Changing Incentives and Course-taking: The Case of 2004 Revisions to Georgia's HOPE Scholarship

ABSTRACT

Since 1993, Georgia has provided merit-based HOPE Scholarships to high school students who graduate with a 3.0 GPA. Students must maintain a 3.0 GPA in college to keep the scholarship. Originally, HOPE Scholars were evaluated every thirty credit hours, which provided them with the incentive to take fewer than fifteen credit hours in some semesters to defer evaluation. In 2004, the Georgia General Assembly instituted a GPA checkpoint after each spring semester to increase credit hours and save HOPE funding. Using data from a mid-size public liberal arts college in Georgia, this paper analyzes the effects of this change on course-taking. In the second year of the spring checkpoint, first-time freshmen decreased attempted credit hours by 0.21 and earned credit hours by 0.27 despite having better high school credentials.

I. INTRODUCTION

Since 1993, Georgia's "Helping Outstanding Pupils Educationally" Scholarship (HOPE) has paid college tuition and fees at Georgia universities for high school students with a "B" average. Student must retain a 3.0 GPA in college to retain the scholarship. In the last decade, research has looked at the incentive effects of the HOPE Scholarship and other merit scholarships. One study found that merit scholarships are correlated with decreased course loads and increased course withdrawals, which increase students' time needed for graduation. (Cornwell, Mustard, and Lee 2005).

Originally, HOPE scholars were evaluated every thirty credit hours for eligibility, which provided students with the incentive to reduce course loads.[1] In response to this trend, the Georgia General Assembly instituted a mandatory GPA review after each spring semester beginning in fall 2004. One aim of the spring checkpoint was to save HOPE funding by removing the incentive to stay below thirty credit hours in that first year. Additionally, students who fall below a 3.0 GPA will lose HOPE after just two semesters. Since the 2004 spring checkpoint, the number of students receiving the HOPE Scholarship has decreased in each year, which was the first time the number of HOPE Scholars declined from the previous year. HOPE expenditures still increased in those years due to tuition increases, but the amount of the increase was roughly half the size of previous years (See Figure 1 in Section II). Consequently, it appears that the spring checkpoint has been effective in saving HOPE funding.

In addition to the cost savings, this spring checkpoint may have had an unintended consequence—further reducing student course loads. The spring checkpoint may have

[1] For example, prior to fall 2004, students who completed only 29 or fewer credit hours with a GPA less than 3.0 at the end of their first year of college were able to maintain HOPE for the following semester.

strengthened the incentive for students to take lighter course loads to maintain a 3.0 GPA and remain eligible for the HOPE Scholarship.

Using administrative student data from 2002-2005 on first-time freshmen at Georgia College & State University (GCSU), this study looks at the impact of the 2004 implementation of a spring eligibility checkpoint on course-taking for HOPE recipients. Based on these data, I find that student quality increased in each year as measured by SAT scores, AP credit hours, and high school GPA. Thus, course-taking should have improved because GCSU students had better incoming credentials. This trend was the case before the spring checkpoint change and during the year of the change. However, GCSU freshmen enrolled in 0.21 fewer credit hours and earned 0.27 fewer credit hours in the second year of the spring checkpoint when compared with the previous year. The face that earned credit hours decreased by more than attempted credit hours suggests that students increased course withdrawals slightly. Nonetheless, the decrease in attempted credit hours appears to be of larger magnitude than the decrease in course completion. This result indicates that freshmen appear to value HOPE retention above faster academic progress.

Section II of this paper discusses the history of Georgia's HOPE Scholarship including past research on HOPE and other merit scholarship programs. The data are described in Section III. Section IV reports regression results for attempted and earned credit hours as the dependent variables to see the effects of the spring checkpoint on first-time freshmen course-taking in the spring semester. Section V includes concluding remarks, further research possibilities, and policy implications.

II. THE GEORGIA HOPE SCHOLARSHIP

A. HOPE Scholarship History

In 1993, the HOPE Scholarship was created to give merit-based financial aid to Georgia students who attend public and private universities within the state.[2] To be eligible for the HOPE Scholarship, students must graduate from a Georgia high school with a "B" average and attend a university in Georgia. The scholarship pays for tuition, some fees, and a $150 book allowance per semester at public institutions. Full-time students at private institutions receive $1500 per semester. Part-time students receive $750. [3] As of December 2006, the HOPE Scholarship has given $3.3 billion in financial assistance to 1,065,024 Georgia students.[4] HOPE expenditures have increased each year since its inception in fiscal year 1993-1994. Figure 1 shows that those increases have flattened since the spring checkpoint implementation in fiscal year 2003. Additionally, the number of students receiving the scholarship flattened between 2003 and 2004 in the first year of the checkpoint. In 2005, the number of scholarship recipients decreased for the first time.

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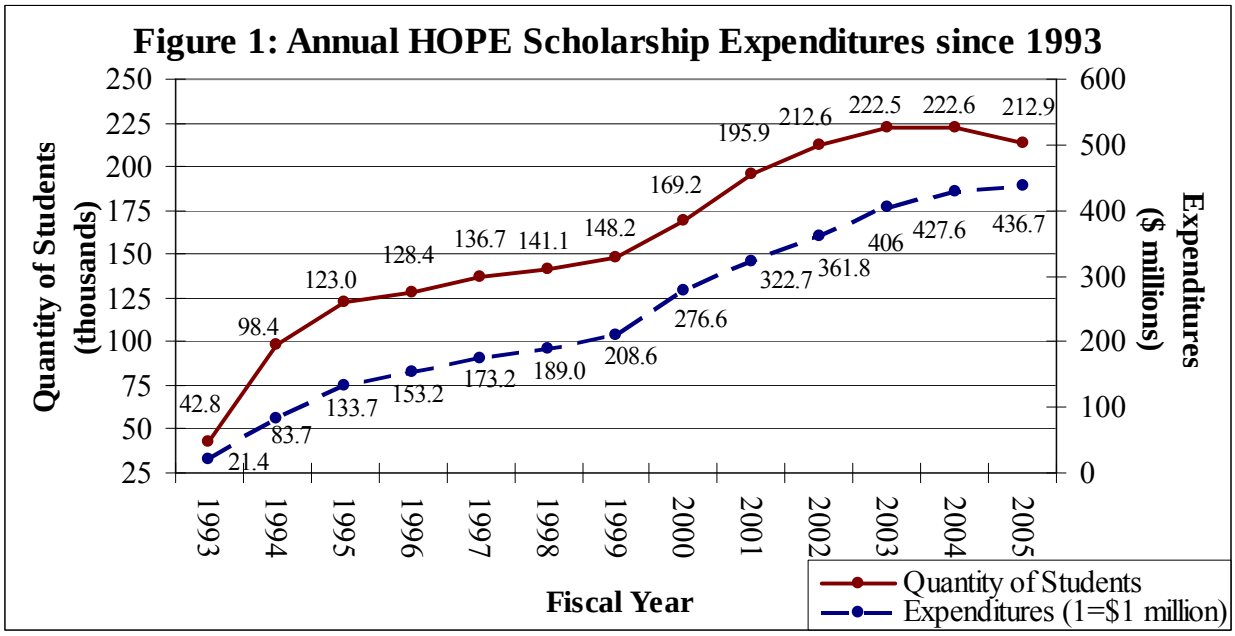
[2] Georgia voters approved a statewide lottery to fund HOPE Scholarships. The lottery funding also covers HOPE Grants for students at technical colleges and pre-kindergarten programs. Any extra funding is earmarked for school construction or technology.

