State Politics, Tuition and the Dynamics of a Political Budget Cycle

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Abstract

The tendency for spending to increase during election years could be consistent with a variety of simple models put forth to explain it. This paper attempts to improve the understanding of political budget cycles by first identifying a previously undocumented cycle in tuition and required fees at public four-year institutions of higher education in the United States. I find that tuition and fees are 1.5 percent lower during gubernatorial election years than non-election years. No similar cycle is found in private tuition and fees. Using a newly constructed dataset, I then explore the variation in electoral competition in gubernatorial and state legislative elections within states over time to uncover the underlying electoral incentives creating the cycle. The results suggest that the tuition cycle is not designed to increase the reelection prospects of governors as standard theories would predict. I find that tuition decreases during gubernatorial election years as the reelection prospects of the incumbent governor increases. Instead, the evidence suggests that popular governors use lower tuition as political pork to expand party power in the state by capturing swing districts in concurrent state legislative elections. I find that the magnitude of the cycle increases with the level of competition in state house elections and that the effect is concentrated among those districts held by the opposition party, particularly if those opposition districts are populated with voters likely to be responsive to tuition as a policy lever. These results reveal important dynamics about party competition within states in the United States and suggest that the electoral incentives driving political budget cycles can be complex.

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1 Introduction

That government expenditures tend to rise during election years is a well-documented phenomenon. Political budget cycles have been identified across nations (Persson and Tabellini, 2002; Brender and Drazen, 2005; Shi and Svensson, 2006; Alt and Lassen, 2006) and subnationally across states, provinces and cities (Mexico (Gonzalez, 2002; Persico et al., 2011), India (Khemani, 2004; Ghosh 2006), Russia (Akhmedov and Zhuravskaya, 2004), Colombia (Drazen and Eslava, 2010), Germany (Mechtel and Potrafke, forthcoming), United States (Levitt, 1997)). However, recent work suggests that researchers have a limited understanding of the electoral dynamics and driving forces of these cycles. Brender and Drazen (2008) present evidence in a cross-country panel that these cycles do not seem to improve the releection prospects of the political leader up for reelection.

One reason that the underlying electoral incentives are not well-understood is that the basic political budget cycle pattern would be consistent with a number of different models. For example, Rogoff (1990) models the cycle as a separating equilibrium in a signalling framework while Shi and Svennson (2006) model the cycle as a moral hazard problem. The theoretic models, in general, have taken a fairly simple view of the actual electoral competition generating the cycle. Almost universally these models assume a politician seeking reelection and treat the politician as a single agent or parties as unified groups. This is also true of much of the distributive politics literature which looks at how expenditures should be allocated across political districts for electoral gain (see Larcinese et al. (2008) for a review of the literature). This simple modeling ignores the complexities of electoral competition such as the role of multi-member parties or the interactions of politicians and parties across different levels of government. Some recent work has begun to explore the underlying electoral competition in more detail. Persico et al. (2011) provide a model of electoral competition based on contests between factions across different levels of government and demonstrate that this can lead

to political budget cycles. Drazen and Eslava (2006) layout a model of targeted expenditures to swing districts during election years leading to a political budget cycle in some components of spending as opposed to aggregate expenditures. Some empirical work has suggested that compositional cycles do exist (Khemani, 2004; Drazen and Eslava, 2010).

In this paper, I investigate a political budget cycle in in-state tuition and required fees at public four-year institutions in the United States associated with elections of state governors.[1] I argue that public tuition is primed for electoral manipulation by governors who have both the ability and the motivation to adjust tuition during election years. The standard models of political budget cycles would predict that tuition would be lower during gubernatorial election years and, further, that the incentive to hold tuition lower would be to increase the reelection prospects of the candidates. I construct an extensive dataset combining state-level tuition with measures of the level of electoral competition to test not only for the existence of the cycle but also the underlying electoral mechanisms that create it. Identifying the electoral mechanisms in the context of the tuition cycle expands our understanding of the range of possible electoral incentives underlying political budget cycles. Additionally, it also reveals important dynamics of partisan competition within states in the United States.

This paper makes several contributions to the literature. First, I identify a previously undocumented cycle in public tuition at four-year institutions from 1972-2003. I find that on average tuition at public four-year institutions are 1.5 percent lower during gubernatorial election years than non-election years. Importantly, the election year deviation in tuition represents a sharp decrease which is statistically different from all non-election years during the gubernatorial term. Additionally, I find no evidence of a similar cycle in tuition at private institutions, which I argue should be immune to electoral manipulation, suggesting that the election year deviation in public tuition

[1]Henceforth, unless otherwise noted "election year" refers to a gubernatorial election year and "tuition" refers to in-state tuition and required fees at public four-year institutions. In-state (or resident) tuition is the rate charged to students who reside in the state. Students whose permanent residence is in another state are typically charged a separate and higher non-resident (or out-of-state) rate.

does not represent some unknown cycle in higher education.

Second, I utilize variation across states and time in the level of competition in the elections to identify the electoral incentives which create the cycle. I find no evidence that the tuition cycle is designed to increase the reelection prospects of governors. Instead, I find evidence that the cycle is created by those governors most likely to win reelection. Using previous margins of victory to proxy for the level of competition in gubernatorial elections, I find that a 10 point decrease in the level of competition causes a 0.5 percent decrease in tuition during gubernatorial election years. Additionally, I find that gubernatorial term limits, which prevent the incumbent from running for reelection, have no effect on the existence or magnitude of the tuition cycle. This finding provides complementary evidence to Brender and Drazen (2008) that despite the characterization in standard models, reelection motivations may not always be the driving force behind political budget cycles.

Instead, I find evidence that the tuition cycle may represent political pork from the governor used to expand party control of state legislatures by capturing state house districts narrowly held by the opposition party. Coattail effects of popular governors during gubernatorial election years make all opposition seats slightly more contestable by the governor's party, thus providing the opportunity to target swing voters with spending. This is similar in spirit to the model of Drazen and Eslava (2006), though in this case the swing district is targeted by the governor not to increase his or her own vote share but instead to increase the vote share for same-party candidates in concurrent state house elections. If this hypothesis is true then we should see not only that increased competition in state house elections leads to a larger tuition cycle but that the effect should be concentrated in districts where voters are responsive to tuition as a policy lever and in districts held by the opposition party.

I investigate this possibility by creating a unique panel of state legislative district electoral and demographic characteristics over time. I find that the magnitude of the tuition cycle increases with the level of competition in state house elections, though

the effect is non-linear and concentrated among highly contested elections. I find that a 1 percent increase in the average level of competition in these competitive districts is associated with a 0.8 percent decrease in tuition during a gubernatorial election year. Additionally, I find that a 10 percent increase in the number of tight elections decreases tuition by 0.7 percent during gubernatorial election years. Furthermore, I demonstrate that the effect is concentrated among districts which I argue are likely to be populated by voters responsive to lower tuition. In particular, the effect of competition on the magnitude of the cycle is isolated to those districts with colleges and those districts which are relatively young. Finally, I show that the effects are further concentrated in those districts currently held by a member of the opposition party, particulary if these opposition districts are also relatively young or have colleges. These results not only suggest that the electoral incentives driving political budget cycles can be much more complex than simple reelection motives, but also reveal important dynamics of partisan competition within state governments in the United States.

The rest of this paper is organized as follows: Section 2 begins by discussing the electoral incentives that governors have to manipulate tuition as well as the tools that they have at their disposal to do so. Section 3 discusses the data and empirical methodology and presents the results for the existence of the political budget cycle in tuition. Section 4 discusses the hypotheses to be tested about the electoral incentives driving the tuition cycle, the methodology and data used to test the hypotheses and the results of these tests. The paper concludes in Section 5.

2 Tuition Setting and State Politics

Tuition and fees at public four-year institutions provides an interesting examination of political budget cycles for several reasons. First, tuition is a potentially important issue for voters when judging the performance of governors and legislators. Education is typically the most important issue to voters in state elections, particularly for gover-

nors; stabilizing or lowering tuition during an election year is a concern for politicians (Gray et al., 1999). Part of the reason tuition is a potentially important political issue is that tuitionhave been increasing over the last thirty years in the United States at a rate surpassing inflation (Figure 1). While some of this increase in tuition in the public four-year college sector is due to an increased demand for higher education, much of it is due to reductions in state appropriations to higher education because of budgetary pressures (Mumford and Freeman, 2005), particularly with the rise of nondiscretionary spending on corrections and entitlement programs (Kane, Orszag and Gunter, 2003). College costs have become a concern not just for parents with college-age children but all parents, for whom paying for their children's college is tied with retiring comfortably as the most important long-term financial goal (Immerwahr et al., 2009).[2]

Additionally, college tuition provides valuable insight into political budget cycles because tuition setting satisfies a number of criteria found to be important in the political budget cycle literature. For example, cycles are likely in forms of spending more visible to voters (Drazen and Eslava, 2010). Tuition is highly visible with the annual changes in tuition making headlines in state news and higher education expenditures accounting for over 10% of state budgets. Additionally, electoral manipulations of policy levers are more likely to occur close to elections (Akhmedov and Zhuravskaya, 2004). Tuition for the following academic year is typically announced in late spring, primarily because this is when state budgets are set, while general elections for state governors are held in early November. Thus, the tuition announcement occurs within six months of the election. Furthermore, the beginning of the academic year in August or September means that students and parents feel the impact of tuition just before the general election (often leading to additional news stories about the cost of college).

