: Much of the existing research suggests a prominent role for the national economy in determining the individual vote for governor (e.g., Chubb 1988; Peltzman 1987; Holbrook 1987; Stein 1990). In particular, a classical model of retrospective voting suggests that voters reward incumbents for increases in real per capita disposable income and punish incumbents for increases in unemployment. Thus, measures of the <u>percentage change in national unemployment</u> and <u>percentage change in national real per capita disposable income</u> from the year prior to the election to the year of the election are included in the model. These variables are also weighted by the relevant presidential party and gubernatorial party in power.

Voters also respond to state-level economic conditions when choosing between candidates for the governorship (Jewell 1968; Chubb 1988; Atkeson and Partin 1995; Svoboda 1995; Hansen 1999; MacDonald and Sigelman 1999; Howell and Vanderleeuw 1990). The debate over the relative importance of national and state economic conditions is an ongoing one. Thus, the model includes <u>percentage change in state unemployment</u>, weighted by gubernatorial party in power.²⁵

<u>Political Conditions</u>: Evaluations of the sitting president have also been found to affect the vote for governor (Simon 1989; Peltzman 1987; Stein 1990; Piereson 1975). While some have argued that coattails are decreasing in importance (Tompkins 1984, 1988, Chubb 1988; Jewell and Olson 1988), few dismiss the effect outright (e.g., Tompkins 1988). Several studies in the last few years have found presidential evaluations to be important determinants of the gubernatorial vote in the 1990s (Carsey and Wright 1998a; Carsey 2000). Mondak (1994) has argued that coattail voting depends on the context of the election as well as the characteristics of the individual voter. Our model includes a dummy variable for <u>presidential approval</u>, which is coded +1 if the respondent approved of the sitting president (or, in the case of an election year, voted for him) and 0 otherwise. Relevant interactions are included to weight the presidential

²⁵ Several studies that exploit individual-level state-wide data sets employ measures of respondents' impressions of the economy, often weighted by a saliency condition (e.g., Niemi et al. 1995). Such a specification runs the risk of being too restrictive. We argue that coding economic variables by their objective measurements captures these important underlying relationships.

approval variable by the presidential and gubernatorial parties in power. Because the data are taken from exit polls, the results should be insulated from the question order effects of presidential approval ratings on gubernatorial approval that have been found by some researchers (see Alspach 1991).

Incumbency has been found to be a highly significant factor in the vote for governor (e.g., Cowart 1973; Erikson et al. 1993; Jewell and Morehouse 2000). Stein (1990, 40) found incumbency to be "modestly helpful for forecasting gubernatorial elections." An analysis of 1996 gubernatorial contests indicated that incumbency trumped partisan pleas (Katz and Greenblatt 1996). This would mirror the finding that as partisan attachments are loosened, incumbency plays an increased role (Romero and Sanders 1994). In addition, there are indirect advantages that incumbency offers; a great deal of visibility, even more so than some nationallevel offices (Squire and Fastnow 1994). In addition, it is easier for incumbents to raise money (Jewell and Morehouse 2000, 165). Furthermore, it appears that an incumbent governor is likely to be held accountable for past performance more than another representative from his or her party (Atkeson and Partin 1995; Jewell and Morehouse 2000, 191; Niemi et al. 1995). The dynamics of gubernatorial incumbency may be changing with time. Piereson (1977), at the time of his writing, suggested that incumbency is an advantage – and possibly a growing one. This increased importance of incumbency is consistent with continuing decoupling of gubernatorial presidents from presidential election years (Tompkins 1984). Because incumbency is clearly important, three dummy variables are included: whether the incumbent governor is a Democrat, whether there is an incumbent Democrat running, and whether there is an incumbent Republican running. As a result, these variables are interacted with several variables in the model, including the tax variable, as explained below.

Finally, because some governors are elected with a "mandate" and are clearly stronger candidates than others and thereby bring political "tides" to bear on the next election, the <u>Democratic percentage of the vote in the previous gubernatorial contest</u> is included. This is the same approach taken by Niemi et al. (1995) and Hansen (1999). Further, a set of variables is included to account for candidate-specific characteristics (see Squire 1989, 1992). These characteristics include the <u>candidate age</u> (Swinerton 1968; Besley and Case 1995a), <u>candidate gender</u> (Delano and Winters 2002), and <u>candidate quality rating</u> for both the Democratic and the Republican nominees (Delano and Winters 2002, Squire 1992).

<u>Individual Characteristics</u>: Analysts continue to establish that an individual's <u>partisan</u> <u>identification</u> has exhibited an unparalleled role in determining the individual vote for governor (Jewell and Olson 1988, 207; Jewell and Morehouse 2000, 181; Squire 1992; Erikson et al. 1993; Svoboda 1995; Atkeson and Partin 1995; but c.f. Katz and Greenblatt 1996). While the dynamics of partisanship in gubernatorial contests may change with time (Piereson 1977) and may not be the same across state electorates (Jackson and Carsey 1999), these facts are not likely overwhelmingly important in the context of our analysis. As such, dummy variables are included to denote whether the respondent considers himself or herself to be a Democrat or a Republican, or an Independent.²⁶

²⁶ Those who characterized themselves as "other" composed the excluded category. Similarly, for the <u>ideology</u> variable, "moderate" was the excluded category.

Similarly, even after controlling for partisan identification, a voter's <u>ideology</u> has been shown to have a significant effect on the gubernatorial vote, especially when the competing candidates are ideologically far apart (Erikson et al. 1993; Jewell and Morehouse 2000, 185). Thus, two dummy variables are introduced to denote whether the respondent thinks of himself or herself as liberal or conservative.

A measure of the respondent's <u>income</u> is also included. Unfortunately, much of the literature on electoral choice and political behavior has treated income as a dichotomous variable, used mostly as a qualitative control in multivariate methods (see, for example, Axelrod 1972, 1982, and 1986; Stanley et al. 1986; Stanley and Niemi 1993). The VNS surveys provide categorical measures of income, but the exact categories vary across years. Additionally, because of inflation, the effect of a particular value of income in one year cannot be treated the same as the effect of the same nominal income in a later year. Our procedure undertaken to resolve these difficulties involved two steps. First, respondent's income was recoded as the mean of the category that he or she selected. For example, if the respondent selected the income category "\$50,000 - \$75,000," his or her income was recoded to be \$62,500. Top-coded earnings (e.g., "\$100,000 or more") were multiplied by one and a half. The second step was to adjust these figures to 1990 dollars using CPI inflation values. For simplicity, the final income variable was expressed in thousands of dollars. These measures of income were thus roughly equivalent across election years and suitable for use within a pooled cross-sectional design.

Other demographic variables have been found to affect the individual vote. Voters' <u>age</u> is particularly important for this study given that the elderly benefit disproportionately from some state programs such as welfare (MacManus 1995; Rhodebeck 1993. Other research has uncovered effects of age on general policy attitudes and political behavior (Strate et al. 1989; Patterson and Caldeira 1983; Franklin and Jackson 1983; but c.f. Abramson 1979; Miller and Shanks 1996). Other demographic characteristics affecting political behavior are <u>gender</u> (Delano and Winters 2002), <u>race</u> (see Wright 1977; Huckfeldt and Kohfeld 1989; Carsey 1995), and <u>education</u> (Bishop 1976). All of these demographic variables had categorical formats on the VNS surveys, and as such, they were employed as a series of dummy variables in our models.

VII. Further specifications regarding methods and econometrics:

<u>Use of a linear probability model</u>: The binary nature of the dependent variable suggests that a probit or logit model would be more appropriate, however, the coefficients of a linear probability model are more easily interpretable. Several tests were run to compare the key coefficients among the logit, probit, and linear probability models, and the substantive findings did not appear to be dependent upon the choice of model. Thus, it would appear that the choice of model, at least in this instance, is not tremendously important.

