Do Prepaid Tuition Plans Affect State Support for Higher Education?

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Katie Baird
Assistant Professor of Economics
Interdisciplinary Arts and Sciences
University of Washington Tacoma
1900 Commerce Street
Tacoma, Washington 98402-3100
office: 403 WCG
phone: 253-692-5854
fax: 253-692-5718
email: ke Baird@u.washington.edu
website: http://faculty.washington.edu/ke Baird/

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Do Prepaid Tuition Plans Affect State Support for Higher Education?

Katherine Baird¹

Assistant Professor of Economics
Interdisciplinary Arts and Sciences
University of Washington Tacoma
kebaird@u.washington.edu
phone: 253-692-5854

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Abstract

This paper examines the effect of state prepaid tuition programs on state support for higher education. Prepaid tuition programs are state-offered programs whereby citizens can purchase future tuition credits at roughly today's prices. Twenty states now offer such programs, and investments in these programs are growing rapidly. Examining state panel data from 1990-2002 suggests somewhat ambiguous conclusions about the effect these programs may be having on state support for higher education. Investments in these programs are associated with slightly lower tuition levels, but fewer expenditures on higher education. The paper concludes that the contribution these programs make to advancing national higher education policy goals is in need of greater scrutiny.
Do Prepaid Tuition Plans Affect State Support for Higher Education?

In principal, if not always in practice, subsidies to higher education have been
guided by the vision that income should not be a barrier to higher education. General
subsidies that keep tuition at public institutions low to all have traditionally been coupled
with targeted grants and loans to citizens with greater financial needs. As many have
noted, recent changes in higher education policy suggest that this model of public
subsidies is under intense pressure. First, fiscal shortfalls in state budgets have resulted
in rapid tuition inflation over the last two decades; this has made public institutions much
less affordable than they once were. Second, state government’s are increasingly
devoting funds to merit- rather than need-based scholarships. And third, the federal
government has dramatically expanded its commitment to higher education by offering a
wide range of tax incentives.

Many experts of higher education, such as Wolanin (2001), McPherson and
Schapiro (1998), and Heller and Marin (2002), have drawn attention to this movement
toward subsidizing “merit-worthy” rather than financially-needy students, and providing
tax breaks for wealthier college-going families. To date, however, one additional trend
has received much less attention; this is the emergence of state-sponsored college prepaid
tuition (PPT) plans. These represent one of the more innovative programs that
governments have implemented to spur savings and thereby address college affordability.
This paper argues that the existence of PPT plans – plans that insure some families
against tuition inflation and create a constituency favoring more rapid tuition increases --
could result in a decline in state support for higher education. This paper provides early
and somewhat tentative evidence in support of this premise. If wealthier families are
ones joining these programs, PPT plans could thus make public subsidies to higher
education more regressive. PPT plans may thus be furthering the trend away from the
traditional policy emphasis on access, and toward an emerging priority on affordability
for the wealthier segment of the college-going population.

This paper first presents a brief overview of higher education financing, and
discusses states’ prepaid tuition plans. It then discusses the determination of tuition
levels within states, and the role of PPT plans in influencing tuition rates. A third section
empirically examines the role of PPT plans in the determination of state support for
higher education between 1990-2002, and shows somewhat ambiguous but preliminary
support for the belief that PPT plans may lead to reduced state support for higher
education. A fourth concludes that PPT plans’ contribution to overall higher education
policy goals should be subject to greater scrutiny.

I. TRENDS IN HIGHER EDUCATION FINANCING AND THE EMERGENCE
OF PPT PLANS

A. Overview

An excellent overview of the history of public subsidies to higher education can
be found in McPherson and Shapiro (1998), among others. To summarize, since the
1950s a consensus has emerged both at the federal and state level that the overriding goal
of public subsidies should be to assure that higher education remains affordable to all. This goal has been pursued via very large state subsidies to higher education that for several decades kept tuition levels at public institutions low. In 1980, student tuition accounted for only 13 percent of total current fund revenue collected by public higher education institutions, while state subsidies accounted for 46 percent (USDOE 1998, Table 325). A policy of low tuition has been coupled with concerted efforts to target additional aid to the financially needy. This latter role has largely been accepted as the federal government’s purview. In 1972, the federal government instituted Pell Grants, which are grants limited to students with financial need. This was later complemented with additional support for less wealthy students – work study and loan programs in particular. Today Pell Grants account for about 50 percent of federal outlays for higher education (US Bureau of the Census 2003, Table 479; USOMB 2004).

State higher education policy has primarily been guided by the goal that state subsidies should assure low tuition and therefore universal access to higher education. In 1999-2000, states provided over $56 billion in aid to public institutions (USDOE 2002, Table 338), most of which went to maintain low tuition. Some support, however, is targeted aid to individuals, most commonly based on individuals’ need for additional financial assistance. In 2000, states provided almost $5 billion in aid to select students, 75 percent of which was based on financial need (College Board 2002, p. 16).

Together, state and federal policies have contributed to a national vision of higher education policy of “equal educational opportunity”, or, as McPherson and Shapiro
(1998, pp. 7-8) state it: "...that colleges and universities, with significant support from the government, would embrace a commitment to meet the full financial need of all their undergraduate students and to limit their financial aid to that purpose."

However, the implementation of this vision has weakened over the last 20 years, traceable primarily to the inability of state subsidies to maintain low tuition. Between 1981 and 2001, after adjusting for inflation, tuition at public 4-year institutions almost doubled, while median family income rose by only 24 percent (College Board 2002a, Figure 6). Today, tuition payments have grown to 19 percent of total revenue to public institutions, and state support has fallen to 36 percent of revenue (USDOE 2002, Table 338). One result has been that the affordability of higher education is now an issue that extends beyond the traditional constituency of poorer households, and into middle and upper-middle class households. This has led to tremendous competition over who receives targeted subsidies for higher education. During the last 15 years, two trends are discernable in the use of these targeted funds.