Finally, tuition is a type of policy lever that governors have the opportunity to manipulate. Peltzman (1992) shows that increases in aggregate expenditures are po-

[2]Parents and students are not the only voters who care about tuition. College costs are listed as an important concern for all voters (Immerwahr et al., 2009) and tuition is linked to the state budget, the handling of which is an important indicator for the governor (Gray et al., 1999). Finally, higher education is an effective lobbying force in many states, particularly when connected through faculty and lecturers to unions (Gray et al., 1999).

litically damaging to governors, lowering their vote share. This should decrease the likelihood of political cycles in aggregate expenditures at the state-level in the United States. However, he finds no evidence that governors are punished by voters for higher education expenditures. Thus, while governors may be limited in their ability to manipulate the aggregate budget for political gain, governors may be able to manipulate higher education, consistent with models of compositional budget cycles (Drazen and Eslava, 2006, 2010).

Tuition at public four-year institutions is set differently across states but regardless of who has the final authority to set tuition, governors have the ability to influence the stated tuition. In a few states, tuition is set directly by the governor or state legislature during the crafting of the state budget. This provides the most direct manner in which governors can influence tuition. In other states, statewide coordinating or governing boards set tuition rates across the state. Governors frequently serve on these boards or appoint the members, who may show allegiance to the governor. In the remaining states, individual institutions set their own tuition rates. However, in both the case where statewide boards or institutions set tuition, governors can still exert influence over tuition through their control of the state budget.

As stated above, public tuition is primarily a function of higher education appropriations (Mumper and Freeman, 2005). A report by the State Higher Education Executive Officers (SHEEO) states that the level of state appropriations is by far the most important factor in tuition setting across states (Boatman and L'Orange, 2006).[3] In almost all states, governors are given substantial, if not sole, power over crafting and presenting a budget to the legislature as well as veto power over the final budget approved by the legislature (Gray et al., 1999). Thus, governors have significant power to manipulate appropriations to colleges and universities and therefore influence tuition levels. Furthermore, governors have various tools that allow them to set temporary

[3]State general fund appropriations was listed as the most influential factor by 36 states and was listed as one of the top three factors by 47 states. In comparison, prior year's tuition was listed as most influential by two states, tuition at peer institutions was listed as most influential by one state and inflation was listed as the most influential factor by three states. These factors were only listed in the top three factors by 16, 19, and 6 states, respectively.

limits on tuition growth. Such caps on tuition growth were the second most influential factor, behind appropriations on tuition setting policies in the SHEEO survey.[4]

Finally, governors may be able to influence tuition through bargaining and negotiation, exerting pressure on institutions to temporarily curb tuition increases (see Mumper and Freeman, 2005). For example, the governors and universities in Michigan and Ohio informally agreed to make future appropriations changes conditional on current tuition decisions in an attempt to limit tuition growth. In New Jersey the governor threatened institutions that increased tuition too much with an audit despite simultaneously cutting state aid to colleges.[5] This type of negotiation between governors and institutions of higher education or threats to punish high tuition by lowering future appropriations was often commonly mentioned in the survey results in Boatman and L'Orange (2006). Thus, state governors have a variety of ways to influence tuition at public four-year institutions within the state.

3 Empirical Methodology and Existence of the Tuition Cycle

3.1 Data and Methodology

The main variable of interest in my analysis is the average in-state tuition and required fees at public four-year institutions within each state. I use tuition data from the Higher Education General Information System (HEGIS) and the Integrated Postsecondary Education Data System (IPEDS). These surveys provide tuition data for approximately 500 public four-year institutions in each year beginning in 1972.[6] The average state tuition is constructed from the in-state tuition and fees reported by each four-year institution and weighted by total enrollment at each institution. Weighting by enrollment has two advantages. First, it creates a more accurate measure of the

[4] In the survey, 18 states reported having such caps sometime in the previous three years.

[5] See "Granholm Wants Limit on Tuition Increases" by Amy F. Bailey (Associated Press, Feb. 10, 2005), "Tuition Freezes on Thin Ice; Public, Private Colleges Mull Rate Hikes Amid Rising Operating Costs, State Funding Uncertainty" by Shannon Mortland (*Crain's Cleveland Business*, January 19, 2009) and "Tuition Increases and Audits" by Wendy Ginsberg (*The New York Times*, May 12, 2002).

[6] While the HEGIS files do provide some tuition data before 1972, it is collected intermittently and has a significant degree of item non-response. Therefore, I begin the sample in 1972, the earliest year where consistent data is available.

tuition experienced by students at public institutions in the state. Second, it emphasizes larger institutions within the state. If tuition is manipulated because of electoral competition then we may expect to see a tuition cycle at the larger more visible institutions within the state, such as the state flagship. I weight using the three-year moving average enrollment at each institution because tuition and contemporaneous enrollment are endogenously determined. All results are insensitive to the length of the moving average used, including using average enrollment over the length of the sample. Tuition data is not available for three years of the sample period. In the regression analysis which follows, year effects will account for the gaps in the tuition data.[7]

Given the potential political nature of tuition, the simple prediction from a standard political budget cycle model is that governors have an incentive to keep tuition at public institutions of higher education artificially low during election years. A look at the annual changes in real tuition at the state level suggest that tuition may be influenced by the gubernatorial election cycle. Table 1 shows that real annual tuition changes averaged 2.3 percent over this period and that changes were smaller during gubernatorial election years than non-election years. The average change in real tuition during election years was 1.5 percent while tuition changes across the non-election years average 2.6 percent, a statistically significant difference.

To formally explore the role of politics on tuition changes I estimate the effect of gubernatorial elections on real tuition at four-year public institutions as:

$$ln(T)_{st} = \alpha + \beta E_{st} + \gamma X_{st} + \delta_s + \phi_t + \epsilon_{st}, \tag{1}$$

where $ln(T)_{st}$ is the natural log of enrollment-weighted average real tuition in a state and year, E_{st} is a set of variables representing the electoral cycle, X_{st} is the set of state-level covariates described below which vary by state and time, δ_s are state effects,

[7] An alternative dataset of tuition and fees constructed by the Washington Higher Education Coordinating Board (HECB) has no years of missing data. However, it only includes a sample of institutions within each state and is not enrollment-weighted. Thus, I prefer the IPEDS dataset for this project. However, I repeated the analysis using the HECB data and the results were quantitatively and qualitatively similar suggesting that neither the enrollment-weighting nor the gaps in annual tuition data are driving the estimates.

and ϕ_t are year effects. E_{st} is an indicator variable or in some specifications a set of indicators for a gubernatorial election in a particular state and year. The state effect removes time invariant state characteristics that could affect higher education spending or state politics.[8] The year effects remove national trends in tuition as well as national macroeconomic factors. Thus, β represents the average deviation of (logged) tuition from the within state average during gubernatorial election years. The hypothesis of a political cycle is that $\beta < 0$, indicating that tuition is lower during gubernatorial election years.[9]

One potential difficulty is that elections are negatively serially correlated; not having an election raises the probability of having an election the next year and having an election this year decreases the probability of having an election next year. The dependent variable is positively correlated across time such that high tuition in one year is followed by high tuition the next year. Therefore, the simple estimates will overstate the standard errors on the election coefficient. Following Bertrand et al. (2004), I correct for the serial correlation by clustering the errors at the state level.

I collected data on gubernatorial elections from various years of *The Book of the States*. The data collected includes all gubernatorial elections between 1972 and 2003. Most states elect governors to four-year terms of office, although 9 states have two-year terms of office either during part or all of the time period considered. *The Book of the States* also contains information on the political party of the governor and whether the governor is prohibited from running for reelection by term limits, rules that limit the number of terms politicians can hold the same office. I collect both pieces of information to later investigate the electoral incentives underlying the cycle.

I also construct a variety of state-level covariates to account for demographic and

[8] An alternative approach would be to use state linear time trends to control for slow moving covariates which are not captured by state fixed effects. I prefer the approach that I use, which is similar to that used frequently in the literature (see Besley and Case (1995) and Persico et al. (2011)), because the state linear time trends take up much of the variation with only 48 states over 29 years. All results have been estimated using state specific time trends and the substantive results are unchanged although the precision of the estimates decreases in some specifications. These results are available from the author upon request.