<u>Pooling only states and years</u>: It should be noted that a pooled cross-sectional design presents a number of statistical obstacles (see Stimson 1985 for an overview). First, observations within each state exit poll are likely to be correlated with each other, a problem that can be solved through the addition of state fixed effects. However, a problem arises from the fact that state

fixed effects, by definition, will constrain the effect to be the same across time. As such, there may be "common group effects" that *are* time-variant, and as a result, the combination of state and year fixed effects may fail to capture the entire relationship. An example would be some exogenous shock __{st} that occurs in a particular state in a particular year and affects the vote but does not affect the vote in any other periods/state. This is a well-documented problem that exists when the independent variable (in this case, taxation) is more highly aggregated than the dependent variable (Moulton 1986, 1990).

One approach to solve the common group effects dilemma would be to use fixed effects at the level of "state-year" units. However, because the tax change variables only vary with state-year, the addition of such fixed effects would prohibit identification of the tax coefficients. To get around this, one approach is to "cluster" the standard errors by state-year while still including the state fixed effects. In effect, this makes the standard errors behave as if a random effects estimator were employed. This approach was employed in each of the models.

Interaction Terms and Weighting By "Party in Power:" In many previous studies of elections (e.g., Bloom and Price 1975) and gubernatorial contests in particular (e.g., Chubb 1988; Kone and Winters 1993; Niemi et al. 1995; Lowry et al. 1998), a standard coding scheme is employed to measure the dependent variable. For individual-level data, the dependent variable is dichotomous, coded as +1 if the respondent voted for the Democratic candidate and 0 if the respondent voted for the Republican candidate. For aggregate vote share models, the dependent variable is recorded as the percentage of the vote received by the Democratic candidate.²⁷

The problem with this choice of dependent variable is that it does not measure incumbency directly. That is, if one expects an incumbent to be punished if unemployment increases, the model encounters a problem: an increase in unemployment will appear to have a positive effect on the vote for the Democrat if there is a Republican incumbent, while that same increase will appear to have a negative effect on the vote for the Democrat if there is a Democratic incumbent. Including a simple measure of change in unemployment, then, is clearly inappropriate. As such, scholars have interacted these variables with "party in power" terms. If the original variable was a national condition, then it was multiplied by +1 if the president was a State-level condition, then it was multiplied by +1 if the original variable was a state-level condition, then it was multiplied by +1 if the incumbent governor was a Democrat and -1 if the incumbent governor was a Republican.

While this scheme is intuitive and does force the effects to operate in the correct *directions*, it is also improper on two levels. First, it fails to account for party-dependent effects (e.g., if Republican incumbent governors were to be punished more for an economic downturn than their

²⁷ In the case of individual-level models, the choice of which party to assign to which value is arbitrary; some authors code the variable as +1 for a Republican vote and 0 for a Democratic vote. The same is true for aggregate models; the vote share could just as easily refer to that received by Republican candidates. However, for the purposes of clarity, the rest of this section assumes the use of this coding scheme.

Democratic counterparts).²⁸ And, as the literature on "asymmetric effects" suggests, these effects are often not only sizeable but significant as well (Bloom and Price 1975). A more serious problem arises, however, with the fact that the introduction of these interacted variables by themselves creates a misspecified model due to omitted variable bias. If the "party in power" variable is not included in the model (and, in the case of the existing research, it sometimes is not), the interaction term will be biased, and potentially seriously so.²⁹

The gravity of the problem can be illustrated by a simple example using the case of presidential coattails, although any of the weighted variables will fall prey to the same critique. Assume that there is a Democratic governor in power. His popularity varies exactly, systematically, and proportionally to the popularity of the president in a one-to-one ratio; that is, as a Democratic president gains 10 points in popularity, so also does the governor, and as a Republican president gains 10 points in popularity, the governor loses 10 points. Using this information to create twenty-two data points, with presidential popularities ranging from 0% to 100% for both of these theoretical presidents (popularity measured in 10% increments), permits an examination of the competing specifications.

A specification in which presidential popularity is weighted by "party in power" with the "party in power" variable excluded yields a coefficient of 0.285 and only explains 29% of the variance. It is only with the addition of a dummy variable for president's party that the coefficient obtains the correct coefficient of 1.000 and the correct R^2 of 1.000 are obtained. However, the problem is worse still: in real-world models, it is entirely plausible that there may be unique effects associated with *each combination* of presidents and governors: Democrat-Democrat, Democrat-Republican, Republican-Democrat, and Republican-Republican (see Partin 1995; Jewell and Morehouse 2000). Introducing a three-way interaction term would account for all these possible effects in a straightforward way.

To summarize, if the public assigns responsibility for political or economic conditions in a rational way, then the effects of such retribution may vary based upon the party of the president and the party of the governor. For national-level conditions, this situation is dealt with by using six variables: (1) the independent variable as it was recorded, without any weighting; (2) a dummy variable for the party of the incumbent president, (3) a dummy variable for the party of the incumbent governor, (4) an interaction between the independent variable and the gubernatorial party dummy; and (6) a three-way interaction between the independent variable, the presidential party dummy; and the gubernatorial party dummy. For state-level variables, the same basic procedure is followed, but those categories involving the dummy for party of the president are excluded. While this general approach of adding interactions to account for more complicated dynamics can reduce the efficiency of the parameter estimates, those estimates will be unbiased.

²⁸ Robert Plotnick first pointed this problem out to one of the authors in private conversation many years ago.

²⁹ Using the "weighted" variable and the "party in power" variable is only one of several structurally-similar possibilities that would be correct. Equally legitimate would be a model including the main effect, a dummy variable for the party in power, and an interaction term. It is this latter specification that is employed for weighting the control variables in this thesis.

In general, this approach is used for the control variables. The tax variables, however, employ the simple multiplication by +1 and -1 scheme. This is to keep the interpretation of the important coefficients as simple as possible.

<u>A Comment on Fixed Effects</u>: The inclusion of year and state fixed effects adds a twist to the analysis. For reasons of multicollinearity, in a model that includes year fixed effects, any control variables that change in value only by year cannot be added. Similarly, in a model that incorporates state fixed effects, any variables that take on values that are time-constant but specific to each state also cannot be added. Within a linear regression, any continuous variable that takes on *k* values can be represented as well or better through the inclusion of k - 1 dummy variables. Further, if the relationship between the dependent variable and the independent variable in question is even slightly non-linear, then the non-parametric approach will actually yield a higher R^2 value.³⁰ Several of the variables that are listed in the preceding sections – including the national-level measures of percent change in real disposable income and unemployment – would exhibit this very type of collinearity problem with respect to the year dummies. As a result, the "main effects" of these variables were not included when the regressions were run. However, these variables can still be *interacted* with the "party in power" variables as described in the previous section and then added to the model without generating perfect collinearity.³¹

VIII. Testing the models:

Because we employ a linear probability model, there may be questions of how precisely to interpret the coefficients. The obvious and intuitive way to conceptualize them is as the average change in voters' probabilities of voting for the candidate given that the governor raises the tax in question. This change is measured in terms of percentage points.³² An inappropriate interpretation, albeit a reasonable-sounding one, is the coefficient indicates the direction and size of impact on the electoral margin that the incumbent will obtain. This is an incorrect way to

³⁰ Of course, a non-parametric approach can also quickly absorb degrees of freedom, thereby resulting in less efficient parameter estimates.

³¹ While this statement is true in the simplest sense, the conclusion does not hold in very complex models such as the one used here. Because certain variables only vary by year, such as the change in unemployment or real wages, they take on relatively few values. Thus, when these variables are interacted with the dummies that represent the parties-in-power, the explanatory power of these interactions is quickly exhausted. The result is that most statistical programs will begin to drop some of these interactions, making it difficult to estimate the set of effects associated with the original set of variables.

³² What this means is that if the coefficient is, for example, -0.05, then the voter will be five percentage points less likely to vote for the incumbent. So, if the voter would have had a 60 percent probability of voting for the incumbent if there had been no tax increases, then the same voter would have a 55 percent probability of voting for the incumbent if there had been a single tax increase. These changes in percentage points are distinct from changes in percent, and the two should not be confused.

conceptualize the dependent variable, which is, after all, a description of individual behavior, but if the number of voters is large, it should be a close approximation.