The first trend is a discernable movement away from state scholarships based on need, toward scholarships based on merit. One of the best-known example of this is Georgia’s merit-based HOPE scholarship. Established in 1993, this program awards all or partial tuition to Georgia students with a 3.0 or better GPA attending in-state institutions. With no income limitation on recipients, it is not surprising that recipients are disproportionately wealthy and white (Cornwell and Mustard 2001). Studies of the characteristic of merit scholars in other states also show that recipients are
disproportionately white or Asian, and wealthier (Heller and Rasmussen 2002; Binder, Ganderton, and Hutchens 2002). Several years after the establishment of the Hope Scholarship program, Georgia ended all state need-based scholarships.

As suggested by the number of states that have copied Georgia’s HOPE scholarship program (Institute for Higher Education Policy 1999, p. 17), declining support for state need-based assistance is found not just in Georgia. While in 1981 nine percent of state-provided grants to its undergraduates was non-need based, today 25 percent is awarded on criteria other than need (College Board 2002, p.16). Four states have completely eliminated all need-based aid from their education budget, and an additional nine states spent less on need-based aid in 2000 than they did in 1987 (USDOE 2002, Table 329) – despite much higher tuition levels. While there is evidence to suggest that need-based scholarships increase college enrollment (McPherson and Schapiro 1991; Heller 1997), to date there is little evidence that merit scholarships result in more students enrolling in college (Binder, Ganderton and Hutchens 2002; Cornwell and Mustard 2002). Rather, evidence suggests the effect of merit scholarships is to transfer resources from the public sector to select households; this transfer may influence the institution in which students enroll, but not whether or not they enroll (Cornwell and Mustard 2002).

The second trend in higher education financing is the increasing attention paid at the federal level to the issue of college affordability for middle and upper-middle class families. In 1992, Congress removed income and eligibility limits for one federal loan
program, and created another loan program for wealthier households (Institute for Higher Education Policy 1999, p. 5). In 1997, the Taxpayer Relief Act of 1997 provided unprecedented federal aid to middle and upper middle class families through the Hope Scholarship and Lifetime Learning Credit programs. The US Department of Education estimated that in 2000 these two tax credits would reduce tax revenue by $10 billion (USDOE 2000), although in 2003 the OMB estimated that tax expenditures for the two would equal about $6 billion (US Bureau of the Census 2003, Table 482). This compares with about $11 billion spent on Pell Grants in 2003 (Budget FY 2005). As discussed in Conklin (1998), lower income individuals usually do not qualify for these credits because they are non-refundable and are offset by any financial aid received. Evidence in Long (forthcoming) shows that primarily middle and upper-middle-class families benefit from these tax credits. Long also finds that these tax credits have had no discernable effect on college enrollments, and if true they (like merit scholarship) act as a transfer to eligible college-going households rather than as an incentive to attend college.

Movement away from the low tuition/targeted-aid-to-poorer-students model of higher education finance is not in and of itself a bad thing. The merits of this model have long been in dispute among policy makers and education researchers, with many, for example, arguing for a high tuition/high aid model. Yet such disputes have been motivated by disagreement over the means, not the ends, of public subsidies: assuring that the cost of higher education does not keep qualified citizens from pursuing an college degree has motivated both camps. Today’s policy trends, by contrast, are reflective of a change in the purpose of public subsidies to higher education: meeting the needs of

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2 This is based on adjusting the reported data for inflation.
college-going middle and upper middle class households has been gradually replacing the goal of assuring that all citizens have access to higher education.³

Whether the new directions in educational policy noted above have been deliberate or not, the promoters of these policies often inaccurately portray both their beneficiaries and their expected effect. For example, President Clinton introduced his tax credits as a way of making higher education affordable to all and thereby increasing enrollments. This tax benefit “… opens the doors of college to a new generation…”, he announced in 1996, and his Education Secretary later wrote that “we anticipate an enrollment boost from the [Hope] program...(Wolanin 2001, p. 1 and p. 5).

PPT plans have similarly been portrayed as programs designed to assure that all citizens have access to higher education. In his 1986 State of the State address, then-Governor Blanchard called the proposed Michigan Education Trust (MET) an “investment program designed to help parents guarantee to their children the opportunity of a Michigan college education” (cited in Lehman 1990, p. 1043). Today, most states similarly promote their programs as a way to assure that all citizens have access to higher education.⁴ However, as discussed below, PPT plans target upper-middle class households, and, as with merit scholarships and tax incentives, they are unlikely to have any effect on enrollment levels.

³It is noteworthy that this new direction comes at a time when the gap in college participation rates by social group appears to be increasing. For evidence see McPherson and Schapiro (1998) and Kane (2001).
B. State PPT

State-sponsored prepaid tuition (PPT) plans allow parents (or others) to buy future college education by prepaying at roughly the existing tuition rate. Individuals buy a specified number of academic periods or credits at today’s price; in the future they can redeem their investment for the equivalent educational quantity at a public institution within their state. In most states, accounts can be redeemed for the equivalent in-state tuition value should the beneficiary choose to attend either a private or an out-of-state institution. A state invests contributions into its program, and uses the principle and interest to meet its liabilities. For PPT plans to operate without a loss, investment returns must equal or exceed tuition inflation.

Michigan initiated the first PPT plan in 1988. Over the next ten years a few states copied the Michigan program; however, most were reluctant to initiate PPT plans until 1995 when the IRS clarified their tax-advantaged status. Today PPT plans exist in 20 states, generally guaranteeing the investor a rate of return equivalent to the inflation rate on state tuition. As shown in Figure 1, over the period 1989 to 2002, the real value of investments in PPT plans has increased rapidly to almost $8 billion, and today there are over 1.2 million individuals PPT accounts (Figure 2). Table 1 shows the current size of PPT plans in each state; the third column shows the relative size of these programs by indicating enrollments as a share of the state’s 0-17 population. Florida’s program is exceptionally large: the number of PPT accounts equals almost 15 percent of the state’s

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*As examples, one TV add for Texas’ PPT opens with a young girl asking her mom if she will be able to go to college (Olivas 2003, p. 1); and the opening article on the home page of the College Savings Plan Network is entitled “Delivering the Dream” (see www.collegesavings.org).
0-17 population. More typically, though, the number of accounts equals about 1-2 percent of a state’s 0-17 population.

