The Impact of the HOPE Scholarship on High School Graduation in Georgia

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Abstract

Since Georgia enacted its widely acclaimed merit aid HOPE policies, many states have followed suit, ostensibly due to its large, positive, and significant impact on college enrollment. There has been muted interest in the impact of the policy on high school graduation of both students who will go on to college and those who will not. Using a differences-in-differences methodology, I contrast high school graduation rates in Georgia against similar states and found the enactment of the HOPE Scholarship has increased the probability of graduating high school by 12.5%. When viewed in light of a 7% point jump in college enrollment due to HOPE Scholarships (Cornwell et al., 2006), I conclude that the policy has increased the graduation rates—by about 5%—of students who will not be immediately enrolling in college after graduation from high school.

A merica may be facing a silent high school graduation problem. Although figures provided by government agencies seem to show a tremendous leap in graduation rates (see Figure 1), the raw numbers mask a hidden but fundamental problem. By 2011, around 12% of all high school graduates obtained this credential through the General Education Degree (GED) (Murnane, 2013).[1] While statistically indistinguishable, labor market outcomes and long-term educational achievement is very different among GED holders than among true high school graduates (Cameron & Heckman, 1993).
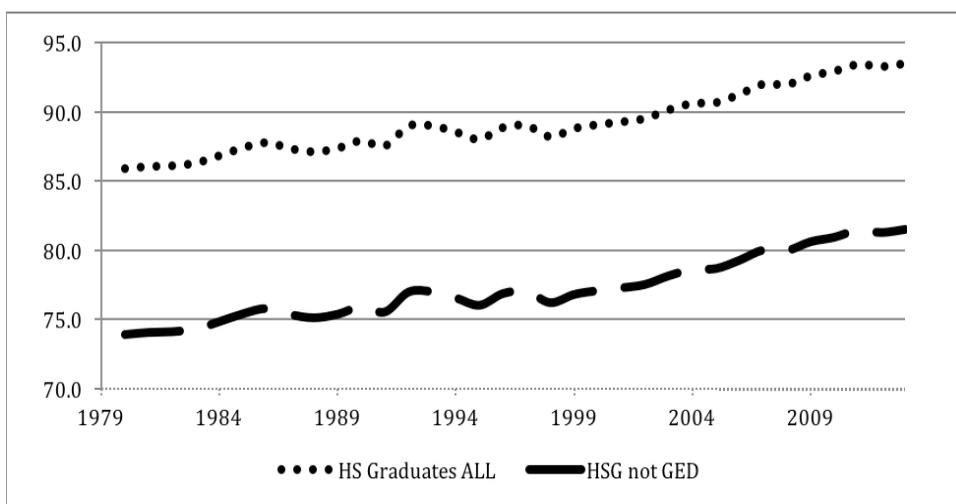

Figure 1. A plot of graduation rates over time. The dotted line shows the graduation rate, including the GED, while the dashed line shows the graduation rate without GED credentials, assuming the GED rate is 12% of the total every year. Source: https://eric.ed.gov /?id=ED524955.

To develop and maintain a highly skilled workforce, many states have resorted to providing merit-based subsidies that incentivize college enrollment. However, Fenske et al. (1997) argue that policies that intervene earlier in students' education may be just as important. Research on the efficacy of these merit-based policies tend to focus mainly on the impact of said policy on tertiary enrollment (Dynarski, 2002).

In this study, I examine the impact of Georgia's Helping Outstanding Pupils Educationally (HOPE) scholarship on high school graduation. Using a pooled

1. The General Educational Development (GED) certificate was supposed to be an equivalent credential to the high School diploma for veterans of the Second World War. It has later morphed into the medium through which many Black, Hispanic and lower income individuals receive their diploma. As a result of this transformation, the value of the credential has weakened considerably (Cameron & Heckman, 1993).

cross-section of IPUMS CPS Annual Social and Economic supplement (ASEC) data, I analyze the impact of Georgia's 1993 HOPE Scholarship/Grant programs on graduation rates. I use a differences-in-differences identification strategy to contrast the graduation rates of individuals in Georgia against those in other states after the HOPE Program was started.

The main contribution of this paper is the better understanding it provides of the positive impacts of merit aid policies such as the HOPE Scholarship. I expect the rate of high school graduation to increase in Georgia relative to its peer states that lack a merit aid policy. High school graduation rates will increase because (1) the discounted cost of attending an institution of higher education is reduced substantially, and (2) the demand for labor in states with merit aid policies will gravitate towards students with higher educational attainment.