[3] "2006-2007 Award Year HOPE Regulations." *Georgia Student Finance Commission*. 2006. <http://www.gsfc.org/Main/publishing/pdf/2006/2006_hope_regs.pdf>. Last accessed: 4 April 2007.

[4] "HOPE Program Facts and Figures." *Georgia Student Finance Commission*. 2006. <http://www.gsfc.org/main/ga411info/hope_facts.html?CFID=19213948&CFTOKEN=e765505392f19b76-EC137044-AB63-BF08-51310AC9942F7E9A>. Last accessed: 4 April 2007.



To retain the scholarship once in college, students must maintain a 3.0 GPA. Under the original regulations, students were evaluated when they had attempted 30, 60, 90, and 120 credit hours. If they lost eligibility for failing to obtain a 3.0 GPA, they were able to reapply for the scholarship after they had attempted 60 or 90 credit hours. Students who retain the scholarship can receive HOPE funding until reaching 127 attempted hours of course work or as many as 150 credit hours if major requirements exceed 127 credit hours. The HOPE Scholarship has no eligibility time limit.

In 2004, the Georgia General Assembly passed House Bill 1325 to ensure solvency and decrease wasted resources in the HOPE program. Among the changes was the institution of a GPA evaluation after each spring semester.[5] This checkpoint evaluates HOPE eligibility in the spring regardless of attempted credit hours. Lawmakers recognized that students under the 30-credit hour checkpoints had the incentive to enroll in fewer courses in some semesters to

[5] In addition to the spring checkpoint, House Bill 1325 included a provision that will decrease HOPE coverage of the book allowance and student fees if lottery resources decline. It also tightened high school GPA standards. The bill can be accessed at <http://www.legis.state.ga.us/legis/2003_04/fulltext/hb1325.htm>. Last accessed: 4 April 2007.

postpone evaluation. This decrease in attempted courses had prolonged HOPE eligibility an additional semester and increased time to graduation.[6]

B. Academic Research

Much of the merit scholarship research dealing with course-taking has looked at the incentives underlying scholarship programs. Scholarships alter student incentives by decreasing the cost of attending college. For example, many scholarships have minimum achievement standards to ensure that recipients study while receiving funding. This evaluation gives students the incentive to raise achievement to at least the minimum requirement to retain the scholarship. However, Sahin (2004) argues that lower tuition levels due to scholarships may also decrease the students' sense of the value of time spent studying. Since students no longer pay tuition, they bear less of an economic burden for skipping classes or not studying. This incentive to decrease effort may lead students to seek the minimum grades required for retention. In the case of the HOPE Scholarship, students may focus simply on maintaining a 3.0 GPA to retain eligibility rather than a higher goal.

This behavior is consistent with the idea that students may have different motives for attending college than the individuals who pay for their education. Becker (1981) holds that children in a family often have differing incentives for education from their parents, who are their benefactors. For example, a student's primary reason to attend college may be social interaction and a casual environment rather than human capital improvements or better life outcomes. As a result, he may not value graduating in four years because a prolonged academic career extends his time in the college environment. This attitude shifts the motivation for

[6] "HOPE Scholarship: Joint Study Commission Report." The HOPE Scholarship Joint Study Commission. (2004). p. 42. <http://www.cviog.uga.edu/services/research/hope/report.pdf>. Last accessed: 4 April 2007.

studying and achievement from long-term salary gains or increased career choices to simply maintaining sufficient grades to remain in college. Students will also have other scholarship retention incentives such as switching majors and taking easier courses to maintain eligibility with less effort.

The above course-taking incentives due to merit scholarships can be applied to the 3.0 minimum GPA to retain HOPE eligibility. Tuition at all University System of Georgia institutions is a flat price once a student is considered full-time at 12 credit hours or more of coursework. As a result, students without financial assistance may have an incentive to enroll in as many courses as possible to graduate in less time.[7] However, merit scholarships like the HOPE scholarship may decrease this incentive. Without a time limit, students can enroll in 12 credit hours per semester and graduate in five or more years with the same tuition cost. They pay only for room and board, which would be a cost whether they work or attend college. Students may also value extra time spent in a college environment, so the HOPE Scholarship may increase the incentive to prolong their undergraduate career.

In addition, students may seek alternative ways to maintain the minimum GPA requirement other than increasing study time. For example, students may enroll in fewer courses or withdraw from difficult courses to spend more study time per course. Additionally, they may choose courses, instructors, or majors where they anticipate higher grades. Cornwell, Lee, and Mustard (2005a) find the presence of these effects at the University of Georgia after the creation of HOPE in 1993. Comparing first-year Georgia resident students with nonresident students before and after the HOPE scholarship implementation, Georgia residents decreased course loads and increased course withdrawals, while nonresident course loads remained constant. The

[7] For example, a student can take 18 credit hours in each semester to graduate in less than four years at the same cost per semester of students who enroll in 12 credit hours for five years.

combination of these two effects resulted in a 9.3 percent reduction in the probability of completing a full load of 12 or more credit hours.

In another study using the same student data at the University of Georgia, Cornwell, Lee, and Mustard (2005b) find that resident students had a 0.13 point higher GPA than nonresident students after HOPE implementation. This effect is partially attributed to 1.2 fewer completed credit hours in math and science courses in the first and second years of college. Since the effect is in both years, they argue that students may be avoiding difficult courses rather than postponing them. In addition, first-year Georgia resident students were 1.2 percentage points more likely to major in Education than non-Georgia residents after HOPE creation. This result may have been due to Education courses yielding higher grades as well as the significant salary increases provided for Georgia teachers over this period of time.

Other research has dealt with the enrollment impact of the HOPE Scholarship in Georgia. Although one of the policy goals of the scholarship was to increase opportunity for low-income students, Cornwell, Mustard, and Sridhar (2006) find the HOPE Scholarship may affect a student's college choice rather than whether or not he/she attends college. They observe that two-thirds of the 9 percentage point gain in enrollment at 4-year public institutions in Georgia after the HOPE scholarship was due to students choosing Georgia universities over out-of-state universities. Though maintaining HOPE eligibility may not be necessary to remain in college, the scholarship may provide students with the financial ability to attend college away from home. In other words, students are able to attend a college more suited to their preferences rather than living at home during college. Due to HOPE, parents' college savings can pay for room and board at another institution instead of tuition at the local university. If students lose the

scholarship, it may then result in attending college at home and removing them from the desired social environment.