Figure 1 here

Figure 2 here

Table 1 here

Advantages of PPT Plans

Recent changes in federal tax policy offer tax advantages for saving for college through specified programs. For the most part, these plans must be sponsored by a state government, with the funds managed by state-authorized investment specialists and backed by the government. The most common of these plans is often referred to as a “529 plan”.\(^5\) These 529 plans take two forms:

a. **Prepaid tuition (PPT) plans** that permit individuals to pay tuition at today’s rates, through lump sum, periodic or regular (contract) payments. The specifics of each plan vary from state to state.

b. **College savings plans**, where individuals can establish an investment account for a future college student, and use account balances to pay for a beneficiary’s college-related expenses.

All states now offer at least one of these two 529 options: all states offer or will soon offer the savings plan, and 20 states also offer a prepaid tuition plan. Over $34 billion in almost 5.5 million accounts has now been invested in both types of 529 plans (Schmidt 2003).

\(^5\)529 plans are named after the section in the federal tax code that authorizes their usage, and are sometimes also referred to as Qualified Tuition Programs (QTP).
Both 529 plans offer investors preferential treatment under the federal income tax code. Most recently, the Economic Growth and Tax Relief Reconciliation Act of 2001 allows all 529 earnings to be tax exempt. And most states offer their own tax advantage to 529 plans: 42 states exempt 529 earnings from state income (or dividend) taxes, and 25 states allow individuals to at least partially deduct their 529 contributions from their taxable income (Levine, 2003). The last column of Table 1 categorizes the tax benefits offered by each state PPT plan.

These tax breaks offer significant advantages to wealthier households. Assuming households are saving over 23 years at a rate to cover the cost of five years of college, Coronado and McIntosh (2001) estimate the net present value of tax breaks from a 529 savings account at $12,000 for households in the 45 percent tax bracket versus $4,500 for households in a 17 percent tax bracket. It is clear that 529 plans offer an important advantage to college savers in higher income tax brackets.

Benefits to PPT plans can also be large due to higher returns than alternative investment options. In fact many states prepaid tuition plans are operating with an actuarial deficit due to low investment returns and rising tuition (Max, 2003; Schmidt, 2003). In 2003, Washington State’s PPT program was operating with an actuarial deficit of $35 million – or almost $1,000 per account (GET 2003a). Pennsylvania was operating with a $53 million deficit in 2003 (over $700 per account), and Ohio with a $70 million

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*Brackets are combined state and federal marginal income tax rates. Roughly 20 percent of all households pay no federal income taxes, and therefore would receive no benefit. For further estimates, see the websites [http://www.collegeachievementplan.com/home.html](http://www.collegeachievementplan.com/home.html) and [http://www.smartmoney.com/college/investing/index.cfm?story=529calc#calc](http://www.smartmoney.com/college/investing/index.cfm?story=529calc#calc)*
deficit (over $600 per account) (Schmidt 2003). A number of the state programs guarantee PPT investments, which means that the state legislature must fund any program loss.\textsuperscript{7}

**Participant Characteristics**

The tax advantage to someone investing in a PPT account is based on her income tax bracket; as such PPT plans are especially attractive to higher income households. Moreover, for federal financial aid purposes, the monetary value of a PPT account is treated as student resources, 100 percent of which are expected to go toward paying for college. For students eligible for federal financial aid, each dollar invested in a PPT plan reduces financial aid by one dollar. Parents who both wish to save and expect financial aid are better off investing in parental assets, as these reduce the student’s eligibility for financial aid by at most 5.6 cents for every dollar saved (Levine, 2003). Even assets saved by students reduce financial aid eligibility by 35 cents of each dollar saved.\textsuperscript{8} Thus families expecting financial aid are likely be made worse off by saving for college through a PPT plan rather than just about any other way.

\textsuperscript{7}PPT program benefits in Illinois, Maryland, Washington, Texas, Ohio, Massachusetts, Florida, and Mississippi are backed by the full faith and credit of their state (Olivas 2003). In states without such a guarantee, enrollees theoretically stand to lose if their state’s investment comes up short of tuition inflation. Whether or not this would actually happen is another matter. In Michigan, PPT investments are not guaranteed, but the Governor is quoted in Olivas (2001, p. 92) as saying the state had a moral, if not legal, obligation to fund any shortfall. Despite often poor investment returns, with the exception of Colorado no state has yet failed to give account holders the full tuition value of their account (Block, 2002).

\textsuperscript{8}For financial aid purposes, 12 percent of family assets above the family’s allowance is considered as income for financial aid purposes. Families in the highest bracket are expected to contribute 47 percent of available income to their child’s education. Thus, the highest rate at which family assets would reduce financial aid is 5.6 percent (47 percent x 12 percent) (Levine, 2003).
Stiff penalties associated with the use of 529 balances for non-educational purposes is a final reason why PPT programs primarily attract only wealthier families. The president of a company providing investment advice for college discourages those families with less than $60,000 per year in earnings from investing in 529 plans (Schmidt 2001). And a recent Congressional Research Service report concluded that 529 plans are not a prudent choice for many middle class savers:

If, for example, a family suffers a reversal of fortune brought about by extended unemployment, very high medical bills or some other unanticipated event...after having established a [529 account], it is more likely that a middle-income compared to high-income family will need the plan’s savings for current consumption. As previously noted, however, account owners must pay income tax and penalties on refunds from either type of [529 account]....Thus, for some middle income families, saving for college through a vehicle not dedicated to a single purpose might be a more prudent choice. (Levine, 2003, p. 14)

