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**The Adoption of Prepaid Tuition and
Savings Plans in the American States:
An Event History Analysis**

IHELG Monograph

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University of Houston Law Center/Institute for Higher Education Law and Governance (IHELG)

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Introduction

Students and parents have long been concerned about saving for college. In the mid- 1980's a set of new policy options were created to aid individuals in saving for college: the prepaid tuition or college savings plans (Olivas 2003; Lehman, 1990). Prepaid tuition plans guarantee college tuition at some point in the future in return for a current payment from families. Savings plans offer tax or other types of incentives as a reward for placing funds in some form of savings plans (Institute for Higher Education Law and Governance, 2004).

The number of states with policies regarding these plans grew throughout the 1980's and 1990's until the popularity of savings plans exploded as a result of Congress' codification of these plans in section 529 of the Internal Revenue Code. After this change, all fifty states and the District of Columbia created their own version of a prepaid tuition or savings program (Dynarski, 2003).

This paper investigates the rise of prepaid tuition and savings plans from 1986, when the first plan was created, until 1999, when the 529 legislation at the federal level went into effect. During this 12-year time period, 21 states adopted prepaid tuition plans while 33 states adopted savings plans.

We posit four possible reasons why states may have adopted these programs. First, state policymakers may have been engaged in a process of policy privatization. Second, policymakers may have been using these plans as a part of an overall strategy to remain competitive in elections. Third, the characteristics of the system of higher education in the state may make some states more likely to adopt these plans than others.

Finally, the policies may have spread from one state to another as a result of policy diffusion.

To investigate these claims, we make use of a competing risks formulation of the Cox proportional hazards model. This model, which has been used extensively in event history analysis in biostatistics, has not been widely used in the field of policy adoption (Kalbfleisch and Prentice, 2002). Results from this modeling process can indicate how covariates proportionately impact the hazard rate for any individual state adopting the policies under study.

The plan of this paper is as follows. First, we briefly review the literature on prepaid tuition and savings plans, as well as the literature on policy adoption in the field of higher education. Next, we discuss each of the four sets of hypotheses that comprise our conceptual framework. After our discussion of data and methods we present a discussion of the results, followed by the implications of these results for each of the four sets of hypotheses that have been presented. Finally we conclude with some theoretical and policy-relevant findings from the study.

Literature Review

This literature review covers two topics: first, what does the existing literature say about prepaid tuition and college savings plans? Second, what are the major findings from other studies regarding policy adoption in the field of higher education?

Prepaid Tuition and Savings Plans: Policy Implications and Distributional Impact

There have been relatively few systematic or analytic studies of prepaid tuition and college savings. Most of what has been written about the topic is descriptive,

outlining the relative advantages for consumers of different types of programs (Hurley, 2003). Much of the analytic work has been conducted by Olivas (2003). Additionally, Lehman (1990) discusses possible implications of the prepaid tuition plan implemented in Michigan in the mid 1980's. In addition to this work, Dynarski (2004) describes the distributional impacts of prepaid tuition and savings plans.

Olivas, in his 2003 work on prepaid tuition and college savings plans, points out that these programs create a set of issues for states that remain largely unresolved. Among the most critical of these are issues of equity—what types of students will benefit from these plans, both directly as a result of transfer of wealth, and indirectly as a result of the tax benefits associated with these programs. Another important set of issues are operative at the institutional level. Olivas writes “I also fear that at some point institutional behavior will change, so that admissions might be predicated on ability to pay” (Olivas, 2003 p. 503). Olivas emphasizes that these programs may have the effect of emphasizing students' financial qualifications over their academic qualifications in the process of admissions.

Most importantly for this study, Olivas also poses a set of possible legislative implications, along with a number of hypotheses about the circumstances under which these programs would most likely be adopted. In terms of legislative implications, Olivas is concerned about prepaid tuition and savings plans taking the form of policy privatization—as he writes: “In other words, will this program *supplant* state support rather than *supplement* appropriations? (Olivas, 2003 p. 505) In addition to the possibility that these programs represent a shift among legislators in their stance toward higher education, Olivas also points out that California in the late 1990's had:

the perfect, fertile climate for such a plan: many students in excess of the state's capacity to build new institutions, a thriving private sector system of independent colleges, several elite and nearly-elite public institutions, a large economy and very low tuition in the public institutions (Olivas, 2003, p. 480)

We test some of the hypotheses Olivas posited in this paper.

Two studies have addressed the effects of these programs. The first, written by Lehman in 1990, addresses the equity implications of one plan: Michigan's prepaid tuition plan, the Michigan Education Trust (MET). In a section of the article, Lehman investigates whether the MET "gives aid to the poor or gives comfort the rich" (Lehman, 1990 p.1111). By the author's own admission, the data on the income and other characteristics are far from perfect, however, he does find that "it is clear that, whatever reference group one chooses, MET's beneficiaries are drawn disproportionately from the upper reaches of the income distribution" (Lehman p.113). Lehman concludes by speculating about another possible unintended consequence of these programs: the possibility that less than hoped for gains in the program's trust fund will place pressure on institutions of higher education to "cap" increases in costs so as not to make higher education unaffordable for those who have participated in the plan.

Dynarski (2004) addresses the distributional impacts of savings plans. Using a series of tax simulations to analyze how families at different income levels might benefit differently from these plans, she concludes that it is the wealthy who are most likely to benefit from the tax incentives put in place for most savings plans. This is because for most middle and low income there is a substantial implied tax on increased savings for colleges—as a family saves more for college, the result is a higher expected family

contribution (EFC) under the current federal methodology. Higher income families are not subject to this tax, since they are ineligible for federal aid in any case.

Policy Adoption in Higher Education

Studies of state policy adoption are relatively new to the field of higher education. This section will review several of the studies in this developing area. As the review shows, many such studies are concerned chiefly with identifying the characteristics of states that lead governments to adopt new policies. Those characteristics include, for example, postsecondary governance arrangements, enrollment in institutions of higher education, political partisanship, and economic indicators.

The pioneering study in this field is the Hearn & Griswold (1994) study of state policy innovations. The authors demonstrate a link between governance mechanisms and the adoption of certain forms of policy innovations in the states. A subsequent study by McLendon, Heller, and Young (2005), in which the authors make use of time series-cross section data and a binary outcomes model, finds that Republican control of the legislative branch is associated with the adoption of college-savings and prepaid tuition. In a more recent study, McLendon et al. (2005) examine the adoption of performance accountability policies in the states. In this more recent analysis, the authors employ event history analysis, and find a negative relationship between that the proportion of legislators that are Republican and the adoption of performance-budgeting policies in the 1980s and 1990s. A complementary finding shows that a larger proportion of Republican state legislators is positively associated with the adoption of performance-funding policies during this same period.

While the study of state policy adoption has produced a number of insights, the research in this study will advance understanding in two ways. First, our conceptual framework makes use of a number of competing hypotheses, which we believe illuminate ongoing debates concerning the relative importance of state politics, institutional structures, and state demographic and economic conditions on the policy-adoption behavior of state governments (McLendon, 2003a). Second, our empirical approach incorporates a flexible model for the underlying process of the adoption of these policies in the states. This more flexible framework has been shown to provide a better fit to observed data in other applications.

Conceptual Framework

In our conceptual framework for this paper, we build on rival sets of hypotheses to explain the circumstances under which state policymakers might be more likely to adopt either a prepaid tuition or a savings plan. The first set of hypotheses centers on the idea of policy privatization mentioned earlier in the discussion of Olivas (2003). This conception asserts that the plans may represent a shift in responsibility for financing higher education away from the state and toward individual students and families. In American politics, these ideas are most closely associated with conservatives in general and the Republican party in general. A second set of hypotheses suggests that legislative adoption of prepaid tuition and savings plans is a function of the programs' political popularity among higher income families. Because of this popularity, we believe the programs are more likely to be adopted shortly before an election (so as to maximize incumbency advantages) and in states where electoral competition (i.e., two-party competitiveness) is more fierce. A third framework draws on the postsecondary

organizations and governance literature in surmising that the governance structures, enrollment conditions and tuition and financial aid patterns of a given state are the likely influences of governmental behavior. Our final framework suggests that the spread of prepaid tuition and savings plans in the American states may have occurred as a result of the diffusion of policy from one state to another.