[9] The log specification is for ease of interpretation as β represents the deviation during election years in percentage terms. Results of a specification using levels of real tuition instead were similar in relative magnitude.

economic conditions which may influence state support of higher education or the level of tuition and fees at public four-year institutions. I calculate the percentage of the population aged 5-17, percentage of the population aged 18-24, and percentage of the population over 65 years old from intercensal population estimates from the Census Bureau to represent the demands for different state services. To control for state-level economic cycles, which may affect both higher education enrollments and funding as well as state budgets, I collect real state income per capita and state unemployment rates from the Bureau of Labor Statistics. Finally, I include the number of public two-year and four-year institutions per capita, using the 18-24 year old population as the relevant population for both, to control for differences in state emphasis on the four-year sector of public higher education. In the regression analysis I also include state fixed effects to account for time-invariant differences across states and year effects to control for national macroeconomic conditions and trends in tuition.[10]

The final panel includes 46 states over 29 years providing 1334 state-year observations. I exclude four states from the final panel because of missing data, primarily with the measures of electoral competition used later.[11] Results of the regressions including these states when data are available are not qualitatively different and are available upon request. Table 2 presents means and standard deviations of selected variables used in the analysis. The average tuition during the period is $3,198 but the mean masks the changes in tuition during the sample period depicted in Figure 1.[12] Approximately 27 percent of the state-year observations have a gubernatorial election providing approximately 350 gubernatorial elections during the sample.

[10]The governance structure of higher education has been found to affect the level of tuition in the cross-section by Lowry (2001). To the extent that these governance structures are constant over time, the differences will be picked up by the state fixed effect. Unfortunately, consistent data on governance structures over time is not available. However, I have estimated regressions across states by governance structure in the later years of the sample when such data is available and have found that while the governance structure may affect the level of tuition across states it has no effect on the existence or magnitude of the tuition cycle within states.

[11]Nebraska has a nonpartisan, unicameral state legislature and thus while margins can be constructed for districts, party competition at the district level cannot be determined. Vermont, Alaska and Hawaii are excluded because of missing data in the early years of the sample period.

[12]Throughout the paper, all dollar values are inflated to real 2008 dollars using the CPI-U.

3.2 Existence of the Tuition Cycle

I begin by first investigating the existence of a cycle in public tuition associated with gubernatorial elections. Two specifications of the election year variable E_{st} are used to estimate equation (1). The first version includes a single dummy variable for a gubernatorial election year, while the second specification instead includes dummy variables for each non-election year. The results of these regressions are presented in the first two columns of Table 3 and present a picture of a political budget cycle consistent with what was observed in the simple means in Table 1. In the first specification, the coefficient on the election year variable is statistically significant and indicates that tuition is 1.5 percent lower in election years than non-election years, a reduction of 65% compared to the average annual rate of change. The second specification shows that the election year decrease in tuition is statistically different from each non-election year level. Additionally, the F-test on the null hypothesis that the coefficients on non-election year indicators are jointly zero is rejected. Therefore, tuition during gubernatorial election years appears to have a statistically significant deviation from all non-election years, including both the year prior to the election and the year immediately following the election. Finally, there is no statistically or economically significant difference in tuition rates across non-election years. Thus, the cycle appears to be characterized by a single sharp deviation during gubernatorial elections.

While the results above suggest a political cycle in tuition, they may in fact represent some other cycle in higher education which is coincidental with elections. The evidence from the second specification of a solitary deviation during election years may discount this possibility some, as it seems unlikely that some other nonelectoral cycle follows such a distinct pattern by coincidence. To explore whether the cycle identified above represents an actual electoral cycle in public tuition, I conduct a false experiment by estimating both specifications of equation (1) using average in-state tuition at private institutions, weighted within state by enrollment identically to public tuition, as the dependent variable. Private institutions receive little to no funding from state

governments and have few other connections to the state. As such, they should be immune from electoral manipulation and we should not expect to find an electoral cycle in private tuition. Additionally, there is little cross-market relationship between public and private four-year colleges, primarily because the private institutions are much more expensive with average tuition and fees in the sample period of $12,807 compared to the $3,198 in the public sector (e.g. Lovenheim and Reynolds, forthcoming).[13]

The results for private institutions show that tuition is actually higher during gubernatorial election years, though the magnitude of the deviation is small. Additionally, not all of the coefficients on the non-election year indicators are statistically significant and the null hypothesis that the non-election years are jointly zero cannot be rejected. However, this positive effect of gubernatorial elections on private tuitions is driven entirely by a few highly leveraged observations from states with very few private colleges. Removing these observations or estimating robust regressions downweighting highly leveraged observations eliminates any economically or statistically significant cycle in private four-year tuition. Similar procedures have no impact on the estimated cycle in public four-year tuition. These findings as well as later findings on how the cycle varies across elections suggest that the estimated deviation in tuition represents a political cycle instead of some other correlated cycle.[14]

4 The Electoral Incentives Underlying the Tuition Cycle

The evidence in the previous section suggests that tuition at public four-year institutions decreases during gubernatorial election years. This result is consistent with other political budget cycles previously found in the literature. However, identifying the tuition cycle expands our understanding of which types of elections and types of spending are susceptible to political cycles. I now attempt to expand our understand-

[13] One might also consider using non-resident or out-of-state tuition as an alternative falsification test as this is tuition charged to students from other states and therefore would not impact voters within the state. However, over half of states specifically index non-resident tuition to resident tuition, and individual may choose to do so as well.

[14] Wyoming has no private four-year institutions and therefore is not included in the regressions using private tuition. Removing Wyoming from the regressions using public tuition does not substantively change the results so the exclusion of this state does not explain the difference between public and private tuition.

ing of the mechanisms that can create political budget cycles by using the variation in the level of political competition within states over time to identify the electoral incentives which create the cycle. I will test two separate hypotheses about the form of electoral competition that might create a cycle in tuition associated with gubernatorial elections. The first hypothesis is that the cycle is generated by governors to increase their own reelection prospects. This is the primary electoral incentive in standard models of political budget cycles (Rogoff, 1990; Shi and Svennson, 2006; Drazen and Eslava, 2006).

The second hypothesis is that the cycle is generated not to increase the reelection prospects of gubernatorial candidates, but is designed instead to influence concurrent state legislative elections. In particular, I test the hypothesis that the cycle is designed to increase the number of seats held by the governor's party in state legislatures. Expanding the share of seats held by the governor's party advances two goals of a governor: first, increasing the power of the party in the state, and second, enacting their own agenda (Morehouse, 1998). More seats in the state legislature increases party power within the state and party members are more likely to support the governor's agenda, particularly those party members whose election depended on the governor's support (Morehouse, 1998).

Importantly, the opportunity to increase party control may be higher during gubernatorial election years than off-year state legislative elections because of gubernatorial coattails. Coattails refers to the phenomenon that the popularity of candidates in elections flows downhill to candidates from the same party in concurrent lower-level elections. It is thought that upper-level elections increase voter turnout and that these additional voters may be less informed about the lower-level races and vote for the candidates from the same party as the one they chose in the upper-level election (Hogan, 2005). Evidence suggests that an increase in the vote share of a gubernatorial candidate leads to an increase in the vote share of a generic state legislative candidate from the same party (Hogan, 2005) and an increase in the percentage of legislative seats

held by the candidate's party (Chubb, 1988; Lowry et al. 1998). Importantly, coattails make opposition districts more contestable for members of a popular governor's party, and make same-party districts less contestable by the opposition.

Thus, tuition policy could be a form of political pork used to influence highly competitive state legislative elections. This would be similar to the compositional spending model of political budget cycles by Drazen and Eslava (2006) though, again, the purpose would not be to sway a swing district for the politician allocating the pork (the governor) but would be intended to sway voters in a concurrent election. This type of pork spending would also be consistent with swing voter models of distributive politics (for example, Lindbeck and Weibull (1987)). It is important to note, however, that targeting spending to swing districts is only one possibility and that spending could instead be targeted to stronghold districts, those districts strongly supportive of the governor's party (for example, Cox and McCubbins (1986)). Recent evidence on distributive politices tends to support stronghold effects (Larcinese et al. 2006, 2008; Ansolabehere and Snyder, 2006). Additionally, stronghold effects have been found in election year capital spending in Mexico (Persico et al., 2011) and Canada (Joanis, 2011).

While it is possible that lowering tuition could be used to reward loyal constituents, a swing voter motivation is more likely. First, party control of legislatures and gubernatorial agendas (as stated above) are more consistent with tuition being used as pork to swing voters in close elections, particularly when combined with gubernatorial coattails during gubernatorial election years. Second, the evidence of stronghold effects in Persico et al. (2011) and Joanis (2011) is about targeted, direct expenditures to certain districts or voters. This paper explores the possibility that political competition across state legislative districts could produce a cycle in a centrally provided public good. While tuition may be targeted to certain groups of voters, which I explore later, it entails significant spillover effects throughout the state as there are voters across all districts who benefit from lower tuition. These spillover effects may make it more

difficult for tuition to be used to reward the loyalty of a particular district. However, the same spillover effects are useful if the aim is to increase the election prospects of party members across the state.