So who does enroll in these programs? In 1990, Lehman (1990) showed that higher income families had disproportionately enrolled in Michigan’s PPT plan; he estimated that 50 percent of enrollees were in the states’ top income quintile, and four percent were in the bottom quintile (Lehman 1990, p.1139). A 1995 General Accounting Office study reported similar income characteristics for Alabama, Florida and Ohio participants (USGAO 1995). Table 2 presents estimates of the distribution of enrollees by state household income quartiles for several other state programs. Estimates in Table 2 of enrollee household income are based on the average household income in the enrollee’s zipcode, and as such can be seen as conservative estimates of the actual extent to which PPT enrollees’ income differs from the overall distribution of income in the state.
II. PREPAID TUITION PLANS AND TUITION LEVELS

Over the last couple of decades, researchers have become interested in the effect of student resources and student aid on the pricing behavior of tuition-setting authorities. At least initially, this interest was motivated by arguments that increased federal aid to students would result in institutions of higher education raising tuition in order to “capture” students’ increased ability to pay. Numerous empirical studies have supported the position that tuition-setting authorities respond to incentives created by student aid policies. Li, cited in Long (2003), reports that each dollar increase in federal Pell Grants resulted in a $1.12 increase in tuition rates. In her study of Georgia’s financial aid program, Long (2003) concludes that Georgia colleges have responded to increased student scholarships by increasing tuition and/or lowering institutional aid. And Long (forthcoming) finds evidence that recent federal tax credits for tuition expenses may have induced some colleges to increase their tuition.

Do PPT plans which among other things provide public subsidies to those saving for college, change the incentives of tuition-setting authorities, and if so, in what way? Let us first assume authorities are trying to maximize tuition revenue, subject to some constraint such as obtaining some level of student quality. First consider private institutions. If PPT plans do nothing to student (family) wealth, then they would have no

\footnote{These subsidies would include tax expenditures, subsidized program start up and/or maintenance costs (see USGAO 1995 and Olivas 2003), and any state resources used to cover investment shortfalls.}
effect on the incentives facing private institutions. If they increased family wealth, they
would not likely have any effect on general tuition levels as long as total demand for
higher education remains the same. Increased family wealth may reduce any institutional
aid the individual might otherwise have received, although as discussed above, PPT plans
primarily attract families that are likely ineligible for need-based aid.

Tuition-setting authorities of public institutions face different incentives. Tuition
increases have no affect on those who have PPT credits (at least for these credit units),
and thus tuition increases would have little affect on their demand for attending a public
institution. Higher tuition would, however, affect those without PPT plans – the number
of applicants at higher tuition levels would likely be measurably lower. Thus, from the
point of view of a single public institution, higher tuition would be desirable if the added
revenue exceeded the lost revenue, or decrease in student quality, that would result.

Since tuition levels in state public institutions are rarely set by individual
institutions, and are always subject to political considerations such as budgetary
constraints or legislative allocations, one might then ask, what affect might PPT plans
have on state subsidies to higher education? If one assumes officials are likewise seeking
to maximize tuition revenue (alternatively minimize subsidies to higher education), then
the existence of PPT plans may quell pressure for tuition increases since they would also
increase the state’s future PPT liability. However, as shown in Baird (2004), this is
unlikely to occur until state PPT plans become much larger than they currently are. This
is because increased revenue from higher tuition will almost always swamp any adverse
change in the actuarial balance of a state’s PPT plan. For this reason, for at least the near term the future liability of PPT plans is unlikely to cause lower tuition inflation than otherwise would be the case.

But legislative decisions over allocations to higher education may not be motivated by a desire to set tuition levels as high as possible (subject, of course, to some constraint). Rather, they make reflect the willingness of the general population to tax themselves for the provision of public institutions of higher education. If we assume that legislators’ votes over expenditures on higher education reflect their constituents’ preferences for these expenditures, then according to median voter theory, where voters are choosing between two candidates based on the proximity of the candidate’s position to their own, legislators will seek the funding level of public programs preferred by the median voter. As shown in Baird (2004), the median voter with a PPT plan will likely prefer fewer expenditures for higher education than the median voter without a PPT plan. This is because enrollees become less sensitive to tuition increases, and tuition inflation increases the value of their PPT account while lowering their taxes.\(^{10}\) PPT plans thus may create a constituency favoring more rapid tuition increases which may translate into less public support for higher education.

This fear that PPT plans may translate into less public support for higher education is expressed by Olivas (2001, p. 94): “Will [PPT programs] supplant state

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\(^{10}\)Increasing the value of one’s PPT account through higher tuition is unambiguously beneficial if one attends private or out-of-state institutions. In 2002-2003, 21 percent of Washington citizens who used their PPT-plan benefits to pay for college attended out of state or private in-state institutions (GET, 2003). This percent is consistent with percentages reported in other states as well (USGAO, 1995).
support rather than supplement appropriations?...What will happen if the answer is to free tuition levels to rise to “market levels”? (emphasis in original). As shown in Table 3, on average in states that now have a PPT program, tuition grew faster than the national average both 5 years before the initiation of their PPT program as well as 5 years after. This is consistent with the interpretation that PPT plans have been initiated in states with higher than average tuition growth, and that states with PPT plans have not supported higher education as much as those without them.

Table 3 here

III. DO PPT PLANS REDUCE PUBLIC SUPPORT FOR HIGHER EDUCATION? AN EMPIRICAL INVESTIGATION

This section presents results of an empirical analysis of the relationship between public support for higher education and the size of state PPT programs. To investigate whether the existence of PPT plans has had any affect on public support to higher education, data for a multivariable regression model were collected for each year and state over the period 1990-2002.