Policy Privatization

The first conceptual lens builds on the notion of policy privatization in the American states. This framework contends that college-savings and prepaid-tuition policies may represent an effort in some states to shift the policy paradigm in higher education from one of state subsidy of public bureaucracy (the “welfare state”) to one of rewarding individuals for preparing financially for college (an “ownership society”). This privatization explanation provides us with our study’s first two hypotheses:

HYPOTHESIS 1: States where Republican legislative strength is greater will be more likely to adopt college savings plans and prepaid tuition plans.

A persistent puzzle in the state politics and policy literature is the extent to which partisanship influences the policy behavior of state governments. Theoretically, party control of government should help shape the policy directions of the states because there are notable differences between the parties on some fundamental questions, such as the proper role of government in the marketplace or in ensuring social well-being (Barrilleaux, Holbrook, and Langer, 2001; Garand, 1985; Berry et. al, 1998). Yet, much of the early empirical work found Republican and Democratic party strength statistically unrelated to state policy (e.g., Dawson and Robinson, 1963; Dye, 1966). On the other hand, some more recent analyses, using various time-series techniques, have documented

strong partisanship effects. For example, Stream (1999) documented a relationship between Republican control of government and state adoption of certain health reforms viewed as insurance-industry friendly. Shipan and Volden (2004) found that states where the legislative and executive branches are under unified Republican control are less likely to adopt certain anti-smoking laws. Barrilleaux, Holbrook, and Langer (2001) found a relationship between Democratic strength in state legislatures and state spending on welfare benefits.

In the specific context of higher education, scholars have largely ignored party control of governmental institutions as a prospective explanation for interstate variations in policy outcomes. Recent studies, however, by McLendon, Heller, and Young (2005), McLendon, Hearn, and Deaton (2005), and McLendon, Deaton and Hearn (2005) provide some initial empirical evidence of partisanship influences.¹ In the study by McLendon, Heller, and Young (2005), the authors found that states where the legislative branch was controlled by Republicans are more likely to adopt one of several innovative postsecondary financing policies, including the two policies (college-savings and prepaid tuition) that are the subject of our present investigation. The authors report their finding as unexpected, and speculate that the relationship may owe to differences between the two parties in their views on the marketplace. They argue that the policies, which encourage private savings for college, may be associated more with Republican-held legislatures than with Democratic-held ones because Republicans often favor market mechanisms as a means for furthering public policy ends, instead of the redistributive

¹ But see Doyle (2005), whose recent event history analysis found no such relationship between party strength in state government institutions and the adoption of broad-based, merit-aid policies. This disparate set of findings suggests that the question of partisanship effects in the area of higher-education policy is far from settled.

levers of state taxation. When cast against the backdrop of recent Republican gains in state legislatures and declining effort in state funding of public higher education, might the adoption of college-savings and prepaid-tuition policies indicate that a privatization movement is underway in state finance of higher education? Our initial hypothesis seeks to test this proposition.

Importantly, however, McLendon and colleagues caution that their partisanship finding might be a proxy for the political-ideological propensities of the American states. Partisanship and ideology are not always highly correlated (Erikson, Wright, and McIver, 1989), and the McLendon-led study did not control for state government ideology as a potential influence on policy adoption patterns. This larger privatization explanation, therefore, leads us to a second, complementary hypothesis for state adoption of college-savings and prepaid-tuition plans:

HYPOTHESIS 2: States that are more conservative ideologically will be more likely to adopt college savings plans and prepaid tuition plans.

Researchers traditionally have studied political ideology by measuring the general level of a state's liberalism (defined as government activism), and then attempting to determine the relationship between the value and state policy behavior. An impressive body of research now suggests that states vary considerably from one another in their ideological positions (Berry, et al., 1998), and that these differences seem to play an important role in shaping the policy postures of the states (Elazar, 1966; Erikson, Wright, and McIver, 1989, 1993). A number of studies, for example, note the existence over time of relatively durable differences in state orientations toward welfare provision, with more liberal states historically favoring more generous welfare benefits (Rom, 1999; Soss

et al, 2001). Likewise, a substantial literature exists on the connections between ideological conservatism and state corrections policies; namely, more conservative states and states with greater Republican legislative strength tend to be positively related to imprisonment rates (Smith, 2004; Yates and Fording, 2005). But such relationships are not always clear cut. While states that are more ideologically liberal tend toward greater interventionism in the redistributive and regulatory policy spheres, states that are more conservative tend to intervene more in the arena of social-morality policies – i.e., policies involving the regulation of alcohol, gambling, drugs, sex, and abortion, which involve the redistribution of *values* rather than material benefits (Meier, 1994).

We believe a reasonable case can be made for the adoption of college-savings and prepaid-tuition policies as a product of either liberal or conservative state political ideologies. Clearly, the adoption of these programs demands a considerable investment of capital, time, and analytic resources on the part of policy-makers, and much of the literature on policy innovation in the American states argues that such investments are more likely to be made by states with more ideologically liberal leanings (e.g., Dawson and Robinson, 1963; Walker, 1969). However, if in fact a privatization movement is now underway in state financing of higher education, and if the adoption of college-savings and prepaid-tuition programs are one manifestation of that larger policy redirection, as McLendon, Heller, and Young (2005) surmise, then we might expect conservative state governments to be more likely to adopt the programs because of their adherence traditionally to the values of individual responsibility, economic choice, and reliance on private market mechanisms to achieve public ends. Our second hypothesis, therefore,

seeks to examine the ideological (rather than partisanship) underpinnings of the policy-privatization explanation.

Electoral Competition and Timing of Votes

Another conceptual lens is associated with political characteristics of states that have little to do with partisanship or ideology and more with rational calculation of electoral advantage through the adoption of policy. The theoretical framework in this section draws heavily from the political economy literature, beginning with Downs' (1957) original framework as proposed in *An Economic Theory of Democracy*. We propose two hypotheses under this conceptual lens.

Hypothesis 3: States with a more competitive electoral environment will be less likely to adopt either a prepaid tuition or savings plan.

The political science literature has long suggested that the competitiveness of elections may affect elections in ways that are not related to partisanship or ideology. In his classic work, V.O. Key suggested that in the south, where electoral competition was minimal, the lack of competitiveness resulted in policies that benefited the well-off as opposed to the have-nots (Key, 1949). Subsequent work has formalized and tested this claim, with mixed results. While several authors have found that electoral competition increased funding for programs that would primarily benefit the poor, the results from others are mixed (Besley and Case, 2002).

We propose that electoral competition will matter for the adoption of these types of programs. We hypothesize that since this is a policy intervention that will primarily benefit the middle and upper income citizens of any given state, it should be more likely to occur in states where there is less competition for elected office. In essence, governors

and legislators who feel secure in their office will not push to enact programs for the less well-off, but will use their power to reward their most important constituency (Barrilleaux, 1995; Barrilleaux, Holbrook, & Langer, 2002).

To measure electoral competition, we propose a variable based on electoral results. We do not think that the proportion of seats held by different parties in the legislature is an appropriate measure of competitiveness, since it is possible (although not likely) that one party will dominate the legislature even when every single seat in the legislature was decided by a very close election. As Holbrook and van Dunk (1994) point out, the electoral competition hypothesis has to do with competition in elections, not the level of control of state government. This measure differs from more traditional ones like the Ranney index in that it looks only at electoral results, and posits that the level of divergence from perfect competition is the key concept to be measured.

Hypothesis 4 The adoption of a prepaid tuition or savings plan will be more likely as an election comes closer.

The timing of an election may affect the hazard rate for adopting such a program, making it more likely that in an election year, states would adopt such a program. .

Political scientists and economists have provided several rationales for a possible “political business cycle” like the one observed in the private sector. As elections draw near, politicians may be likely to enact some popular programs in order to garner further electoral support. Once elections are over, those politicians who have won office may be most likely to enact their least popular programs by claiming a mandate for action. This also provides a “buffer” of sorts before the next election, so that public attention will drift

from any possibly unpopular policy enactments (Besley & Case, 1995; Figueiredo, 2001; Nelson, 2000; Nordhaus, 1975; Rogoff, 1990).

In one of the first theoretical treatments of this phenomenon, Nordhaus (1975) suggested the policymakers will cycle between macroeconomic policies for reducing inflation and policies for reducing unemployment depending on the timing of the election. Policies to reduce unemployment will be utilized most heavily at the end of an electoral term, while policies to reduce inflation will be utilized most heavily at the beginning of an electoral term.