It is also important to note that nearly all of the models in this section code the tax variable using the scheme that is usually employed in the literature – multiplying the number of increases by +1 if there is a Democratic incumbent governor and -1 if the incumbent administration is Republican. As it has been noted, this choice of coding will miss the underlying party-specific differences in electoral retribution (although one set of models below explores this particular question), but it also makes interpretation of the coefficients relatively straightforward and simple.

<u>*The Basic Model:*</u> Table 1 presents a series of basic specifications of the tax-vote relationship, with each column indicating the addition of increasingly sets of control variables along with the changed results for the variables under examination.

Column 1 presents the results of a model with just the variables for increases in the income and sales taxes, without any additional controls. Only the sales tax variable has a coefficient in the expected negative direction, and it suggests that governors take a 3 percent hit for raising this tax. By contrast, the coefficient on the income tax variable would suggest that governors who choose to raise the income tax actually gain over 3.5 points. However, neither of these coefficients is significant, and the R^2 value is a miniscule 0.0020.

Column 2 adds state and year fixed effects, and while both coefficients become smaller in absolute value, neither is again significant. It is only with the addition of variables designed to control for incumbency (whether the incumbent is a Democrat or a Republican, and whether the incumbent is running for reelection) in specification 3 that the sales tax coefficient becomes significant at $_{-}$ = 0.05. The income tax coefficient is again small and insignificant.

This effect becomes elaborated in specifications in columns 4, 5, 6, and 7, which serially incorporate controls for presidential approval (column 4), for the national and state economy (5), respondent characteristics (6), and for candidate characteristics (7). In each of these specifications, the coefficient on the sales tax variable becomes larger in absolute magnitude and more significant, and reaches a peak of a 10 percentage point impact on the taxing incumbent's party in the final model. Across the board, however, every specification has an income tax coefficient that is slightly positive but insignificant.

In the end, these results provide new perspectives on electoral retribution, and we suggest two possible interpretations: one of tax "timing" and the other, the cost of political information. Only the sales tax seems to have a negative and significant effect upon the vote for the incumbent or his or her party's nominee, and this suggests that an increase in that tax is much more salient than an increase in the income tax. The reasonable explanation might have to do with the fact that citizens encounter the sales tax on an everyday basis, while they deal with the income tax just once a year when filing returns. Another distinction is that income tax code is more complex due to the presence of exemptions and deductions, and thus it is more difficult for voters to ascertain the effect due to a rate increase. This latter explanation implies that the coefficient on

the income tax is subject to omitted variable bias of code complexity and voters' informational barriers.

Examining Incumbency and Party-Level Asymmetries: The issue of incumbency is explored in Table 2. While the first specification replicates the last column from Table 1, the other two specifications are the models run for elections with an incumbent seeking another term and those elections with an open seat, respectively. Interestingly, for the specification with incumbents, the income tax variable becomes significant – but in the direction opposite that which would be expected. Indeed, it would appear that voters are 4.3 percentage points more likely to vote for an incumbent who raised the income tax, a puzzling finding.

The timing and information cost explanations set out above provide reasons why voters might not be aware of or care about increases in the income tax, but rewarding the incumbent is another issue entirely. A further explanation: candidates are interested in recruiting votes and support from key constituencies as well as satisfying the general electorate. Incumbents may feel that they can obfuscate on the income tax issue, thereby evading general electoral retribution, while "buying" support for various interest and demographic groups from new revenues.³³

The other coefficients are not surprising. Non-incumbents do indeed bear a burden from tax increases imposed by the predecessor from their party; the 1.5 percentage point decline with respect to increases in the income tax is significant as well. Perhaps most interestingly, however, is that while voters are 10.4 percentage points less likely to vote for the nominee from an incumbent's party following a sales tax increase, that figure drops to 5.5 percentage points if the incumbent is seeking another term. Incumbents who choose to run again are either well-suited to defend their jobs and their records, or well-informed about the relative electoral risks of taxing actions. This may also be evidence of the selection problem; one might believe that those incumbents who expect that their actions would cause them to lose a reelection bid would choose not to run again, which could manifest itself in the form of punishment being levied on the governor's party's candidate in the next election. Thus, this diminished impact of sales tax impacts on incumbents' reelection figures simply reflects the finer calculations of some and/or greater electoral security for other, non-tax-related reasons. Further the heightened impact on the non-incumbent candidate of the "taxing" party reflects retrospective punishment of those collectively responsible for added tax burdens.

<u>Party-Level Differences:</u> Table 3 presents the results from models designed to estimate the conditional probabilities that are associated with not only incumbency but also the party of the incumbent. As the first specification shows, there does not appear to be any significant effect from increasing the income tax. However, disaggregating the model to separate incumbents from non-incumbents reveals another story altogether: Republican incumbents appear to be able to raise the income tax and prosper (voters are 13.6 percentage points more likely to vote for

³³ While collinearity between the two tax variables may bias the sales tax coefficient downward and the income tax coefficient upward, nevertheless, this is incorrect. Models were run in which the sales tax variable was excluded (not shown), but the relative magnitude and significance levels of the income tax coefficients did not change much. Thus, the purchase of services argument is a considerably more compelling explanation.

these candidates), while Democratic incumbents lose significantly by doing so (a 22.6 percentage point differential). If challengers from the incumbent's party run instead, then those challengers take a hit regardless of party, although the penalty is much more severe for Democrats (a total of 13.4 percentage points) than Republicans (2.7 points).

For the sales tax, Democratic non-incumbent nominees also take an additional, significant hit relative to their Republican counterparts. The effect specific to Democratic incumbents raising the sales tax and seeking another term could not be estimated, likely due to collinearity issues. The results suggest that incumbents are better able to skirt blame for tax increases than the candidates from their party who run for the governorship in the subsequent election. These findings go contrary to the expectations of a rational electorate that correctly assigns functional responsibility. However, it also may provide an important comment on the power of incumbency for the office of governor in that it may afford candidates a great deal of leeway on policy issues. However, we do not attempt to sort out this theory from that which espouses that incumbents would self-select themselves out of reelection campaigns that would be lost causes. The results also suggest that Democrats are, across the board, held liable for increases in either tax more so than members of the GOP. This holds both for incumbents seeking another term and for Democratic nominees.

<u>Voter Characteristics</u>: This section turns to the critical question of whether the level of electoral retribution depends upon the particular characteristics of the voter in question. This can be accomplished, as is explained in previous chapters, by the use of interaction terms. However, employing interactions when the variable of interest has a number of categories presents a dilemma. Examples of such variables include education and income. One approach to evaluating the conditional probabilities associated with each of these would be to introduce a set of terms that interact each tax variable with each category. However, this type of model can be particularly difficult to consider and to interpret – especially given the lack of variation in the tax variables, which can cause many of these interaction terms to simply drop out of the model.

Because both education and income in the VNS study are coded using ordered multichotomous schemes, it is possible to convert the variables into continuous ones – albeit with some degree of measurement error. Income was accordingly transformed into a continuous variable as was explained earlier on page 26, and education was converted into a continuous variable as is explained in a like process (see the Appendix). While the extent of measurement error may be considerable, the procedure itself is likely sufficient so as to gain more valid inferences regarding the direction and significance of the interaction terms.

Income: Table 4 presents the results by adding interaction terms for income to the model. In each of the three specifications, the income interaction terms are always insignificant and small in magnitude. Indeed, a \$100,000 increase in the voter's earnings changes a voter's probability of voting for the incumbent by at most three percentage points. Contrary to expectations, it appears that higher income voters actually are more likely to oppose the sales tax and more likely to support the income tax relative to their lower income counterparts. This fact holds true for both races in which the incumbent is seeking reelection and races with an open seat. However, the lack of significance of any of the coefficients means that there is insufficient evidence to

merit rejecting the hypothesis that higher income citizens would support the sales tax while lower income citizens would support the income tax.