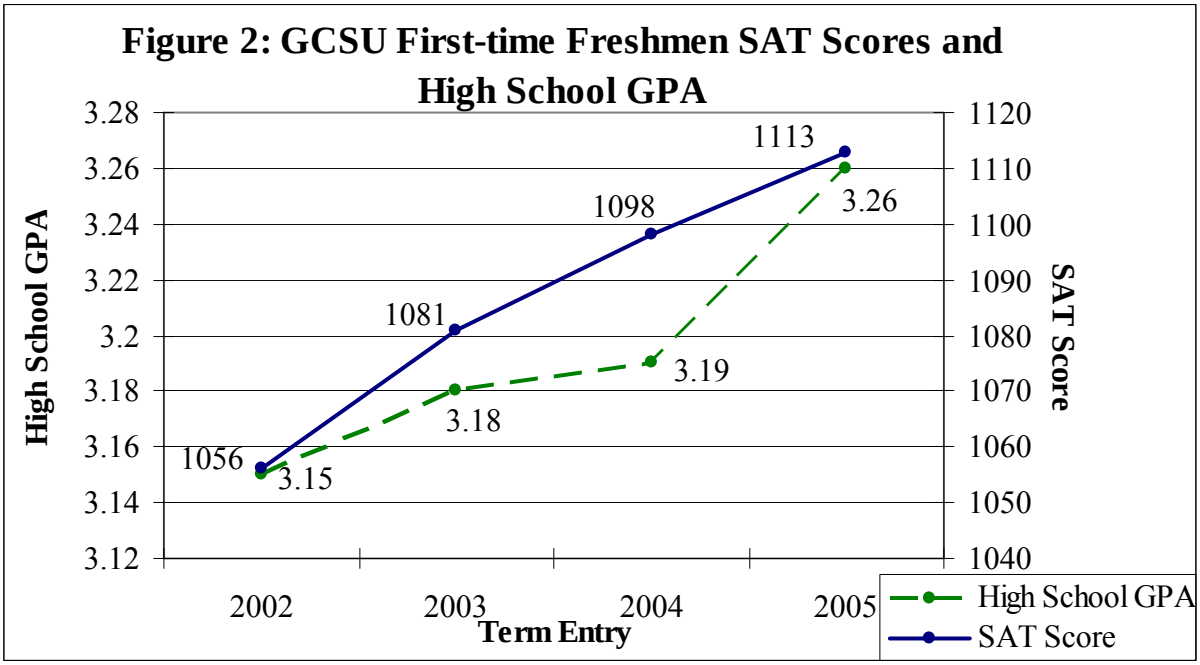
III. DATA AND SUMMARY STATISTICS

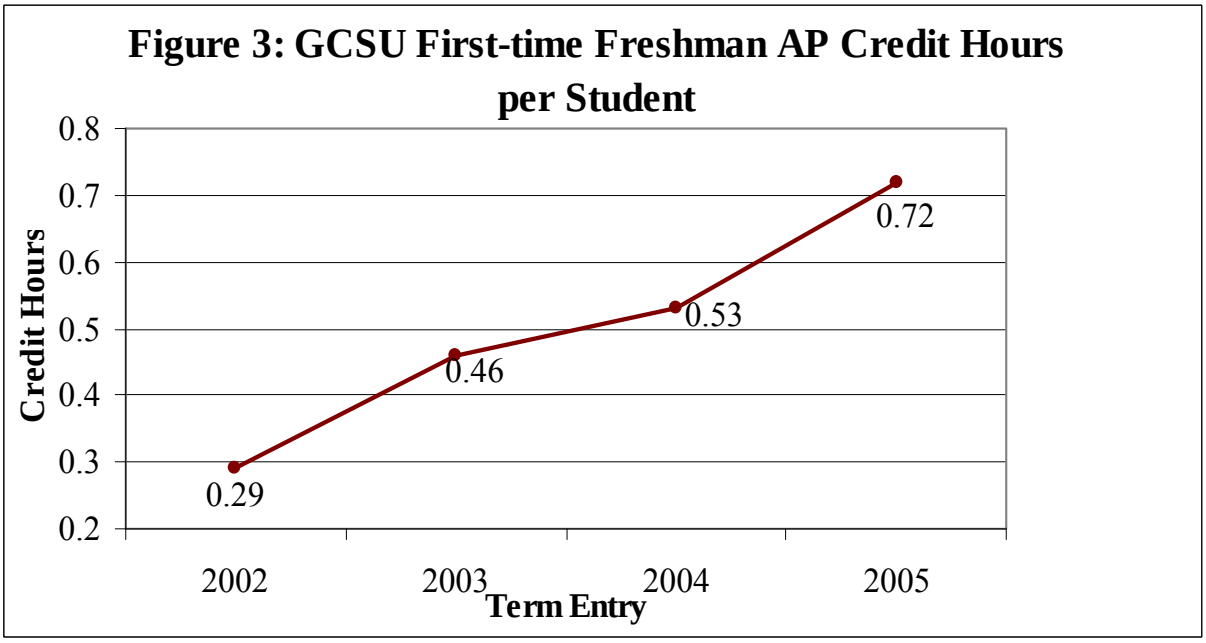
A. Summary Statistics

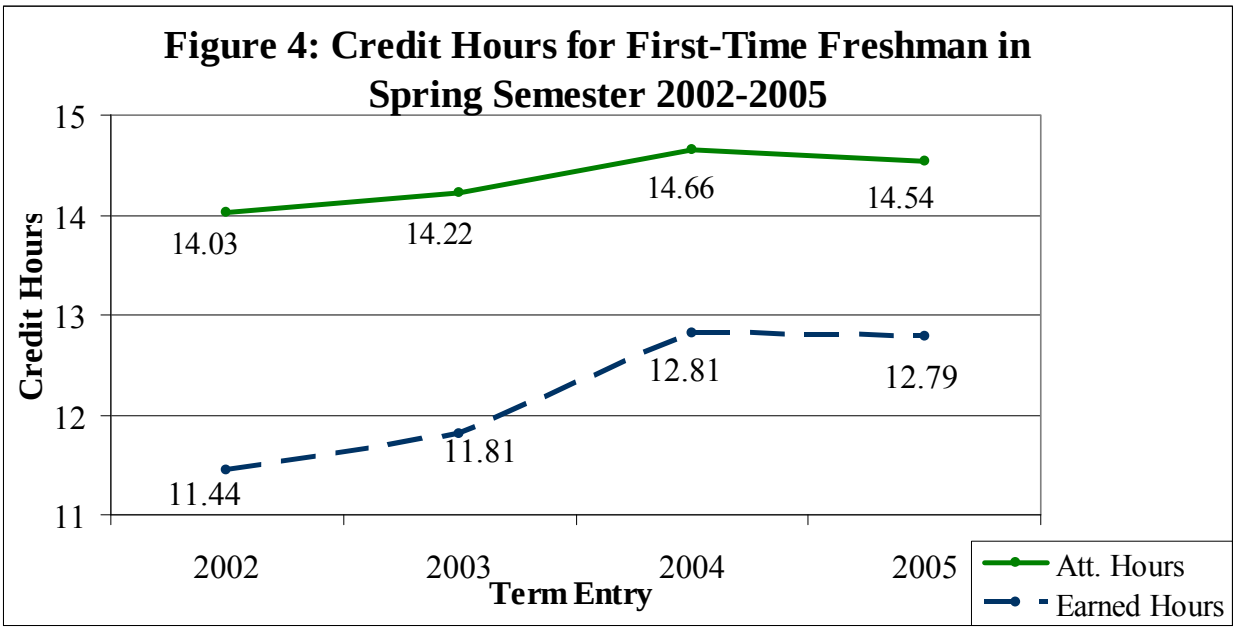
This paper measures the course-taking effects of the HOPE spring checkpoint using administrative data on first-time GCSU freshmen from 2002-2005. Attempted credit hours represent initial course loads for first-time freshmen. Earned credit hours represent courses where a student receives a grade other than a failure or withdrawal. The difference between attempted and earned credit hours represents withdrawn or failed courses. Since the checkpoint follows the spring semester, the research is focused on data from the spring term because students have a more direct incentive to alter course-taking to maintain HOPE eligibility than in other terms. The regression results from other terms are discussed in Section IV and Appendix I.