In an empirical treatment of this hypothesis, Nelson (2000) looked at how tax policy might vary according to the proximity of elections. While Nelson finds little support for the idea that tax cuts occur in proximity to elections, he does find strong support for the idea that tax increases are most likely in the period immediately following a governor's election. His results are consonant with the overall framework proposed by Nordhaus, in which more "painful" policy changes are most likely to occur when the next election is quite far off.

Besley and Case (1995) add a compelling dimension to this line of research by suggesting that the process of political business cycles may also be affected by the policy choices of decision makers in neighboring states. They provide a theoretical model that suggests that voters make decisions on politician's actions based on both their own past experience and what they observe occurring in nearby areas. They therefore suggest that voting decisions may be based on a "yardstick" that is different from state to state. For instance, a governor may not necessarily have to not raise taxes in order to succeed, the governor only needs to not raise taxes *as much* as they are raised in neighboring states.

In our current framework, we have posited that these policies are quite popular among middle- and upper-income citizens. These policies would therefore seem to be an ideal policy intervention to take place late in a term, regardless of the political leanings of individual policymakers.

Institutional Structure of the Higher Education System

Still another conceptual lens would hold that the educational context in each state would be the most important factor in determining whether a state adopts a prepaid tuition or savings program. Here, we suggest four hypotheses:

HYPOTHESIS 5: States with more highly centralized higher-education governance structures will be less likely to adopt prepaid tuition and savings plans.

An important aspect of educational structure is the nature of postsecondary governance arrangements in a state. States vary in the degree of centralization of their postsecondary system governance, with some featuring powerful consolidated governing boards with substantial academic and budgetary authority, while others on the opposite extreme feature only an advisory planning agency. Between the two extremes lie coordinating boards or commissions with varying levels of authority over academic and fiscal directions in public higher education. Such entities are less powerful and less fully staffed than consolidated boards, but clearly hold more authority than the weak planning agencies present in Nebraska and a handful of other states. Many analysts (Berdahl, 1971; Hearn and Griswold, 1994; Hearn, Griswold, and Marine, 1996; McGuinness, 1997; McLendon, 2003b; Zumeta, 1996) have hypothesized that centralization is likely to be associated with greater knowledgeability and analytic resources at the state level, and may therefore lead to greater rates of innovation in postsecondary policy. Several studies

have found evidence for this hypothesis (Hearn and Griswold, 1994; McLendon, Heller, and Young, 2005).

At the same time, different innovations have different implications for differing interests in postsecondary systems. The evidence on the effects of various governance structures on financing policies is complex. Notably, a tendency to innovate in one domain may be unrelated or even negatively related to a tendency to innovate in another. The notion that centralization always prompts innovation is not undisputed. In fact, our hypothesis for this study is that states with more centralized governance arrangements will be less, not more, likely to adopt new prepaid tuition and savings policies. Hearn and Griswold (1994), in a study of the factors contributing to the adoption of prepaid tuition and savings plans and other postsecondary innovations, found that governance arrangements appeared to be influential in the adoption of some academic reforms, but were not systematically associated with innovations in the financing of postsecondary education. Interpreting these results in light of the writings of such political theorists as Ripley (1985) and Lowi (1964), they concluded that financing innovations are distinct from more purely “educational” reforms in states, and may fall more within the relatively separate domain of populist, redistributive politics. That is, unlike the case of academic policy, there is unlikely to be any generic tendency among centralized systems to reform postsecondary financing.

In a later analysis, Hearn, Griswold, and Marine (1996) found that centralization was indeed connected to financing policy, but in a way unanticipated by their initial hypothesis: the non-centralized states were the most likely to adopt the “rationalist” approach of higher tuition in the public sector. More centralized states were somewhat

more likely to take the traditional choice of keeping tuition levels relatively low. Similarly, in recent work using more sophisticated analytic techniques and superior data, McLendon, Hearn, and Deaton (2004) found that centralization was associated with the adoption of one kind of finance-related policy, performance-based budgeting, but not with the adoption of another, performance-based funding. Because performance funding arguably represents a more aggressive reform than performance-based budgeting, this finding suggests again that the centralization-reform connection is complex as it relates to financing.

To better understand these results, McLendon, Hearn, and Deaton turned to the work of Lowry (2001), concluding that *interests* rather than analytic capabilities, may explain the divergence in effects of differing governance arrangements: centralized boards may represent somewhat different constellations of interests from other governing arrangements, and may in fact seek to *protect* academic institutions from certain reform initiatives at the state level, such as tuition rationalization or performance funding.

In the present case, we hypothesize that a more centralized board system will most likely reduce the likelihood of adopting a prepaid tuition or savings program, because with a more centralized system, policymakers can directly push the system to hold costs down, instead of indirectly attempting to do so via a prepaid tuition or savings plan. Board leaders will prefer their traditionally clear line of authority on pricing over the indirect, more complex pricing control processes likely to arise under the terms of prepaid tuition and savings plans (Lowry, 2001).

HYPOTHESIS 6: States with more students in private institutions will be more likely to adopt prepaid tuition and savings plans.

HYPOTHESIS 7: States with more students in two-year colleges will be less likely to adopt prepaid tuition and savings plans.

The “enrollment ecology” of states’ postsecondary education contexts seems quite relevant to their likelihood of adopting state-funded savings and tuition plans. Two hypotheses stem from this observation. First, to the extent a state has high proportions of students in private institutions, states may more likely to initiate programs to help families and students cope with the high costs of these types of institutions. Second, to the extent that a state has high proportions of students in two-year institutions, states may be less likely to evince concerns over college costs and design programs tailored to meeting those costs, such as prepaid tuition and savings plans. In effect, a state’s choice to invest in two-year systems may represent an alternative approach to containing the college costs faced by citizens in the state.

HYPOTHESIS 8: States with greater investments in student aid will be less likely to adopt prepaid tuition and savings plans.

It is possible to construct contrasting arguments regarding the relationship between a state’s investment in student-aid programs and its investment in prepaid tuition and savings plans. On one side, it seems plausible to suggest that states committed philosophically to increasing access to postsecondary education would pursue several approaches toward that end, ranging from direct student aid through to tax-advantaged financial assistance to families planning and saving for college. On balance, however, it seems more plausible to suggest that the contemporary constrained fiscal environments will lower the likelihood that states providing substantial direct student aid (whether via merit or need-based grants) will also invest significantly in tuition and savings plans.

One might even argue that investment in tuition and savings plans deflects the political pressures to expand access via student aid in the shorter term. As such, the plans may represent an alternative, rather than complementary, approach to containing college costs.

Diffusion

A key concept in analyses of policy adoption in the fifty states has been diffusion—the idea that states emulate the previous policy behaviors of their neighbors or peers. While many studies have pursued a fairly straightforward spatial conception of diffusion (e.g., ones in which policies migrate between contiguous neighbors or among states within set geographical regions), others have approached the study of diffusion from the perspective of policy networks or other similarities among states.

Walker's (1969) pathbreaking work used a correlational analysis to investigate regional patterns of policy diffusion among the states. Other studies since Walker have built heavily on Walker's regional or temporal concept to show how policies are adopted throughout the American states. The advent of event history analysis, a family of time-series technique that permit the analyst to study duration and timing of complex social or political processes, has allowed for a greater understanding of possible modes of policy diffusion in the states see, for example, Berry and Berry, 1990; Box-Steffensmier and Jones, 1997; DesJardins, 2003). Among the very first studies to analyze patterns of diffusion in the American states using event history analysis were Berry and Berry's (1990, 1992) studies of the adoption of state lotteries and tax changes, respectively. Their work found strong empirical evidence of the influence on policy adoption both of certain internal characteristics of the states (e.g., electoral timing, economic conditions) and of the prior policy decisions of a state's neighbors. More recent work employing this

method, such as Mintrom's (1997) analysis of the origins and spread of charter school legislation in the states, also found empirical evidence of a diffusion effect.