4.1 The Effects of Electoral Competition in Gubernatorial and State House Elections on the Tuition Cycle

To investigate the incentives driving the cycle, I include measures of electoral competition separately for governors and state legislators and interacted with gubernatorial election year indicators in equation (1). Thus, I estimate:

$$\begin{aligned} ln(T)_{st} &= \alpha + \beta E_{st} + \psi_1 E_{st} GC_{st} + \psi_2 GC_{st} + \theta_1 E_{st} LC_{st} + \theta_2 HC_{st} \\ &\quad + \gamma X_{st} + \delta_s + \phi_t + \epsilon_{st}. \end{aligned} \tag{2}$$

where GC_{st} is the level of competition in the gubernatorial election, LC_{st} is the average competition in concurrent state legislative elections, and all other variables are as previously defined. The main parameters of interest in this equation are the marginal effects of an increase in competition for either the gubernatorial election (ψ_1) or the state legislative elections (θ_1). If the cycle is designed to increase the reelection prospects of governors, then we would expect that tuition will decrease during gubernatorial elections as competition increases. If instead electoral competition in state legislative elections are contributing to the tuition cycle, then the sign of θ_1 would indicate whether swing district or stronghold effects are the driving factor. Evidence of swing voter effects would be found if the magnitude of the cycle increases as state legislative elections tighten, while stronghold effects would be found if the magnitude of the cycle increases as elections become less competitive.

To measure the competitiveness of a gubernatorial election I calculate the margin of victory in the previous election using vote totals collected from various years of *The Book of the States*. Prior vote shares are used frequently in the literature to examine the

role of electoral competition (e.g. Joanis (2011) and Larcinese (2008)). Additionally, evidence in Chubb (1988) and King (2001) suggest that previous margins of victory are strong proxies for electoral competition even when there is no incumbent in the race as the popularity of the previous governor carries forward to the candidate from the same party. The margin of victory is simply

$$m = \frac{V_I - V_{I-1}}{\sum_i V_i} \tag{3}$$

where V_i represents the votes cast for candidate i and candidates are ordered from 1 to I such that candidate $i = I$ has the highest vote tally in the election. Thus, the margin of victory is the difference between the votes for the winner of the election ($i = I$) and the candidate with the second highest vote tally ($i = I - 1$) as a fraction of all votes cast.[15] In addition to matching the previous literature, using previous margins of victory allow me to control for changes in tuition policy in the term leading into an election induced by the competitiveness of the prior election. Furthermore, previous margins of victory avoid the potential simultaneity problem associated with contemporaneous margins of victory caused by voters responding to lower tuition by increasing their votes for incumbent candidates, thereby impacting margin of victory. However, estimates using contemporaneous margins produce similar results so the use of previous margins is not driving the results.

Similar to the calculation for gubernatorial margins of victory, I construct a measure of average competition in state house elections using previous margins of victory in the district using the set of state legislative election returns from 1967-2003 by Carsey et al. (2008). I focus on state house elections because there is more variation in competition during gubernatorial election years. Most states have more state house than state senate districts and house members are elected more frequently than members in the

[15]Throughout the paper, I use the margins of victory in general elections. Some gubernatorial and state legislative elections go to a runoff election if no candidate wins a majority of votes. As discussed previously, the decisions about tuition and state budgets are made before the general election in each state. Additionally, only the top candidates in the general election qualify for the runoff election so incumbents still have an incentive to maximize their vote share in the general election. For both these reasons, the margin of victory in the general election would seem to be the appropriate measure. Regardless, the relatively infrequent runoff elections do not appear to be driving the results.

senate in most states.[16] For single-member districts, 80 percent of districts during the sample period, I calculate the margin of victory using equation (3). For multi-member districts, districts in which multiple politicians represent the same geographic area, I first sum the vote tallies for all candidates by political party and calculate the margin as the difference between the votes for the highest vote-tally party and the second highest vote-tally party as a fraction of total votes cast. This provides of measure of the competition at the party level in the district.[17]

One important feature of state legislative elections is that they are often uncontested, meaning that the number of candidates in the race is exactly equal to the number of seats up for election. From 1972-2003, the time period considered, 28 percent of state house contests are uncontested creating a mass of races where the margin of victory is 1 (see Figure 2). Figure 2 also shows that a substantial number of races are technically contested but are far from competitive. This distribution of margins suggests that there may be substantial non-linearities in the impact of competition on policy variables that may be missed by using the average margin of victory in the state as a measure of electoral competition.

Unfortunately, neither theory nor practice suggests the margin at which an election is no longer competitive. Therefore, throughout the analysis I use the distribution of the state house margins to identify potential non-linearities in the level of competition. I define a competitive election as one where the margin of victory is below the median for the sample of contested races (0.228 or 22.8 points). I define a tight election as one where the margin of victory is below the 20th percentile of the distribution of contested elections (approximately 0.08 or 8 points). For consistency, I also define competitive and tight gubernatorial elections using the same margins.[18] One could argue that the

[16]The majority of states (31) have four-year terms of office for state senators and two-year terms of office for house members. However, roughly half of states stagger the elections of senate members such that in any given gubernatorial election year only some senate districts experience an election. With rare exceptions, all house members are elected concurrently with governors in all states.

[17]Note that the margin calculated in single-member districts can also be thought of as a measure of competition between political parties because each party can only have one candidate in the election. A candidate from a major party may run as an independent which would split the vote of that party, though it is relatively rare. Given that there are over 5,000 state house districts, the occasional independent candidate is not driving the results.

[18]I use the state house margin distribution to define competitive and tight elections because the state house distribution is more skewed than the gubernatorial margin distribution. The results are not driven by how competitive and tight

measures include elections which may not be that competitive or tight. While this is certainly possible, I argue that both are at primarily removing those elections which are clearly neither competitive nor tight. Additionally, if the effects of competition are concentrated among the smallest election margins and districts are included which are not actually competitive or tight then my estimates will be attenuated toward zero.

Table 4 presents the effects of electoral competition on the magnitude of the tuition cycle estimated from equation (2). If the election year deviation in tuition is designed to increase the reelection prospects of gubernatorial candidates then we would expect that the magnitude of the cycle should increase as elections become more competitive. Instead, the results in column 1 suggest that a 10 point increase in the margin of victory decreases tuition during election years by 0.5 percent. This suggests that the election year deviation in tuition actually increases as gubernatorial elections become *less* competitive. Thus, tuition is held lower during gubernatorial election years when the reelection prospects of the governor are greater, which is inconsistent with governors inducing the tuition cycle to increase their reelection prospects. This result is consistent with the recent evidence in Brender and Drazen (2008) that political budget cycles may not be designed to increase reelection prospects of politicians as well as the evidence in Peltzman (1992) that gubernatorial reelection prospects do not increase with spending.

The second column of Table 4 presents the estimates of equation (2) including both the gubernatorial and average state house margins of victory. However, as discussed previously, the high percentage of uncontested and uncompetitive state house elections makes the average margin of victory in state house elections a poor measure of electoral competition in the state. Therefore, in the third column I estimate equation (2) using the margin of victory in competitive district elections. Regardless of which measure of state house competition is used, the estimates continue to show that the magnitude of the tuition cycle decreases with the level of competition in gubernatorial elections.

elections are defined and are robust to other definitions of close elections. For example, the substantive results are unchanged if I use the median and 20th percentiles of the gubernatorial margin distribution, 0.119 and 0.044 respectively, instead of the state house distribution to define competitive and tight elections (see Table A-1).

However, the results suggest that the cycle is correlated with competition in concurrent state house elections and, in contrast to the results for gubernatorial competition, the magnitude of the cycle increases with the level of competition in these state house elections. In column 2, the coefficient on the interaction of average state house margins in all elections and the election year indicator is positive, although imprecisely estimated. However, when the average margin in the competitive districts is used (column 3) there is a substantial negative marginal effect on the magnitude of the cycle. The estimates suggest that a 10 point increase in the margin of victory in competitive districts decreases the magnitude of the cycle by 7.9 percent. The positive coefficient is consistent with a swing voter model because it suggests that the cycle disappears when districts become less competitive and therefore less likely to swing from one party to another.