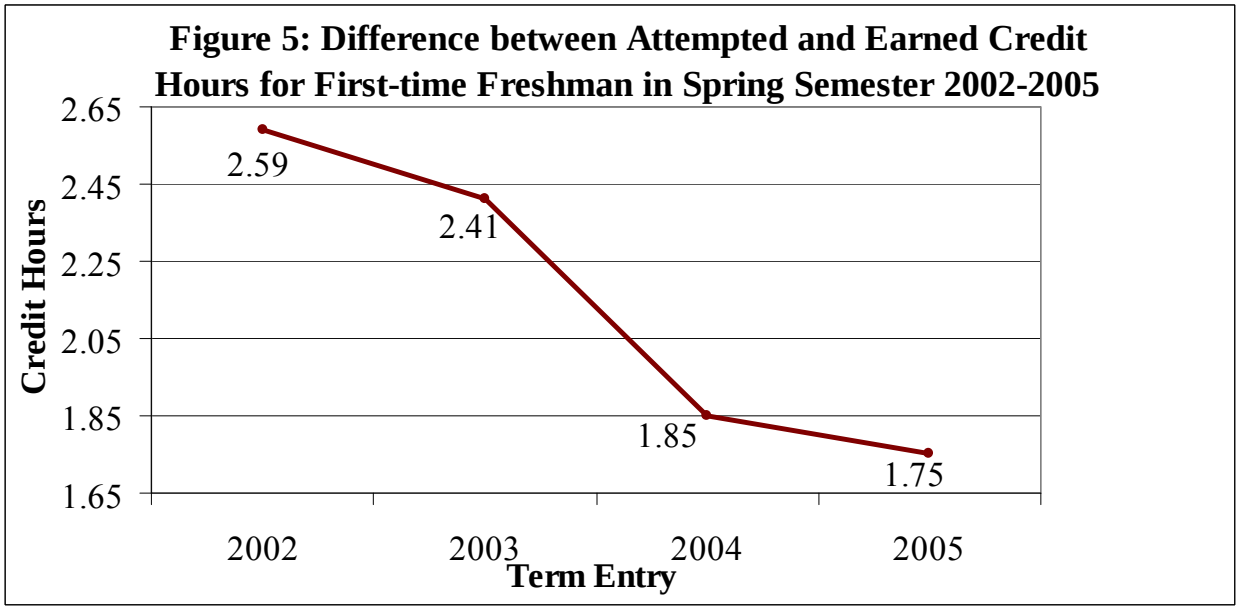
GCSU is a midsize public liberal arts university in Milledgeville, Georgia with more than 5,100 undergraduate and 1,000 graduate students. From 2002-2005, the school matriculated between 950 and 1050 first-time freshmen each fall term. 97 percent of its students are Georgia residents. In 1996, GCSU was designated as "Georgia's Public Liberal Arts University." Since this designation, the State of Georgia has granted millions of dollars for new facilities and smaller class sizes. These changes have improved student quality as GCSU draws students from all areas of Georgia. The percentage of first-time freshmen with the HOPE Scholarship increased from 73.4% to 93.6% between 1995 and 2004. Between fall 1995 and 2005, SAT scores of entering freshman increased from 967 to 1,116. Between 2002 and 2005, SAT scores, AP credit hours, and high school GPA increased steadily as a reflection of this trend. SAT scores increased

by 57 points, AP credit hours increased by 0.43 credit hours, and high school GPA increased by 0.11 points over that period of time (Figures 2 and 3). These three indicators point to large and consistent gains in student quality at GCSU between 2002 and 2005.









As shown in Figure 4, GCSU students attempted and earned more credit hours each year between 2002 and 2004. This increase in academic progress is expected as the credentials of incoming students steadily increased. However, Figure 4 also shows a course-taking adjustment in the second year of the spring checkpoint. First-time freshmen increased attempted credit hours

from 14.03 to 14.22 between 2002 and 2003. Attempted credit hours increased by 0.44 the following year, which was the first year of the spring checkpoint. First-time freshmen in 2005 then decreased attempted hours by 0.12 credit hours. The decrease in attempted credit hours occurred despite SAT scores increasing by 15 points, high school GPAs increasing by .07 points, and AP hours increasing by 0.19 credit hours between 2004 and 2005. Attempted hours should have increased in conjunction with measured student quality gains unless another factor like the spring checkpoint or other institutional changes altered behavior.

The trend for earned credit hours also demonstrated a similar pattern in the spring semester. Between 2002 and 2003, first-time freshmen increased earned hours by 0.37 credit hours. In the following year, earned credit hours jumped by 1.00 credit hours, which was the first year of the checkpoint. Freshmen decreased earned hours by 0.02 between 2004 and 2005. Since this decrease is smaller than the decrease in attempted credit hours, the change was due to smaller initial course loads in the spring semester instead of the spring checkpoint.

Another important trend in the summary statistics is the difference between attempted and earned credit hours as seen in Figure 5. This value represents credit hours where students either withdrew or failed courses. Since measured first-time freshmen quality increased from year to year, it may be assumed that the number of failed credit hours also decreased year to year. As a result, the difference should narrow if course withdrawal rates do not change between years. Between 2002 and 2005, the difference decreased from 2.59 to 1.75 credit hours in the spring semester. In the second year of the spring checkpoint, the difference between earned and attempted credit hours decreased by 0.10 credit hours in comparison to the previous year. The smaller decrease in earned hours for freshmen who entered in 2005 indicates that the spring checkpoint may have had a larger impact on initial course loads than on course withdrawals.

IV. EMPIRICAL MODEL

A. Model Description

The summary statistics indicate a decrease in spring semester course loads for first-time freshmen in the second year of the checkpoint. Course withdrawals do not appear to have increased appreciably in conjunction with the checkpoint. Though this trend is evidence of the impact of the spring checkpoint, multiple regression analysis is needed to compare first-time freshmen with identical characteristics from year-to-year. Using a multiple regression framework will allow a more careful isolation of the impact of the spring checkpoint on course taking by controlling for high school achievement, home location, race, and sex.

The GCSU data on first-time freshmen from 2002-2005 provides two years of data before and 2 years of data after the spring checkpoint's implementation in 2004. The empirical models below represent the regressions used to estimate the effects of the spring checkpoint on attempted credit hours (H_A) and earned credit hours (H_E). Attempted credit hours are the dependent variable to indicate a first-time freshman's initial course load in the spring semester. Earned credit hours are the dependent variable used to demonstrate student course completion. The empirical models estimated in this paper are:[8]

$$(1)\ H_A = \beta_0 + \beta_1 SAT_i + \beta_2 AP_i + \beta_3 HS_i + \beta_4 MA_i + \beta_5 NW_i + \beta_6 FM_i + \beta_7 TE_{03} + \beta_8 TE_{04} + \beta_9 TE_{05} + \epsilon_1$$

$$(2)\ H_E = \alpha_0 + \alpha_1 SAT_i + \alpha_3 AP_i + \alpha_2 HS_i + \alpha_4 MA_i + \alpha_5 NW_i + \alpha_6 FM_i + \alpha_7 TE_{03} + \alpha_8 TE_{04} + \alpha_9 TE_{05} + \epsilon_2$$

The dependent variables attempted credit hours (H_A) and earned credit hours (H_E) were regressed on SAT scores (SAT), Advanced Placement credit hours (AP), high school GPA (HS), an indicator variable for students from Metro Atlanta (MA), a indicator variable that denotes if a

[8] Variable definitions are listed in Table 1.

student is nonwhite (NW), an indicator variable that denotes if a student is female (FM), and indicator variables for term entries 2003, 2004, and 2005 (TE_{03}, TE_{04}, TE_{05}).