Few studies have examined systematically the impact of diffusion on the adoption of new higher-education policies in the states, and the evidence that does exist provides a somewhat mixed picture.² Using pooled, cross-sectional time-series analysis, McLendon, Heller, and Young (2005) found a strong relationship between adoption of certain new postsecondary finance policies and the prior policy behavior of states' neighbors. In an event history analysis of performance-accountability mandates in the states, however, McLendon, Hearn, and Deaton (2005) found no such evidence of a diffusion effect.

Building on this research in higher education and in the larger political science literature, we hypothesize that regional diffusion also may be at work in the adoption of prepaid tuition and college savings plans. In particular, we posit that states with more neighbors with either type of plan (prepaid tuition or savings) will be more likely themselves to adopt that specific type of plan.

Hypothesis 9: States with more neighbors that have either type of program (prepaid tuition or a savings plan) will themselves be more likely to adopt a merit aid program

Data and Methods

Our study makes use of a data set comprised of aggregate data for the fifty states for the years 1986-1999. The starting year of 1986 was chosen as this was when the first prepaid tuition plan was adopted. In 1999, changes in federal legislation made it much

² Importantly, however, there is a long tradition within the field of analyzing the impact of regionality on the postsecondary policy postures of the states. See for example the work of Hearn and Griswold (1996), Hearn, Griswold, and Marine (1997), and Zumeta (1996), concerning connections between geographical region and state policies toward college financing and the private higher-education sector.

more appealing for states to adopt a college savings plan, something that all fifty states had done by the time of writing.

In event history analysis, issues of both left-censoring and right-censoring of the data are quite important. Left-censoring would mean that important information about individuals in the study was left out because the study began after the period of interest (Allison, 1984). Our study does not involve left-censoring, as it begins with the specific time period of interest—when states began to observe the effects of having some form of college payment plan. Right censoring would indicate that important information was excluded because the study ended before all possible event times had been observed. Again, right-censoring does not affect our data set because the underlying circumstances for these types of policies changed dramatically in 1999 with the adoption of federal legislation, effectively ending the time period of interest by this date.

We limit the data set to include only information on the 48 contiguous states. This is done both because Hawaii and Alaska differ on a number of important economic and political variables that make them less directly comparable than their counterparts. This was also done as the variables for diffusion would make less sense for states that do not share a border with any other states (Holmes, 1998).

Data in this study are drawn from a variety of sources, as the specific description of each data element will make clear. Descriptive statistics for all data in the analysis are available in Table 1.

Dependent Variables

The study utilizes two dependent variables. The first, adoption of a prepaid tuition plan, is an indicator variable for the year in which a state adopted a prepaid tuition plan.

A prepaid tuition plan is defined for the purposes of this study as a plan where the family's contribution to the plan guarantees a certain level of tuition at an institution or institutions in the state. The second, adoption of a savings plan, is likewise an indicator variable for the year in which a given state adopted a savings plan. A savings plan is defined as a plan where tax exemption or other incentive is offered for families as a reward for investment in a plan specifically concerned with higher education expenses. . These variables are derived from the authors' analysis of state legislative histories.

Variables for Policy Privatization Hypotheses

We make use of two types of variables to test the policy privatization hypothesis. First, we look at how liberal or conservative the state government may be depending on the characteristics of its elected representatives. Second, we look at the proportional representation of each party in each house of the legislature.

To capture the concept of ideology, we utilize the index of state liberalism developed by Berry et al in their study. Berry's index is based on patterns of Congressional roll call voting in each state and the proportional representation of each party in the branches of government in the state. A state is considered more liberal in this index based on the degree to which its congressional delegation from each party votes for liberal causes, and the degree to which representatives from that party dominate state government, including the upper and lower houses of the legislature and the governor's office (Berry, 1998).

To capture the concept of party dominance, we look at the proportion of the upper house and the lower houses of the state legislature that are Republican. These data have

been collected in the Book of the States (Council of State Governments, 2001), and recently updated and extensively cleaned by Klarner (2003).

Variables for Electoral Competition Hypotheses

Two variables are used to capture the concept of electoral competition and policy cycles. First, we use a simple competition index for the most recent gubernatorial election based on voting patterns. Second, to measure policy cycles, we use a measure of time until the next election.

Our competition index is based on the degree to which the governor from either party won the previous election. The formula for determining this variable is as follows:

$$competition = - | .5 - perc\ repub |$$

Where *competition* is our variable for electoral competition and *perc repub* is the percent of the population that voted for the Republican candidate for governor in the previous election. The opposite of the absolute value of the difference of this percentage from .5 forms the basis for this measure. In short, as the election grows more competitive, the difference between the vote share and a perfect 50-50 split will grow smaller, with a maximum value of 0.

Our measure for electoral timing is simply the number of years until the next gubernatorial election. This variable follows the logic laid out by Nordhaus and others in that executives should seek to implement policies that are maximally pleasing to their electorates as the next election draws near. Therefore, as this number grows smaller, we expect that the likelihood of adoption of a savings or prepaid plan will grow larger.

Variables for Institutional Structure Hypotheses

Four variables are included in order to test our hypotheses regarding the institutional structure of higher education in the state. First, we include a measure of the type of governing board; second, we include a measure of financial aid awarded in the state, next we include two measures of enrollment, one for the percent of full time equivalent (fte) students in privates, another for percent of fte enrollment in community colleges.

The measure for governing board makes heavy use of the typology defined by McGuinness and his colleagues in a series of reports for the Education Commission of the States (McGuinness, 1997). Governing board type in this study is defined in the following way, ordered roughly from the least centralized to most centralized forms:

- Planning Board: No coordination functions, but some statewide planning entity
- Weak Coordinating Board: Coordination functions may include things such as course articulation and some program input, but no budgetary review power
- Strong Coordinating Board: Coordination functions include budgetary review
- Governing Board Four Years Only: A single governing board exists for all public four year institutions in the state
- Governing Board for all Institutions: A single governing board exists for all public institutions in the state.

In all of our results, we use the planning board designation as the excluded category for the purposes of analysis.

The next variable to be included is the total amount of financial aid awarded in the state. This information is available from the National Association of State Student Grant and Aid Programs for all years. Because of the highly skewed nature of this

variable, we enter it into the equation as the log of financial aid, plus a single dollar to allow for the log of states with no financial aid awards.

The last two variables included as part of the institutional structure hypotheses are the percent of fte in private institutions and the percent of fte in community colleges. Both of these variables are derived from information reported in the Digest of Education Statistics, which draws this data from the Integrated Postsecondary Education Data System.

Variables for Diffusion

We include two cause-specific variables for diffusion, one for prepaid tuition and one for savings plans. Both are constructed in precisely the same way. For every state in every year, a count is made of bordering states with the type of policy in question. Borders are land borders only; we use the same definitions of borders as utilized in (Holmes, 1998).

Control Variables

Finally, our study includes two control variables, one for demographic characteristics of the state and one for economic characteristics of the state. For demographics, we control for the percent of the state population aged 18-24. This data is drawn from the Census Bureau's Current Population Survey. For state economic characteristics, we control for gross state product per capita. This data is drawn from the Bureau of Economic Analysis. This data is adjusted for inflation using the Consumer Price Index for all urban consumers, which is produced by the Bureau of Labor Statistics.

Methods

As with other standard event history models, we posit that the hazard function for any individual at time t is:

$$(1) \quad \lambda[t; X(t)] = \lim_{h \rightarrow 0} h^{-1} P[t \leq T, t+h | T \geq t, X(t)]$$

Where T is the continuous set of times for any event, t is a member of the set of times, X represents a set of time varying covariates for all units, h represents an arbitrarily small increment of time, and λ represents the hazard rate for adopting a policy at time t (Kalbfleisch & Prentice, 2002).

Our model differs from many standard event history models in that we incorporate competing risks. The primary difference here is that we model the hazard rate for the possibility of more than one type of event occurring. In our case, we model the hazard rate for both the adoption of a prepaid tuition program and a savings plan in the states, based on covariates X .

$$(2) \quad \lambda_j[t; X(t)] = \lim_{h \rightarrow 0} h^{-1} P[t \leq T, t+h, J = j | T \geq t, X(t)]$$

Where equation 2 is identical to equation 1 with the exception of the subscript j to λ , indicating that there are multiple hazard rates to be estimated, as opposed to the single hazard rate in equation 1 (Kalbfleisch & Prentice, 2002).