Another interpretation may be helpful in terms of ascertaining why the results are contrary to theoretical predictions. Because the correlation between income and education is quite high, it may be the case that the interaction terms are tapping into respondent's educational status as well. Those individuals with a great deal of education, and particularly post-graduate work, are perhaps more likely to oppose regressive taxes because they realize that these taxes are imposed predominantly on those citizens who are least able to pay. This might lead such individuals to oppose the sales tax and support the income tax, which would be consistent with the results from this table. However, this proposition can be empirically tested with a model that includes interactions of the tax variables with education, and it is this topic that is examined next.

Education: Table 5 presents a set of results for the issue of the respondent's education. Compared to the results with income, however, the same pattern does not manifest itself. In particular, incumbents seem to do better after raising either the income tax or the sales tax among higher education voters than lower education ones – although neither of these interactions is significant. By contrast, non-incumbents seem to be hurt among better educated voters when raising the income tax but helped when raising the sales tax, although these effects are again insignificant.

Putting aside the question of statistical significance for the moment, it should be noted that the magnitudes of each of these coefficients is quite small as well. An additional year of education has, at most, a change of a third of a percentage point on the respondent's probability of voting for the incumbent. , It would thus appear that an "underlying education" hypothesis cannot explain the results obtained from models that involve interactions of the tax variables and income. It also appears that voters' education levels do not significantly affect the extent to which they engage in electoral retribution, regardless of both the type of tax raised and whether the race has an open seat or an incumbent seeking another term.

Partisan Identification: One of the most common ways in which the parties are painted is that the Democratic party favors "tax and spend" politics while the Republican party prefers fiscal restraint and non-interference by government in economic matters. If this statement is an accurate description of reality, then it might follow that self-identified Democrats should be more willing to accept taxes then self-identified Republicans. Table 6 shows three specifications designed to investigate this proposition. The interaction term in this model is the number of taxes raised, weighted by the party in power and multiplied by +1 if the respondent identified himself or herself as Democratic and 0 if he or she identified with the Republican party. For these models, those respondents who identified themselves as either independent or "other" were excluded.

In none of the specifications were any of the interaction terms significant. However, it is notable that across the board, for both races with incumbents and races with open seats, the directions of the effects are the same: Democratic voters appear to punish an income tax increase (0.76 percentage points more for incumbents and 1.5 percentage points more for open races) while rewarding a sales tax increase (1.0 percentage point more for incumbents and 1.5 percentage

points more for nominees from the incumbent's party), both relative to their Republican counterparts.

This is a puzzling result. Theory and conventional wisdom would suggest that Republicans earn higher incomes and thus would be disproportionately hurt, dollar-for-dollar, by an income tax relative to a sales tax. Similarly, it is often thought that Democrats may support income tax programs, which place a great deal of the burden on high-income citizens, in order to obtain funding for social programs. The results from the models in Table 5, even though not significant, still suggest that this logic should be reconsidered. It is true that the size of the standard errors relative to the magnitudes of the coefficients means that even the direction of the effects cannot be inferred in any meaningful sense. However, it is also true that were the effect suggested by theory to be pronounced, the magnitudes of the coefficients would be sufficiently large to overwhelm the standard errors. This clearly does not happen in any of these specifications, and as a result it is fair to conclude that the conventional wisdom that Democrats are more conducive than Republicans to the politics of taxing and spending at least needs reevaluation. There also may be an alternative explanation for the odd results. It could be that, because the model does not account for whether the incumbent candidate raising taxes is a Democrat or a Republican, that is to say, there is omitted variable bias.

Election Contextual Factor -- the State of the Economy: The last factor that we incorporate is specific to the economic climate. It has already been observed that measuring these conditional probabilities may provide a crude and indirect solution to the endogeneity problem when there are no suitable instruments available. One of these important sets of variables is the state of the economy. Many have argued that the state of the economy has a significant effect upon whether or not taxes are increased within a state. However, it is difficult to obtain an objective and comprehensive measure of state fiscal health that accurately takes into account all the relevant factors that might contribute to a tax hike. As a result, another approach is employed here. It builds on the recognition by Poterba and others that the early 1990s was a period of fiscal stress for nearly all of the states. This period contrasts with the middle and latter part of the decade in which the states experienced unprecedented growth and economic health. As a result, a dummy variable was created to denote whether or not the year was 1990 or 1992. This term was then interacted with the income and sales tax variables, so that the interaction term could measure the additional retribution against (or reward for) a tax increase during allegedly difficult years. These models are presented in Table 7.

The results suggest that for races with and without incumbents, the "political opportunity" hypothesis is correct. In all cases, the interaction terms are negative and significant. In particular, for both incumbents and nominees from the incumbent's party, the sales tax is punished more in economically-trying years than the income tax. In particular, the coefficients on the interaction terms for the model with incumbents only are enormous. This can be attributed in part due to collinearity, but it is also fair to say that incumbents in the early 1990s were uniquely more vulnerable than incumbents later in the decade. Of course, it may be the case that there are other year-specific factors that hurt incumbents in the other 1990s. If these factors were correlated with the tax variable, then the omitted variable bias would push the absolute magnitude of the tax coefficients upward, making the tax issue appear more important than it really was. This critique is not directly refuted here, but it would be informative for future

research to re-examine these results using actual state-level economic indicators rather than just year effects.

IX. Conclusion

Our study pooled tens of thousands of respondents across 116 gubernatorial elections so as to obtain a better estimate of the impacts of changing taxes on electoral outcomes as these revenue actions affect individual voters. The numbers of elections and of voters allows us to impose rigorous systematic control for state and time, while also allowing for a rich set of "contextual conditions" that are our variables of interest.

A corollary interest is to explore causal endogeneity in the tax-elections link, a heretoforeunexamined issue in the political science literature. To the extent that governors are driven by reelection or electoral interests, and if they hold to the conventional wisdom of taxes-affectingelections, then their gubernatorial behavior is likely profoundly affected by these beliefs. In fact, it is among the most competitive races that tax-avoidance by incumbents will be likely seen, precisely where tax changes might be hypothesized to have the most decisive impact. We set out a second-best strategy for ascertaining causation in these kinds of elections by speculating when and under what conditions tax changes are rationally "endogenized" by incumbents. We argue that there do not exist for our study satisfactory ordinary and usual strategies for handling such causation issues.

We have another corollary issue, and one that will be reported more fully in subsequent reports of our research (Stults and Winters 2002a, b). An analysis that combine individual-level analysis of tax changes and the vote, as reported here, with aggregate-level analyses of the same elections and with tax variables coded in similar fashion may help resolve the seeming inconsistency between results obtained at the two levels on more general measures of economic change and the vote. We hypothesize that there will be little or no conflict in results between these two levels. Simply put, better measures of government-induced changes in personal income, e.g. tax changes, and better measures of the actual individual vote and the aggregate electoral results will be consistent. For our purposes, at the moment, we would expect aggregate retribution for sales tax changes and little, if any for income tax changes, *ceteris paribus*, precisely what was discovered in an earlier, albeit flowed, study of one of the authors (Kone and Winters 1993).

The results of our present anlaysis suggest that incumbents and the candidates from the incumbents' party do suffer from electoral retribution if the sales tax is raised. The same cannot, however, be said for the income tax. Perversely, here and in other tables, the impacts of changes in the income tax on the vote are either negligible or, counter-intuitively, positive. We further hypothesized that retribution should be more severely visited on the incumbent running for reelection who bears heightened personal responsibility. While, it is the case, that voters punish incumbents, it is at a much-diminished rate relative to nonincumbents of their party responsible for the prior-term tax actions. This is, we assume, a reflection of the endogeneity issue: incumbents who would have been held personally responsible get out of the race and do not run for re-election; or such incumbents change taxes in their last term; or, incumbents who tax double and re-double electoral efforts at overcoming the tax impacts.

Contrary to most research in the field, we hypothesize party-asymmetric effects. Previous models have implicitly assumed that the effect of tax hikes on the vote is symmetrical for Republicans and Democrats – a proposition which can explicitly be tested. We ask, relative to all incumbent or non-incumbent candidates, are Democratic candidates more severely punished? There are some mixed effects, but it does appear that, at the margins, Democrats are more severely punished.

