Evaluating the Impact of the D.C. Tuition Assistance Grant Program

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ABSTRACT

The D.C. Tuition Assistance Grant program dramatically changed college prices for District of Columbia residents, allowing them to pay in-state tuition at public institutions around the country. Between 1998 and 2000, the number of D.C. residents attending public institutions in Virginia and Maryland more than doubled; when public institutions in other states were added, this number again nearly doubled. The impact was largest at nonselective public four-year colleges, particularly predominantly black institutions. The total number of financial aid applicants, Pell Grant recipients, and college entrants from D.C. also increased by 15 percent or more.

I. Introduction

In the United States, state and local governments heavily subsidize higher education, keeping tuition charges low for students at public two- and four-year institutions, regardless of need. The impact of subsidized public college tuition and its distributional implications have been the subject of intense debate for decades.[1] However, because such subsidies are an established feature of the U.S. higher education landscape, it has been difficult as an empirical matter to identify their impact.

1. See, for example, Hartman (1971), Hansen and Weisbrod (1969 and 1971), and Pechman (1970, 1971). The debate is summarized in Kane (1999).

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[Submitted March 2006; accepted September 2006]

ISSN 022-166X E-ISSN 1548-8004 © 2007 by the Board of Regents of the University of Wisconsin System

In the fall of 2000, the U.S. Congress created an opportunity to shed new light on this old debate by dramatically changing the menu of college prices offered to residents of the District of Columbia. Before the fall of 2000, residents of the district were offered subsidies at one public institution, the University of the District of Columbia (UDC), an open-admissions institution that operates much like a community college. With UDC as their only subsidized public option, two-thirds of district residents (64 percent) enrolled at institutions outside the district.[2] (Elsewhere in the United States, only 15 percent of college entrants attended schools outside their state.) Moreover, because of the lack of publicly subsidized options, roughly half of district residents enrolled in private institutions prior to 2000—twice the rate of students elsewhere in the United States.[3]

Before the D.C. Tuition Assistance Grant program (D.C. TAG) was created, the average D.C. resident paid much more to attend college than residents of other states. For example, during the 1999–2000 school year, dependent undergraduates from the District of Columbia paid $7,890 per year in tuition, minus all grant aid (including means-tested federal grants).[4] This was more than twice the national average of $3,215 for dependent students, despite the fact that the percentage of families in D.C. who live below the poverty line is among the highest in the nation.

Beginning in the fall of 2000, district residents became eligible for a D.C. TAG to pay the difference, up to $10,000, between in-state and out-of-state tuition at public institutions in other states.[5] In so doing, the D.C. TAG program essentially provided the same menu of subsidized options offered to residents of other states—in fact, it offered the best of options across all the states. In this paper, I evaluate the impact of the D.C. TAG program on the college enrollment decisions of D.C. residents.

I have found that between 1998 and 2000, the first years the program was implemented, the number of D.C. residents attending public institutions in Virginia and Maryland more than doubled. Between 2000 and 2002, when public institutions outside Virginia and Maryland were added, the number of D.C. residents attending such institutions again nearly doubled. The increases were largest at nonselective public four-year institutions, particularly predominantly black public institutions in Maryland and Virginia. The percentage of D.C. residents deciding to enter college also apparently increased: The number of first-time federal financial aid applicants, first-year college students receiving Pell Grants, and D.C. residents reported enrolled as freshmen by colleges and universities nationwide all climbed by 15 percent or more. The magnitude of the increase, although large, was consistent with prior estimates of the elasticity of demand for college enrollment.

I also studied the neighborhoods from which grant recipients were drawn. Although residents of neighborhoods with median incomes close to the median for

2. *Digest of Education Statistics, 2002*, Table 203.

3. Author's tabulation of proportion of first-time freshmen, recent high school graduates attending public institutions in fall of 1998.

4. Author's tabulation of the National Postsecondary Student Aid Survey, 1999–2000.

5. Despite the prominent example of the University of Virginia (where the difference in tuition for residents and nonresidents was $15,210 in 2002), the $10,000 maximum was sufficient to cover the price difference between in state and out-of-state residents at most public institutions: Out of 606 public four-year institutions nationally reporting tuition for the fall 2002–2003 school year, the difference between resident and nonresident tuition exceeded the $10,000 maximum at only 69.

the district were more likely to receive grants than those from the lowest-income neighborhoods (presumably reflecting higher college enrollment with higher family income), recipient rates were similar in middle- and higher-income neighborhoods.

II. Description of D.C. Tuition Assistance Grant Program

The legislative history of the District of Columbia College Access Act was remarkably brief, its introduction and swift passage fitting neatly between the end of one college admission cycle and the beginning of the next. Sponsored by Rep. Eleanor Holmes Norton of Washington, D.C., Rep. Thomas Davis of Virginia, Rep. Constance Morella of Maryland, and eight others, the legislation, known as H.R. 974, was introduced in the U.S. House of Representatives in March 1999, just as the college admission season for the fall of 1999 would have been closing. The bill was passed by the House in May 1999 and by the Senate in October. The legislation, P.L. 106-98, was signed into law by President Clinton on November 12, 1999, just as the new admission season was heating up.

In addition to providing grants for students at public institutions, the law provided smaller grants for those choosing selected private institutions in D.C., Maryland, and Virginia. D.C. residents attending private nonprofit institutions in the D.C. metropolitan area and private nonprofit historically black institutions in Maryland and Virginia received $2,500.[6] Students attending public historically black institutions qualified for the full grants. Students attending private for-profit institutions, such as those that provide certificates for occupational training, were not eligible for the D.C. TAG program.

The program originally was limited to D.C. residents who did not have a bachelor's degree and had graduated from high school in 1998 or later.[7] Students who had already started college were eligible, as long as they met the residency requirement and had graduated in 1998 or later. The program was not limited to those graduating from D.C. public schools; district residents attending private or public schools outside the district were also eligible.

To meet the residency requirement, applicants were required to provide D.C. tax returns and other documentation, such as drivers' licenses and utility bills. For dependent students (those who had been claimed as a dependent on a parent's tax return), the parents needed to prove residency. For independent students, residency depended upon the student's place of residence.

The program was limited originally to public institutions in Virginia and Maryland, but the legislation allowed the D.C. mayor to expand the program to public

6. Those receiving the $10,000 grants to attend public institutions face a lifetime cap of $50,000. There is a $12,500 cap on the grants for those attending private institutions. Originally, the qualifying private institutions were American University, Capitol College, Catholic University, Columbia Union College, the Corcoran School of Art, Gallaudet University, George Washington University, Georgetown University, Hampton University, Howard University, Maryland College of Art and Design, Marymount University, Saint Paul's College, Southeastern University, Trinity College, Virginia Union University, Washington Adventist Hospital School of Radiography, and Washington Bible College.

7. To qualify, students also had to be attending college at least half-time. Students were also ineligible if they had defaulted on a prior student loan or had failed to register for selective service (if they were male).

institutions in other states, if there were sufficient funds. In May of 2000, Mayor Anthony Williams took that step, announcing that the grants could be used at public institutions outside of Virginia and Maryland. Coming so late in the spring, the announcement left little chance for students to apply to public colleges outside those two states in the first year of the program.[8] I present evidence that the impact on enrollment at public institutions outside of Maryland and Virginia did not occur until after fall 2000. In April 2002, the program was changed again in several ways. Most importantly, all private historically black institutions—not just those in Maryland and Virginia—were made eligible for the $2,500 awards.[9]

III. Literature Review

In an extensive literature, researchers have attempted to measure the impact of various types of tuition and financial aid policies on college-going. Much of that work has focused on the decision to enroll in college (often referred to as college access). Others have studied the impact of college prices on the percentage of students attending a specific institution or type of institution (often referred to as college choice). In their review of the literature on student responsiveness to changes in college cost, Leslie and Brinkman (1988) report a consensus estimate that a $1,000 change in college costs (in 2001 dollars) is associated with a four- percentage-point difference in college enrollment rates. A number of papers have used between-state differences in state tuition policy, and they essentially compare the college entry rates of otherwise similar youth in high- and low-tuition states.[10] The empirical strategy in this literature typically assumes that the relevant price for marginal students is the tuition at public institutions in their state and evaluates the effect of tuition and college-going by comparing college-going rates in high- and low-tuition states. Such studies also assume that the supply of college slots is perfectly elastic: Given a change in price, it is solely student demand that determines enrollment and not the supply of college slots.