Our specific method of estimation relies on a Cox proportional hazards model (Cox, 1972). Unlike other models for survival data, the Cox model does not rely on a specific parametric form for the underlying hazard rate λ . Instead, the model looks at how the covariates X proportionally increase or decrease the hazard rate relative to an underlying baseline hazard rate λ_0 , which is estimated non-parametrically from the data. Equation 3 shows the specific form of the estimating equation for a competing risks model.

$$(3) \lambda_j[t; X(t)] = \lambda_{0j}(t) \exp[Z(t)' \beta_j], \quad j = 1, \dots, m$$

Where Z is a vector of covariates derived from X , and β_j is a vector of possibly cause specific covariates. As equation 3 shows, the covariates and coefficients in this model can be allowed to vary according to the cause. That is, specific covariates can be specified as only affecting the hazard rate of adoption of one of the types of policies in questions, or, if desired, both of the types of policies (Kalbfleisch & Prentice, 2002; Therneau & Grambsch, 2000).

Our methods add two new elements to the literature on the adoption of higher education policy. First, the competing risks framework provides a flexible method for investigating the degree to which similar state characteristics may simultaneously influence the adoption of multiple polices. Second, the Cox proportional hazards model with cause-specific hazard functions allows us to model the proportional increase or decrease in hazard rates for multiple types of policies without reliance on a specific parametric form for the hazard rate. This allows us to make better use of the existing data to understand how state characteristics may affect their likelihood of adopting a particular policy option at a given point in time.

Results

Results for the Cox Proportional Hazards competing risks model can be found in Table 2. In all, we estimated coefficients for five models. We estimated one model for each of the four specific conceptual frameworks described in the previous section (models 1-4, table 2), as well as a model that included variables for all of the variables in

each framework, plus controls for the states' economic and demographic characteristics (model 5).

As table 2 shows, the p value for the joint significance of the variables in models 1 and 2 does not exceed .1, indicating that these variables by themselves provide a poor fit to the data, which is statistically indistinguishable from the null model with no covariates. We conclude from these results that the models for ideology and partisanship or electoral competition do not fit the data well when not conditioned on other variables. On the other hand, the likelihood ratio test for both Models 3 and 4 are significant, with p-values less than .1. Both of these models do provide a fit to the observed data that is better than could be achieved without any covariates. Last, the p value for the likelihood ratio test for the full model is .02, indicating a good fit with the data. Because of this finding, we restrict the rest of our discussion to the estimates obtained under model 5.

Results for Ideology and Partisanship

We hypothesized that states that are more conservative and those with higher levels of Republican control will have higher hazard rates for adoption of a prepaid tuition or savings plan. In model 5 in table 2 we report results testing these two hypotheses. The coefficient for government liberalism is .92, with a 95% confidence interval bounded by [-.07, 1.91]. The confidence interval at this level includes 0. However, the 90% confidence interval ranges from .08 to 1.76. At this lower level of confidence, the effect of a 10 unit increase would be predicted to increase the proportional hazard for adoption of either type of plan by an estimated 1.1 times, with a low bound of 1 and an upper bound of 1.2. These results indicate that as a state grows more liberal, it is more likely to adopt either one of the programs under study. This result

contradicts our hypothesized outcome, which posited the influence of ideological conservatism in state governments on adoption of new college financing programs.

Figures 2 and 3 show a graphical representation of the effect of government liberalism on the hazard rate for the adoption of prepaid tuition plans and savings plans, respectively. The average level of government liberalism is compared with a conservative state government (with a value for the liberalism variable one standard deviation below average) and a liberal state government (with a value for the liberalism variable one standard deviation above average). As the figure shows, the effect is more substantively pronounced for the risk of adoption of a prepaid tuition program.

Neither of the coefficients for the variables for Republican control of the legislature is significant at any conventional level, indicating little support for this aspect of the conceptual framework.

Results for Electoral Competition

As we describe in the earlier section, electoral competition may affect the adoption of one of these programs in two ways: first state policymakers may be more likely to adopt one of the programs under consideration as an election draws near; second, state policymakers where elections are less competitive may be more likely to adopt such a prepaid tuition or savings plan.

We do not find strong support for the idea that electoral *timing* plays a role in states' adoption of a prepaid tuition or savings plan. As model 5 in table 2 shows, the coefficient for years until election is .14, with a standard error of .11, a result which implies very low precision for this estimate.

On the other hand, we do find support for the idea that electoral *competition* does negatively affect the hazard rate for adopting a prepaid tuition or savings plan. The coefficients for the variable on electoral competition is -3.08, with a 95% confidence interval bounded by [-6.18, .02], and a 90% confidence interval bounded by [-5.67,-.49]. At the 90% confidence level, the interval for the reduction in proportional hazards is bounded by [.003, .61] with a maximum likelihood estimate of .05. In terms of the range of outcomes found in the data, the most competitive election was essentially even, with a value of 0. The least competitive was .37 away from .5. Over this range of outcomes, the proportional hazard goes from 1 (no change in hazard rate from baseline) to .37, meaning the state has a hazard rate that is proportionally 2.7 times less than average. This finding suggests strong support for the idea that policymakers in a less competitive electoral environment will be more likely to adopt either a prepaid tuition or a college savings plan.

These results are summarized in figures 4 and 5. As the figures show, for both types of risks being modeled, the proportional hazard increases as electoral competition decreases.

The educational characteristics of states are conceptualized to affect the hazard rate of adoption of a prepaid tuition or savings plan in a number of ways. First, we hypothesized that states with a more highly centralized governing board will be less likely to adopt a prepaid tuition or savings plan, as they are among the states that will be more likely to adopt a low tuition, low aid strategy. This hypothesis finds support in our analysis. The categorical variable for board structure is included in model 5, table 2, with five levels: planning board, weak coordinating board, strong coordinating board,

governing board for four year institutions, and centralized governing board. In the model, planning board is excluded to avoid a singularity. The results show that states with a coordinating board are distinct from all other states—they have a higher hazard rate for adopting a prepaid tuition or savings plan. The coefficient for this variable is 1.17, with a 95% confidence interval bounded by [.05,2.28]. This result indicates that states with a weak coordinating board have a hazard rate for adopting either of the types of programs under study that is 3.22 times the average rate.

Figures 6 and 7 provide a graphical representation of this result. As the figures show, states with a weak coordinating board—meaning that authority over public higher education is less centralized, residing more with local campuses than with a central state agency – are much more likely to adopt either kind of plan than are states with a centralized governing board. This result provides strong support for this hypothesis.

The remaining variables in the educational characteristics of the state were not found to have a statistically significant relationship with the hazard rate for adopting a prepaid tuition or savings plan. These variables include student financial aid and variables for the enrollment ecology of the state.

We hypothesized that the diffusion of policy would mean that having neighboring states with a particular type of policy would increase the hazard rate for adoption of that same policy. The diffusion variables are the only variables in the model with cause-specific effects—prepaid tuition plans in neighboring states can only affect the hazard rate for adopting a prepaid tuition plan, and savings plans in neighboring states can only affect the hazard rate for adopting a savings plan. Model 5 in table 2 shows the surprising result of our test of this hypothesis: while savings plans do not appear to diffuse across

states, prepaid tuition plans have a negative diffusion effect. As more states bordering a state adopt a prepaid tuition plan, the hazard rate decreases. The estimate for this coefficient is $-.66$, with a 95% confidence interval from -1.37 to $.05$, and a 90% confidence interval from -1.25 to $-.07$. We therefore find contradictory evidence for our hypothesis that these types of policies diffuse from one state to another—instead we find that more neighboring states with a prepaid tuition plan decrease the hazard rate by 1.9 times less likely for each neighboring state.

Figures 8 and 9 provide a graphical representation of this effect for both types of plans. As the figures show, the number of neighboring states has essentially no effect on the hazard rate of adopting a savings plan, but each additional neighboring state substantially reduces the hazard rate for adopting a prepaid tuition plan.

Finally, model 5 in table 2 includes two control variables: percent of population aged 18-24 and gross state product per capita. The standard errors are larger than the coefficients for both of these variables, indicating no statistical significance.

Implications

In this concluding section, we discuss the implications of our findings associated with each of the four frameworks we pursued in our analysis.