SAT, high school GPA, and AP hours were included to control for incoming freshmen quality. The Metro Atlanta indicator variable was included because students from the twenty counties in Metro Atlanta may have different course-taking behaviors than their counterparts elsewhere in the state. These differences may include unmeasured peer effects such as networking and/or better quality k-12 school systems.[9] The nonwhite indicator variable includes American Indian, Asian, African-American, Hispanic, and Multiracial students. These students were measured in the same variable because there is a small percentage of each group in the GCSU student body.[10] The female variable was included to control for course-taking differences between sexes. Concerning race and sex, Betts and Morell (1998) find these demographic characteristics to be correlated with university GPA. These traits may also be correlated with course-taking behavior.

The dummy variables for first-time freshmen in 2003, 2004, and 2005 measure any course-taking changes that result from unmeasured student quality variation between years, changes in GCSU policy, and the institution of the spring checkpoint. The base year for these indicator variables is 2002. If there were no incentive changes due to GCSU policy changes or the spring checkpoint, then all of these coefficients should be positive due to increases in measured student quality. Additionally, increases in measured student quality in terms of SAT scores, AP credit hours, and high school GPA probably have correlated with increases in unmeasured student quality. Any decrease in the coefficients on the fiscal year indicator

[9] The percentage of first-time freshmen from Metro Atlanta increased from 43 to 56 percentage points from 2002 to 2005.
[10] Roughly 10 percent of GCSU first-time freshmen each year fall are nonwhite.

variables would suggest that it is possible that the spring checkpoint led to a decline in attempted and earned credit hours.

Table 1: Variable Definitions	
Attempted Hrs (H_A)	Credit hours attempted in a semester
Earned Hrs (H_E)*	Credit hours earned in a semester
SAT Score (SAT_i)	Composite Math and Verbal score. ACT scores were converted to equivalent SAT scores
AP Hrs (AP_i)	The number of Advanced Placement credit hours a student earns in high school
HS GPA (his)	High School Grade Point Average based on a 4.0 scale
Metro Atlanta (MA_i)	=1 if student comes from one of the twenty counties that the Atlanta Regional Commission considers the Metro Atlanta
Nonwhite(NW_i)	=1 if student is not Caucasian, 0 if otherwise
Female ($FM_{i)}$	=1 if student is female, 0 otherwise
FTF fall 2003 (TE_{2003})	=1 if a First-time Freshman who entered GCSU in fall 2003
FTF fall 2004 (TE_{2004})	=1 if a First-time Freshman who entered GCSU in fall 2004
FTF fall 2005 (TE_{2005})	=1 if a First-time Freshman who entered GCSU in fall 2005

*The credit hours from courses a student attempts are not counted as earned hours (H_E) if the student fails or withdraws from the course.

Table 2: Summary Statistics for First-time Freshmen in Spring Semester between 2002-2005*

	Mean	Std. Deviation	Minimum	Maximum
Attempted Hrs	14.37	1.76	3	20
Earned Hrs	12.24	3.83	0	20
SAT	1088	99.37	690	1500
AP Hrs	0.51	1.90	0	28
HS GPA	3.20	0.44	2	4
Metro Atlanta	0.50	0.50	0	1
Nonwhite	0.10	0.30	0	1
Female	0.62	0.49	0	1
FTF fall 2003	0.26	0.44	0	1
FTF fall 2004	0.24	0.43	0	1
FTF fall 2005	0.28	0.45	0	1

*Includes first-time freshmen who enrolled in more than 2 credit hours in the spring term of their first year in college after graduating from high school in the spring of the prior year. The sample size is 3577 students.

Table 3: Variable Mean Values from First-time Freshman by Term Entry (2002-2005) in Spring Semester.

	2002	2003	2004	2005
Attempted Hours	14.03	14.22	14.66	14.54
Earned Hours	11.44	11.81	12.81	12.79
SAT	1056	1081	1098	1113
AP Credit Hours	0.29	0.46	0.53	0.72
HS GPA	3.15	3.18	3.19	3.26
Metro Atlanta	0.43	0.45	0.55	0.56
Nonwhite	0.09	0.09	0.09	0.11
Female	0.63	0.60	0.63	0.61

Table 2 displays the summary statistics for each variable in the regression equation. Table 3 compares the mean values of each variable from year to year between 2002 and 2005. Attempted and earned credit hours increase between 2002 and 2004 but decrease in 2005. The mean values for SAT, AP credit hours, and high school GPA increased in each year, which demonstrate the consistent student quality gains. There was a 13 percentage point increase in Metro Atlanta students between 2002 and 2005. The percentage of nonwhite and female students remained somewhat constant over this period.

The regression included all students regardless of their GPA in the fall semester. The proximity of a freshman's GPA to 3.0 in the fall semester probably correlates with his/her responsiveness to the spring checkpoint. In other words, a student with a GPA well above or below 3.0 will not have a strong incentive to alter course-taking to maintain HOPE eligibility due to the spring checkpoint. To look at this effect, first-time freshmen were divided into three subgroups: fall semester GPA <2.7; GPA 2.7-3.3; and GPA >3.3. Cornwell, Lee, and Mustard (2005a) also used this method to estimate course-taking behavior for first-time freshmen at

UGA. However, these subgroups had insignificant results for many of the coefficient values due to the small sample size.[11]

B. Attempted Hours Regression Results

SAT Score, AP Credit Hours, and High School GPA variables should have positive signs because student quality likely has a positive relationship with attempted and completed credit hours in a semester. The Metro Atlanta indicator variable should also have a positive sign because students in the Atlanta area may have greater peer networking and better k-12 school system quality that encourage larger course enrollment in comparison with other students. As for the coefficient for the term entry dummy variables, the signs should be positive in each term due to increases in unmeasured student quality without factoring in the spring checkpoint. If measured student quality is increasing via higher SAT scores, AP credit hours, and GPA, then unmeasured student quality is expected to be increasing as well. Unique GCSU characteristics and the time needed for students to learn how to maximize retention may explain why a decrease in credit hours is not expected in 2004, which is the first year of the checkpoint. These issues are discussed in appendix II.

[11] Data from all University System of Georgia institutions would increase the sample size and allow regression analysis with GPA divisions.

Table 4: Attempted Credit Hours for First-time Freshman in Spring Semester

	Coefficient	Std. Error	P-value		
SAT	0.003	0.000	0.000	N	3577
AP Credit Hours	0.041	0.016	0.011	F(9, 3499)	33.73
High School GPA	0.275	0.071	0.000	Prob > F	0.000
Metro Atlanta	0.280	0.058	0.000	R-squared	0.078
Nonwhite	0.168	0.097	0.082		
Female	0.416	0.062	0.000		
FTF fall 2003	0.095	0.082	0.248		
FTF fall 2004	0.465	0.085	0.000		
FTF fall 2005	0.259	0.083	0.002		
Constant	9.866	0.373	0.000		

Table 4 includes the regression results with attempted credit hours as the dependent variable. For the most part, the regression results are consistent with the summary statistics listed in Figure 4. The coefficient on SAT was 0.003 and statistically significant ($p< .01$). A 100-point increase in SAT score correlates with a 0.3 increase in attempted credit hours. The AP Credit Hours coefficient was 0.041 and statistically significant ($p< 0.02$). A 1-credit hour increase in AP credit correlates with a 0.04 increase in attempted hours. The High School GPA coefficient was significant ($p< 0.01$) and suggests that a 0.2-point increase in GPA is associated with a 0.06 increase in attempted hours. As a whole, student quality appears to have a moderate effect on initial course loads for first-time freshman in the spring semester.