An important weakness of these studies is that they rely on relatively fixed differences in tuition levels between states. For instance, California has been a relatively low-tuition state for the past 40 years and also has built a number of community college. These studies, therefore, may be attributing the effect of these other policy differences to tuition policy. Using Current Population Survey data, Kane (1994) and Card and Lemieux (2000) include state fixed effects in their analyses and find that the effect of public tuition levels is often not statistically significant. Kane (1994) finds a negative and statistically significant effect of tuition on African American

8. Students are likely to have been even more confused when, in the fall of 2000, four large public institutions—the University of Michigan, the University of Florida, the University of California, and the State University of New York—refused to sign the participation agreement, complaining that the reporting requirements were too burdensome. An agreement was eventually reached with these institutions in December 2000, just in time for the new admission season.

9. In addition, those who had graduated before 1998 were made eligible, as long as they could show that they were enrolled in a D.C. TAG-eligible institution in 2002 and could provide evidence of D.C. tax returns going back five years. D.C. residents who were not citizens or permanent residents of the United States were made ineligible.

10. See, for example, Cameron and Heckman (1998), Kane (1994, 1999), Card and Lemieux (2000).

youth after including state fixed effects, but the coefficient on tuition is no longer significant for whites with the inclusion of state fixed effects. Card and Lemieux (2000) report small (one- to two-percentage-point differences in college enrollment per $1,000 difference in tuition) and occasionally statistically insignificant effects of tuition on college-going.

Dynarski (2003) estimates the impact of ending college benefits for Social Security Survivors, as well as a number of state merit-based aid programs. She finds that after the discontinuation of the Social Security Student Benefit Program, college-going by students with deceased parents declined dramatically relative to other youth, by 19 to 26 percentage points, implying a three to four-percentage-point reduction in enrollment per thousand dollar change in price. In a second paper, Dynarski (2004) compares the change in enrollment rates for youth in Georgia to those in other southern states after the HOPE Scholarship program was initiated in that state.[11] She estimates that the program increased college enrollment rates of youth aged 18 to 19 by 7.0 to 7.9 percentage points. (This estimate converts to 2 to 3 percentage points per $1,000 difference in cost.) Dynarski also analyzes the impact of a number of other state merit-aid programs created during the 1990s and finds broadly similar results.

In these papers, the source of variation in price is plausibly exogenous. However, in the analysis of tuition benefits for Social Security Survivors, it is difficult to know whether the responsiveness of such a narrow subgroup—youth with deceased parents—can be generalized to other groups. Moreover, the estimate is based on an exceedingly small sample—107 children of deceased parents before the change in policy and 49 after the change. With Georgia's HOPE Scholarship program, it must be presumed that the impact estimates reflect some combination of supply-and-demand parameters; it is probably not plausible that the supply of college slots was perfectly elastic, because the program was affecting so many residents in the same state.

Others have focused on the effect of price on college choice. Manski and Wise (1983) found large effects of price relative to family income on the choice of college. More recently, Wilbert van der Klaauw (2002) exploited discontinuities in the formula determining fellowship offers at a major Eastern university to identify the effect such offers had on students' decision to attend that institution. His estimates suggest that each $1,000 in aid (in 2001 dollars) raises the likelihood of attending the university by three to four percentage points.

A paper by Abraham and Clark (2003) studied the impact of the D.C. Tuition Assistance Grant program on student application decisions. Using data on SAT-takers in D.C. and a comparison set of cities, they studied changes in the percentage of D.C. residents having SAT scores sent to institutions outside D.C. Beginning with high school students taking the SAT in 1999–2000, they report a nine-point rise in the percentage of D.C. residents sending their scores to a public institution in Maryland or Virginia and a six-point increase in the percentage sending their students to public institutions in any state. They find an additional six-percentage-point rise in both figures relative to the comparison group in the 2000–2001 school year. They also report a larger impact on D.C. residents attending private high schools than for those attending

11. Begun in 1993, the Georgia (Helping Outstanding Pupils Educationally) HOPE Scholarships are merit-based financial assistance for students from Georgia.

D.C. public schools: The percentage of D.C. residents sending scores to a public university nationwide rose by 21 points for private school students between 1999 and 2001, compared to nine points for public school students. They also reported that the impact was larger on white students in D.C. (23 points) than for black students (ten points).

However, the program's impact on application decisions may be very different from the impact on enrollment decisions. Submitting an application is similar to purchasing an option: With the availability of the D.C. TAGs, the chance of admission at a flagship public institution—such as the University of Virginia, University of Maryland, University of North Carolina, or University of California—became an increasingly valuable if far-from-certain prospect for many D.C. residents, since they had to be admitted first. The fact that private school students and white youth were more likely to purchase that option does not necessarily mean that their enrollment decisions were more likely to be affected.

IV. Data

I use three sources of data in this analysis. First, I use data on state of residence for first-time freshmen from the Integrated Postsecondary Education Data System (IPEDS) from fall 1994 through 2002. Institutions were asked to report the total number of first-time freshmen by their state of residence prior to entry, as well as the subset of first-time freshmen from each state who had graduated from high school in the previous 12 months.[12]

Second, I obtained data from the U.S. Department of Education on all students submitting federal financial aid applications from D.C., Maryland, and Virginia in the 1998–99 through 2001–2002 award cycle. The federal financial aid form allows students to list the codes for up to six institutions to which they want their financial aid data to be sent. I use those data to study the change in the likelihood that a student would list a public institution on the form. Like Abraham and Clark (2003), I study the change in the likelihood of D.C. residents listing a public institution before and after 2000, relative to Maryland and Virginia residents. Moreover, I identify the institutions attended by the subset of financial aid applicants receiving Pell Grants. Since private for-profit institutions participate in the federal student aid programs, the Free Application for Federal Student Aid (FAFSA) data offer more reliable measures of proprietary school enrollment before and after the start of the D.C. TAG program.

Finally, working with data from the D.C. TAG program office, I identify the location of D.C. TAG grant recipients in D.C. by 2000 census block group. I report evidence on the characteristics of the neighborhoods from which the D.C. TAG recipients were drawn, as well as the high schools they attended.

V. Impact on Enrollment of Freshmen from D.C.

I begin by analyzing the percentage changes in enrollment of D.C. residents at various institutions associated with changes in the prices they faced. If

12. At institutions that enroll a large number of older students, such as UDC, there can be a large difference between the two series.

all residents have the same preferences as the representative consumer, the resulting coefficient on the price change has a natural interpretation as a parameter from a conditional logit specification.[13] Although tuition and state are the only school characteristics used in the model, taking differences over time accounts for other institutional characteristics that are fixed but more difficult to measure.

In 1998, half of all D.C. freshmen attending an institution outside D.C. attended schools where they made up less than 1 percent (0.8 percent) of the freshmen at the school. The maximum representation of D.C. residents at schools outside D.C at all grade levels in 1998 was at the Maryland College of Art and Design, where they made up 12 percent of the student body. Given that D.C. residents accounted for a small share of students, it seems reasonable to assume that even a large change in attendance by D.C. students was unlikely to lead to much change in total enrollments or institutional environments.

Table 1 reports the tuition paid by D.C. residents (in 2002 dollars), net of D.C. TAG awards, at different types of institutions from 1998 through 2002. (In calculating these means, each institution's tuition was weighted by the number of freshmen D.C. residents attending the institution in the fall of 1998, before the change in policy.) The first two rows describe categories of institutions whose prices were not directly affected by the change in policy—UDC and private nonprofit institutions outside the D.C. metropolitan area that were not historically black institutions. Tuition for D.C. residents at UDC actually fell in real value between 1998 and 2002, from $2,218 to $2,070, while prices rose by about $2,000 at the private institutions outside D.C. over the same period.

The next category of institutions, public two- and four-year colleges outside D.C., was most directly affected by the D.C. TAG program. The price of public four-year institutions in Maryland and Virginia fell by $6,213 relative to the price at UDC between 1998 and 2000. Then, between 2000 and 2002, the price of public four-year institutions in the rest of the country fell by $5,512 relative to UDC. The staggered timing of the tuition changes—first at institutions in Maryland and Virginia and then at public institutions elsewhere—will be helpful in identifying the impact of the program.

The timing and magnitude of the price changes also varied among private historically black colleges and universities (HBCUs) in the D.C. area. The policy first affected only the private institutions in the D.C. area and private HBCUs in Maryland and Virginia. The prices at these institutions fell by $1,735 and $2,511, respectively, relative to the price of UDC. Then, between 2000 and 2002, private HBCUs outside D.C. became eligible for the benefits and their prices also declined, by $1,805 relative to UDC.