I find that the enactment of the HOPE Scholarship increased the probability of students graduating from Georgia high schools by around 12.5%. In practical terms, this result echoes the conclusions of Henry and Rubinstein (2002) and Pallais (2009). In both instances, the performance of students on standardized tests increased in states where merit aid policies are instituted relative to peer states. It is not surprising that scores on standardized tests improved, since the eligibility conditions of merit aid rests on the students attaining a minimum cutoff on the tests. What is surprising is that distribution scores have shifted upwards; fewer students perform poorly on standardized tests when merit aid policies are enacted. Along similar lines, I also find the distribution of graduating grade point averages (GPAs) is shifting upwards towards the cutoff point.

Background

As part of legislation aiming to introduce a lottery into the state of Georgia, Governor Zell Miller in 1991 proposed a unique model where the bulk of the proceeds of the lottery scheme would be devoted to educational causes. In 1991,the Georgia legislature passed the lottery amendment while statewide residents narrowly passed a referendum supporting the amendment in 1992. This paved the way for the enactment of the HOPE Scholarship and the HOPE Grant programs.

The HOPE Scholarship

The HOPE Scholarship was created to encourage the academic achievement of Georgia's high school students and Georgians seeking degrees from postsecondary institutions (Georgia Student Finance Commission, n.d.). Funding for the program is derived from Georgia Lottery for Education, and is administered by the

Georgia Student Finance Commission. To qualify for a HOPE Scholarship, a student must be a U.S. citizen, a Georgia resident for at least 12 consecutive months prior to the award, and must graduate high school with a 3.0 GPA. To retain the scholarship, the student must maintain a 3.0 or B average throughout his/her academic program (limited to 6 years) with regular inspection by the state to ensure compliance. The scholarship is very generous—estimated around $4,700 in the 2003 academic year (Cornwell et al., 2006). When the HOPE Scholarship was first enacted, a student could get $1,000 towards tuition at private universities. This amount was later increased to $3,000 to reflect the growing trend of tuition increases. At the beginning of the program, eligibility was capped for students whose annual family income exceeds $66,000. The $66,000 hard cap was first increased to $100,000 in 1994 but then later abolished in 1995.

The HOPE Grant

This is the second plank of the lottery-funding program introduced under the HOPE Program. The HOPE Grant program provides assistance to residents of Georgia pursuing certificates or diplomas at Georgia's public tertiary institutions. Its aim is to encourage residents to obtain practical training provided in 2-year colleges to broaden the talent pool of Georgia's workforce. The eligibility criteria for the HOPE Grant program are the same as for the scholarship with one exception: students need not graduate with a 3.0 GPA.

Merit Aid: Incentive, Effort, and High School Student Quality

Bishop (1996) argues that pecuniary incentives that subsidize college costs are also expected to elicit more effort by high school students in order to meet or exceed the threshold of the merit aid policy. To demonstrate how this transpires, consider the following. Students cannot determine ex-ante if their academic effort will enable them scale the eligibility threshold. To obtain a grade point average sufficient for the merit aid scholarship, students who are either at or are perceived to be right below the threshold will likely exert more effort to scale that hurdle. That is, a student with a 2.9 GPA may exert moderately more effort to cross the 3.0 mark. At the same time, a student with a 2.5 GPA may substantially improve his/her effort in order to scale the threshold. Even if the student with the 2.5 GPA falls short of the cutoff (finishing with a 2.9 GPA, for example), that student's probability of graduation nonetheless increases immensely. In essence, merit aid creates a positive externality that leads students to perform better, hence improving the chances of graduation (Betts, 1998; Kremer, Miguel, & Thornton, 2009) Indeed, the number of students graduating with

a 2.90-2.99 GPA rose faster in Georgia than in surrounding states (Bugler, Henry, & Rubenstein, 1999).

Another externality introduced by merit aid policies is that they improve the quality of high school students across the ability spectrum (Betts, 1998). Employers will realize that when standards are improved, the quality of students seeking to attain those standards is higher, and they therefore should be compensated differently.

While the general consensus is that merit aid improves quality, Price suggests that merit aid simply rewards students who do not need the help (2001). He contends that since well-to-do students will attend college with or without merit aid, the policies do not lead to the attainment of their main objective: providing "equal opportunity."