The coefficient on the Metro Atlanta dummy had a value of 0.28 that was statistically significant ($p< 0.01$). Thus, students from Metro Atlanta enroll in 0.28 more credit hours than students with similar credentials from other parts of the state. The Nonwhite dummy variable coefficient was 0.168 ($p< 0.10$). This coefficient estimate indicates that nonwhite freshmen enroll in 0.168 more credit hours in the spring semester than white students all else constant. The estimated coefficient on Female was 0.416 ($p<.01$). This estimate suggests that female freshmen enroll in 0.416 more credit hours than male freshmen in the spring semester, all else equal.

The results for the term entry dummy variables were consistent with the summary statistics. The coefficient on the FTF fall 2003 dummy was 0.10, but the result was not statistically significant. Thus, it appears the increase in first-time freshmen course loads between 2002 and 2003 can be attributed to changes in observable factors such as increased student credentials. However, first-time freshmen in 2004 increased attempted credit hours by 0.465 credit hours ($p<.01$) relative to 2002. As mentioned earlier in the paper, 2004 was the first year of the spring checkpoint. Various unique GCSU characteristics such as advising changes, an unexpected early matriculation deadline, and an on-campus residency requirement may have led to increased course loads. These factors are explained in detail in Appendix II. Additionally, students may not have recognized the best course-taking behavior to maximize HOPE retention in the first year of the new policy. Instead, they may have increased credit hours in the first year because the checkpoint eliminated the incentive to enroll in fewer than 30 credit hours.

In the second year of the checkpoint (2005), first-time freshmen attempted 0.259 more credit hours than students in 2002, all else being equal. This estimated coefficient suggests a decrease in attempted credit hours between 2004 and 2005. Thus, these results imply that of two students with identical high school credentials and demographic characteristics, the student who matriculated in 2005 had fewer attempted hours in the spring semester than the identical student who matriculated in 2004.

C. Earned Credit Hours Regression Results

The earned credit hours regression is used to analyze course completion before and after the spring checkpoint while controlling for incoming student quality, home location, race, and sex. Table 5 shows the regression results for first-time freshmen in the spring semester with

earned credit hours as the dependent variable regressed on the same independent variables as attempted credit hours.

Table 5: Earned Hours for First-time Freshman in Spring Semester

	Coefficient	Std. Error	P-value		
SAT	0.004	0.001	0.000	N	3577
AP Credit Hours	0.079	0.034	0.018	F(9, 3499)	78.17
High School GPA	2.485	0.146	0.000	Prob > F	0.000
Metro Atlanta	0.951	0.120	0.000	R-squared	0.165
Nonwhite	-0.358	0.199	0.071		
Female	0.740	0.128	0.000		
FTF fall 2003	0.173	0.169	0.308		
FTF fall 2004	0.982	0.174	0.000		
FTF fall 2005	0.707	0.171	0.000		
Constant	-1.120	0.767	-0.144		

As seen in the attempted credit hours regression, the coefficient for SAT scores was 0.004 and statistically significant ($p< 0.01$). A 100-point increase in SAT score correlates with a 0.4 increase in completed credit hours. The AP Credit Hours coefficient was 0.08 and significant ($p< 0.05$). A 1-credit hour increase in AP credit is related to a 0.08 increase in earned credit hours. The High School GPA dummy coefficient was 2.49 ($p< 0.01$). In other words, a 0.2-point high school GPA increase results in a 0.5 increase in course completion with all else being held constant. This large correlation is probably because a student's GPA demonstrates his/her determination and hard work throughout high school. Conversely, AP and SAT scores focus on a student's test-taking ability. Good test-takers may not have the perseverance of students with high GPAs to stay in difficult courses that push them to complete courses.

The coefficient on the Metro Atlanta dummy variable was 0.951 ($p< 0.01$). First-time freshmen from Metro Atlanta earned 0.951 more credit hours in the spring semester than students from other areas of the state with similar credentials. This coefficient is 0.671 greater

than the Metro Atlanta coefficient for attempted credit hours. Consequently, it appears that unmeasurable student quality differences between Metro Atlanta and other students relate more strongly with course completion than with course enrollment.

The Nonwhite indicator variable coefficient was -0.36 ($p< 0.10$). This coefficient estimate suggests that nonwhite first-time freshmen complete 0.36 fewer courses than white freshmen. Nonwhite students attempted 0.17 more credit hours but completed 0.358 fewer credit hours than white students with similar credentials. This trend suggests that nonwhite students may adjust course-taking through course withdrawal rather than decreasing initial course loads.

The Female variable coefficient was 0.74 ($p< 0.01$). Female freshmen complete 0.74 more credit hours than male students with similar credentials. This value is 0.32 greater than the female dummy coefficient for attempted credit hours. This pattern indicates that the difference in unmeasurable sex characteristics may have greater correlation with course completion than course enrollment.

The results from the term entry dummies indicate similar trends in the spring semester for earned credit hours in comparison with attempted hours. The coefficient on the FTF 2003 dummy variable was 0.17 but statistically insignificant. This value points to the idea that first-time freshmen in 2002 and 2003 may not have had any incentive changes between years. The estimated coefficient for first-time freshmen in fall 2004 was 0.98 ($p< 0.01$). This increase in earned credit hours in the first year of the spring checkpoint coincided with the advising changes, on-campus residency requirement, and unexpected early matriculation deadline mentioned in Appendix II. The increase in earned credit hours is more than double the size of the attempted credit hour increase in 2004. As a result, it appears that these unique GCSU characteristics had a larger impact on course completion than initial course loads in the spring semester.

In the second year of the spring checkpoint, the FTF fall 2005 dummy variable coefficient was 0.71 and statistically significant ($p< 0.01$). This value is 0.17 less than the first-time freshmen coefficient in 2004. This decrease represents freshmen adjustments to course-taking due to the spring checkpoint, changes in GCSU policies, and unmeasured student quality variations. Since measurable first-time freshmen quality increased from fall 2004 to fall 2005, unmeasured student quality likely increased as well. In addition, GCSU did not institute any policies for the spring semester 2006 that seem to impact course-taking. Thus, the coefficient value decrease is probably a good representation of decreased earned hours due to the spring checkpoint.

The difference between attempted and earned credit hours represents credit hours where a freshman either withdrew or failed.[12] Since the number of course failures is expected to decrease as student quality increases, a small narrowing of the gap should be observed if the checkpoint did not affect course withdrawal rates. In the summary statistics, the difference between attempted and earned hours decreased by 0.10 from first-time freshmen in 2004 to 2005. The regression results demonstrated a different pattern in that earned credit hours decreased by 0.06 more than attempted credit hours. This small widening of the gap between attempted and earned credit hours may indicate that students responded to the spring checkpoint by slightly increasing course withdrawals. However, this change is much smaller than the 0.21 decrease in attempted hours, so the largest effect of the spring checkpoint appears to be decreased initial course loads.