In addition to data on public support to higher education (SUPED) and the size of state PPT programs (PPT), data on other variables thought to influence support for higher education were collected. Two other factors were hypothesized to affect changes in a state’s support for higher education in any one year: demand for public institutions of higher education, and the ability of the state to raise funds to support higher education. The two variables most important for capturing demand is the size of the college-going
population (COLPOP), and state income (INCOME). The ability of the state to devote funds to higher education is captured by both income and the existence of other cyclical public priorities (ECON). Thus, a proposed general model is:

\[ \text{SUPED} = f(\text{COLPOP}, \text{INCOME}, \text{ECON}, \text{PPT}) \]

**Econometric Specification**

**Dependant Variables.** Public support of higher education can be measured in a variety of ways. Tuition charges is one obvious measure. Thus, one measure of public support is tuition (TUI), where TUI is the average tuition charged at public 4-year institutions in the state. Higher TUI would indicate less public support for higher education. A second indicator of support examined is the overall level of state support to public higher education institutions (STED), where STED is annual state appropriations to public institutions of higher education.

**Independent Variables.** The number of high school graduates (HSGRAD) in the state in each year is used to approximate the size of the college going population. More graduates may increase the public’s willingness to provide for higher education, but it may also lead to a decrease in per-student support. So the expected sign of this variable is not clear – it should increase EDEXP, but may also increase TUI, indicating less support per student.

Per capita income (PCI) is included to capture both the demand of the population for higher education, as well as approximate the size of the tax base to pay for the
public’s support of higher education. PCI should have a positive effect on support for higher education.

The state’s ability to pay for higher education is captured by the size of the state’s tax base, which can be approximated by PCI. However it is also affected by the willingness of the population to be taxed. An additional variable, STGEN, is included, where STGEN is overall state public expenditures in any one year. Controlling for PCI, higher state expenditure (STGEN) suggests a state whose citizens are more able and willing to tax themselves, and consequently may be more willing to support public higher education. Thus, we expect the effect of STGEN on support for higher education to be positive.

The health of the economy is predicted to be positively correlated with support for higher education, since during economic upturns, states expenditures on welfare programs go down, freeing up resources for other priorities. Average annual unemployment rates in the state (UNEM) are used to approximate the condition of the economy, and is expected to be negatively correlated with support for higher education.

The size of state PPT plans is approximated by the book value of investments at the end of each state’s fiscal year (PPT). Regressions were also run with the number rather than value of accounts (NUM). Since the results of regressions using NUM rather than PPT do not change the paper’s conclusions, they are not reported here.
Table 4 lists the variables used in the regression analyses, along with their descriptive statistics. Appendix A provides sources and greater detail on the variables.  

**Table 4 here**

**Results**

Tables 5 presents the estimated standardized coefficients resulting from OLS regression analyses of state-level panel data covering the period 1990-2002. For the dependent variables, the year indicates the beginning of the fiscal year, whereas for the independent variables, it marks the end of the fiscal year. In this sense, the independent variables lag behind the dependent variable in time. Standardized coefficients represent the estimated change in standard deviations of the dependant variable that occurs with a one standard deviation change in the independent variable. All models account for state and year fixed effects.

The first two models presented in Table 5 examine the dependent variable TUI, while the second two examine a variant of STED. The first model reveals that with the exception of the fixed effect variables, only two of the explanatory variables have a statistically significant relationship with tuition. PCI has a large and statistically significant negative impact on tuition, while UNEM has a smaller statistical and real positive impact on tuition. Contrary to expectation, the size of a state’s investment in PPT plans (PPT) is estimated to reduce tuition levels, although the relationship is very small and not statistically significant.\(^\text{11}\)

\(^{11}\)Tests for nonlinearity in the relationship between state support for higher education and prepaid tuition plans did not support a nonlinear specification.
The second model in Table 5 normalizes several explanatory variables by dividing them by the size of the state’s population (POP). Thus, the number of high school graduates is the percent of the population graduating from public high schools, and investments in PPT are per capita investments. This model reveals a better fit with the data as four of the estimated coefficients of the independent variables are statistically significant. However, the model predicts that tuition decreases with increased per capita investments in PPT plans, although the estimated size of this effect (.044) is quite small: every $23.37 invested in PPT plans per person in the state is estimated to decrease tuition by $52.14 ($1,185 x .044). Evaluated at their mean value in states, this estimates that a $126 million increase in a state’s PPT would decrease tuition by 1.5 percent below what it otherwise would be.

A second way of examining the relationship between PPT programs and state support of higher education is to investigate the effect of PPT programs on overall state subsidies to higher education. While less state support to higher education usually results in higher tuition, the connection is often not direct nor immediate. Thus, the third model in Table 5 examines whether there is any evidence that public resources devoted to higher education (STED) decline with larger PPT programs. Relevant variables are normalized by dividing by the state’s population. The dependent variable is thus STED/POP, or per-capita state expenditures on higher education.

\[12\] These regressions results are based on 1990-2000 data only, as data on state expenditures on higher education are available only through 2000.
As shown in model 3, Table 5, the regression analysis reveals statistically significant relationships between STED/POP and four of the five explanatory variables. While all the coefficient signs are (as expected) opposite of those in Model 2, the coefficient estimated for PPT investments is the same. This means that the regression finds that PPT plans investments lead to less state expenditures on higher education. This relationship is, however, small (-.048): a $23.37 dollar per citizen increase in the value investments in a state PPT plan is estimated to decrease state expenditures on higher education by $2.83 per citizen. Evaluated at their mean, this suggests that a $126 million increase in the value of the state’s PPT investment would lead to a 1.4 percent decrease in state expenditures on higher education.