The results in columns 1 through 3, and the distribution of margins in Figure 2, suggest that there may be substantial nonlinearities in the effect of electoral competition on the tuition cycle. I further explore the possibility of nonlinearities in the effect of electoral competition by estimating equation (2) replacing the margins of victory with measures of tight elections. For gubernatorial elections this is simply an indicator that takes a value of 1 if the election is tight and zero otherwise. For state house elections, I use the percentage of elections which are tight. The results in columns 4 and 5 provide further evidence that electoral competition in gubernatorial and state house elections have opposite effects on the existence and magnitude of the tuition cycle. The results in the column 4 suggests that tight gubernatorial elections are not driving the cycle. In fact, the interaction of the gubernatorial election year and competitive gubernatorial election indicator is positive and the magnitude suggests that the cycle actually disappears during tight gubernatorial elections. In contrast, the magnitude of the cycle increases as the percentage of tight state house elections increases. The results in column 5 indicate that a 10 point increase in the percentage of state house districts with margins less than 8 points decreases tuition in gubernatorial election years by 0.7 percent. Thus, the results in columns 4 and 5 provide further evidence that the tuition

cycle is associated with the existence of tight state house elections but disappears as gubernatorial reelection prospects narrow.

Thus, the evidence is consistent with popular governors keeping tuition low during gubernatorial election years in an attempt to influence state house elections instead of attempting to increase their own reelection prospects. Further evidence that the incentives of the governor may be partisan and not personal can be seen in Table 5. In the first column of Table 5, I estimate equation (2) including an indicator for whether the governor is term-limited and therefore unable to run for reelection. As discussed in Besley and Case (1995), gubernatorial term limits may change the decisions made by governors over state policy variables if the governor is motivated by his or her own reelection prospects and not the interests of the party. If the cycle observed in tuition is designed to increase the reelection prospects of governors then the cycle should disappear when the governor is unable to run for reelection.[19] The results in the first column of Table 5 show little evidence that the cycle disappears or even decreases in magnitude when the governor is prevented from running for office. The coefficient on the interaction of the election year and term limit indicators is small and statistically insignificant. Additionally, the F-test of the null hypothesis that there is no cycle in tuition during term-limited gubernatorial terms is rejected at the 10% level.

It also does not appear that the tuition cycle is an issue of party platforms. In the second column of Table 5, I estimate equation (2) including indicators for political party of the governor. I include an indicator for Democrat and Independent, the left out category being Republican, as well as interactions with the gubernatorial election year indicator. The coefficient on the interaction of the Democrat and election year indicator shows no statistically significant difference in the magnitude of the tuition cycle between Republican and Democratic governors. Thus, the cycle appears to be

[19]It is also possible that governors are thinking about their future political careers and thus still inducing a cycle for their own purposes. However, some states have lifetime instead of consecutive term limits so future reelection is not an option for many governors. Additionally, it is not clear why holding tuition low during the last year of office as opposed to the entire term is optimal for increasing reelection chances in some future election many years away. Finally, while it is possible for governors to move up in their party from holding state to holding federal offices, either elected or appointed, the instances of this happening are relatively rare in the data. Also, it is not immediately clear why electoral manipulation of tuition at the state level would increase their prospects for federal positions.

independent of party platforms and governors from both parties engage in the cycle.[20]

4.2 The Role of Pivotal Districts in the Tuition Cycle

To provide further evidence about the electoral incentives in state house elections, I investigate how the cycle varies across types of state house districts. If, as hypothesized earlier, the cycle is designed to expand party power by capturing swing districts then we should see that the competition driving the cycle is associated with certain pivotal districts. A pivotal district has two characteristics: first, the voters in the district are likely to respond to tuition as a policy lever and second, the district is held by members of the opposition party (ie. not currently held by the governor's party). The first characteristic determines whether tuition can be used to influence an election while the second determines whether the election could be used to increase party control of the legislature. To explore the variation across state house districts, I estimate a version of equation (2) including additional interactions of competition in state legislative elections (LC_{st}) across district characteristics.

I create demographic data for each district by constructing weights which map counties into state legislative districts. These county weights are then combined with county-level economic and demographic data collected from various years of *The County and City Databook* to create district-level characteristics. The weight (w_{ij}) county j receives for district i is calculated as

$$w_{ij} = \frac{p_{ij}}{\sum_J p_{ij}} \tag{4}$$

where p_{ij} is the number of people in district i in county j. Thus, the weight assigned to a particular county is the proportion of the district's population in county j. Two different measures of p_{ij} were used depending on data availability. For the period up until redistricting in the 1990s, weights were constructed using county-level votes so

[20] While the results also appear to suggest that the cycle disappears during the terms of independent governors, which would be consistent with the story that partisan competition for state legislative districts drives the tuition cycle, care must be taken when interpreting this result because there are few independent governors during the sample. Therefore, I interpret the effect as possibly suggestive but not definitive evidence of partisan competition.

that w_{ij} is the proportion of the voting population of district i in county j. This data was collected from the Inter-university Consortium for Political and Social Research (ICPSR) dataset 8907 (ICPSR, 2006). Most of the weights in the 1990s and 2000s were constructed from the Public Law 94-171 redistricting files of the Census Bureau. In this case, the weights were constructed based on actual population counts according to the location of Census blocks in districts. County-level voting data was used for states during the 1990s which either did not participate in the Census redistricting project or that experienced mid-decade redistricting not captured in the Census files. For several states I was able to calculate the weights using both voting data and population data and found that they were highly correlated so the results are not driven by differences in the calculation of the weights.[21]

Identifying constituencies in the context of tuition is somewhat difficult as many different people may consider tuition to be an important policy issue. I consider two characteristics of a district that are likely to reflect an increased sensitivity to tuition in the district. First, I define college districts as those districts which represent voters in counties with public four-year colleges and universities. If people geographically sort themselves based on preferences over local amenities then we may expect that those living near colleges are those who place a higher value on higher education. Additionally, those people living near colleges, particularly the larger universities, are more likely to be employed by the colleges or in industries which rely on the college or student population. These voters would likely support having higher enrollments at the university and would therefore support lower tuition as tuition and enrollment are negatively correlated. Perhaps more importantly, these voters would be supportive of higher state support of the university in general and higher state support is negatively correlated with tuition.

The second group likely to be sensitive to tuition changes are parents for whom,

[21] This creates a final panel of approximately 86,000 state house districts over time. Though I do not investigate state senate elections, the same methodology can be used to construct a panel of approximately 20,000 state senate districts as well. To my knowledge, this is the first panel of all state legislative district characteristics over a substantial time horizon and through periodic redistricting. Excellent data from Barone et al. (1998) and Lilley et al. (2008) has been created but are limited to the 1990s and 2000s respectively and do not account for mid-decade redistricting.

as discussed previously, college costs are a growing concern. Therefore, we would expect that districts with a higher proportion of youths would be more responsive to tuition changes. I identify young districts as those districts where the proportion of the district's population aged 0-24 years is above the median district in the state in each year.[22] This constituency definition is simple but fairly broad as there may be districts with relatively few youth in the districts defined as being young. Later, I demonstrate that the results are robust to using more narrowly defined age groups.

College districts and young districts are not mutually exclusive nor overlapping and districts change constituency status over time. The age distribution of districts changes over time with birth, deaths and migration. College districts change as new public colleges are created during this period, though this is relatively infrequent. Additionally, both types of districts vary over time as new district lines are drawn during redistricting. District lines are redrawn following the decennial census and occasionally redrawn between censes following court cases, thus in my sample districts are typically redrawn four to six times. While districts vary with regards to how frequently constituency status changes, the average district in my sample is a college district in 55 percent of the years and is a young district in 46 percent of the years.

I begin by testing whether the cycle is associated with electoral competition in constituent districts where voters are likely to be responsive to lower tuition. Columns 1 and 2 of Table 6 include the average margins of victory separately for those districts with four-year public institutions and those districts without four-year public institutions (referred to as the constituent and nonconstituent districts respectively). The results for all districts in column 1 show a positive though statistically insignificant marginal effect of competition in college districts on the tuition cycle and no substantive or statistically significant effect of competition in non-college districts. When the results are restricted to those districts which could be competitive in column (2), the

[22] I use the proportion aged 0-24 to capture the possibility that tuition is viewed as a proxy for educational issues and therefore parents with younger children may also respond to lower tuition. Results using the proportion of the population aged 18-24 were similar.

estimates show a strong positive effect of margins of victory in college districts on the tuition cycle. The coefficient on the interaction of the election year indicator with previous margins of victory suggests that a 10 point increase in the average margin of victory in college districts is associated with a 5.9 percent decrease in the magnitude of the election year deviation in public tuition. The effect of average margins in the non-college districts remains small and not statistically significant.