[12] The values for attempted and earned credit hours are found by subtracting the estimated coefficient for the first-time freshmen indicator variable in 2005 from the indicator variable coefficient in 2004.

D. Other Term Regression Results

The above results indicate the presence of a statistically significant decrease in first-time freshmen course enrollment in the spring semester following spring checkpoint implementation. The regressions from the fall semester may provide further insight into whether or not the course load decreases occurred in all terms or the spring term alone. Tables A1 and A2 in Appendix I show the regression results for first-time freshmen in the fall term. The coefficient on the term entry variables for attempted credit hours increased slightly in each year, but the results were insignificant. In the second year of the checkpoint, the coefficient value increased by 0.01 relative to 2004. This pattern may be due to improved freshmen quality, procrastination of course-taking adjustments until the deadline in the spring, and a lack of registration flexibility among freshmen in their first term. Freshmen may not adjust course-taking in the fall semester because HOPE evaluation does not follow that term. The inflexibility of course adjustment may be a result of an early registration program for incoming GCSU freshmen, POUNCE, which means "Pre-Orientation Undergraduate Course Enrollment." This program allows admitted incoming freshmen to register for courses in the spring semester of their senior year of high school. Students are given courses based on their major and have little choice without advisor approval concerning the bundle of courses they wish to take in the fall term. Additionally, parents probably have more influence on their students' course load in the first semester than other semester. Students also may not understand how to change their course schedule online in the first week of the semester. These barriers to changes in course enrollment may encourage course withdrawal.

The earned credit hour regressions in the fall term reflect this hypothesis. First-time freshmen in fall 2005 decreased earned credit hours by 0.10 credit hours relative to 2004 ($p<$

0.01). This decrease followed statistically significant increases of 0.36 and 0.25 in the two earlier years based on 2002. Due to barriers in initial course load adjustment, freshmen may have increased course withdrawals to maximize scholarship retention. However, when enrolling in courses for subsequent terms, they had more experience and freedom in course enrollment. They may have reduced course loads in the spring rather than withdrawing from difficult courses, which is consistent with the regression results from the spring term.

Another effect of the spring checkpoint may be an increase in summer course enrollment to compensate for course reductions in other terms. Cornwell, Mustard, and Lee (2005b) found the HOPE Scholarship increased summer course enrollment at the University of Georgia. However, the results for GCSU summer course enrollment and completion showed no pattern and were not statistically significant, perhaps due to the small sample size.

Another way to determine the strength of the spring checkpoint's incentive effects is to look at regressions from students in their second-year of college. Second-year students may have the same HOPE retention incentives as first-time freshmen if they have a GPA close to 3.0. Students with GPAs well above or well below 3.0 may not alter course-taking for HOPE retention because their overall GPA probably will not change enough to affect eligibility. However, the regression results decreased the sample size from 3509 to 2030 students and had insignificant results for the FTF fall dummy variables.

E. Overall Trends

The presence of course-taking adjustment in the second year of the spring checkpoint is consistent with the expected outcome that students adjust behavior to maximize scholarship retention. Initially, students may not have understood fully the incentive to alter course-taking to

accomplish this goal. As a result, they may have enrolled in more courses in response to the removal of the direct incentive to enroll in fewer than 30 credit hours. An in depth discussion of this change and other factors that may have led to the increase in attempted and earned credit hours between 2003 to 2004 can be found in Appendix II. By the second year of the new policy, students may have learned that enrolling in fewer courses and withdrawing from difficult courses in the spring semester increases their chances of HOPE retention.

A decrease in attempted and earned credit hours in the spring semester does not guarantee that the spring checkpoint was the sole motivator. The presence of a ceiling effect on attempted and earned hours as measurable student quality increased may have led to the credit hour decreases. Student quality improvements may have diminishing increases in attempted and earned hours because most students will not enroll in more than 16 credit hours in a given semester. 16 credit hours is a common course load for first-year students who enroll in more than the minimum 12 credit hours to attain a full load because many students have a 4-credit hour math or science course. Between 2003 and 2004, there was a 9 percentage point decrease in the amount of students with more than 15 credit hours while average attempted and earned hours increased. Thus, the average increase in attempted credit hours is probably due to freshmen increasing their initial course load from 12 to 15 or 16 credit hours. The curbing of increased attempted and earned hours could be partially due to students not being willing to increase course loads beyond 15 or 16 credit hours.

Another factor that may have influenced the decrease in initial course loads may be a regression back to the mean. The decrease in credit hours in 2005 followed large gains in 2004. As a result, the unique institutional factors in 2004 such as advising changes, early matriculation deadline, and the on-campus residency requirement explained in Appendix II may have resulted

in short-term increases in credit hours. Thus, the decrease in attempted and earned hours may have represented simply a return to average course loads. Student data for a longer period of time and for other institutions are needed to provide better evidence regarding any changes in course-taking resulting from the spring checkpoint. Given the caveats just listed, the results in this paper are best interpreted as suggestive that the spring HOPE checkpoint reduced attempted and earned credit hours.

Three important statistically significant patterns can be inferred from the regression results in the spring semester for first-time freshmen. Primarily, first-time freshmen decreased initial course enrollment and increased course withdrawals in the second year of the spring checkpoint despite an increase in measurable student quality. The decrease in attempted credit hours is much greater than the decrease in course completion. Second, Metro Atlanta and female first-time freshmen tend to enroll in and complete more courses in the spring semester than other students with similar credentials. Third, of the three indicators of incoming student quality, high school GPA appears to have the strongest correlation with college course completion.

V. CONCLUSION

A. Summary Remarks

Since 1993, Georgia's HOPE Scholarship has provided free tuition to more than one million Georgia students who graduated from high school with a "B" average. It has increased enrollment at Georgia universities and increased the quality of students attending those institutions. The scholarship has also encouraged slower academic progress because students adjust course-taking to maximize scholarship retention. Several studies by Cornwell, Mustard, and colleagues used data from University of Georgia students to find decreased course loads and

increased course withdrawals for HOPE eligible students in comparison with out-of-state students with similar credentials. Based on this trend and the need to save HOPE funding, the General Assembly instituted a mandatory spring checkpoint in 2004 to increase the frequency of eligibility evaluation from every 30 credit hours. Under the previous system, students had the incentive to enroll in fewer than 30 credit hours in their first year to postpone evaluation. This paper has analyzed the impact of the spring checkpoint on course-taking at Georgia College & State University.

In the second year of the spring checkpoint, the regression results demonstrated a decrease in attempted credit hours by 0.21 and earned credit hours by 0.27 in the spring semester for first-time freshmen. The decrease in earned credit hours resulted from decreased initial course loads and increased course withdrawals. Earned credit hours decreased 0.06 more than attempted credit hours, so freshmen increased course withdrawals slightly due to the checkpoint.

Another characteristic of the data was that students increased course loads in the first year of the checkpoint. This trend may be due to GCSU-specific changes in advisement, an unexpected early matriculation deadline, a freshmen on-campus residency requirement, and a lack of student experience in adjusting course-taking to maximize retention under the checkpoint. These factors are explained in Appendix II. By the second year, however, students may have learned to decrease course enrollment and completion in the spring semester to increase the chances of HOPE retention. Freshmen do not appear to have increased enrollment in other semesters to compensate for the decrease because attempted and earned hours did not have statistically significant increases during summer and fall terms. Regressions for second-year students also had insignificant results, perhaps due to the smaller sample size.