The punishment does not appear to be meted out by the wealthy or the better-educated. Contrary to expectations, high levels of wealth -- those likely to be most affected by new taxes -- and higher educational attainments -- those likely better informed about tax changers -- are not related to electoral punishment doled out to "taxers." Nor does punitive behavior appear to be related to the party of the voter --Democratic identifiers are not more likely to punish.

Finally, the last factor that we analyzed should also affect the extent to which governors are punished for raising taxes -- the state of the economy. The economic-variant "political opportunity" hypothesis is well-sustained by our results. Hard time generate electoral punishment. Governors do not appear able to displace blame for new taxes on the "nature of the (economic) times." Those periods with generally difficult economic eras appear to be particularly characterized by electoral retribution. This punitive behavior appears especially true for increases in the sales tax; again, a distinction that has held generally across our analysis.

		(518	andaru errors	s in parenti	eses)	-	-
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Income tax	0.0360	0.0168	0.0045	0.0128	0.0103	0.0128	0.0028
	(0.0233)	(0.0232)	(0.0186)	(0.0173)	(0.0165)	(0.0174)	(0.0234)
Sales tax	-0.0297	-0.0171	-0.0519	-0.0476	-0.0621	-0.0927	-0.1043
	(0.0179)	(0.0154)	(0.0165) *	(0.0161) *	(0.0159) **	(0.0175) **	(0.0205) **
State and year fixed effects	No	Yes	Yes	Yes	Yes	Yes	Yes
Incumbency variab	No	No	Yes	Yes	Yes	Yes	Yes
Presidential approv variables	No	No	No	Yes	Yes	Yes	Yes
National and state economy variables	No	No	No	No	Yes	Yes	Yes
Respondent characteristics (partisanship, ideology, age, gend race, income, education)	No	No	No	No	No	Yes	Yes
Candidate characteristics (gender, age, qualit and previous electo margin	No	No	No	No	No	No	Yes
N	126152	126152	126152	126152	126152	64283	64283
R^2	0.0020	0.0353	0.0450	0.2318	0.2346	0.3928	0.3947

 Table 1: Initial Examination of the Effects of Taxation Increases on the Vote³⁴

 (Standard errors in parentheses)

Coefficients denote the increased probability of voting for the Democratic candidate for each year the incumbent increased the tax rate for each tax. The tax variables are the number of times the tax was raised in the electoral period, multiplied by +1 if the incumbent governor is a Democrat and -1 if the incumbent is a Republican. * p < 0.05 ** p < 0.001

³⁴ The complete table can be obtained by contacting the second author of the paper.

	(1) All races	(2) Races with incumbent running for reelection	(3) Races without incumbent running for reelection
Effect of incumbent/incumbent party increasing income tax	0.0028 (0.0234)	0.0434 (0.0030) **	-0.0148 (0.0046) *
Effect of incumbent/incumbent party increasing sales tax	-0.1043 (0.0205) **	-0.0553 (0.0020) **	-0.1042 (0.0109) **
Ν	64283	37503	26780
R^2	0.3947	0.3844	0.4233

Table 2:	Incumbency Effects of Taxation Increases on the Ve	ote
	(Standard errors in parentheses)	

Coefficients denote the increased probability of voting for the Democratic candidate for each year the incumbent increased the tax rate for each tax. All models include controls based upon the following variables: state and year fixed effects; the party of the incumbent; whether the incumbent is running; the respondent's partisan identification, ideology, age, gender, race, income, and education; percentage change in national and state unemployment; percentage change in national real disposable income; presidential approval; previous Democratic margin; candidate characteristics of age, gender, and quality ratings. ** p < 0.001

* p < 0.05;

	(1) All races	(2) Races with incumbent running for reelection	(3) Races without incumbent running for reelection
Effect of incumbent/incumbent	0.0260	0.1361	-0.0270
party increasing income tax	(0.0249)	(0.0042) **	(0.0039) **
Added effect if	-0.0613	-0.3620	-0.1074
incumbent/incumbent party is	(0.0402)	(0.0085) **	(0.0028) **
Democrat			
Effect of incumbent/incumbent	-0.1436	-0.0670	-0.1269
party increasing sales tax	(0.0270) **	(0.0028) **	(0.0111) **
Added effect if	0.0652	Not identified	-0.0285
incumbent/incumbent party is	(0.0327) *		(0.0117) *
Democrat			
N	64283	37503	26780
R^2	0.3950	0.3844	0.4233

Table 3: Party-Level Effects of Taxation Increases on the Vote (Standard errors in parentheses)

Coefficients denote the increased probability of voting for the Democratic candidate for each year the incumbent increased the tax rate for each tax. All models include controls based upon the following variables: state and year fixed effects; the party of the incumbent; whether the incumbent is running; the respondent's partisan identification, ideology, age, gender, race, income, and education; percentage change in national and state unemployment; percentage change in national real disposable income; presidential approval; previous Democratic margin; candidate characteristics of age, gender, and quality ratings.

* p < 0.05; ** p < 0.001

	(1) All races	(2) Races with	(3) Races without
		incumbent running	incumbent running for
		for reelection	reelection
Effect of incumbent/incumbent	-0.0071	0.0269	-0.0190
party increasing income tax	(0.0250)	(0.0126) *	(0.0061) *
Interaction with respondent's	0.0002	0.0003	0.0001
income	(0.0001)	(0.0003)	(0.0001)
Effect of incumbent/incumbent	-0.0965	-0.0514	-0.0971
party increasing sales tax	(0.0208) **	(0.0086) **	(0.0092) **
Interaction with respondent's	-0.0002	-0.0001	-0.0002
income	(0.0001)	(0.0002)	(0.0002)
Ν	64283	37503	26780
R^2	0.3948	0.3846	0.4234

 Table 4: Income-Level Effects of Taxation Increases on the Vote

 (Standard errors in parentheses)

Income measured per thousands of real dollars. Coefficients denote the increased probability of voting for the Democratic candidate for each year the incumbent increased the tax rate for each tax. All models include controls based upon the following variables: state and year fixed effects; the party of the incumbent; whether the incumbent is running; the respondent's partisan identification, ideology, age, gender, race, income, income, and education; percentage change in national and state unemployment; percentage change in national real disposable income; presidential approval; previous Democratic margin; candidate characteristics of age, gender, and quality ratings. * p < 0.05; * p < 0.001

Table 5: Education-Level Effects of Taxation Increases on the Vote (Standard errors in parentheses)

	(1) All races	(2) Races with incumbent running for reelection	(3) Races without incumbent running for reelection
Effect of incumbent/incumbent	-0.0088	-0.0155	-0.0949
party increasing income tax	(0.0481)	(0.0597)	(0.0451) *
Interaction with respondent's	0.0078	0.0036	-0.0009
education	(0.0029)	(0.0040)	(0.0032)
Effect of incumbent/incumbent	-0.1153	-0.0532	-0.1033
party increasing sales tax	(0.0303) **	(0.0446)	(0.0339) *
Interaction with respondent's	0.0008	0.0015	0.0006
education	(0.0017)	(0.0030)	(0.0024)
Ν	64283	37503	26780
R^2	0.3947	0.3846	0.4233

Coefficients denote the increased probability of voting for the Democratic candidate for each year the incumbent increased the tax rate for each tax. All models include controls based upon the following variables: state and year fixed effects; the party of the incumbent; whether the incumbent is running; the respondent's partisan identification, ideology, age, gender, race, income, and education; percentage change in national and state unemployment; percentage change in national real disposable income; presidential approval; previous Democratic margin; candidate characteristics of age, gender, and quality ratings.