Partisanship and Ideology

Our findings with respect to partisanship and ideology seem intriguing and important on a number of levels. Empirical research in virtually every other policy domain (e.g., K-12 education, corrections, welfare, tax policy) has yielded evidence of connections between party control of governmental institutions and the policy postures of the states. How then do we explain the absence of any statistically significant

relationships between legislative party strength and state adoption of college savings and prepaid tuition programs? One explanation of course is that these new postsecondary financing policies are so broadly popular across the political spectrum as to preclude any distinctive connections with either of the two major parties. A second interpretation – somewhat different in its causal logic – is that college savings and prepaid tuition programs lack qualities linking them to partisanship influences generally. This explanation invites consideration of a larger question: what, if any, characteristics of higher-education policies might make them sensitive to patterns of party control or strength in state legislatures?

Since Lowi's (1964) landmark work, delineating the nature of distributive, redistributive, and regulatory policy-making in the United States, an empirical base has accumulated in support of his proposition that both the level of public salience and the level of technical complexity associated with a policy tends to affect the *politics* that surround its formation. Because redistributive policies tend to be highly salient to the public but technically simple, the adoption dynamics surrounding many redistributive policies exhibit relatively higher levels of partisanship and lower levels of interest group activity. Conversely, regulatory policies tend to be of low public salience but technically complex. Thus, the adoption characteristics of many regulatory policies often exhibit lower levels of partisan conflict but higher levels of interest-group activity (see Gormley, 1986; Haider-Markel & Meier, 1996; Mooney & Lee, 1999).

On the basis of this literature, we might expect to find partisan-based effects involving higher-education policies with clear redistributive implications, ones with potential to shift wealth, power or other material benefits from one designated group or

class within society to another group or class. Although perhaps highly salient to the public, college savings plans and prepaid tuition plans nonetheless lack those key redistributive qualities. On the other hand, other policies in higher education (e.g., the distribution of state student-aid funding through merit- and need-based approaches and so-called “Top 10-Percent” plans) clearly do possess a redistributive quality and, thus, may be sensitive to patterns of party representation in state governmental institutions.

Our finding concerning ideology also merits further study. Although running counter to our initial hypothesis, the existence of a statistically significant connection between government *liberalism* and adoption of college savings and prepaid tuition programs is a substantively important finding. We interpret the finding as supportive of the conclusions reached by some of the classic studies in the field of state policy innovation and diffusion; namely, that states with more liberal-leaning citizenries and governments are more likely to establish new public programs, particularly social programs. Few studies have examined empirically the impact of political ideology or culture on state policy outcomes in higher education. Our finding seems to suggest that the ideological orientations of elected officials do influence the behavior of state governments at least in some areas of public policy for higher education, and probably should be modeled in future analysis such as the kind we have pursued in this paper.

Electoral Competition

Our analysis provides mixed support for the idea of electoral competition driving policy adoption in this area. On the one hand, we found no support for the idea that electoral timing is related to the likelihood of adopting a prepaid tuition plan. On the

other hand, we did find support for the idea that a less competitive electoral environment is related to the hazard rate for adopting one of these types of policy initiatives.

This would suggest that in states where competition for elected office is less intense, there will be more higher education policies that benefit the middle class. This could include policies like merit-based state scholarships, which go overwhelmingly to middle income students. It could also suggest more state support for four year institutions of higher education, where middle and upper income students are more likely to enroll, than for two year institutions, where poorer and first time students are more likely to enroll.

As with other conceptual lenses applied in this study, there is not overwhelming evidence that electoral competition is the “right” way to look at the issue of policy adoption. However, the results from this part of the analysis indicate that electoral competition is certainly part of the puzzle when attempting to understand why states adopt certain higher education policies.

Institutional Structure

The results support the hypothesis that states with centralized educational governance will be less likely to adopt prepaid tuition and savings plans. This finding provides further support for the findings of recent research that the centralization/reform connection is not always positive (Hearn and Griswold, 1994; Hearn, Griswold, and Marine, 1996; McLendon, Hearn, and Deaton, 2004). Centralized systems may be more likely to reform in the purely academic arena, but less likely to adopt reforms that might dilute their financial control over systems, such as

reforms favoring marketization, student choice, and helping students and families finance college attendance.

Nonetheless, the results show no connections between tuition and savings plans and student-aid investments in states. It appears that either the political and governance origins of the plans as innovations lie outside the political and governance base of student-aid programs, or the existence of both kinds of approaches to aiding students and families is not seen as duplicative or contradictory. A similar argument may be made regarding the lack of connections between the plans and the educational ecology of states (i.e., the states' proportions of private and two-year institutions). Each of these factors might seem to be logically linked to the adoption, or non-adoption, of tuition and savings plans, but the results suggest otherwise. Veteran observers and participants in state policymaking would no doubt be unsurprised by the evidence here suggesting that states may not always pursue holistic, integrative reasoning regarding their higher-educational systems.

Diffusion

Our results for diffusion were somewhat puzzling. We found a *negative* diffusion effect, suggesting that as more of a state's neighbors adopt a prepaid tuition plan, the given state is less likely to do so. A positive diffusion effect would be interpreted to mean that the policy had somehow "spread" into a certain state. But how should one interpret a negative diffusion effect? There are two possible approaches. The first presumes that states do in fact learn from their neighbors, but that the lessons derived tend to slow, rather than foster, the spread of policies. The second possibility assumes no relationship.

The first approach is predicated on the notion that states may learn from their neighbors' failures as well as from their successes. Just as the disseminating of information about policy successes in some states may lead states elsewhere to pursue similar policies, the disseminating of information about policy *failures* may lessen the likelihood of subsequent policy adoptions. In the context of prepaid tuition programs, it seems to us conceivable that the implementation difficulties associated with these programs may discourage neighboring states from adopting such policies themselves.

Another possible interpretation would be to assume that the negative effect simply means that diffusion isn't happening, not that states are actively discouraging one another from adopting certain policies. This interpretation would hold that the observed data only show that states with more neighbors are less likely to adopt a plan, not that the process of additional states adopting such a plan would continue reducing the likelihood of adoption in the state of interest.

Further conceptual and empirical work is needed to sort out this conceptual and methodological question. For the purposes of this paper, we can say with some certainty that the positive diffusion effect has not been shown to be occurring for either prepaid tuition or savings plans.

Conclusions

Our results and their implications speak to several aspects of the policy process. First, regarding prepaid tuition plans, we find that states whose governments are more liberal, whose elections are less competitive, whose postsecondary governance structures for higher education are less centralized, and who have *fewer* neighbors with similar prepaid tuition plans are more likely to be adopt the postsecondary financing policies.

Our findings are similar with respect to savings plans, with the exception of the diffusion effect; here, we find no statistically significant relationship.

We did not find support for our policy privatization hypothesis; indeed, the evidence seems to run counter to previous claims found in the literature (McLendon, Heller, and Young, 2005; Olivas, 2003). On the other hand, we did find evidence confirming select other propositions, including those pertaining to electoral competition and governance structures for higher education. As noted, our analysis also yielded a curious and counter-conventional set of findings relative to diffusion.

The next step in terms of theory development would be to begin examining the conditions under which our key explanatory variables – governmental liberalism, electoral competition, governance, and diffusion – also explain the higher-education policy behavior of governments in other areas. For instance, given the association between state liberalism and the policies we have studied in this paper, what other types of postsecondary finance innovations may be associated with more liberal states? Given our electoral-competition finding, to what extent might a link exist between the absence of competitiveness and the adoption of other policies that would be popular with middle or upper income voters? Our governance finding is the latest in a series confirming the importance of higher-education governance arrangements in determining state policy for higher education. Given the accumulated empirical evidence, what is now needed is the development of theory capable of explaining why governance structures may influence policy outcomes in the states. Last, the study of diffusion influences in higher education remains poorly understood (Doyle, 2005). Future research should seek to explicate the

conditions under which and the causal mechanisms by which higher education policy may be diffused through the American states.