A similar picture emerges in columns 3 and 4 defining constituent districts based on the age distribution of each district. When average margins in all elections are including separately in column 3 for young and old districts we again see a positive effect of margins in the young districts and a small, negative effect in the older districts, although the effect is not statistically significant in either case. When the regressions are restricted to only the competitive districts in column 4, we see a large positive effect of margins in young districts on the election year deviation, suggesting that the cycle disappears as elections in young districts become less competitive. The coefficient on the interaction of gubernatorial election year and state house margins suggest that a 10 point increase in the previous margin of victory decreases the magnitude of the election year deviation in tuition by 4.6 percent similar in magnitude to the effect in college districts. Additionally, the coefficient on the interaction for older districts is smaller in magnitude and not statistically significant. Dividing districts into young and old is fairly broad. Table A-2 presents results including the margin of victory separately by terciles of the 0-24 age distribution. The results show that the effect of competition declines as the proportion of youth in a district declines.

The fact that the tuition cycle is correlated with the margin of victory in districts which are likely to have voters responsive to tuition changes provides further evidence that competition for state house districts may be a driving force of the tuition cycle. That the marginal effect of an increase in the level of competitiveness in these districts is to increase the magnitude of the cycle suggests that the cycle may designed to influence swing districts rather than reward strongholds. Further evidence that swing

districts may be the target of the tuition cycle can be seen in Table 7 where I include margins of victory and their interactions with the election year indicators separately, not by constituency but by incumbent party control. The question being investigated is whether the magnitude of the tuition is correlated with the competitiveness of districts currently held by the governor's party or with the competitiveness of districts held by the opposition party.

In both columns 1 and 2 of Table 7, the coefficient on the interaction of the gubernatorial election year indicator and margin in opposition districts is larger than the coefficient on the interaction term for the margin in districts of the governor's party, particularly for competitive elections. As both effects are positive, these coefficients suggest that the magnitude of the cycle disappears as districts become less competitive and the rate at which the cycle disappears is greater in those districts not currently held by the governor's party. However, the results are inconclusive because the estimated marginal effects are not statistically significant at conventional levels.

When the same exercise is performed on the two constituent group districts the pattern becomes clearer. Columns 3 and 4 of Table 7 present the results for college districts while columns 5 and 6 present the results for young districts. For both types of constituent districts the marginal effect of an increase in electoral margins is positive and statistically significant for those districts held by the opposition party. As before, the effects are concentrated among the competitive districts where a 10 point increase in the electoral margin reduces the magnitude of the tuition cycle by 0.5 percent but the marginal effects are statistically significant for all districts for both sets of constituent districts. There is no statistically significant effect of electoral margins in constituent districts held by the governor's party and the marginal effects are small and switch signs between all levels of competition and competitive districts. These results suggest that the level of competition in opposition districts is driving the cycle.

The results in this section provide further evidence that tuition may be used as political pork to capture swing districts held by the opposition party. The cycle de-

creases with the level of competition in districts which may be more likely to respond to lower tuition and there is no effect in other districts. Additionally, it appears that it is the competitiveness of districts held by the opposition party that affects the magnitude of the cycle, particularly in those districts which are likely to be responsive to tuition. There is little evidence that even constituent districts narrowly held by the governor influence the magnitude of the cycle. Again this result, when combined with the evidence that popular governors are more likely to induce the cycle, is consistent with the influence of gubernatorial coattails. Popular governors have long coattails, meaning that the candidates in state legislative elections from the governor's party see an increased share of the vote. This makes otherwise noncompetitive districts held by the opposition party more competitive but it also makes competitive districts held by the governor's party slightly less competitive. The now more competitive opposition districts can be targeted by spending such as tuition and possibly be captured by the governor's party.[23]

5 Conclusion

Despite the prevalence of political budget cycles, researchers do not have a clear understanding of the electoral incentives producing these election year spending changes. To expand our understanding of the range of possible electoral motivations, this paper identifies and explores a political budget cycle in tuition and fees at public four-year institutions in the United States. Using data from 1972-2003, I find that tuition is 1.5 percent lower during gubernatorial election years than non-election years. I find no similar cycle in private tuition suggesting that the effect is not some other cycle in higher education coincidental with gubernatorial elections.

[23]The existence of gubernatorial coattails also serves to explain why the cycle in tuition occurs during gubernatorial elections. In off-year state house elections, there are no coattails and thus fewer competitive opposition districts to be targeted. Consistent with this explanation, estimates of the existence and magnitude of a cycle associated with state house elections, which are more frequent than gubernatorial elections in most states, are presented in Table A-3. The results for all estimates have the same signs as those reported for gubernatorial election years but the magnitudes are much smaller and are never statistically significant. These results suggest that the underlying motivation associated with state house elections may exist in all state house elections but the effects are concentrated among gubernatorial election years.

I then test whether the cycle is designed to increase the reelection prospects of the governors, as standard theories would suggest, or whether the cycle is designed to influence concurrent state legislative elections. Using previous margins of victory as a proxy for competition in these elections, I find that tuition is lower during gubernatorial election years when the governor is *more* likely to be reelected, suggesting that the cycle is not designed to improve reelection prospects. I find that a 10 point increase in the previous margin of victory decreases tuition by 0.5 percent during gubernatorial election years. Additionally, I find that gubernatorial term limits have no effect on the tuition cycle providing further evidence that the cycle in tuition during gubernatorial election years is not driven by competition for the governorship.

Instead, I find evidence that popular governors use tuition as political pork to target swing districts in state house elections. The evidence suggests that a 10 point increase in the average margin in competitive state house elections increases tuition during gubernatorial election years by 7.8 percent. Additionally, I find that a 10 percent increase in the number of close state house elections decreases tuition by 0.7 percent during gubernatorial election years. Both results suggest that the tuition cycle increases in magnitude as state house elections become more competitive. Using a unique dataset on state legislative district characteristics that I construct, I show that the effect is driven by competition for districts which are likely swing districts that could be targeted by lowering tuition. The effects are concentrated in those districts which are relatively young and those districts which have public four-year colleges, particularly if these districts are narrowly held by the opposition party. Thus, the evidence is consistent with popular governors using lower tuition to capture swing districts in concurrent state house elections.

These results reveal important dynamics about party competition and spending within states in the United States. The underlying mechanisms of the tuition cycle suggest that previous models of political budget cycles may be overly simplistic. While these models have explained how a cycle in expenditures could arise in certain contexts,

the evidence in this paper suggests that the assumptions of these models may not fit with the complex realities of political competition. This is not to suggest that the exact mechanisms identified in this paper should be assumed to exist in other cycles. However, the fact that the tuition cycle does appear to be based on complicated political competition provides insight into more complex modeling of political budget cycles.

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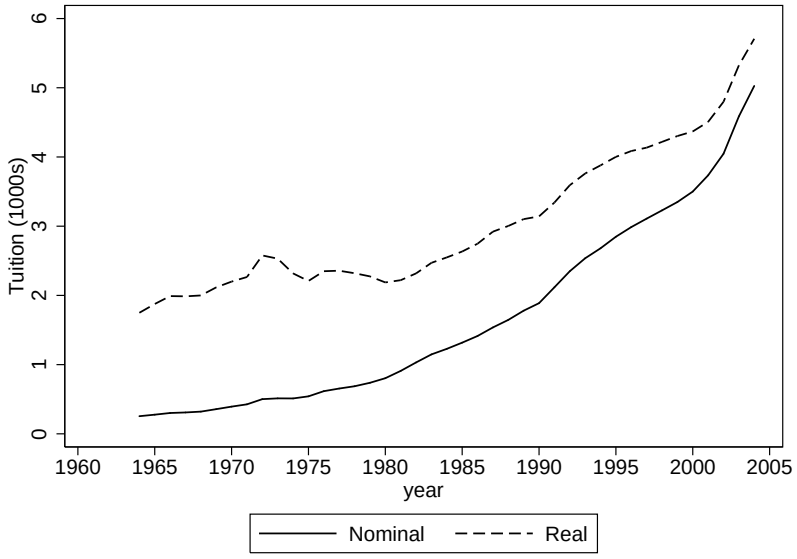
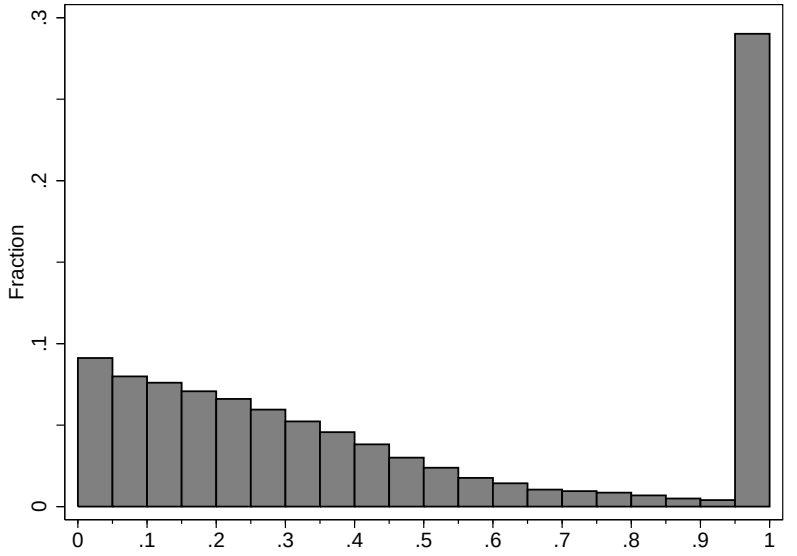
Figure 1: Tuition and Fees at Public Four-year Institutions, 1964-2004



[1] Source: *Digest of Education Statistics 2007*.
[2] Solid line is nominal tuition. Dashed line is real tuition measured in 2008 dollars.