The last two columns of Table 1 report the changes in absolute numbers of D.C. residents attending each category of school between 1998 and 2000 in the IPEDS

13. Using the conditional logit specification (McFadden 1974), the utility the representative person gains from choosing the ith school out of m choices is $U_{it} = \beta T_{it} + \delta_{it} + \varepsilon_{it}$ where T_{it} is the tuition at the school and δ_i represents college characteristics that are fixed in the short term (such as the quality of the faculty) and ε_{it} represents unobserved variation in tastes and school attributes. If the residuals, ε_{it}, are i.i.d. with the type I extreme-value distribution, then it can be shown that the change in the number of people choosing the ith option relative to some base choice o is equal to a constant plus β times the change in tuition at the ith institution. The fixed institutional characteristics drop out.

Table 1
Relative Prices and Enrollments of DC Residents Before and After DC TAG

	Tuition for DC Residents (net of DC TAG)			Difference-in-Difference Relative to UDC			DC Freshmen Enrollment		
							Enrollment	*Change*	
	1998	2000	2002	2000–1998	2002–2000	2002–1998	1998	*2000–1998*	*2002–2000*
Univ. of District of Columbia	$2,218	$2,163	$2,070	$0	$0	$0	260	*−15*	*−5*
Priv, Non-HBCU, Outside DC	21,289	21,829	23,115	595	1,379	1,974	428	*50*	*−66*
Pub 4-Year in MD, VA	10,783	4,515	5,201	**−6,213**	779	−5,434	146	**252**	*−59*
Pub 2-Year in MD, VA	7,126	4,085	3,994	**−2,986**	2	−2,984	30	**35**	*5*
Pub 4-Year in Other States	10,063	10,219	4,614	211	**−5,512**	−5,301	286	*−53*	**245**
Pub 2-Year in Other States	2,876	3,129	1,465	308	**−1,571**	−1,263	6	*5*	**−4**
Priv HBCU in DC, MD, VA	10,373	7,807	8,161	**−2,511**	447	−2,064	139	**−60**	*0*
Priv HBCU Elsewhere	9,466	10,502	8,604	1,091	**−1,805**	−714	119	*−7*	**17**
Priv Colleges in DC	20,819	19,029	20,375	**−1,735**	1,439	−296	158	**−36**	*32*
Total:	$12,830	$12,003	$11,394	−$772	−$516	−$1,288	1,572	*171*	*165*

Note: Based on tuition and enrollment data in IPEDS database and DC TAG program rules. Enrollment figures are reported for first-time freshmen who had graduated within the last 12 months. Tuition estimates net of DC TAG assumed that expansion of the program to public institutions outside of MD and VA was not effective until after 2000. All figures in $2002 using CPI-U-X1. Tuition figures were weighted by the number of DC residents attending institution in 1998.

data. Between 1998 and 2000, the number of D.C. residents enrolling as first-time freshmen at public four-year institutions in Maryland and Virginia more than doubled, from 146 to 398. The 252 additional students represented a 176 percent increase. However, the 15-student decline at UDC was small, in both absolute and relative turns.

The big declines occurred not at UDC but at public institutions outside Maryland and Virginia and at private colleges and HBCUs in D.C., Maryland, and Virginia. Recall from Table 1, before the change in policy, that the price of public four-year colleges in Maryland and Virginia was similar on average to the price of a private historically black college—$10,783 versus $10,373. However, between 1998 and 2000, the price of a public four-year college fell to almost half the price of a private HBCU—$4,515 versus $7,807. The institution for many of those on the margin for entering a public four-year institution in Maryland and Virginia seems to have been a private college in D.C. or a public four-year institution in other states, rather than UDC. Between 2000 and 2002, when public institutions outside Maryland and Virginia were added to the list of eligible institutions, these institutions witnessed a large increase in the number of D.C. freshmen, rising by 252 students after falling by 53 students between 1998 and 2000.

Table 2 reports the effects of regressing log enrollment of D.C. residents on tuition for D.C. residents, time dummies, and institutional fixed effects. To exploit the extra identification offered by the staggered implementation of the program for public institutions in Maryland and Virginia in fall 2000 and subsequent expansion to institutions elsewhere, I first focus on the two periods initially showing differences—1998 to 2000 and 2000 to 2002—before pooling the three years. I also report the results separately for the two different freshmen enrollment series—total first-time freshmen from D.C. and the subset of freshmen from D.C. who had graduated from high school in the previous 12 months.

The top two panels in Table 2 report the results using any institution with one or more D.C. resident enrolled. Between 1998 and 2000, each $1,000 relative price decrease was associated with an 8 percent increase in D.C. freshmen enrollment and a 10 percent increase in freshmen enrollment of recent high school graduates from D.C. Between 2000 and 2002, when a different set of institutions faced the change in relative price, each $1,000 relative price change was associated with respective five- and six-percentage-point increases in enrollment. (The somewhat smaller impact of the latter change may have been because D.C. residents were less likely to attend institutions far from D.C., even with the price change.) When pooling the three years, the results are again in the range of 5 percent and 6 percent respective increases in enrollment for every $1,000 decline in price for D.C. residents.

The bottom two panels of Table 2 limit the sample to institutions with ten or more D.C. residents enrolled. The results are intended as a check of robustness, since small absolute changes at institutions with small enrollments would represent large changes in log terms. The results are quite similar for the 1998 to 2000 period. For the period 2000 to 2002, the estimated impact is actually larger when limiting the sample to institutions with larger enrollments (11 percent versus 5 percent, and 9 percent versus 6 percent). Many of the institutions affected by the policy change in 2000 to 2002 would have been distant public institutions and private HBCUs with smaller absolute numbers of D.C. residents in attendance.

Table 2
Fixed Effect Regressions of Log of DC Resident Enrollment on Price for DC Residents, 1998–2002

	Ln(First-Time Freshmen) *All Institutions (>=1 DC Residents)*			Ln(F-T Fresh, Recent HS Gr) *All Institutions (>=1 DC Residents)*		
	2000–1998	2002–2000	2002–1998	2000–1998	2002–2000	2002–1998
Tuition net of DC TAG (/1000)	−0.075 (0.032)	−0.052 (0.018)	−0.054 (0.012)	−0.095 (0.032)	−0.062 (0.020)	−0.063 (0.014)
Observations	759	796	1180	632	655	960
	>= 10 DC Residents			*>= 10 DC Residents*		
	2000–1998	2002–2000	2002–1998	2000–1998	2002–2000	2002–1998
Tuition net of DC TAG (/1000)	−0.069 (0.045)	−0.105 (0.030)	−0.074 (0.024)	−0.075 (0.061)	−0.090 (0.042)	−0.080 (0.035)
Observations	93	96	145	76	81	118

Note: All regressions include year dummies and fixed effect for each institution. The data are based on tuition and enrollment data in IPEDS database and DC TAG program rules. In estimating tuition for DC residents net of DC TAG, I assumed that the expansion of the program to public institutions outside of MD and VA was not effective until 2001. All tuition figures in 2002 dollars using CPI-U-X1. Huber-White heteroskedasticity-robust standard errors reported.

Table 3 reports the results for various subsets of institutions, using the change in the log of the number of recent high school graduates from D.C. enrolled as the dependent variable. The top left panel limits the sample to institutions in D.C., Virginia, Pennsylvania, Maryland, North Carolina, New York, Georgia, and Delaware. (In the order listed, institutions in these states enroll the largest shares of D.C. residents, together accounting for 76 percent of D.C. resident enrollments in 1998.) The top right panel reports the results for institutions in the remaining states. In the period 1998 to 2000, the standard error is quite large on the change in tuition in the states not near D.C., reflecting the fact that the change in D.C. TAG policy did not affect those institutions. (There was still some natural variation in tuition prices due to differences in tuition policies, but apparently not enough to identify an effect.) Between 2000 and 2002, when the D.C. TAG program was expanded to include public institutions in these other states, the impact of a tuition increase on D.C. resident enrollment was negative and statistically significant in both sets of states, but the point estimate was slightly larger (although not statistically significant) in the states where D.C. residents typically attend college.

The second pair of results in Table 3 compares the impact at two- and four-year colleges. Arguably, we might expect the D.C. TAG program to have had a larger effect on four-year college enrollment than on two-year colleges, since UDC continued to provide D.C. residents who were seeking that type of education a lower-cost option. As reported in Table 1, even after accounting for the D.C. TAG grants, the tuition at public two-year colleges in Maryland and Virginia averaged $4,085 in 2000, compared to $2,163 at UDC. The estimates of enrollment responses with respect to tuition are large and statistically significant at four-year colleges, but not at two-year colleges. However, the small number of two-year colleges enrolling D.C. residents makes it difficult to identify the difference in responses.