Both higher achieving students through the HOPE Scholarship and lower achieving students through the HOPE Grant benefit from merit aid policy. Note that the main eligibility criteria of the HOPE Grant are high school graduation regardless of grade. Rational students who had no thought of obtaining post-secondary education are incentivized to graduate with the promise of a free technical education. The skills learned from these technical colleges would have taken years to obtain if the student had started working immediately upon graduation from high school (Jepsen, Troske, & Coomes, 2014).

Data and Empirical Specification

Data

I use data from three major sources in this study: the March Annual Social and Economic Supplement (ASEC) from the Current Population Survey (CPS);[2] Common Core data from the National Center for Educational Statistics; and Local Area Unemployment Statistics from the Bureau of Labor Statistics. I pool ASEC data from 1993–2003 to create a large data set containing the constructed graduation status of all individuals. I create the graduation status variable as a binary variable coded as 1 for any individual in the data with an above 12th-grade education and coded as 0 for any individual who has a 12th-grade education and below. Due to a large sample size and compatibility issues, the analysis is limited to the 16 comparable states in the Southern Regional Educational Board (SREB)[3] as done in Cornwell et al. (2006).

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2. ASEC CPS provides the usual monthly labor force data, but in addition it also provides supplemental data on work experience, income, noncash benefits, educational attainment, and migration. https://www.census.gov/prod/techdoc/cps/cpsmar13.pdf

3. These states are Alabama, Arkansas, Delaware, Florida, Georgia, Kentucky, Louisiana, Maryland, Mississippi, North Carolina, Oklahoma, South Carolina, Tennessee, Texas, Virginia, and West Virginia.

Table 1 shows the similarities between Georgia and the SREB states. I include as control variables parental income, school investments in facilities and teachers, and macroeconomic variables such as unemployment and minimum wage. Data on state expenditures were extracted from NCES' Common Core data while unemployment figures were derived from the Bureau of Labor Statistics. All other variables were sourced from the CPS ASEC data.

TABLE 1		
Means of key variables in the SREB sample		
	Georgia	SREB
Graduation Rates (%)	66	68
Hours Worked (Weekly)	16.8	17.54
Household Income ($)	70,015	66,764
Parents with HS Diploma (%)	85	81
State Per Capita Education Expenditures ($)	7,493	7034
Unemployment Rates	5.26	4.56
Youth Labor Force Participation (%)	53	57
No. Observations	329	6847
Notes. Income figures are expressed as 1995 dollars.		

I removed all entries with negative income figures and limited all the income variables to within three standard deviations of the mean. I limited hours worked weekly at 60. These adjustments did not alter the sample size significantly.

To obtain an accurate representation of high school graduation, I construct a variable that looks at the current state of residence and tied it to the migratory history of the respondent. CPS data has a variable that captures the migration history of respondents over one-year intervals. For example, if a respondent indicates Alabama as his current state of residence and also indicates no history of migration over the past year, then this suggests that the state of residence and the state of high school graduation are the same. A secondary outcome variable that estimates whether or not the HOPE Program increases the probability of young adults joining the labor force is considered. This is a binary variable that indicates whether or not the respondent is in the labor force. CPS data also has demographic data about the respondent's age, sex, gender, and family characteristics. I present some summary statistics in Table 2.

TABLE 2

Breakdown of key variables by state

STATES	HOURS WORKED WEEKLY	HOUSEHOLD INCOME ($)	PARENTS WITH HS DIPLOMA (%)	PER CAPITA EDUC EXP ($)	UNP RATES (%)	YOUTH LFP (%)	#. OF OBS.
ALABAMA	16.5	63,923	84	6,239	5.6	58	337
ARKANSAS	17.47	58,599	83	6,078	5.4	64	289
DELAWARE	20.1	77,302	86	9,599	4.2	58	294
FLORIDA	16.9	66,680	84	7,287	5.1	60	988
KENTUCKY	16.98	67,889	82	6,338	5.4	62	362
LOUISIANA	15.7	65,556	85	6,304	6.4	60	296
MARYLAND	19.57	93,635	93	9,012	6.4	56	286
MISSISSIPPI	14.12	56,132	76	5,351	6	50	316
NORTH CAROLINA	19.27	69,643	83	6,473	4.7	59	617
OKLAHOMA	17.66	65,581	88	5,980	4.5	59	368
SOUTH CAROLINA	16.97	70,885	82	7,280	5.6	55	305
TENNESSEE	18.33	71,118	84	6,041	4.9	60	292
TEXAS	18	59,325	70	7,215	5.7	55	1318
VIRGINIA	19.7	78,689	86	7,654	3.9	54	382
WEST VIRGINIA	15.12	57,287	84	7,790	6.9	50	397
GEORGIA	16.8	70,015	86	7,492	4.5	53	329

Notes. PER CAPITA EDUC EXP. Represents state expenditures per pupil. UNP RATES are mean unemployment rates. YOUTH LFP stands for youth labor force participation rates. NO. OF OBS. stands for number of observations.