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Table 1: Descriptive Statistics for Variables in Analysis

	Mean, 1986	Mean, 1999
Prepaid Tuition	0.02 (0.15)	0.42 0.50
Savings Plan	0 (0.00)	0.62 0.49
Government Liberalism	0.55 (0.20)	0.44 (0.26)
Proportion of Upper House Republican	0.4 (0.20)	0.49 (0.16)
Proportion of Lower House Republican	0.43 (0.20)	0.49 (0.16)
Years Until Election	3.38 (1.01)	1.68 (1.12)
Electoral Competition	-0.09 (0.06)	-0.1 (0.08)
Governing Board: Planning	0.06 (0.25)	0.06 (0.25)
Coordinating Board: Weak	0.17 (0.38)	0.11 (0.31)
Coordinating Board: Strong	0.36 (0.49)	0.4 (0.50)
Governing Board: Four Years Only	0.21 (0.41)	0.23 (0.43)
Governing Board: All Institutions	0.19 (0.40)	0.19 (0.40)
In Financial Aid +1	175.24 (170.54)	290.54 (227.71)
Percent of FTE in Privates	22.45 (13.57)	24.24 (12.87)
Percent of FTE in Community Colleges	0.23 (0.12)	0.26 (0.11)
Diffusion: Prepaid	0.06 (0.25)	0.11 (0.31)
Diffusion: Savings	0.06 (0.25)	0.77 (0.96)
Percent of Population Aged 18-24	11.65 (0.71)	9.47 (1.07)

Gross State Product per Capita (100s)	26697.94	32013.58
	(7,929.96)	(7,596.76)
<hr/>		
N	48	48

Table 2: Results of Cox Proportional Hazards Model (Competing Risks=Adoption of Prepaid plan, adoption of savings plan—standard errors in parentheses)

	Model 1		Model 2		Model 3		Model 4		Model 5	
	Coeff.	Exp (Coeff)	Coeff.	Exp (Coeff)	Coeff.	Exp (Coeff)	Coeff.	Exp (Coeff)	Coeff.	Exp (Coeff)
Government Liberalism	0.73 (0.42)	2.08							0.92 (0.51)	2.51
Proportion of Upper House Republican	-0.67 (1.25)	0.51							-1.00 (1.40)	0.37
Proportion of Lower House Republican	0.47 (1.18)	1.61							1.51 (1.44)	4.52
Years Until Election			0.14 (0.13)	1.14					0.14 (0.11)	1.15
Electoral Competition			-1.56 (1.33)	0.21					-3.08 (1.58)	0.05
Governing Board: Reference Category= Planning Board										
Governing Board: Weak Coordinating Board					0.59 (0.31)	1.81			1.17 (0.57)	3.21
Governing Board: Strong Coordinating Board					0 (0.23)	1			0.3 (0.50)	1.35
Governing Board: Four Years Only					0.22 (0.22)	1.24			0.5 (0.56)	1.65
Governing Board: All Institutions					-0.21 (0.39)	0.81			-0.24 (0.58)	0.78

Table 2: Results of Cox Proportional Hazards Model (Competing Risks=Adoption of Prepaid plan, adoption of savings plan—standard errors in parentheses)

	Model 1		Model 2		Model 3		Model 4		Model 5	
	Coeff.	Exp (Coeff)	Coeff.	Exp (Coeff)	Coeff.	Exp (Coeff)	Coeff.	Exp (Coeff)	Coeff.	Exp (Coeff)
ln (Financial Aid +1)					0.09 (0.10)	1.09			0.03 (0.11)	1.03
Percent of FTE in Privates					0.01 (0.01)	1.01			0 (0.01)	1
Percent of FTE in Community Colleges					0.17 (0.82)	1.19			-0.32 (1.28)	0.73
Diffusion: Prepaid							-0.6 (0.29)	0.55	-0.66 (0.36)	0.52
Diffusion: Savings							0.18 (0.15)	1.2	0.07 (0.17)	1.08
Percent of Population Aged 18-24									-0.02 (0.15)	0.98
Gross State Product per Capita (1000s)									-0.01 (0.02)	0.99
Likelihood Ratio	3.71		2.8		9.93		4.6		24.31	
Degrees of Freedom	3		2		7		2		16	
N	47		48		47		48		47	

Figure 1: Estimated Hazard Rates for Prepaid Tuition Plan, Savings Plan, and Cumulative Hazard of Both Events

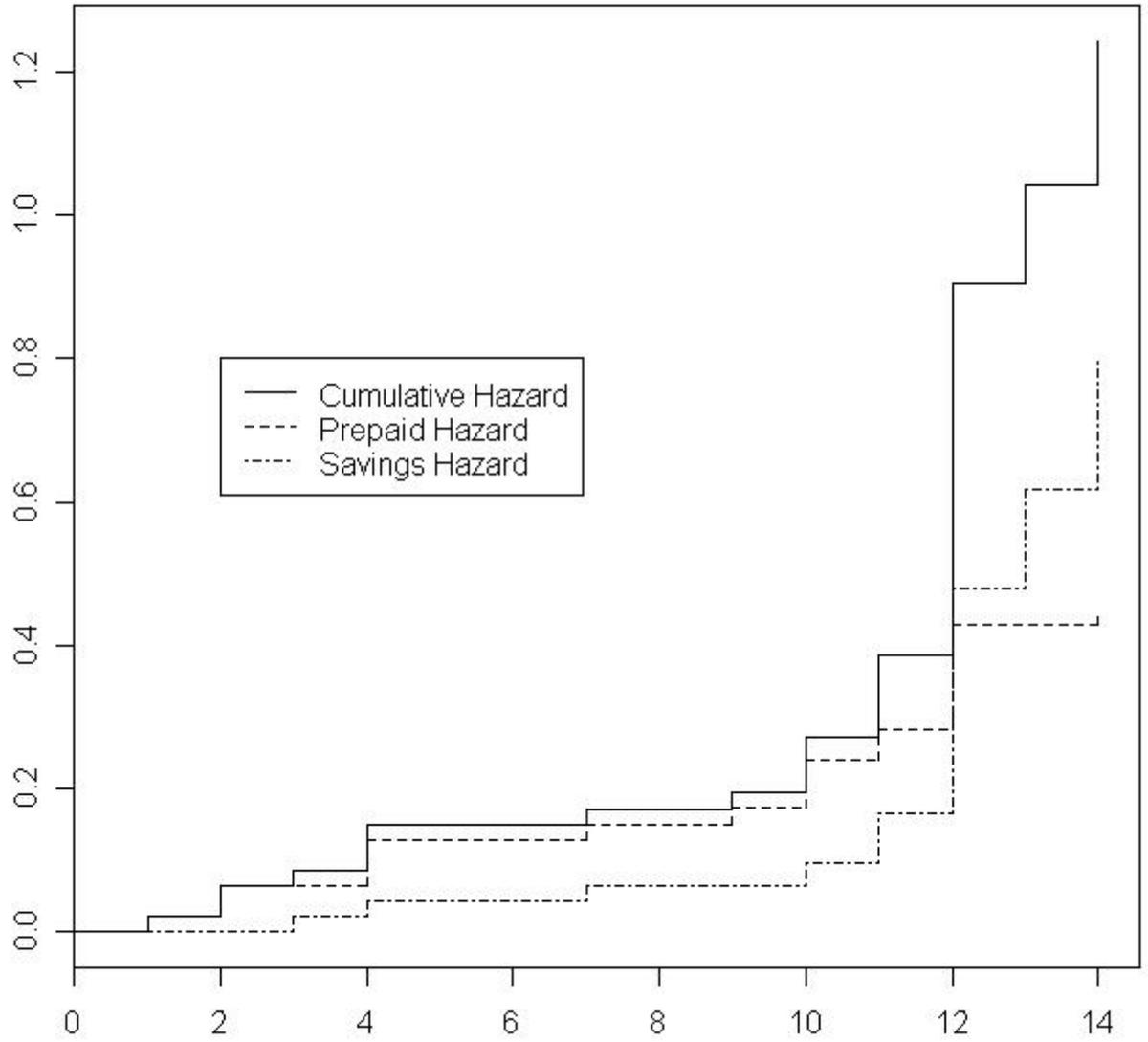


Figure 2: Estimated Hazard Rate for Adoption of Prepaid Tuition Plan, by Levels of Government Liberalism
 (Source: Table 2, Model 5)