The third pair of results in Table 3 compares the estimated impact of the D.C. TAG program among institutions that were more than 50 percent black in 1998 (before the change in policy) and those that had fewer African American students. The point estimates are larger for institutions that had more than 50 percent African American enrollment in 1998, although only the difference in coefficients for the 1998 through 2002 period was statistically significant.

The last pair of results in Table 3 reports the results for selective and nonselective institutions, using as the metric of selectivity the 75th percentile SAT math score of the students at the college. The impact of the program on enrollment appeared to be much larger at the nonselective institutions and were statistically significant when the results are pooled for the 1998 to 2002 period.

Table 4 reports the number of recent high school graduates from D.C. enrolled at the 12 selective colleges in D.C., Maryland, and Virginia reporting 75th percentile math SAT scores above 650. At George Washington, Georgetown, and Howard universities there were large declines in absolute numbers of D.C. freshmen enrolled between 1998 and 2000, the first years the D.C. TAG program was implemented, with some rebound between 2000 and 2002 at Georgetown and Howard. However, with the exception of the University of Maryland-College Park, the increases at other institutions were minimal—both in absolute numbers and in percentages. For example, at the University of Virginia, the absolute number of freshmen from D.C. remained at 14 between 1998 and 2000. Even at the University of Maryland, where

Table 3
Fixed Effect Regressions for Selected Subsamples of Log of DC Resident Enrollment on Price for DC Residents, 1998–2002

	Institutions in DC, VA, PA, MD, NC, NY GA, DE			*Institutions in Other States*		
	2000–1998	2002–2000	2002–1998	2000–1998	2002–2000	2002–1998
Tuition net of DC TAG (/1000)	−0.099 (0.032)	−0.082 (0.027)	−0.078 (0.018)	0.083 (0.125)	−0.051 (0.027)	−0.042 (0.020)
Observations	327	333	493	305	322	467
	Four-Year Colleges and Universities			*Two-Year Colleges*		
	2000–1998	2002–2000	2002–1998	2000–1998	2002–2000	2002–1998
Tuition net of DC TAG (/1000)	−0.093 (0.032)	−0.062 (0.019)	−0.062 (0.014)	0.134 (0.406)	−0.003 (0.064)	−0.036 (0.141)
Observations	602	623	918	30	32	42

	Institutions with >=50% Black Enrollment in 1998			*Institutions with <50% Black Enrollment in 1998*		
	2000–1998	2002–2000	2002–1998	2000–1998	2002–2000	2002–1998
Tuition net of DC TAG (/1000)	−0.177	−0.126	−0.133	−0.083	−0.052	−0.056
	(0.062)	(0.059)	(0.041)	(0.038)	(0.022)	(0.015)
Observations	85	87	130	547	567	829
	Non-Selective Institutions (75th Ptile Math SAT <650)			*Selective Institutions (75th Ptile Math SAT >=650)*		
	2000–1998	2002–2000	2002–1998	2000–1998	2002–2000	2002–1998
Tuition After DC TAG (/1000)	−0.140	−0.060	−0.094	−0.019	−0.055	−0.023
	(0.039)	(0.027)	(0.020)	(0.027)	(0.033)	(0.017)
Observations	313	322	471	196	207	305

Note: All regressions include year dummies and fixed effect for each institution. The data are based on tuition and enrollment data in IPEDS database and DC TAG program rules. In estimating tuition for DC residents net of DC TAG, I assumed that the expansion of the program to public institutions outside of MD and VA not effective until 2001. All tuition figures in 2002 dollars using CPI-U-X1. Huber-White heteroskedasticity-robust standard errors reported.

Table 4
DC Freshmen Enrollment at Selective Institutions in DC, Maryland and Virginia (Schools with 75th Percentile SAT Math Scores > 650)

Institution Name:	1998	2000	2002	*Change 1998–2000*	*Change 2000–2002*
GEORGE WASHINGTON UNIVERSITY	60	23	17	*−37*	*−6*
GEORGETOWN UNIVERSITY	13	5	24	*−8*	*19*
HOWARD UNIVERSITY	86	29	48	*−57*	*19*
JOHNS HOPKINS UNIVERSITY	3	3	3	*0*	*0*
UNIVERSITY OF MARYLAND-BALTIMORE CNTY	5	8	3	*3*	*−5*
UNIVERSITY OF MARYLAND-COLLEGE PARK	13	25	18	*12*	*−7*
COLLEGE OF WILLIAM AND MARY	3	3	6	*0*	*3*
UNIVERSITY OF RICHMOND	0	1	1	*1*	*0*
VIRGINIA POLYTECHNIC INSTIT & STATE UNIV	4	6	8	*2*	*2*
UNIVERSITY OF VIRGINIA-MAIN CAMPUS	14	14	13	*0*	*−1*
VIRGINIA MILITARY INSTITUTE	0	0	0	*0*	*0*
WASHINGTON AND LEE UNIVERSITY	2	2	2	*0*	*0*

Note: Figures are number of first-time freshmen, graduating from high school in the last 12 months, who were residents of the District of Columbia, as reported in the IPEDS database.

the percentage increases were more in line with increases at public institutions elsewhere, the changes in absolute numbers were quite small, from 13 to 25 and back to 18 between 1998 and 2002.

One reason for these numbers may be the high admission standards for out-of-state students at the selective public institutions in Maryland and Virginia.[14] At the University of Maryland, enrollment of nonresident students is capped at 25 percent. At the University of Virginia, the admission rate for state resident applicants for the fall of 2002 was nearly twice the rate for out-of-state students: Approximately 53 percent of resident applicants were admitted, compared to 30 percent of nonresidents.[15] The D.C. residents who have the credentials to meet the high out-of-state admission standards at selective public institutions—such as University of Virginia or University of Maryland—may simply be less sensitive to price.

14. Some institutions are adjusting their admission requirements for D.C. residents. For example, the D.C. TAG program reports that North Carolina A&T has adjusted its admission requirements for D.C. residents to match the criteria for North Carolina residents.

15. There is currently no explicit cap on nonresident enrollment at public colleges in Virginia. However, there are frequent proposals in the Virginia legislature to impose such a cap of 25 percent. For the school year beginning in Fall 2005, University of Virginia reported that approximately one third of all undergraduates come from out of state. For a description of recent calls for such a cap in Virginia, see Walzer (2003).

Did the increase in enrollment of D.C. residents "crowd out" students from other states?[16] To test this hypothesis, I reestimated specifications similar to those in Table 2 for Maryland and Virginia institutions, using both freshman enrollment of in-state students within each state and the freshmen enrollment of out-of-state students from residences other than D.C. as dependent variables. I studied how changes in prices for D.C. residents may have led to the crowding out of in-state students or other out-of-state students. However, I did not find evidence that the variation in price for D.C. residents was related to changes in enrollment of in-state students or other out-of-state students. This need not mean that there was no crowding out; it may simply have been too minimal to discern empirically. The number of D.C. residents attending public four-year institutions in Maryland rose from 105 to 184, a 77 percent increase, while the number entering public four-year institutions in Virginia rose from 69 to 269, a 290 percent increase. Even after such sizable increases, D.C. resident enrollment rose from only 0.8 percent to 1.4 percent of freshman enrollment in Maryland and from only 0.3 percent to 1 percent in Virginia.

VI. Impact on Applications and Enrollment in Federal Financial Aid Data

In this section, I report on an analysis of federal financial aid applications from D.C., Maryland, and Virginia for the school years 1998–99 through 2001–2002. I focus on dependent students who reported the same state of legal residence as their parents on the financial aid application. I limited the sample to first-year students who reported that they had not previously attended college.

FAFSA applicants are allowed to list up to six institutions to which they want their financial aid information sent. Figures 1 and 2 portray the trends in the number of D.C., Maryland, and Virginia FAFSA applicants who requested that their information be sent to various types of institutions. (Figure 1 reports the trend in application rates for the types of institutions qualifying for D.C. TAG aid.) The top left panel portrays the percentage of D.C. residents listing a Maryland or Virginia public institution on their FAFSA, which was stable between the 1998–99 school year (listed as 1998 in the graph) and the 1999–2000 school year, but rose sharply between 2000–2001 and 2001–2002, from 35 percent to 46 percent. There was little change for residents of Virginia or Maryland. The top right panel reports the percentage of D.C. residents listing a public institution outside of D.C., Maryland, or Virginia. The number of D.C. residents applying to public institutions in other states declined from 1999 to 2000 from 36 percent to 34 percent (when only public institutions in Maryland and Virginia were eligible) and rose between 2000 and 2001 from 34 percent to 39 percent (when public institutions outside of Maryland and Virginia became eligible).