* p < 0.05; ** p < 0.001

	(1) All races	(2) Races with incumbent running for reelection	(3) Races without incumbent running for reelection
Effect of incumbent/incumbent party increasing income tax	0.0045	0.0285	-0.0167
	(0.0242)	(0.0140) *	(0.0146)
Added effect if respondent is Democrat	-0.0074	-0.0076	-0.0154
	(0.0164)	(0.0238)	(0.0209)
Effect of incumbent/incumbent party increasing sales tax	-0.1181	-0.0818	-0.0987
	(0.0233) **	(0.0144) **	(0.0218) **
Added effect if respondent is	0.0199	0.0102	0.0147
Democrat	(0.0234)	(0.0245)	(0.0260)
$\frac{N}{R^2}$	46876	27282	19594
	.4711	.4519	.5117

Table 6: Partisan Effects of Taxation Increases on the Vote (Standard errors in parentheses)

Voters who identify themselves as independents and "other" are excluded. Baseline category is self-identified Republicans. Coefficients denote the increased probability of voting for the Democratic candidate for each year the incumbent increased the tax rate for each tax. All models include controls based upon the following variables: state and year fixed effects; the party of the incumbent; whether the incumbent is running; the respondent's partisan identification, ideology, age, gender, race, income, income, and education; percentage change in national and state unemployment; percentage change in national real disposable income; presidential approval; previous Democratic margin; candidate characteristics of age, gender, and quality ratings. ** p < 0.001

* p < 0.05

Table 7:	Fiscal Health-Specific	Effects of Taxation	Increases on the Vote
	(Standard)	arrors in paranthasas)	

(Standard errors in parentneses)			
	(1) All races	(2) Races with	(3) Races without
		incumbent running for	incumbent running for
		reelection	reelection
Effect of incumbent/incumbent	-0.0017	-0.2072	-0.0380
party increasing income tax	(0.0251)	(0.0030) **	(0.0051) **
Added effect in bad economic	0.0206	-0.2956	-0.0948
years	(0.0378)	(0.0066) **	(0.0107) **
Effect of incumbent/incumbent	-0.0724	-0.0590	-0.0286
party increasing sales tax	(0.0255) **	(0.0028) **	(0.0083) *
Added effect in bad economic	-0.0549	-0.6566	-0.1236
years	(0.0397)	(0.0103) **	(0.0051) **
Ν	64283	37503	26780
R^2	.3948	.3844	.4233

Coefficients denote the increased probability of voting for the Democratic candidate for each year the incumbent increased the tax rate for each tax. All models include controls based upon the following variables: state and year fixed effects; the party of the incumbent; whether the incumbent is running; the respondent's partisan identification, ideology, age, gender, race, income, income, and education; percentage change in national and state unemployment; percentage change in national real disposable income; presidential approval; previous Democratic margin; candidate characteristics of age, gender, and quality ratings.

** p < 0.001 * p < 0.05

Bibliography

ACIR (Advisory Commission on Intergovernmental Relations). 1987. Fiscal Discipline in the Federal System: National Reform and the Experience of the States.

Allan and Campbell. 1994.

- Alt, James E., and Robert C. Lowry. 1994. "Divided Government, Fiscal Institutions, and Budget Deficits: Evidence from the States." *The American Political Science Review* 88: 811-828.
- Alvarez, R. Michael. 1997. "Why Study Only Presidential Campaigns? Statewide Races as a Laboratory for Campaign Analysis." Working Paper, California Institute of Technology.
- Angrist, Joshua A., and Alan B. Krueger. 1991. "Does Compulsory School Attendance Affect Schooling and Earnings?" *Quarterly Journal of Economics* 106: 979-1014.
- Barro, Stephen M. 1986. "State Fiscal Capacity Measures: A Theoretical Critique." In *Measuring Fiscal Capacity*, ed. H. Clyde Reeves. Boston: Oelgeschlager, Gunn and Hain.
- Baumer and Gold. 1995.
- Berch, Neil. 1995. "Explaining Changes in Tax Incidence in the States." *Political Research Quarterly* 48: 629-641.
- Berry, Frances Stokes, and William D. Berry. 1992. "Tax Innovation in the States: Capitalizing on Political Opportunity." *American Journal of Political Science* 36: 715-742.
- Berry, Frances Stokes, and William D. Berry. 1994. "The Politics of Tax Increases in the States." *American Journal of Political Science* 38: 855-859.
- Berry, William D., and David Lowery. 1987. Understanding United States Government Growth: An Empirical Analysis of the Postwar Era. New York: Praeger.
- Besley, Timothy, and Anne Case. 1995a. "Incumbent Behavior: Vote-Seeking, Tax-Setting, and Yardstick Competition." *The American Economic Review* 85: 25-45.
- Besley, Timothy, and Anne Case. 1995b. "Does Electoral Accountability Affect Economic Policy Choices? Evidence from Gubernatorial Term Limits." *Quarterly Journal of Economics* 110: 769-798.
- Beyle, Thad. 1983. "Governors." In *Politics in the American States*, ed. Virginia Gray, Hebert Jacob, and Kenneth N. Vines. Boston: Little, Brown, p 180-221.

Bloom, Howard S., and H. Douglas Price. 1975. "Voter Response to Short-Run Economic Conditions...." *The American Political Science Review* 69: 1240-1254.

Books, John W. and Charles L. Prysby. 1983 American Politics Quarterly

Brandeis, Louis. New State Ice Company of Oklahoma City vs. Liebman (1932)

- Books, John W. and Charles L. Prysby. 1992. *Political Behavior and the Local Context*. New York: Praeger.
- Bound, John, D. A. Jaeger, and R. M. Baker. 1995. "Problems With Instrumental Variables Estimation When the Correlation Between the Instruments and the Endogenous Explanatory Variable Is Weak." *Jl. of the American Statistical Association* 90: 443-450.
- Bowler, Shaun, and Todd Donovan. 1995. "Popular Responsiveness to Taxation." *Political Research Quarterly* 48: 79-99.
- Brace, Paul, and Aubrey Jewett. 1995. "The State of State-Politics Research." *Political Research Quarterly* 48: 643-681.
- Bratton, Kathleen A. 1994. "Retrospective Voting and Future Expectations: The Case of the Budget Deficit in the 1988 Election." *American Politics Quarterly* 22: 277-296.
- Brennan, Geoffrey, and James M. Buchanan. 1980. *The Power to Tax: Analytical Foundation of Fiscal Constitution*. New York: Cambridge University Press.
- Buchanan, James M. 1968. *Public Finance in Democratic Process*. Chapel Hill: University of North Carolina Press.
- Burnori, David. 1998. "State Personal Income Taxation in the Twenty-First Century." In *The Future of State Taxation*, ed. D. Brunori. Washington, D.C.: The Urban Institute Press.
- Carsey, Thomas M. 2000. *Campaign Dynamics: The Race for Governor*. Ann Arbor: University of Michigan Press.
- Carsey, Thomas M., and Gerald C. Wright. 1998a. "State and National Factors in Gubernatorial and Senatorial Elections." *American Journal of Political Science* 42: 994-1002.
- Carsey, Thomas and G. Wright. 1998b. "State & National Factors in Gubernatorial & Senatorial Elections: A Rejoinder." *American Journal of Political Science* 42: 1008-1011.
- Chappell, Henry W., Jr. 1983. "Presidential Popularity and Macroeconomic Performance: Are Voters Really So Naïve?" *The Review of Economics and Statistics* 65: 385-392.