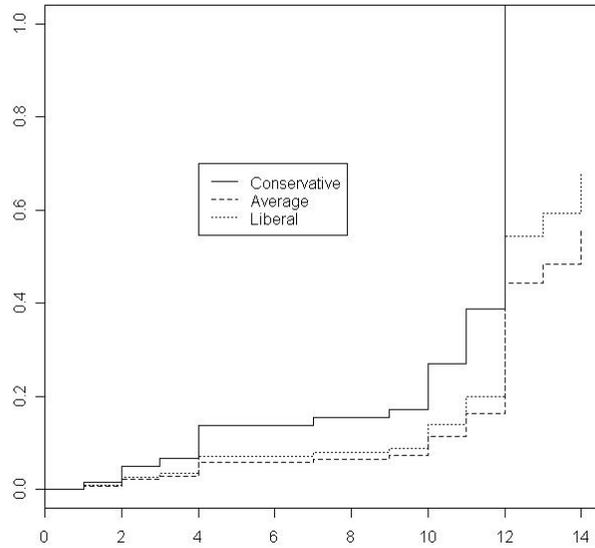


Figure 3: Estimated Hazard Rate for Adoption of Savings Plan, by Levels of Government Liberalism
 (Source: Table 2, Model 5)

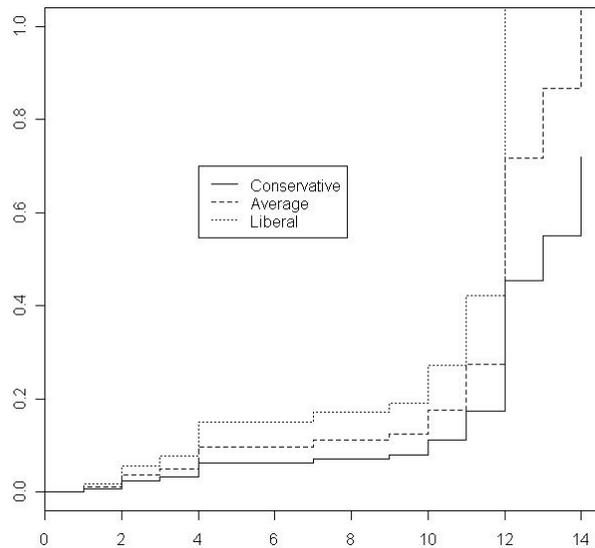


Figure 4: Estimated Hazard Rate for Adoption of Prepaid Tuition Plan, by Levels of Electoral Competition
 (Source: Table 2, Model 5)

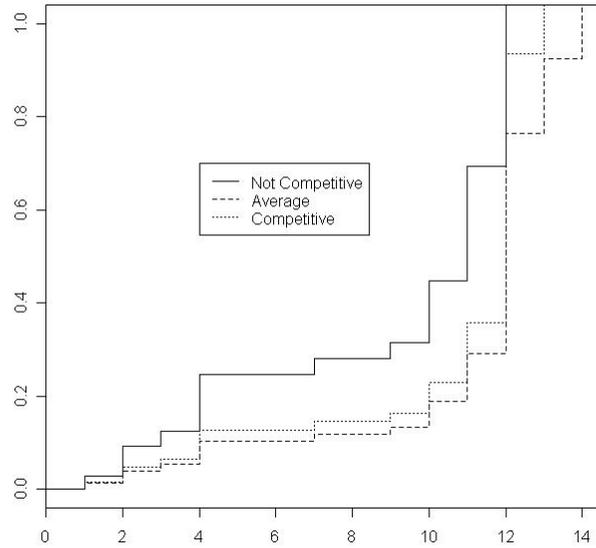


Figure 5: Estimated Hazard Rate for Adoption of Savings Plan, by Levels of Electoral Competition
 (Source: Table 2, Model 5)

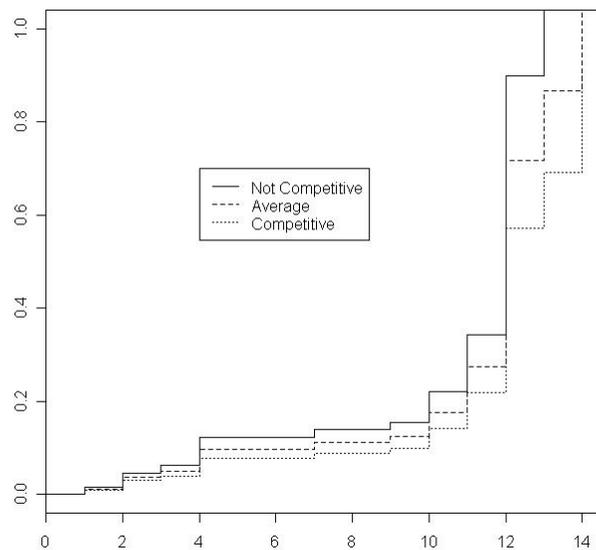


Figure 6: Estimated Hazard Rate for Adoption of Prepaid Plan, by type of State Higher Education Board
 (Source: Table 2, Model 5)

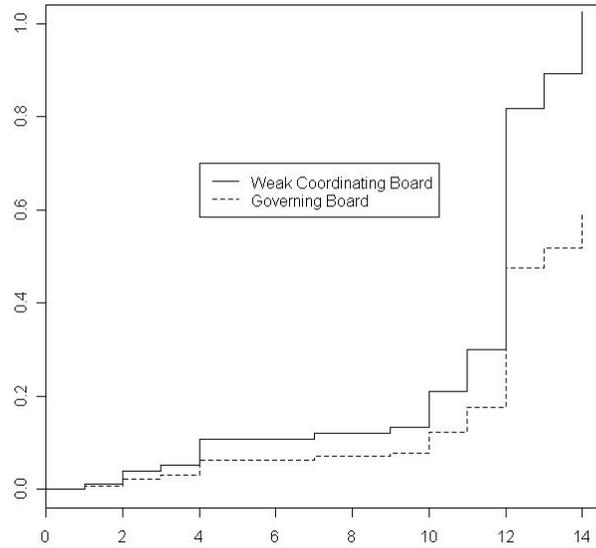


Figure 7: Estimated Hazard Rate for Adoption of Savings Plan, by type of State Higher Education Board
 (Source: Table 2, Model 5)

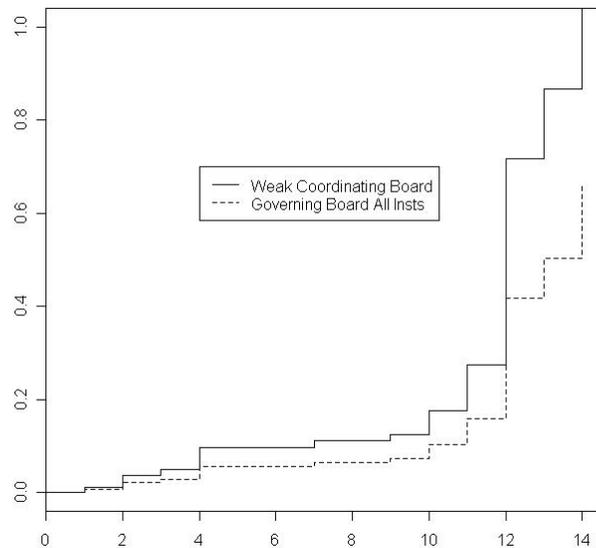


Figure 8: Estimated Hazard Rate for Adoption of Prepaid Plan, by Number of Neighboring States With Similar Plans
(Source: Table 2, Model 5)

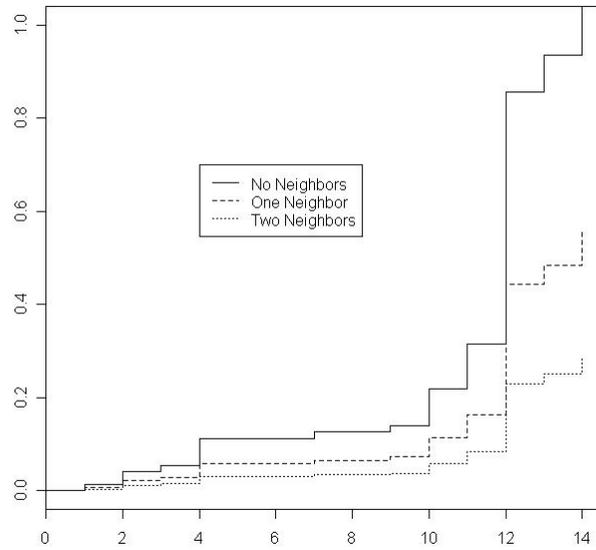


Figure 9: Estimated Hazard Rate for Adoption of Savings Plan, by Number of Neighboring States With Similar Plans