The bottom two panels report the trends in the proportion of FAFSA applicants listing a private institution qualifying for the $2,500 grants under the D.C. TAG program. The percentage of D.C. residents listing a private historically black institution in D.C., Maryland, or Virginia on the FAFSA remained steady at approximately 20 percent between 1998 and 2001. The percentage listing private nonblack institutions

16. I am grateful to an anonymous referee for suggesting such a test.

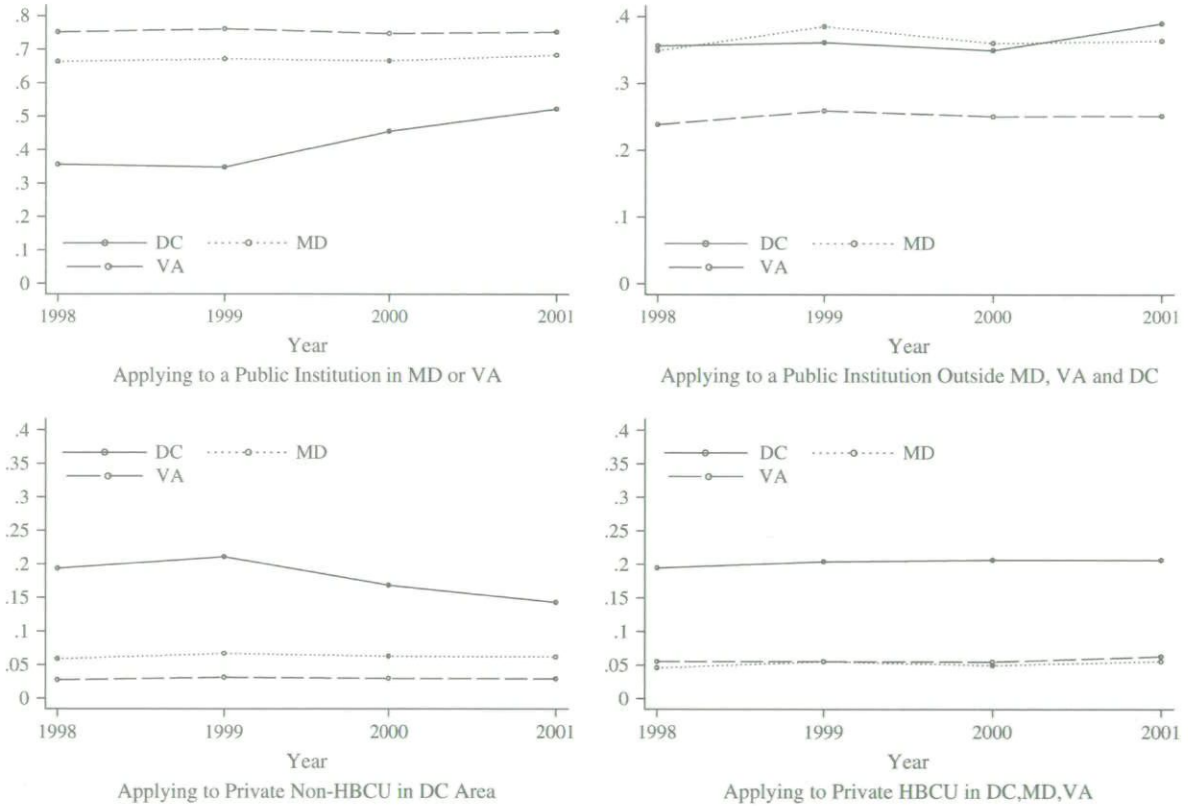
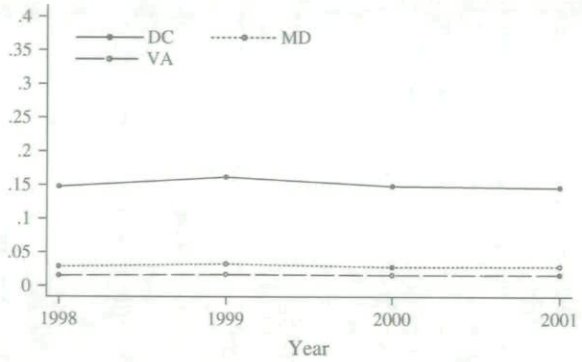
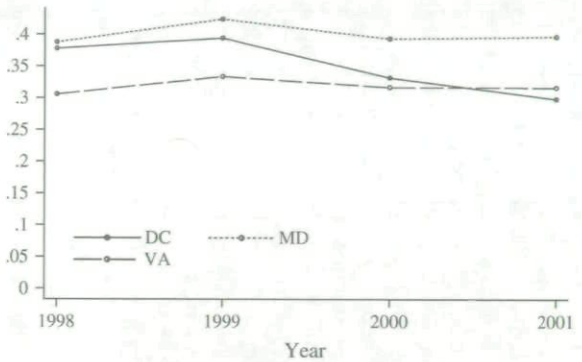


Figure 1

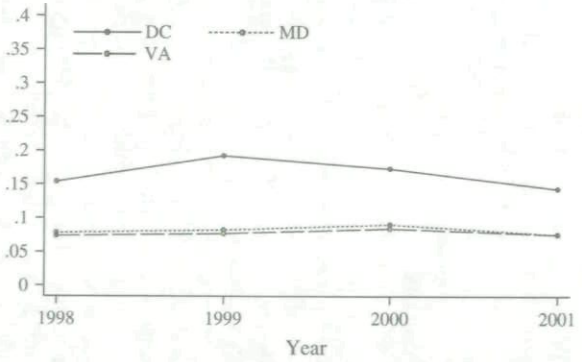
Proportion of Dependent Federal Aid Applicants Listing an Institution on the FAFSA by Type of Institution, State, and Year



Applying to Private HBCU Outside DC,MD,VA



Applying to Private non-HBCU Outside DC Area



Applying to Proprietary School

Figure 2

Proportion of Dependent Federal Aid Applicants Listing an Institution on the FAFSA by Type of Institution, State, and Year

in the D.C. area that qualified for the $2,500 grants actually declined from 17 percent in 1999–2000 to 12 percent in the 2001–2002 school year.

Figure 2 portrays the proportion of dependent FAFSA applicants applying to the types of institutions that did not qualify for a D.C. TAG. The percentage of D.C. residents applying to a private historically black institution outside D.C., Maryland, and Virginia remained constant at about 15 percent between 1999 and 2001, while the percentage of D.C. residents applying to private nonblack institutions outside the D.C. area declined sharply, from 42 percent in 1999–2000 to 32 percent in 2001–2002. The percentage of D.C. residents listing a private for-profit institution on the FAFSA form also declined sharply, from 19 percent to 14 percent. Over the period when the application behaviors of D.C. residents were changing, the proportion of Maryland and Virginia residents applying to these institutions remained stable.

Figure 3 plots the proportion of FAFSA applicants listing a public institution in Maryland or Virginia by family income, state, or residence and year. (I divided the sample using $10,000 intervals of family income up to $150,000, and then included all of those with incomes above $150,000 in one group.) As reported in the top left panel, the proportion of D.C. residents listing a public institution in Maryland or Virginia on their FAFSA form was quite similar in 1998 and 1999, declining slightly in family income. Between 1999 and 2000, when the D.C. TAG program was created, the rates for all groups rose sharply, and they remained high in 2001. In the first year of the program, the increase was larger for families with incomes from $50,000 to $120,000 than for low-income families. Between 2000 and 2001, however, the rates rose for low-income families. Even by 2001, the increase remained small for families with incomes above $150,000.

Table 5 reports the results from several probit specifications, using a binary measure of whether or not an applicant applied to a public college in Maryland or Virginia as the dependent variable. The table reports the marginal impact on the probability of applying to a Maryland or Virginia public institution. The marginal impact of the interaction between D.C. and the year dummy variables measure the differential change in application behavior for D.C. residents relative to Maryland and Virginia residents. (The baseline difference is the difference that existed in 1999, the year prior to the D.C. TAG program's establishment.) The first column includes no other regressors and suggests a ten-percentage-point differential increase in the probability of D.C. residents applying to a Maryland or Virginia public institution between 1999 and 2000. The difference grew to 14 percentage points in 2001.