A final measure of state commitment to higher education is to examine the proportion of state expenditures spent on higher education (STED/STGEN), rather than per capita expenditures. This provides a measure of the public priority of higher education, relative to other areas of state expenditures. Thus, model 4 in Table 5 examines the determinants of the dependent variable STED/STGEN.\textsuperscript{13}

Model 4 reveals a close statistical fit between the explanatory variables and the proportion of state resources devoted to higher education – all of the variables are significant at least at the five percent level of statistical significance. Model 4 reveals that this percent is estimated to decrease with larger investments in PPT plans. The

\textsuperscript{13}This specification assumes a linear relationship between STED/STGEN and the explanatory variables. This, however, may not be a reasonable assumption since the dependent variable is bounded by 0 and 1. To test for nonlinearity, the model was also run with the logit of STED/STGEN as the dependent variable, with very similar results. For brevity, these results are not reported here.
coefficient of -.085 means that for each $23.37/citizen investment in a state’s PPT plan, the percent of state resources spent on higher education is expected to decline by .42 percentage points. Evaluated at their mean values, this suggests that a $126 million investment in a state’s PPT would be associated with a reduction in the percentage of state expenditures that go to higher education, from 13.17 to 12.75 – for a 3.2 percent decrease.

IV. CONCLUSIONS

Currently offered in 20 states, prepaid tuition plans have become a popular and growing component of state higher education policy. It is clear, however, that these plans are designed for wealthier college-going families since their benefits are skewed towards this segment of the population. Actual enrollment data from several states confirm this. This bias alone does not make these programs suspect, of course. However, the programs are consistent with other trends in higher education policy whereby assuring college affordability to middle and upper class families has been taking precedent over assuring access to all families. Given the characteristics of families attracted to these programs, it is very doubtful that PPT programs -- like merit scholarships and tax incentives – will lead to higher college enrollments. In this sense, they are best seen as simply a transfer program.

From this point of view, PPT programs are problematic in that their true effects are not transparent – either to education policy experts or to the general public. Moreover, there may be unintended adverse consequences associated with them. One
such effect, not discussed here, is that if they do succeed in increasing college savings for enrollees, they may simply affect enrollee’s choice of institution. If they succeed in increasing demand at more expensive, prestigious institutions, then they may make it more difficult to gain access to these institutions. This has been seen in Georgia with the HOPE Scholarship, where one consequence may be the exacerbation of racial stratification in Georgia’s higher educational system (Cornwell and Mustard 2002, p. 67).

The most important potential effect of these programs is that their success may come at the cost of achieving other goals central to education policy: assuring access to all. This could happen if the existence of these programs led to a decline in state (or federal) support for higher education. The results of this paper’s analysis into this question are somewhat ambiguous. On the one hand, the size of investments into PPT plans are statistically associated with lower tuition rates in states, suggesting they foster greater support for higher education. However, examining PPT’s effect on either total higher education expenditures or expenditures as a percent of total state expenditures finds that a one standard deviation increase in investments in PPT plans is associated with reductions in state expenditures on higher education ranging from 1.4 to 3.2 percent.

One interpretation of this inconsistency is that PPT plans result in reduced support for targeted rather than general state support for higher education, since general support is what usually goes to defray tuition. A second interpretation is that the effect of reduced state support for higher education has a delayed effect on tuition, as in the shortrun educational institutions can adjust to less state revenue without increasing tuition. A third
explanation is that to date, these programs are too small and too new to be able to clearly discern their effect on education policy. A fourth is that the models have been mispecified.

In an era of both increasing pressure on limited state resources and increasing public demand for entry into institutions of higher education, higher education policy is faced with many challenges. For these reasons, it is especially important that state education policy be clear sighted. This means a clear articulation of goals, and evaluating the means to achieving these goals. This also means an open discussion of the relative merits of the competing goals of access versus affordability for the already college-going population. PPT plans are relatively new, but to date have not been subject to the sort of scrutiny they deserve. For these reasons, all levels of government should be considering the potential pitfalls of PPT plans, and examining their contribution to overall national higher education goals.
Appendix A

Data Sources


Prepaid Tuition Program Statistics, made available by individual state PPT offices. Year is end of the state’s fiscal year. Investment is, and number is number of active contracts at end of state’s fiscal year.

Number of High School Graduates. Number of public high school graduates, from USDOE Digest of Education Statistics (various years). Excludes persons receiving high school equivalency certificates. Year is end of the academic school year.

State Education Expenditures. Current fund revenue from state appropriations to public higher education institutions, in thousands of dollars. Year is beginning of fiscal year. From USDOE Digest of Education Statistics (various years).


Tuition. Average undergraduate tuition and fees paid at public 4-year institutions. From USDOE Digest of Education Statistics (various years). Year is for beginning of academic year. 2002 data provided by Tom Snyder of the USDOE.

REFERENCES


GET (September 15, 2003). “Nearly 1,000 Washington students go to college this fall using state’s Guaranteed Education Tuition (GET) program”. News Release. Unpublished.


National Governors Association (Nov 2002). The Fiscal Survey of States. Available at www.nga.org/cda/files/NOV2002


US Bureau of the Census (various years). Statistical Abstract of the US.