Empirical Methodology

The aim of this study is to examine whether Georgia's merit aid (the HOPE Scholarship) has increased the rate of high school graduation. At first blush, the answer seems mechanically simple. When merit aid is available, more students will graduate from high school in pursuit of the program's benefits. The eligibility criteria, which requires students to attain a 3.0 GPA, presents a twist on this presumption. That is, students with a 3.0 GPA or above typically graduate from high school with or without merit aid. Hence, the graduation rate of students with a GPA that exceeds the threshold will not be affected by the policy. Those at the margin and those within striking distance of the cutoff are the ones most affected by the policy.

Therefore, the identifying assumption is that upon enacting the HOPE Program, high school students in Georgia will graduate at higher rates than their counterparts in surrounding states with similar characteristics. I use a differences-in-differences method similar to its application in Singell, Waddell, and Curs (2006) to determine the impact of the HOPE Program on high school graduation:

$$Grad_{\pi} = \partial \ (GA*HOPE) + yXi + \alpha T + \beta s \ (ST) + \varepsilon_{it}$$

We compare each individual *i* at time *t*, to determine whether the policy as implemented causes the graduation status to differ between Georgia and the surrounding states. *ST* are state level macro variables that change over time, such as unemployment and education expenditures. *GA* is an indicator for the state of Georgia, and *HOPE* is an indicator for years after 1994. Even though the HOPE Scholarship was enacted in 1993, I am constrained to use 1995 as a cutoff due to the data setup. By design, the ASEC CPS data is collected in March of every year. Any respondent that indicates he or she has graduated must be referring to his status based on the previous year. That is, if a respondent in March 1995 indicates having completed 12th-grade, then it must mean that he or she graduated around June 1994.

The coefficient of interest is *HOPE.X,* is a vector of individual level covariates, and is the error term. I include a linear time trend to control for secular growth in graduation rates. Graduation rates in the U.S. have been rising due to higher college premium, the sophistication of the U.S. economy, and laws aimed at keeping students in school. This time trend variable is expected to wash away most of the up-tick in graduation rates coming from other sources. NCES data show large disparities in graduation rates between male and female, white and black, and low-income and high-income groups (NCES, 2011). This makes it imperative to analyze the sample with respect to these dimensions.

While it is hard to detach the impact of class from the impact of race on high school graduation rates, Storer et al. (2012) still find the difference in drop-out rates on the basis of race statistically significant.

Results and Discussion

Full Sample

I initially ran a naive model of equation (1) above in order to obtain a sense of the magnitude and direction of the coefficients. To do this, I ran a simple logit without any non-student covariates, hence obtaining the summary estimates of the model as seen in column 1 of Table 3. The reported coefficients are the marginal effects of the

policy. Judging by the low F statistic of the specification, the model is not properly specified. The coefficient shows the positive correlation between the enactment of the HOPE Program and higher graduation rates.

TABLE 3

Marginal Impact of merit aid policies on high school graduation

	(1)	(2)	(3)	(4)	(5)
GA*HOPE	0.168**	0.121**	0.138**	0.125*	0.099*
Parental Characteristics	X	Y	Y	Y	Y
Individual Characteristics	X	X	Y	Y	Y
State Level Covariates	X	X	X	Y	Y
No. of Observations	7176	7,176	7176	7,176	7176
Pseudo R^2	0.05	0	0.19	0	0.26

Notes. *** $p< 0.01$, ** $p< 0.05$, * $p < 0.1$.

I estimate a second model that measures parental income and present the results in column (2) of Table 3. This shows the enactment of the HOPE Scholarship in Georgia has led to a 12.1% increase in graduation rates. I improve the model further by adding variables dealing with parental education as controls to determine the causal impact of the HOPE Scholarship. This is motivated by the work of Foley, Gallipoli, and Green (2014) who argued that there is a strong causal relationship between the educational attainment of parents and the graduation decision of their children. After adding parental education measures, the coefficient for increases from 12.1% as seen in model (2) to 13.8% in this specification (column 3, Table 3). The fourth model is my preferred specification. It incorporates macroeconomic variables in addition to the covariates mentioned above. Column 4 of Table 5 shows the result of this analysis. It shows that the marginal effect of instituting the HOPE Scholarship program on graduation rates in Georgia is around 12.5% significant at a 90% confidence level. These results are comparable but smaller in magnitude to Keane and Wolpin (2000) who conclude that a proposed $25,000 subsidy to low-income households can decrease high school drop out rates by two-thirds.