Figure 2: Distribution of Election Margins in State House Elections 1972-2003



[1] Height of each bar indicates the fraction of elections with margins in that range.

Table 1: Average Annual Growth Rate of Tuition and Fees at Public Four-year Institutions, 1972-2003

	All years	Election year	Non-election year	Difference
Nominal	0.076	0.063	0.080	-0.017 **
	(0.002)	(0.003)	(0.002)	(0.005)
Real	0.023	0.015	0.026	-0.012 **
	(0.002)	(0.004)	(0.002)	(0.005)
N	1200	311	889	

[1] Real tuition and fees is in 2008 dollars.
[2] The growth rate is calculated as $g = \frac{T_t - T_{t-1}}{T_{t-1}}$, thus it includes two years of data. Tuition data is missing for 1982, 1985 and 1999 so these years, as well as the following year in each case, is excluded from the calculation above.
[3] Standard errors are in parentheses. Asterisks indicate statistical significance at the 10% (*) and 5% (**).

Table 2: Means of Selected Variables, 1972-2003

	Mean	St. Dev.
Tuition and fees	3.198	1.318
Gubernatorial election year	0.266	0.442
State covariates		
Percent population aged 5-17	0.204	0.027
Percent population aged18-24	0.113	0.017
Percent population aged 65+	0.119	0.020
Unemployment rate	0.060	0.020
Per capital income	17.466	3.354
Governor		
Democrat	0.546	0.498
Republican	0.441	0.497
Term-limited	0.275	0.447
Margin	0.163	0.138
State house		
House election year	0.493	0.500
Margin	0.475	0.177
Percent races not contested	0.280	0.222
Margin, competitive elections	0.111	0.018
Margin, tight elections	0.034	0.024

[1] All dollars are in 1000s of 2008 dollars.
[2] Margin is the margin of victory in the previous election calculated as described in the text. Competitive districts are those districts with margins less than the median in the sample of state house elections.

Table 3: Effect of Gubernatorial Elections on Real Tuition and Fees at Four-year Institutions, 1972-2003

	Public Four-year Institutions		Private Four-year Institutions	
Independent Variables	(1)	(2)	(3)	(4)
Election year	-0.015 **		0.007 **	
	(0.005)		(0.003)	
One year after election		0.010 **		-0.006 *
		(0.005)		(0.003)
Two years after election		0.017 **		-0.008 **
		(0.005)		(0.004)
Three years after election		0.015 **		-0.003
		(0.005)		(0.003)
F-test		4.18 **		2.05
		(0.011)		(0.121)
N	1334	1334	1300	1300
R^2	0.92	0.92	0.96	0.96

[1] The dependent variable is the natural log of the enrollment-weighted state average tuition and fees in 2008 dollars. The regressions include the proportion of the population aged 5-17, the proportion of the population aged 18-24, the proportion of the population aged over 65, the state unemployment rate, the state real per capita income, the number of public two-year institutions and public four-year institutions per 18-24 year olds as well as state and year fixed effects. Standard errors are clustered by state.

[2] Election year is an indicator which takes the value of 1 if there is a gubernatorial election in that state and year and a value of zero otherwise.

[3] The F-test is a test that the nonelection years are jointly significant.

[4] Standard errors are in parentheses below coefficients and p-values are in parentheses below F-statistics. Asterisks indicate statistical significance at the 10% (*) and 5% (**) levels.

Table 4: Effects of Competitiveness in Gubernatorial and State House Elections on the Magnitude of the Tuition Cycle

Independent Variables	All Elections (1)	All Elections (2)	Competitive Districts (3)	All Elections (4)	All Elections (5)
Election year	-0.006	-0.021	-0.091 **	-0.022 **	-0.011
	(0.007)	(0.014)	(0.034)	(0.005)	(0.008)
Election year *	-0.052 *	-0.060 *	-0.053 *		
gubernatorial margin	(0.030)	(0.031)	(0.031)		
Gubernatorial margin	0.007	0.006	0.012		
	(0.055)	(0.057)	(0.055)		
Election year *		0.032	0.786 **		
house margin		(0.025)	(0.299)		
House margin		-0.006	0.264		
		(0.082)	(0.311)		
Election year *				0.019 *	0.019 *
tight gubernatorial election				(0.010)	(0.010)
Tight gubernatorial election				-0.007	-0.006
				(0.015)	(0.015)
Election year *					-0.071 *
* tight house election share					(0.040)
Tight house election share					-0.004
					(0.070)
N	1334	1330	1334	1330	1330
R^2	0.92	0.92	0.92	0.92	0.92

[1] The dependent variable is the natural log of the enrollment-weighted state average tuition and fees in 2008 dollars. The regressions include the proportion of the population aged 5-17, the proportion of the population aged 18-24, the proportion of the population aged over 65, the state unemployment rate, the state real per capita income, the number of public two-year institutions and public four-year institutions per 18-24 year olds as well as state and year fixed effects. Standard errors are clustered by state.

[2] Gubernatorial margin is the margin of victory in the previous gubernatorial election. House margin is the average margin of victory in the previous state house elections. A competitive election is defined as having a margin below the median of the distribution of contested state house elections, equivalent to a margin less than 0.228. A tight election is defined as having a margin below the 20th percentile of the distribution of contested state house elections, equivalent to a margin below 0.083.

[3] Standard errors are in parentheses below coefficients and p-values are in parentheses below F-statistics. Asterisks indicate statistical significance at the 10% (*) and 5% (**) levels.

Table 5: Effect of Gubernatorial Term-limits and Governor's Political Party on Tuition and Fees at Public Four-year Institutions During Gubernatorial Election Years

Independent Variables	(1)	(2)
Election year	-0.016 **	-0.019 **
	(0.007)	(0.006)
Term limited *	0.002	
election year	(0.012)	
Term limited	0.008	
	(0.012)	
Democrat governor *		0.006
election year		(0.010)
Democrat governor		-0.000
		(0.015)
Independent governor *		0.028 *
election year		(0.014)
Independent governor		0.004
		(0.032)
F-test	3.03 *	3.01 *
	(0.089)	(0.090)
N	1334	1334
R^2	0.92	0.92

[1] The dependent variable is the natural log of the enrollment-weighted state average tuition and fees in 2008 dollars. The regressions include the proportion of the population aged 5-17, the proportion of the population aged 18-24, the proportion of the population aged over 65, the state unemployment rate, the state real per capita income, the number of public two-year institutions and public four-year institutions per 18-24 year olds as well as state and year fixed effects. Standard errors are clustered by state.

[2] For the term limit regression the F-test is that nonelection years equal the election year during term-limited terms. For the party regression this is the test that nonelection years equal the election year during Democratic terms.

[3] Standard errors are in parentheses below coefficients and p-values are in parentheses below F-statistics. Asterisks indicate statistical significance at the 10% (*) and 5% (**) levels.

Table 6: Effect of Competitiveness of State House Elections on Tuition and Fees at Public Four-year Institutions by Constituent and Nonconstituent Districts

	Constituent: College districts		Constituent: Young districts	
	All Districts	Competitive Districts	All Districts	Competitive Districts
Independent Variables	(1)	(2)	(3)	(4)
Election year	-0.017	-0.079 **	-0.021	-0.087 **
	(0.014)	(0.025)	(0.015)	(0.033)
Election year *	-0.060 *	-0.041	-0.056 *	-0.052
gubernatorial margin	(0.031)	(0.034)	(0.030)	(0.031)
Gubernatorial margin	0.013	0.007	0.002	0.005
	(0.056)	(0.054)	(0.057)	(0.056)
Election year *	0.020	0.591 **	0.040	0.459 *
margin constituent districts	(0.038)	(0.186)	(0.035)	(0.250)
Margin constituent districts	0.033	0.087	0.046	0.131
	(0.084)	(0.172)	(0.115)	(0.272)
Election year *	0.007	0.040	-0.006	0.274
margin nonconstituent districts	(0.038)	(0.189)	(0.038)	(0.269)
Margin nonconstituent districts	-0.059	0.089	-0.051	0.144
	(0.058)	(0.209)	(0.090)	(0.189)
N	1321	1300	1320	1311
R^2	0.92	0.92	0.92	0.92

[1] The dependent variable is the natural log of the enrollment-weighted state average tuition and fees in 2008 dollars. The regressions include the proportion of the population aged 5-17, the proportion of the population aged 18-24, the proportion of the population aged over 65, the state unemployment rate, the state real per capita income, the number of public two-year institutions and public four-year institutions per 18-24 year olds as well as state and year fixed effects. Standard errors are clustered by state.