Table 1  
Size and Tax Advantage of Prepaid Tuition Programs,  
By State, 2002

<table>
<thead>
<tr>
<th>STATE</th>
<th>Investment Value ($thousand)</th>
<th># Accts as %</th>
<th># Accts as State 0-17 Population</th>
<th>State Tax Advantage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alabama</td>
<td>$481,471</td>
<td>4.90</td>
<td></td>
<td>b</td>
</tr>
<tr>
<td>Colorado</td>
<td>$92,100</td>
<td>1.09</td>
<td></td>
<td>b, d</td>
</tr>
<tr>
<td>Florida</td>
<td>$3,136,443</td>
<td>14.79</td>
<td>e</td>
<td></td>
</tr>
<tr>
<td>Illinois</td>
<td>$223,492</td>
<td>0.89</td>
<td>b, d</td>
<td></td>
</tr>
<tr>
<td>Kentucky</td>
<td>$18,800</td>
<td>0.42</td>
<td>b</td>
<td></td>
</tr>
<tr>
<td>Maryland</td>
<td>$91,317</td>
<td>1.07</td>
<td>b, d</td>
<td></td>
</tr>
<tr>
<td>Massachusetts</td>
<td>$116,631</td>
<td>2.41</td>
<td>b</td>
<td></td>
</tr>
<tr>
<td>Michigan</td>
<td>$933,921</td>
<td>1.93</td>
<td>b, d</td>
<td></td>
</tr>
<tr>
<td>Mississippi</td>
<td>$79,249</td>
<td>1.90</td>
<td>b, d</td>
<td></td>
</tr>
<tr>
<td>Nevada</td>
<td>$35,568</td>
<td>1.74</td>
<td>a</td>
<td></td>
</tr>
<tr>
<td>New Mexico</td>
<td>$267</td>
<td>0.01</td>
<td>b, d</td>
<td></td>
</tr>
<tr>
<td>Ohio</td>
<td>$667,400</td>
<td>3.75</td>
<td>b, d</td>
<td></td>
</tr>
<tr>
<td>Pennsylvania</td>
<td>$372,611</td>
<td>2.97</td>
<td>b, e</td>
<td></td>
</tr>
<tr>
<td>South Carolina</td>
<td>$46,865</td>
<td>0.42</td>
<td>b, d</td>
<td></td>
</tr>
<tr>
<td>Tennessee</td>
<td>$35,200</td>
<td>0.55</td>
<td>b, d</td>
<td></td>
</tr>
<tr>
<td>Texas</td>
<td>$787,207</td>
<td>1.77</td>
<td>a</td>
<td></td>
</tr>
<tr>
<td>Virginia</td>
<td>$440,664</td>
<td>3.28</td>
<td>b, d</td>
<td></td>
</tr>
<tr>
<td>Washington</td>
<td>$120,574</td>
<td>1.60</td>
<td>a</td>
<td></td>
</tr>
<tr>
<td>West Virginia</td>
<td>$57,391</td>
<td>2.11</td>
<td>b, d</td>
<td></td>
</tr>
</tbody>
</table>

Note:  Data on Alaska’s program not available.  
a-No State Tax Advantage  
b-PPT earnings exempt from state income taxes  
c-Some contributions to PPT exempt from state income taxes  
d-All Contributions to PPT exempt from state income taxes  
e-Miscellaneous tax benefit  
Table 2

Estimated Distribution of PPT Participants by Income Quartile
Various States (a)

<table>
<thead>
<tr>
<th>State</th>
<th>Washington</th>
<th>Alaska</th>
<th>Michigan</th>
<th>Penn</th>
<th>Wyoming (b)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Poorest Quartile</td>
<td>10.9</td>
<td>20</td>
<td>7</td>
<td>13</td>
<td>29</td>
</tr>
<tr>
<td>3rd</td>
<td>19.1</td>
<td>26</td>
<td>16</td>
<td>22</td>
<td>27</td>
</tr>
<tr>
<td>2nd</td>
<td>27.3</td>
<td>27</td>
<td>23</td>
<td>27</td>
<td>25</td>
</tr>
<tr>
<td>Richest</td>
<td>42.7</td>
<td>28</td>
<td>54</td>
<td>38</td>
<td>19</td>
</tr>
</tbody>
</table>

(a) Participant income estimated from participant zipcode. Income is household income.
(b) Wyoming’s program is no longer in operation.

Sources: Washington data from Baird (2004); all other state data from USGAO (1995).
<table>
<thead>
<tr>
<th>STATE</th>
<th>Initial Year</th>
<th>Tuition Increase</th>
<th>Average Tuition Increase in Nation</th>
<th>Tuition Increase</th>
<th>Average Tuition Increase in Nation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alabama</td>
<td>1990</td>
<td>24.9%</td>
<td>33.5%</td>
<td>40.6%</td>
<td>50.8%</td>
</tr>
<tr>
<td>Alaska</td>
<td>1991</td>
<td>55.2%</td>
<td>49.9%</td>
<td>68.7%</td>
<td>40.9%</td>
</tr>
<tr>
<td>Colorado</td>
<td>1997</td>
<td>18.2%</td>
<td>32.2%</td>
<td>18.4%</td>
<td>30.5%</td>
</tr>
<tr>
<td>Florida</td>
<td>1988</td>
<td>26.7%</td>
<td>33.5%</td>
<td>33.4%</td>
<td>34.4%</td>
</tr>
<tr>
<td>Illinois</td>
<td>1998</td>
<td>26.9%</td>
<td>27.2%</td>
<td>24.5%</td>
<td>25.8%</td>
</tr>
<tr>
<td>Kentucky</td>
<td>2001</td>
<td>42.5%</td>
<td>25.5%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Maryland</td>
<td>1998</td>
<td>40.1%</td>
<td>27.2%</td>
<td>24.0%</td>
<td>25.8%</td>
</tr>
<tr>
<td>Massachusetts</td>
<td>1995</td>
<td>65.2%</td>
<td>50.8%</td>
<td>-6.1%</td>
<td>23.1%</td>
</tr>
<tr>
<td>Michigan</td>
<td>1988</td>
<td>32.3%</td>
<td>26.0%</td>
<td>40.6%</td>
<td>42.4%</td>
</tr>
<tr>
<td>Mississippi</td>
<td>1997</td>
<td>43.2%</td>
<td>32.2%</td>
<td>9.6%</td>
<td>30.5%</td>
</tr>
<tr>
<td>Nevada</td>
<td>1998</td>
<td>27.7%</td>
<td>27.2%</td>
<td>29.3%</td>
<td>25.8%</td>
</tr>
<tr>
<td>New Mexico</td>
<td>2000</td>
<td>35.4%</td>
<td>23.1%</td>
<td>14.9%</td>
<td>15.8%</td>
</tr>
<tr>
<td>Ohio</td>
<td>1989</td>
<td>22.7%</td>
<td>26.0%</td>
<td>40.0%</td>
<td>51.0%</td>
</tr>
<tr>
<td>Pennsylvania</td>
<td>1993</td>
<td>34.5%</td>
<td>42.4%</td>
<td>23.4%</td>
<td>27.2%</td>
</tr>
<tr>
<td>South Carolina</td>
<td>1998</td>
<td>21.6%</td>
<td>27.2%</td>
<td>79.1%</td>
<td>25.8%</td>
</tr>
<tr>
<td>Tennessee</td>
<td>1997</td>
<td>34.0%</td>
<td>32.2%</td>
<td>56.3%</td>
<td>30.5%</td>
</tr>
<tr>
<td>Texas</td>
<td>1996</td>
<td>76.7%</td>
<td>40.9%</td>
<td>47.1%</td>
<td>25.5%</td>
</tr>
<tr>
<td>Virginia</td>
<td>1996</td>
<td>30.9%</td>
<td>40.9%</td>
<td>-4.7%</td>
<td>25.5%</td>
</tr>
<tr>
<td>Washington</td>
<td>1998</td>
<td>35.0%</td>
<td>27.2%</td>
<td>36.1%</td>
<td>25.8%</td>
</tr>
<tr>
<td>West Virginia</td>
<td>1998</td>
<td>24.6%</td>
<td>27.2%</td>
<td>13.2%</td>
<td>16.1%</td>
</tr>
</tbody>
</table>