- Chappell, Henry W., Jr., and Motoshi Suzuki. 1993. "Aggregate Vote Functions for the U.S. U.S. Presidency, Senate, and House." *The Journal of Politics* 55: 207-217.
- Chubb, John E. 1988. "Institutions, the Economy, and the Dynamics of State Elections." *The American Political Science Review* 82: 133-154.
- Conway, M. Margaret The Political Context of Political Behavior (in Presidential Address) *The Journal of Politics*, Vol. 51, No. 1. (Feb., 1989), pp. 3-10.
- Cowart, Andrew T. 1973. "Electoral Choice in the American States: Incumbency Effects, Partisan Forces, and Divergent Partisan Majorities." *The American Political Science Review* 67: 835-853.
- Cox, Gary W., and Matthew D. McCubbins. 1993. Legislative Leviathan: Party Government in the House. California Series on Social Choice and Political Economic, volume 23. Berkeley: University of California.
- Crain, W.M., and J.C. Miller. 1990. "Budget Process and Spending Growth." *William and Mary Law Review* 31: 1021-1046.
- Davies, David G. 1986. "Unites States Taxes and Tax Policy." New York: Cambridge University Press.
- Downs, Anthony. 1957. An Economic Theory of Democracy. New York: Harper and Row.
- Downs, Anthony. 1960. "Why the Government Budget is Too Small in a Democracy." *World Politics* 12: 541-563.
- Eismeier, Theodore J. 1983. "Votes and Taxes: The Political Economy of the American Governorship." *Polity* 15: 368-379.
- Erikson, Robert S. 1990a. "Economic Conditions and the Congressional Vote: A Review of the Macrolevel Evidence." *American Journal of Political Science* 34: 373-399.
- Erikson, Robert S. 1990b. "Reply to Jacobson." *American Journal of Political Science* 34: 405-407.
- Fenno, Richard F. 1966. *The Power of the Purse: Appropriations Politics in Congress*. Boston: Little, Brown.
- Fiorina, Morris P. 1978. "Economic Retrospective Voting in American National Elections: A Micro-Analysis." *American Journal of Political Science* 22: 426-443.
- Fiorina, Morris P. 1981. *Retrospective Voting in American National Elections*. New Haven: Yale University Press.

- Gilligan, Thomas W., and John G. Matsusaka. 1995. "Deviations from Constituent Interests: The Role of Legislative Structure and Political Parties in the States." *Economy Inquiry* 33: 383-401.
- Golden, David G., and James M. Poterba. 1980. "The Price of Popularity: The Political Business Cycle Reexamined." *American Journal of Political Science* 24: 696-714.
- Gough, Paul A. 1984. "Economic Conditions and Congressional Elections: An Attempt to Control for the Depression." *American Politics Quarterly* 12: 71-88.
- Gruber, Jonathan, Phillip Levine, and Douglas Staiger. 1999. "Abortion Legalization and Child Living Circumstances: Who Is the 'Marginal Child'?" Journal of Economics 114: 263-291.
- Hansen, Susan B. 1983. *The Politics of Taxation: Revenue without Representation*. New York: Praeger.
- Hansen, Susan B. 1999. "Life Is Not Fair': Governors' Job Performance Ratings and State Economies." *Political Research Quarterly* 52: 167-188.
- Harris, Louis. 1959. "Why the Odds are Against a Governor's Becoming President." *Public Opinion Quarterly* 4: 370.
- Hettich, Walter, and Stanley L. Winer. 1988. "Economic and Political Foundations of Tax Structure." *The American Economic Review* 78: 701-712.
- Hibbing, John R., and John R. Alford. 1981. "The Electoral Impact of Economic Conditions: Who Is Held Responsible?" *American Journal of Political Science* 25: 423-439.
- Holbrook, Thomas M. 1987. "National Factors in Gubernatorial Elections." *American Politics Quarterly* 15: 471-483.
- Howe, Edward T., and Donald J. Reeb. 1997. "The Historical Evolution of State and Local Tax Systems." *Social Science Quarterly* 78: 109-121.
- Howell, Susan E., and James Vanderleeuw. 1990. "Economic Effects on State Governors." *American Politics Quarterly* 64: 154-162.
- Jacobson, Gary C., and Samuel Kernell. 1981, 1983. *Strategy and Choice in Congressional Elections*. New Haven: Yale University Press.
- Jewell, Malcolm E., and Sarah M. Morehouse. 2000. *Political Parties and Elections in American States*, 4th ed. Washington, D.C.: CQ Press.
- Kenney, Patrick J. 1983. "The Effect of State Economic Conditions on the Vote for Governor." Social Science Quarterly 64: 154-162.

- Kiewiet, D. Roderick, and Matthew D. McCubbins. 1991. *The Logic of Delegation*. Chicago: University of Chicago Press.
- Kiewiet, D. Roderick. 1981. "Policy-Oriented Voting in Response to Economic Issues." *The American Political Science Review* 75: 448-459.
- Kinder, Donald R., and D. Roderick Kiewiet. 1979. "Economic Discontent and Political Behavior: The Role of Personal Grievances and Collective Economic Judgments in Congressional Voting." *American Journal of Political Science* 23: 495-527.
- Kinder, Donald R., and D. Roderick Kiewiet. 1981. "Sociotropic Politics: The American Case." *British Journal of Political Science* 11: 129-61.
- Kirschten, Dick. 1990. "Targets of Discontent." *National Journal* 10 November 1990, p 2736-42.
- Klorman, Ricardo. 1978. "Trends in Personal Finances and the Vote." *Public Opinion Quarterly* 42: 31-48.
- Kone, Susan L. and Richard F. Winters. 1993. "Taxes and Voting: Electoral Retribution in the American States." *The Journal of Politics* 55: 22-40.
- Kramer, Gerald H. 1971. "Short-Term Fluctuations in U.S. Voting Behavior, 1896-1964." *The American Political Science Review Papers and Proceedings* 65: 131-143.
- Kramer, Gerald H. 1983. "The Ecological Fallacy Revisited: Aggregate- versus Individuallevel Findings on Economics and Elections, and Sociotropic Voting." *The American Political Science Review* 77: 92-111.
- Kuklinski, James H., and Darrell M. West. 1981. "Economic Expectations and Voting Behavior in United States House and Senate Elections." *The American Political Science Review* 75: 436-447.
- Levi, Margaret. 1988. Of Rule and Revenue. Berkeley: University of California Press.
- Levitt, Steven D. 1996. "How Do Senators Vote? Disentangling the Role of Voter Preferences, Party Affiliation, and Senator Ideology." *The American Economic Review* 86: 425-441.
- Lewis-Beck, Michael S. 1988. *Economics and Elections: The Major Western Democracies*. Ann Arbor: University of Michigan Press.
- Lockerbie, Brad. 1991. "Prospective Voting in U.S. House Elections 1956-1988." *Legislative Studies Quarterly* 16: 239-261.

- MacDonald, Jason A., and Lee Sigelman. 1999. "Public Assessments of Gubernatorial Performance: A Comparative State Analysis." *American Politics Quarterly* 27: 201-215.
- MacKuen, Michael B., Robert S. Erikson, and James A. Stimson. 1992. "Peasants or Bankers? The American Electorate and the U.S. Economy." *The American Political Science Review* 86: 597-611.
- MacKuen, Michael B., Robert S. Erikson, and James A. Stimson. 1996. "Presidents and the Prospective Voter: Comment." *The Journal of Politics* 58: 793-801.
- MacManus, Susan A. 1995. "Taxing and Spending Politics: A Generational Perspective." *The Journal of Politics* 57: 607-629.
- Mann, Arthur J. 1980. "Wagner's Law: An Econometric Test for Mexico, 1925-1976." *National Tax Journal* 33: 189-201.
- Markus, Gregory B. 1988. "The Impact of Personal and National Economic Conditions on the Presidential Vote: A Pooled Cross-Sectional Analysis." *American Journal of Political Science* 32: 137-154.
- Markus, Gregory B. 1992. "The Impact of Personal and National Economic Conditions on Presidential Voting, 1956-1988." *American Journal of Political Science* 36: 829-834.
- Mayhew, David R. 1974. *Congress: The Electoral Connection*. New Haven: Yale University Press.
- Merrifield, John D. 1991. "The Institutional and Political Factors Which Influence Taxation." *Public Choice* 69: 295-310.
- Merrifield, John D. 2000. "State Government Expenditure Determinants and Tax Revenue Determinants Revisited." *Public Choice* 102: 25-50.
- Mikesell, John L. 1978. "Election Periods and State Tax Policy Cycles." *Public Choice* 33: 99-105.
- Mikesell, John L. 1998. "The Future of American Sales and Use Taxation." In *The Future of State Taxation*, ed. David Brunori. Washington, D.C.: The Urban Institute Press.
- Monroe, Kristen R. 1978. "Economic Influences on Presidential Popularity." *Public Opinion Quarterly* 42: 360-369.
- Monroe, Kristen R. 1981. "Presidential Popularity: An Almon Distributed-Lag Model." *Political Methodology* 8: 43-69.