The second column of Table 5 includes additional regressors—including dummy variables for parental education, income categories, and asset categories, and an indicator for those with a zero expected family contribution (which would have qualified them for a maximum Pell Grant). The point estimates on the effects of year do not change substantively, implying that there was little differential change in the composition of the applicant pool between 1999 and other years.

The remaining columns in Table 5 report estimates for various subsamples—those with parents with no college education, parents with some college education, those with family incomes less than $75,000, those with family incomes greater than or equal to $75,000, and those with zero expected family contributions. The results suggest that in the first year of the program, the marginal impact on the likelihood of applying to a Maryland or Virginia public institution seemed to be somewhat larger

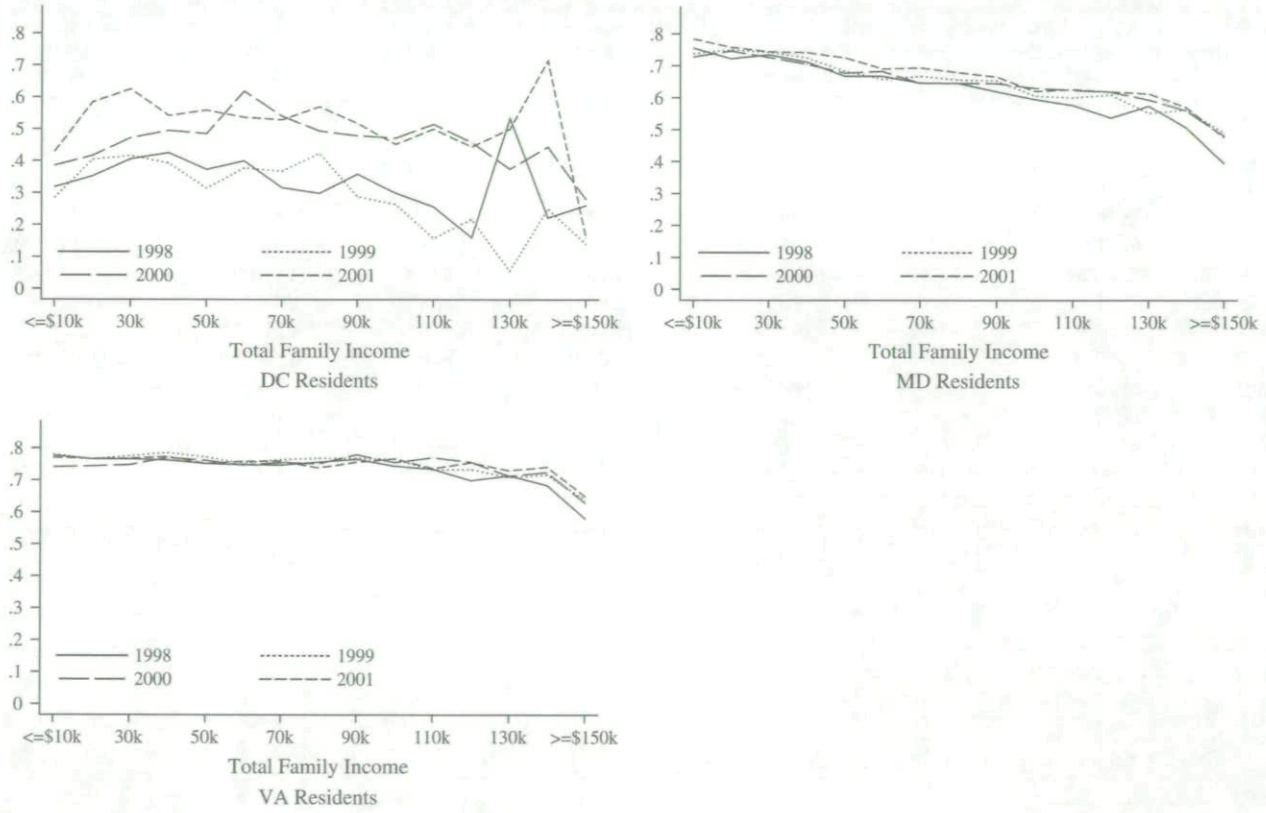


Figure 3

Proportion of FAFSA Applicants Listing a Public Institution in Maryland or Virginia by Family Income, State, and Year

Table 5
Changes in the Probability of Applying to a Public College in MD and VA: 1998–99 to 2001–02

			Estimated Separately for Selected Subsamples:				
	Total	Add Controls	Parents No College	Parent w/ Some College	Family Income <75k	Family Income >=75k	Zero EFC
			P(Apply to a Public College in Maryland or Virginia)				
DC	−0.3764	−0.3854	−0.3685	−0.4082	−0.3718	−0.4506	−0.3945
	(0.0109)	(0.0109)	(0.0144)	(0.0166)	(0.0121)	(0.0242)	(0.0193)
Year 1998–99	−0.0154	−0.0234	−0.0285	−0.0155	−0.0172	−0.0283	−0.0237
	(0.0027)	(0.0027)	(0.0044)	(0.0034)	(0.0031)	(0.0053)	(0.0073)
Year 2000–01	−0.0120	−0.0089	−0.0238	0.0011	−0.0140	0.0007	−0.0202
	(0.0026)	(0.0026)	(0.0041)	(0.0034)	(0.0031)	(0.0048)	(0.0067)
Year 2001–02	−0.0018	0.0046	0.0005	0.0053	0.0054	−0.0005	0.0088
	(0.0026)	(0.0026)	(0.0040)	(0.0034)	(0.0031)	(0.0047)	(0.0067)
DC*Year 1998–99	**0.0225**	**0.0253**	**0.0261**	**0.0302**	**0.0133**	**0.0856**	**−0.0033**
	(0.0140)	**(0.0139)**	**(0.0184)**	**(0.0210)**	**(0.0147)**	**(0.0379)**	**(0.0246)**
DC*Year 2000–01	**0.0995**	**0.0986**	**0.0872**	**0.1193**	**0.0853**	**0.1765**	**0.0600**
	(0.0111)	**(0.0111)**	**(0.0145)**	**(0.0165)**	**(0.0116)**	**(0.0272)**	**(0.0197)**
DC*Year 2001–02	**0.1362**	**0.1332**	**0.1375**	**0.1194**	**0.1184**	**0.1849**	**0.1129**
	(0.0095)	**(0.0096)**	**(0.0117)**	**(0.0164)**	**(0.0101)**	**(0.0258)**	**(0.0161)**
Other Covariates?	No	Yes	Yes	Yes	Yes	Yes	Yes
Observations	254448	254448	103137	151311	176236	78212	38535

Note: The coefficients on the DC*year interactions measure the change in the probability of applying to a public college in Maryland or Virginia for DC residents relative to the change for MD, VA residents. (The baseline year was 1999–2000.) The sample consisted of all financial aid applicants from DC, MD and VA during the 1998–99 through 2001–2002, in which both the student and the parent listed the same state as their permanent legal address. The above represent marginal effects on probabilities evaluated at the mean characteristics of the sample or subsample, based on probit specifications. Other covariates included dummy variables for mother's education, father's education, four income categories, four asset categories, a zero EFC indicator and a zero asset indicator.

for those with higher family income levels and those with parents with some college. However, by the second year of the program, the estimated impact for all subgroups was in the range of 12 to 18 percentage points.

VII. Impact on College Choice by Pell Grant Recipients

For the subset of financial aid applicants receiving a federal Pell Grant, I also observed the college the student subsequently attended. The Pell Grant program is the main federal means-tested grant program for undergraduate college students. Eligibility for Pell Grants was expanded between 1998 and 2001, as the maximum Pell Grant was raised from $3,000 to $3,750. In order to focus on similar students over time, I limit the sample to Pell Grant recipients with expected family contributions less than $2,600—a group that would have been Pell Grant eligible in all four years. Among this group, the median family income was $22,403 in the three states.[17]

The percentage of Pell Grant recipients from D.C. attending public institutions in Maryland or Virginia doubled in the first year of the program, from 14 percent to 30 percent, and remained at 30 percent in 2001. Moreover, the percentage of Pell Grant recipients from D.C. attending public institutions anywhere outside D.C., Maryland, and Virginia actually declined by roughly one-third in the first year of the program, from 12 percent to 8 percent (when public institutions in these other states were only added late in the spring) and bounced back from eight percent to 13 percent between 2000 and 2001 (when public institutions nationwide were eligible). Although private institutions in D.C. were eligible for $2,500 awards, these schools typically lost enrollment among low-income D.C. residents. The percentage of D.C. Pell Grant recipients attending private institutions in the D.C. area declined from 8 percent in 1998 and 1999 to 6 percent in 2000 and 2001. The percentage attending private historically black institutions in D.C., Maryland, and Virginia also declined, from 5 percent to 4 percent.