Other groups

Table 4 presents the estimates of the impact of HOPE scholarships/grants on high school graduation for female students, black students, and low-income groups. The first column of Table 4 shows the regression results when the sample is restricted to female students. The marginal effect (0.143) is higher when compared to the full sample (0.125). The second column shows the result of the analysis when restricted to black students. The results show the HOPE Scholarship increasing graduation rates of black students by 36%. The analysis on black students may be spurious due to small sample size. It is expected that, as in the case of females, black students should respond more to the policy. Column 3 of Table 4 presents the result of the analysis on lower income student's regression.

TABLE 4

Marginal Impact of merit aid policies on different populations

	Female Students	Black Students	Lower Income	Upper Income	Low Educ.	Highly Educ.
GA*HOPE	0.143**	0.36+	0.23**	0.07	0.042	0.158**
	(1.97)	(4.57)	(2.24)	(0.91)	(0.40)	(2.44)
Parental Characteristics Individual	Y	Y	Y	Y	Y	Y
Characteristics	Y	Y	Y	Y	Y	Y
State Level Covariates	Y	Y	Y	Y	Y	Y
No. of Observations	3293	1,015	3561	3506	3,576	3600
Pseudo R²	0.22	0.18	0.14	0.24	0.16	0.23

Notes. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$. The numbers is parentheses are clusters standard errors. +The results from the black student sample may suffer from low sample size.

The marginal effect of 0.23 indicates an above average impact for this group. The implied subsidy provided by the HOPE Program is much higher for lower income families as a percentage of their income. It is not surprising that this group responds at a higher rate than their wealthier counterparts. These results are consistent with Angrist and Lavy (2002), who also find that the impact of high school cash incentives leads to stronger graduation rates for low-achieving students.

Discussion

The social and economic gains of having more graduates in a state are both substantial and long lasting (Catterall, 2011; Levin et al., 2007). However, those who drop out and those who graduate differ in some important characteristics (Eckstein & Wolpin, 1999). Factors such as a healthy labor market may incentivize students to drop out (McNeal, 2011). As such, providing a financial incentive may encourage students to stay in school and graduate.

The impact of a comprehensive policy like the HOPE Program, which incentivizes college enrollment, should also encourage students to graduate from high school. The estimates presented in Tables 3 and 4 show graduation rates increasing by around 10% to 12.5% when the HOPE Program was instituted.

The results also confirm the heterogeneity of the policy's impact on different groups. Disaggregating the results for different subgroups is very useful, especially as it relates to formulating policy objectives because different groups have different elasticities to the policy. For instance, we can see from Table 4 that lower income groups have a higher response rate to the policy when compared to the full group. The results suggest that around 5,793 more students are graduating from high school in Georgia as a result of the HOPE Program. This large increase in the number of high school graduates has significant impacts on the economy of the state. Using D'andrea's (2010) baseline estimates, every high school dropout is expected to cost the state $1,100 in Medicare costs and $950 in incarceration costs annually. At this rate, Georgia could save around $6.3 million in Medicaid costs and about $5.5 million in incarceration expenses per year.

Conclusion

I analyze the impact of merit aid policy in Georgia (HOPE) on high school graduation rates. Unlike many studies on this policy, my analysis seeks to find the pre-college benefits of the policy. Results from differences-in-differences shows a 12.5% increase in high school graduation due to the policy. The responsiveness to the policy is more pronounced on the traditionally lower graduating groups—women, minorities, and students from poorer backgrounds.

While the results presented here are robust, care must be taken in extrapolating the results to other states. Because Georgia was the first to implement the policy, it is uncomplicated to use Georgia as a treatment. States that have not implemented a similar policy were similarly uncomplicated to use as controls. Many states unveiled several policies to improve graduation rates in the 1990s, so extending the same model

to other states will be susceptible to confounding effects. What can be concluded from this analysis is that when incentives are provided encouraging students to enroll in college, these same policies will have a positive effect on all students—not just those who will eventually enroll in college.

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