Unweighted Average  
| Tuition Increase | Average Tuition Increase in Nation | Tuition Increase | Average Tuition Increase in Nation |
| 35.9%            | 32.6%                           | 26.6%            | 25.6%                             |

(a) Or 2002, which is latest data available.

Source: Department of Education (various years). “Tuition” is based on average in-state undergraduate tuition and fees at 4-year public institutions.
### Table 4
Variable Description and Descriptive Statistics
By State, 1990-2002
Constant $2002

<table>
<thead>
<tr>
<th>Variable</th>
<th>N</th>
<th>Label</th>
<th>Mean</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of High School Graduates</td>
<td>650</td>
<td>HSGRAD</td>
<td>47,284</td>
<td>49,324</td>
</tr>
<tr>
<td>Percent of Population Graduating</td>
<td>650</td>
<td>HSGRAD/POP</td>
<td>0.90%</td>
<td>0.20%</td>
</tr>
<tr>
<td>Unemployment Rate</td>
<td>650</td>
<td>UNEM</td>
<td>5.23%</td>
<td>1.49%</td>
</tr>
<tr>
<td>Tuition and Fees at Public 4 Year Institutions</td>
<td>649</td>
<td>TUI</td>
<td>$3,373</td>
<td>$1,185</td>
</tr>
<tr>
<td>State Higher Education Expenditures ($000)*</td>
<td>550</td>
<td>STED</td>
<td>$1,002,112</td>
<td>$1,122,306</td>
</tr>
<tr>
<td>Per Capita State Higher Education Expenditures*</td>
<td>550</td>
<td>STED/POP</td>
<td>$202</td>
<td>$59</td>
</tr>
<tr>
<td>State Population (‘000)</td>
<td>650</td>
<td>POP</td>
<td>5,374</td>
<td>5,869</td>
</tr>
<tr>
<td>Per Capita Income ($000)</td>
<td>650</td>
<td>PCI</td>
<td>$27.17</td>
<td>$4.28</td>
</tr>
<tr>
<td>State General Expenditures ($000)</td>
<td>650</td>
<td>STGEN</td>
<td>$9,229,000</td>
<td>$11,357,000</td>
</tr>
<tr>
<td>Investment in Prepaid Tuition Programs ($000)</td>
<td>635</td>
<td>PPT</td>
<td>$72,088</td>
<td>$282,880</td>
</tr>
<tr>
<td>Per Capita Investment in PPT Programs</td>
<td>635</td>
<td>PPT/POP</td>
<td>$7.37</td>
<td>$23.37</td>
</tr>
<tr>
<td>Number of Active PPT Contracts</td>
<td>628</td>
<td>NUM</td>
<td>11,198</td>
<td>49,331</td>
</tr>
<tr>
<td>Percent of State Expenditures on Higher Ed*</td>
<td>550</td>
<td>STED/STGEN</td>
<td>13.17</td>
<td>4.98</td>
</tr>
</tbody>
</table>

*Only available through 2000
See Appendix A for a fuller description and for data sources.
Table 5
Estimated Standardized Coefficients

<table>
<thead>
<tr>
<th>Independent Variables</th>
<th>TUI</th>
<th>TUI</th>
<th>STED/POP</th>
<th>STED/STGEN</th>
</tr>
</thead>
<tbody>
<tr>
<td>UNEM</td>
<td>0.035*</td>
<td>0.033</td>
<td>-0.209***</td>
<td>-0.133***</td>
</tr>
<tr>
<td>PCI</td>
<td>-0.246***</td>
<td>-0.214***</td>
<td>0.650***</td>
<td>0.200**</td>
</tr>
<tr>
<td>HSGRAD</td>
<td>0.045</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>HSGRAD/POP</td>
<td></td>
<td>-0.057*</td>
<td>0.138***</td>
<td>0.134***</td>
</tr>
<tr>
<td>PPT</td>
<td>-0.026</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PPT/POP</td>
<td></td>
<td>-0.044**</td>
<td>-0.048*</td>
<td>-0.085***</td>
</tr>
<tr>
<td>STGEN</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>STGEN/POP</td>
<td></td>
<td>-0.081**</td>
<td>0.082</td>
<td></td>
</tr>
<tr>
<td>State Fixed Effect</td>
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<td>yes</td>
<td>yes</td>
</tr>
<tr>
<td>Year Fixed Effect</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
</tr>
<tr>
<td>Adjusted R2</td>
<td>0.947</td>
<td>0.948</td>
<td>0.918</td>
<td>0.929</td>
</tr>
<tr>
<td>degrees of freedom</td>
<td>569</td>
<td>569</td>
<td>474</td>
<td>475</td>
</tr>
</tbody>
</table>
Sources: PPT state agencies.