However, the biggest declines in enrollment of low-income students from D.C. occurred at private nonblack institutions outside D.C. and for-profit proprietary schools. The percentage of D.C. Pell Grant recipients attending private nonblack institutions outside D.C. declined from 17 percent to 10 percent, and the percentage attending proprietary schools declined from 23 percent in 1999 to 14 percent in 2001.

Table 6 reports results the marginal effects for a series of binary variables measuring the type of college attended by Pell Grant recipients. Each specification includes the full set of covariates, including family income, assets, and parental education, and an indicator for zero expected family contribution status. There was a 17-percentage-point differential rise in the proportion of D.C. Pell Grant recipients attending public institutions in Maryland or Virginia between the baseline academic year of 1999–2000 (immediately before the creation of D.C. TAG) and 2000–2001 (the first year of the program). Moreover, there were sizeable declines in the percentage of D.C. Pell Grant recipients attending private nonblack institutions outside of Maryland and Virginia and for-profit proprietary schools. Interestingly, there was no substantial change in the percentage of Pell Grant recipients from D.C. attending UDC.

17. The tenth percentile family income in this group was $6,068 and the ninetieth percentile was $39,171.

Table 6
Changes in the Probability of Attending Various Types of Colleges for DC, MD and VA Pell Grant Recipients 1998–2001

	Public MD,VA	Public Outside MD,VA, DC	Private College in DC Area	Private HBCU in DC, MD,VA	Private HBCU Outside MD,VA, DC	Private non-HBCU Outside MD,VA, DC	For-Profit Proprie-tary School	UDC
DC	−0.525	0.070	0.072	0.021	0.056	0.079	0.062	0.0916
	(0.013)	(0.011)	(0.010)	(0.006)	(0.008)	(0.014)	(0.011)	(0.0183)
Year 1998–99	0.009	−0.005	0.000	−0.004	−0.002	−0.006	0.006	−0.0002
	(0.005)	(0.002)	(0.001)	(0.001)	(0.001)	(0.003)	(0.003)	(0.0002)
Year 2000–01	0.010	0.001	0.000	−0.003	−0.003	−0.007	0.001	−0.0001
	(0.005)	(0.003)	(0.001)	(0.001)	(0.001)	(0.003)	(0.003)	(0.0002)
Year 2001–02	0.025	0.004	−0.002	0.004	0.000	−0.014	−0.013	0.0001
	(0.005)	(0.003)	(0.001)	(0.001)	(0.001)	(0.003)	(0.003)	(0.0002)
DC*	0.019	0.004	0.000	0.011	−0.001	0.000	−0.022	0.0005
Year 1998–99	(0.027)	(0.010)	(0.002)	(0.007)	(0.002)	(0.014)	(0.009)	(0.0005)
DC*	0.169	−0.020	−0.002	0.003	−0.004	−0.039	−0.015	0.0001
Year 2000–01	(0.018)	(0.007)	(0.002)	(0.005)	(0.002)	(0.011)	(0.010)	(0.0003)
DC*	0.160	0.008	−0.002	−0.002	−0.002	−0.054	−0.041	0.0001
Year 2001–02	(0.018)	(0.010)	(0.002)	(0.004)	(0.002)	(0.009)	(0.007)	(0.0003)
Observations	74734	74734	74734	74734	74734	74734	74734	74734

Note: The coefficients on DC*year interactions measure the change in probability of attendance for DC residents relative to the change for MD and VA residents. (The baseline year was 1999–2000.) To ensure comparability as the Pell Grant maxima increased, the sample was limited to Pell Grant recipients with an EFC < 2600 from DC, MD and VA during the 1998–99 through 2001–2002 award cycles. The above represent marginal effects on probabilities evaluated at the mean characteristics of the sample or subsample, based on probit specifications. Other covariates included dummy variables for mother's education, father's education, four income categories, four asset categories, a zero EFC indicator and a zero asset indicator.

VIII. Impact on College Entry

The results above suggest that the D.C. TAG program had a large impact on the types of colleges chosen by D.C. residents. However, there also has been a large increase in the proportion of youth from D.C. choosing to enter any college. Figure 4 reports the proportional increases in the number of D.C., Maryland, and Virginia students reported as first-time freshmen (recent high school graduates) in the IPEDS data, the number of FAFSA applications filed by dependent first-time college students, and the number of first-time college students who received a Pell Grant. Between 1998 and 2002, there was a 23 percent increase in the number of D.C. residents reported as first-time freshmen by colleges and universities around the country. Between 1999 and 2001, there was a 15 percent increase in the number of FAFSA applications submitted by dependent first-time freshmen in the District of Columbia. Moreover, there was a 21 percent increase in the number of first-time freshmen Pell Grant recipients from the District.[18] All three increases were considerably larger than the changes observed in Maryland or Virginia. Over the same time period, the number of graduates from D.C. public high schools remained flat.[19]

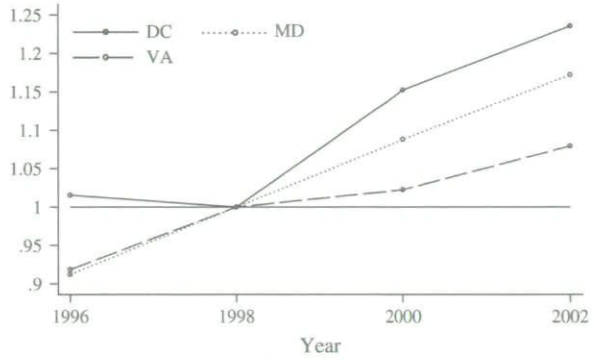
The D.C. TAG program created a number of low-cost options that had not been available previously to residents of the district. Kane (1999) used variation in tuition at public two- and four-year colleges across states to evaluate the impact on college enrollment using the cross-section of the National Education Longitudinal Study. According to Table 1, the D.C. TAG program lowered the tuition cost for D.C. residents of public two- and four-year colleges in Maryland and Virginia by approximately $3,000 and $6,200, respectively. Based only on the cross-sectional variation in state tuition policies, Kane's estimates would have implied a 25-percentage-point rise in college enrollment.[20] Therefore, the increases in enrollment, applications, and Pell Grant recipients that occurred following the creation of D.C. TAG program seem consistent with prior cross-sectional estimates.

However, it may not be appropriate to attribute all of the increase to the D.C. TAG program. The D.C. College Access Program (D.C. CAP)—a private program funded primarily by corporations and foundations—also began operations in six public high schools in D.C. for those graduating in the spring of 2000. The program was expanded to all D.C. public high schools the following year. The program provided college counselors in the high schools and "retention advisers" to help students remain in college. The program also provided $2.2 million in scholarships to D.C. residents in the 2002–2003 school year, as compared to $17 million for the D.C. TAG program that year.

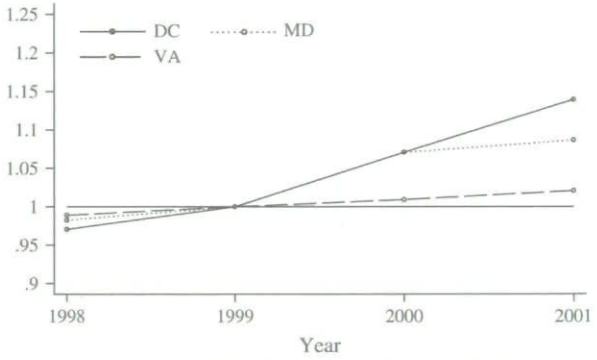
18. I am only counting Pell Grant recipients with expected family contribution (EFCs) below $2,600. As a result, this is not simply due to the growth in the Pell Grant maximum over time.

19. The number of D.C. public high school graduates for the years 1998 through 2002 was 2,777, 2,675, 2,695, 2,808, and 2,894, respectively.