- Morehouse, Sarah McCally. 1997. *The Governor as Party Leader: Campaigning and Governing*. Ann Arbor: The University of Michigan Press.
- Niemi, Richard G., Harold W. Stanley, and Ronald J. Vogel. 1995. "State Economies and State Taxes: Do Voters Hold Governors Accountable?" *American Journal of Political Science* 39: 936-957.
- Oates, Wallace E. 1975. "Automatic Increases in Tax Revenues The Effect on the Size of the Public Budget." In *Financing the New Federalism*, ed. Wallace E. Oates. Washington, D.C.: Resources for the Future.
- Peltzman, Sam. 1987. "Economic Conditions and Gubernatorial Elections." *The American Economic Review* 77: 293-297.
- Penniman, Clara. 1976. "The Politics of Taxation." In *Politics in the American States*, ed. Herbert Jacob and Kenneth N. Vines. Boston: Little, Brown.
- Phares, Donald. 1980. *Who Pays State and Local Taxes?* Cambridge, MA: Oelgeschlager, Gunn and Hain.
- Plotnick, Robert D., and Richard F. Winters. 1985. "A Politico-Economic Theory of Income Redistribution." *The American Political Science Review*79: 458-473.
- Plotnick, Robert D., and Richard F. Winters. 1990. "Party, Political Liberalism, and Redistribution: An Application to the American States." *American Politics Quarterly* 18: 430-458.
- Pomper, Gerald. 1968, 1976. Elections in America. New York: Dodd, Mead.
- Pomper, Gerald. 1975. Voters' Choice. New York: Dodd, Mead.
- Poterba, James M. 1994. "State Responses to Fiscal Crisis: The Effects of Budgetary Institutions and Politics." *The Journal of Political Economy* 102: 799-821.
- Poterba, James M. 1996. "Budget Institutions and Fiscal Policy in the U.S. States." *American Economic Review* 86: 395-400.
- Radcliff, Benjamin. 1988. "Solving a Puzzle: Aggregate Analysis and Economic Voting Revisited." *The Journal of Politics* 50: 440-455.
- Ranney, Austin. 1965, 1976. "Parties in State Politics." In *Politics in the American States*, Herbet Jacob and Kenneth Vines, ed. Boston: Little Brown.
- Rhodebeck, Laurie A. 1993. "The Politics of Greed? Political Preferences Among the Elderly." *The Journal of Politics* 55: 342-364.

- Roemer, John E. 1999. "The Democratic Political Economy of Progressive Income tax." *Econometrica* 67: 1-19.
- Rohde, David. 1991. Parties and Leaders in the Post-Reform House. Chicago: University of Chicago Press.
- Sabato, Larry. 1983. Goodbye to Good-Time Charlie. Lexington, MA: Lexington Books.
- Sanders, Arthur. 1988. "Rationality, Self-Interest, and Public Attitudes on Public Spending." Social Science Quarterly 69: 311-324.
- Stambough, S.J., and Thorson, G.R. 1999. "Toward Stability in Presidential Forecasting: The Development of a Multiple Indicator Model." *International Journal of Forecasting* 15: 143-152.
- Stein, Robert M. 1990. "Economic Voting for Governor and U.S. Senator: The Electoral Consequences of Federalism." *The Journal of Politics* 52: 29-53.
- Stonecash, Jeffrey M. 1996. "The State Politics Literature: Moving Beyond Covariation and Pursuing Politics." *Polity* 28: 559-579.
- Stults, Brian and R. F. Winters. 2002a. "The Political Economy of the Vote" (v. 2) prepared for the annual Conference on the American States, U. of Wisconsin-Milwaukee, May 24-25, 2002
- Stults, Brian and R. F. Winters. 2002b. "The Political Economy of the Vote" (v. 3) prepared for the annual meeting of the American Political Science Association, Boston, MA August, 2002
- Svoboda, Craig J. 1995. "Retrospective Voting in Gubernatorial Elections: 1982 and 1986." *Political Research Quarterly* 48: 135-150.
- Teixeira, Ruy. 1998. "The New Economics of Voting." Challenge 41: 19-37.
- Tidmarch, Charles M., Lisa J. Hyman, and Jill E. Sorkin. 1984. "Press Issue Agendas in the 1982 Congressional and Gubernatorial Election Campaigns." *Journal of Politics* 46: 1226-1242.
- Tufte, Edward R. 1975. "Determinants of the Outcomes of Midterm Congressional Elections." *The American Political Science Review* 69: 812-826.
- Turett, J. Stephen. 1971. "The Vulnerability of American Governors, 1900-1969." *Midwest Journal of Political Science*15: 108-132.
- von Hagen, J. 1991. "A Note on the Empirical Effectiveness of Formal Fiscal Restraints." Journal of Public Economics 44: 199-210.

- Wagner, Richard E. 1976. "Revenue Structure, Fiscal Illusion, and Budgetary Choice." *Public Choice* 25: 45-61.
- Weatherford, M. Stephen. 1983. "Evaluating Economic Policy: A Contextual Model of the Opinion Formation Process." *Journal of Politics* 45: 866-888.
- Wides, Jeffrey W. 1976. "Self-Perceived Economic Change and Political Orientations: A Preliminary Exploration." *American Politics Quarterly* 4: 394-411.
- Wides, Jeffrey W. 1979. "Perceived Economic Competency and the Ford/Carter Election." *Public Opinion Quarterly* 43: 535-543.
- Winters, Richard F. 1996. "The Politics of Taxing and Spending." In *Politics in the American States*, ed. Virginia Gray and Herbert Jacob, 6th ed. Washington, D.C.: CQ Press.

Appendix: Coding of Selected Independent Variables

Demographics: The following illustrates how age, race, and education were coded into dummy variables for use in the models:

<u>Age</u>

1=	18 - 24
2=	25 - 29
3=	30 - 39
4=	40 - 44
5=	45 - 49
6=	50 - 59
7=	60 - 64
8=	65 and over

<u>Race</u>

- 1= white
- 2= black
- 3= Hispanic
- 4= Asian
- 5= other

Education

- 1= did not complete high school
- 2= high school graduate
- 3= some college, but no degree
- 4= college graduate
- 5= postgraduate study

<u>*Candidate Quality:*</u> The candidate quality estimates were obtained from a data set provided by Richard Winters. In that data set, quality ratings were formed as follows:

- 7.50 = incumbent governor or former governor
- 6.00 = U.S. Senator
- 5.75 = lieutenant governor or attorney general
- 5.25 = secretary of state or state treasurer
- 5.00 = U.S. Representative
- 4.50 = state senator
- 4.00 = state representative or state party chair
- 3.50 = mayors of large cities within the state
- 3.00 = other statewide elected officials
- 2.00 = locally elected officials
- 1.00 = other politically elected positions
- 0.00 = no elective political experience

The rating was then multiplied by the proportion of the state electorate represented by the office; proportions can take on values greater than zero and less than or equal to one. In the case of state senate and house leaders, the multiplier was simply 1. Winters's justification for the coding of state level offices was the following:

The finely delineated classifications of the upper level statewide elected positions – lieutenant governor and attorney general, secretary of state and state treasurer – are approximations devised to capture the relative frequency that the occupants of those offices pursue the governorship and the relative prestige of those offices. We believe that the lieutenant governorship and the attorney generalship are offices which offer better political positioning for a gubernatorial run than those of state treasurer and secretary of state. However, all four positions have substantial advantages statewide, thus their positioning between US Senator and US Representative.

Education Made Continuous: The variable for education was made continuous for the purposes of creating interaction terms in one set of models. The following scheme explains how each of the categories were coded:

Original coding	Category	New Coding (years of education)
1	did not complete high school	8
2	high school graduate	12
3	some college, but no degree	14
4	college graduate	16
5	postgraduate study	19