[2] Gubernatorial margin is the margin of victory in the previous gubernatorial election. House margin is the average margin of victory in the previous state house elections. A competitive election is defined as having a margin below the median of the distribution of contested state house elections, equivalent to a margin less than 0.228.

[3] College districts are those districts representing voters in counties with public four-year institutions. Young districts are those districts with a proportion of 0-24 year olds above the median in the state.

[4] Standard errors are in parentheses below coefficients. Asterisks indicate statistical significance at the 10% (*) and 5% (**) levels.

Table 7: Effect of Competitiveness of State House Elections on Tuition and Fees at Public Four-year Institutions by District Party Control

	All Districts		College Districts		Young Districts	
	All Districts	Compet. Districts	All Districts	Compet. Districts	All Districts	Compet. Districts
Independent Variables	(1)	(2)	(3)	(4)	(5)	(6)
Election	-0.031 *	-0.078 *	-0.023	-0.080 **	-0.045 **	-0.063 **
	(0.016)	(0.036)	(0.015)	(0.019)	(0.015)	(0.027)
Election year *	-0.041	-0.048	-0.040	-0.053	-0.037	-0.053
gubernatorial margin	(0.030)	(0.031)	(0.032)	(0.032)	(0.030)	(0.032)
Gubernatorial margin	-0.011	-0.005	0.001	0.005	-0.004	-0.003
	(0.055)	(0.057)	(0.059)	(0.061)	(0.057)	(0.056)
Election year *	0.006	0.181	-0.016	0.101	0.021	-0.056
house margin (governor's party)	(0.027)	(0.244)	(0.054)	(0.179)	(0.027)	(0.210)
House margin (governor's party)	0.050	0.118	0.003	0.165	0.015	-0.016
	(0.063)	(0.242)	(0.055)	(0.143)	(0.049)	(0.183)
Election year *	0.048	0.465	0.049 *	0.564 **	0.064 **	0.575 **
house margin (opposition party)	(0.029)	(0.277)	(0.026)	(0.218)	(0.029)	(0.184)
House margin (opposition party)	-0.020	-0.194	-0.016	-0.029	-0.037	0.082
	(0.050)	(0.223)	(0.054)	(0.144)	(0.030)	(0.172)
N	1301	1301	1288	1258	1290	1290
R^2	0.92	0.92	0.92	0.92	0.92	0.92

[1] The dependent variable is the natural log of the enrollment-weighted state average tuition and fees in 2008 dollars. The regressions include the proportion of the population aged 5-17, the proportion of the population aged 18-24, the proportion of the population aged over 65, the state unemployment rate, the state real per capita income, the number of public two-year institutions and public four-year institutions per 18-24 year olds as well as state and year fixed effects. Standard errors are clustered by state.

[2] Gubernatorial margin is the margin of victory in the previous gubernatorial election. House margin is the average margin of victory in the previous state house elections. A competitive election is defined as having a margin below the median of the distribution of contested state house elections, equivalent to a margin less than 0.228.

[3] College districts are those districts representing voters in counties with public four-year institutions. Young districts are those districts with a proportion of 0-24 year olds above the median in the state.

[4] Standard errors are in parentheses below coefficients. Asterisks indicate statistical significance at the 10% (*) and 5% (**) levels.

Table A-1: Effects of Competitiveness in Gubernatorial and House Elections on the Magnitude of the Tuition Cycle Defining Competitive and Tight Elections Based on the Distribution of Gubernatorial Elections

Independent Variables	All Elections (1)	All Elections (2)	Competitive Districts (3)	All Elections (4)	All Elections (5)
Election year	-0.006	-0.021	-0.047	-0.015 **	-0.008
	(0.007)	(0.014)	(0.036)	(0.005)	(0.007)
Election year *	-0.052 *	-0.060 *	-0.055 *		
gubernatorial margin	(0.030)	(0.031)	(0.031)		
Gubernatorial margin	0.007	0.006	0.005		
	(0.055)	(0.057)	(0.054)		
Election year *		0.032	0.715		
house margin		(0.025)	(0.574)		
House margin		-0.006	0.454		
		(0.082)	(0.578)		
Election year *				0.003	0.003
tight gubernatorial election				(0.013)	(0.013)
Tight gubernatorial election				0.007	0.007
				(0.017)	(0.017)
Election year *					-0.091 *
* tight house election share					(0.054)
Tight house election share					-0.020
					(0.078)
N	1334	1330	1334	1330	1330
R^2	0.92	0.92	0.92	0.92	0.92

[1] The dependent variable is the natural log of the enrollment-weighted state average tuition and fees in 2008 dollars. The regressions include the proportion of the population aged 5-17, the proportion of the population aged 18-24, the proportion of the population aged over 65, the state unemployment rate, the state real per capita income, the number of public two-year institutions and public four-year institutions per 18-24 year olds as well as state and year fixed effects. Standard errors are clustered by state.

[2] Gubernatorial margin is the margin of victory in the previous gubernatorial election. House margin is the average margin of victory in the previous state house elections. A competitive election is defined as having a margin below the median of the distribution of gubernatorial elections, equivalent to a margin less than 0.119. A tight election is defined as having a margin below the 20th percentile of the distribution of gubernatorial elections, equivalent to a margin below 0.044.

[3] Standard errors are in parentheses below coefficients and p-values are in parentheses below F-statistics. Asterisks indicate statistical significance at the 10% (*) and 5% (**) levels.

Table A-2: Effects of Competition on the Magnitude of the Tuition Cycle Across Within-state Age Distribution of State House Districts

Independent Variables	All Districts (1)	Competitive Districts (2)
Election year	-0.013	-0.034 **
	(0.014)	(0.034)
Election year	-0.062 *	-0.065
* gubernatorial margin	(0.033)	(0.039)
Gubernatorial margin	0.005	-0.004
	(0.059)	(0.055)
Election year	-0.037	0.561 **
* margin in youngest districts	(0.038)	(0.232)
Margin in youngest districts	0.071	-0.008
	(0.101)	(0.243)
Election year	0.051	0.421 *
* margin in middle districts	(0.038)	(0.238)
Margin in middle districts	-0.062	-0.046
	(0.060)	(0.211)
Election year	0.008	-0.149
* margin in oldest districts	(0.033)	(0.249)
Margin in oldest districts	-0.055	0.292
	(0.084)	(0.178)
N	1240	1197
R^2	0.92	0.92

[1] The dependent variable is the natural log of the enrollment-weighted state average tuition and fees in 2008 dollars. The regressions include the proportion of the population aged 5-17, the proportion of the population aged 18-24, the proportion of the population aged over 65, the state unemployment rate, the state real per capita income, the number of public two-year institutions and public four-year institutions per 18-24 year olds as well as state and year fixed effects. Standard errors are clustered by state.

[2] Gubernatorial margin is the margin of victory in the previous gubernatorial election. House margin is the average margin of victory in the previous state house elections. A competitive election is defined as having a margin below the median of the distribution of contested state house elections, equivalent to a margin less than 0.228.

[3] Districts are divided into terciles of the within-state distribution across of the proportion aged 0-24 years old.

[4] Standard errors are in parentheses below coefficients. Asterisks indicate statistical significance at the 10% (*) and 5% (**) levels.

Table A-3: Effects of State House Elections on Tuition and Fees at Public Four-year Institutions

Independent Variables	All Districts (1)	All Districts (2)	Competitive Districts (3)
State house election year	-0.002	-0.011	-0.021
	(0.005)	(0.009)	(0.020)
State house election year		-0.029	-0.023
* gubernatorial margin		(0.027)	(0.027)
Gubernatorial margin		0.003	0.000
		(0.056)	(0.054)
State house election year		0.027	0.203
* house margin		(0.020)	(0.173)
House margin		-0.006	0.390
		(0.081)	(0.271)
N	1334	1330	1330
R^2	0.92	0.92	0.92

[1] The dependent variable is the natural log of the enrollment-weighted state average tuition and fees in 2008 dollars. The regressions include the proportion of the population aged 5-17, the proportion of the population aged 18-24, the proportion of the population aged over 65, the state unemployment rate, the state real per capita income, the number of public two-year institutions and public four-year institutions per 18-24 year olds as well as state and year fixed effects. Standard errors are clustered by state.

[2] Gubernatorial margin is the margin of victory in the previous gubernatorial election. House margin is the average margin of victory in the previous state house elections. A competitive election is defined as having a margin below the median of the distribution of contested state house elections, equivalent to a margin less than 0.228.

[3] Standard errors are in parentheses below coefficients. Asterisks indicate statistical significance at the 10% (*) and 5% (**) levels.