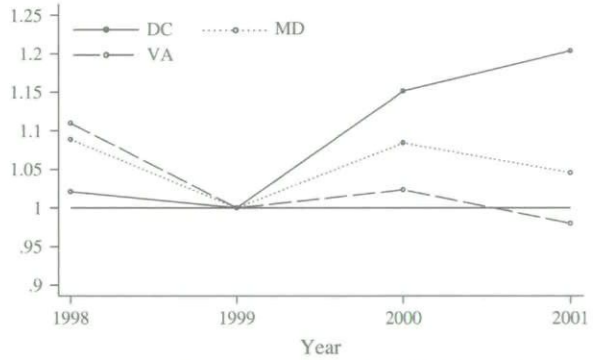
20. Table 4-5 on page 104 of Kane (1999) reports coefficients of -0.045 and -0.008 on the tuition (in 1996 dollars) of public two- and four-year college enrollment, respectively. Adjusting for inflation using the CPI-U and multiplying the two- and four-year price declines by the relevant coefficient would predict a 16.8-percentage-point decline in enrollment rates. Dividing by a base enrolment rate of 0.68 yields a predicted percentage increase in enrollment of 25 percent.



Enrollment of First-Time Freshmen, Recent HS Grads



Number of FAFSA's Filed (Relative to 1999)



Number of Pell Recips w/ EFC<2600 (Relative to 1999)

Figure 4

Proportional Changes in Enrollment, Number of FAFSA Applications and Pell Grant Recipients by State and Year

Note: Year refers to fall of academic year.

The D.C. CAP probably accounts for some share of the increase in enrollment observed over that time period. The expansion of the D.C. CAP to all the district public high schools in the fall of 2000 corresponded with the rise in the proportion of low-income D.C. residents applying to public institutions in Maryland and Virginia, as reported in Figure 4. But the D.C. CAP probably does not account for all of the increase. Recall that much of the rise in college enrollment for D.C. residents seemed to occur for those graduating from high school in the spring of 2000, when the D.C. CAP would have been serving only six of the 16 public high schools in D.C.

IX. Distributional Impact

When subsidizing public institutions, states typically offer the same low-tuition policies to all resident students, regardless of need. Similarly, the D.C. TAG program is not means tested. Unfortunately, because income data were not consistently collected for D.C. TAG recipients, it is not possible to use administrative data to measure directly the income or family background of recipients of D.C. TAG aid.[21] As a result, I use the domicile information to identify the characteristics of the neighborhoods in which the D.C. TAG recipients were living.

Out of 4,980 observed who received D.C. TAG aid at some point between 2000 and 2002 (those receiving grants in multiple years are counted only once), domicile data were matched to block group identifiers from the 2000 U.S. Census for 96 percent of the cases. There were 426 block groups within the District of Columbia, with a median population of 1,100 in the 2000 Census.[22]

A simple map of the residential locations of recipients reveals that they were spread out across the District, including low-income neighborhoods (see Kane 2004).[23] However, beyond offering a sense of geographic dispersion, it is difficult to measure systematically the relationship between neighborhood income and recipient rates with such figures. To evaluate differences in receipt of D.C. TAG aid in high- and low-income neighborhoods, I calculated the total number of new grants (not counting renewed grants) in each block group in each year. Then, for each block group I calculated the ratio of the number of new grants in each year to the number of own and related children between the ages of 15 and 17 in the block group at the time of the 2000 Census.[24] Finally, I sorted each of the block groups into ten deciles, based on median household income in the block group. Table 7 reports the mean recipient ratio for the census tracts in each of these neighborhood income deciles.

There are three facts worth noting. First, the recipient ratio rises substantially between the neighborhoods in the lowest decile and those in the fifth decile. In the first

21. They do collect tax returns to confirm family domicile. Such data could potentially be used to identify incomes of recipients. Moreover, in 2003–2004 they began to collect information on applicants' incomes, but such data were not available for the early years of the program.

22. Of these 426 neighborhoods, there were 28 block groups with more that 50 people living in college dormitories—presumably parts of college campuses. These block groups were dropped.

23. In a January 2002 report, the General Accounting Office (2002) also provided a map of the number of D.C. TAG applicants per population aged 18–24 by ward. There are eight wards in the district.

24. I used population data from the Census STF1 files. As an alternative, I also used the total number of own and related children younger than age 18 as a denominator, with similar results.

Table 7
Ratio of DC TAG Recipients to the Number of Own Children 15–17 Yrs Old by Median HH Income in Block Group

		Recipiency Ratio:		
Decile	Median Household Income	2000	2001	2002
Lowest	$12,672	*0.037*	*0.043*	*0.057*
2nd	20,385	*0.084*	*0.070*	*0.049*
3rd	24,087	*0.086*	*0.081*	*0.082*
4th	27,584	*0.094*	*0.070*	*0.088*
5th	31,194	*0.125*	*0.101*	*0.099*
6th	34,102	*0.123*	*0.088*	*0.093*
7th	38,591	*0.144*	*0.114*	*0.115*
8th	47,163	*0.149*	*0.106*	*0.102*
9th	60,682	*0.202*	*0.153*	*0.129*
Highest	114,390	*0.140*	*0.115*	*0.117*
Total	$39,737	*0.115*	*0.092*	*0.091*

Note: The recipiency ratio is defined as the ratio of the number of new DC TAG recipients in that block group to the number of own and related children between the ages of 15 and 17. Twenty-eight block groups with more than 50 people living in college dormitories were dropped. There were 398 block groups remaining. Income deciles were calculated using median household income in the block group and weighting by the number of own children between the ages of 15 and 17.

year of the program, neighborhoods in the fifth decile of neighborhood incomes (with a median household income of $31,194) had a mean recipient ratio roughly three times the recipient ratio in the bottom decile (0.125 versus 0.037). Second, for the fifth-decile neighborhoods and higher, the differences in the recipient rate associated with neighborhood income are much smaller. For instance, the recipient ratio in the highest-decile neighborhoods (with a median household income of approximately $114,390) was 0.140, only slightly higher than for the recipient ratio for the middle decile. In fact, the recipient ratio seems to peak around the ninth decile and then declines between the ninth and tenth deciles. Finally, the differences in the neighborhood recipient ratios seem to flatten out between 2000 and 2002.

The higher recipient ratios in middle- and higher-income neighborhoods reflect some combination of two effects: differences in the proportion of youth entering college, and differences in the proportion of youth attending the types of institutions that qualify for the grants. Even though college enrollment rates tend to rise monotonically with family income, Kane (1999) reports that higher-income families are more likely to attend private institutions—few of which would have qualified for D.C. TAG aid. The greater likelihood of attending private institutions at higher income levels may partially offset the regressivity arising from the greater likelihood of attending college at higher income levels. This may explain the flattening out of the recipient ratios by neighborhood family income.

Using data provided by program administrators, I also calculated the proportion of recipients reporting to have graduated from different types of high schools. The vast majority of recipients (74 percent) graduated from a regular D.C. public school, while another 4 percent attended public charter schools in D.C. and 5 percent attended public schools outside D.C. Seventeen percent of recipients attended private high schools.

X. Conclusion

The D.C. Tuition Assistance Grant program dramatically changed the menu of college prices offered to residents of the District of Columbia. Between 1998 and 2000, when the effective price of public two- and four-year colleges for D.C. residents was reduced by approximately $3,000 and $6,200, respectively, the number of D.C. residents attending public institutions in Virginia and Maryland more than doubled. When public institutions in other states were included in subsequent years, there were also large increases in D.C. students enrolling in public institutions in more distant states, although the percentage changes were smaller. The increases were largest at nonselective public four-year institutions in the Mid-Atlantic States, particular predominantly black public institutions.

The D.C. TAG program also seems to have had a large impact on the percentage of D.C. residents entering college. The number of first-time federal financial aid applicants, the number of first-year college students receiving Pell Grants, and the number of freshmen from D.C. reported by colleges and universities nationally all increased by 15 percent or more. The magnitude of the increase was consistent with prior estimates of the effect of tuition changes on enrollment, based primarily on cross-sectional data.

Although the program did seem to have an impact on the proportion of youth entering college, it also led to a widespread reshuffling of students from private nonprofit and proprietary schools toward public colleges and universities, particularly in Maryland and Virginia. As Peltzman (1973) recognized, the net effect of in-kind subsidies to higher education (those that are limited to public higher education institutions) on bachelor's degree completion rates and total investments in higher education is ambiguous. On the one hand, more people seem to be entering college. On the other hand, actual expenditures per student and BA degree completion rates tend to be lower at public institutions than at the private institutions they left behind. The net effect of the D.C. TAG program on the proportion of D.C. residents completing higher education degrees and in the quality of education they receive remains to be seen. Future work will need to focus on changes over time in eventual BA completion and the quality of education received by D.C. residents by comparing the outcomes of those who graduated from D.C. high schools in 2000 and after with the outcomes for those who graduated in earlier years.

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