B. Policy Implications

The decrease in course loads and slight increase in course withdrawals for first-time freshmen in the spring semester indicates that the spring checkpoint may lead to slower academic progress. Without a time limit on the HOPE Scholarship, lottery and state funding bears the burden of students needing more time to graduate. Consequently, the General Assembly must seek new restrictions if there is a policy objective to increase academic progress under the HOPE Scholarship.

1. Three-Course Withdrawal Limit

A three-course withdrawal limit will decrease the incentive to withdraw from difficult courses to maintain HOPE eligibility. When a student withdraws from a course, HOPE and state funding still pay for the course and will also pay for the additional course needed to make it up. Additionally, universities must provide extra classrooms and instructors for course sections needed to compensate for expected withdrawals. Although the student bears the opportunity cost of not working for the extra time he/she needs to complete additional courses, the incentive to graduate in less time is decreased. Thus, HOPE and state funds bear most of the cost of course withdrawals. This policy will shift some of the burden of slow academic progress to the student and lower costs for the University System of Georgia.

2. Time Limit on HOPE Eligibility

To curb the costly trend of decreased course enrollment and completion, the State of Georgia should explore the possibility of time constraints for eligibility to give students an incentive to graduate is less time. Last fall, the General Assembly passed the "Fixed for Four" legislation that held tuition steady at state universities for four years. After four years pass, a student's tuition will jump to the tuition for first-time freshmen in his/her fifth year. This tuition

hike after four years was created to increase academic progress at Georgia universities. However, in February 2007, the Board of Regents postponed the "Fixed for Four" legislation. As a result, students have no long-run incentive to increase course loads.

In 2001, the Education Commission of the States released a report summarizing the thirteen state-sponsored merit scholarship programs in the United States. Eight of the programs place a time limit on eligibility.[13] Further merit scholarship research could compare academic progress differences between states with credit hour limits and others with time limits. Strict time limits will disadvantage part-time students who seek their degree over an extended period of time. Georgia should investigate how states with time limits offer exceptions for part-time students. Regardless of research results, Georgia should pursue a way to increase academic progress at Georgia universities.

C. Further Research Possibilities

This paper adds to the body of research on the incentive effects of merit-based scholarships. The results indicate that first-time freshmen may have decreased course loads and slightly increased course withdrawals during the spring semester of spring checkpoint's second year despite consistent increases in student quality. Though the above results point to the spring checkpoint as a motivation for this behavior, further research should clarify the intensity and source of these changes.

One method for further research is to obtain first-time freshmen data from the 2006-2007 academic year at GCSU. The additional year's data would show course-taking in the third year of the checkpoint. It may also give insight into whether the decrease in attempted and earned

[13] "ECS State Notes." *Education Commission of the States*. July 2001. <http://www.ecs.org/clearinghouse/27/11/2711.pdf>. Last accessed: 4 April 2007

credit hours is a one-year aberration following large gains in attempted and earned credit hours in the 2004-2005 academic year. One problem with this method is the General Assembly's institution of "Fixed for Four" for first-time freshmen in 2006 at Georgia universities. This policy holds tuition constant for 4 years but then allows a large increase in the fifth year. It may give students the incentive to attempt and earn more credit hours. In February 2007, the Board of Regents postponed implementation.[14] However, the change occurred during the spring term, so students still had the incentive to increase academic progress during registration. This added incentive may bias estimates of the spring checkpoint's effect on course-taking for first-time freshmen in 2006.

To avoid the bias created by the "Fixed for Four," further research could use data from the entire University System of Georgia. Along with a small sample size, GCSU also has unique campus qualities such as a small minority and out-of-state student populations, an on-campus residency requirement, and limited major choices. The population of students at the 35 state universities would allow research on the actual impact of the spring checkpoint on course-taking. With a larger amount of out-of-state students, a study would be able to use a difference-in-difference method comparing in-state and out-of-state students before and after the policy change. In-state students have a HOPE retention incentive while out-of-state students do not have that course-taking incentive. This technique will allow a better inference as to whether the course-taking changes are due to HOPE incentives or changes in general student behavior. Out-of-state students will respond to any institution-specific changes like early matriculation deadlines and advisement changes without being affected by HOPE course-taking incentives.

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[14] Treiguts, Edgar. "Wednesday News Headlines." *Georgia Public Broadcasting.* 14 February 2007. <http://www.gpb.org/public/radio/news/shows.jsp?episid=5402&catid=1100>. Last accessed: 4 April 2007.

APPENDICES

Appendix I: First-time Freshmen Fall Semester Regression Results

Table A1 and A2 show the regressions for attempted and earned credit hours in the fall semester for first time freshmen. The effect of the spring checkpoint is expected to be smaller in the fall semester. Students cannot lose HOPE eligibility in their first semester, so they do not have the immediate incentive to alter course-taking. If students were not myopic, they would have an equal incentive to enroll in and complete fewer credit hours in both semesters. Smaller expected changes in fall course-taking may also be a result of inexperience. Students learn about their college performance after first semester grades and may adjust course-taking based on that knowledge.

Table A1: Attempted Credit Hours for First-time Freshman in Fall Semester

	Coefficient	Std. Error	P-value		
SAT	0.002	0.000	0.000	N	3806
AP Hours	0.014	0.013	0.279	F(9, 3499)	12.03
High School GPA	0.045	0.054	0.404	Prob > F	0.000
Metro Atlanta	0.140	0.044	0.002	R-squared	0.028
Nonwhite	-0.019	0.074	0.798		
Female	0.175	0.047	0.000		
FTF fall 2003	0.058	0.063	0.356		
FTF fall 2004	0.086	0.065	0.183		
FTF fall 2005	0.101	0.063	0.112		
Constant	12.095	0.285	0.000		

Table A2: Earned Credit Hours for First-time Freshman in Fall Semester

	Coefficient	Std. Error	P-value		
SAT Composite	0.004	0.001	0.000	N	3806
AP Hours	0.058	0.031	0.061	F(9, 3499)	73.38
High School GPA	2.206	0.130	0.000	Prob > F	0.000
Metro Atlanta	0.711	0.107	0.000	R-squared	0.148
Nonwhite	-0.590	0.178	0.001		
Female	0.509	0.114	0.000		
FTF fall 2003	0.356	0.150	0.018		
FTF fall 2004	0.613	0.155	0.000		
FTF fall 2005	0.509	0.152	0.001		
Constant	-0.152	0.684	0.824		

The results from Table A1 for attempted hours show positive signs on the coefficients for SAT Composite, AP Hours, and High School GPA variables. The year-to-year indicator variable results show gradual increases in attempted hours in each year from 0.058 in 2003 to 0.101 in 2005. Each of these coefficients was statistically insignificant. As a result, it appears that the spring checkpoint did not significantly alter initial course loads in the first semester for first-time freshmen. This trend could be the result of the early enrollment POUNCE program, which is described in the Other Term Regression Results portion of Section IV. In this program, students have less control over course schedules without advisor approval and less experience in schedule changes. Additionally, parents may have more control over first semester course enrollment than later semesters.

The earned credit hours regressions in Table A2 demonstrated stronger trends than attempted hours. The coefficient signs remained the same with each variable. For the term entry dummy variables, the regression results showed a pattern similar to earned credit hours in the spring semester. The coefficient on the FTF fall 2003 variable was 0.356 and was statistically significant ($p< 0.05$). The coefficient estimate for first-time freshmen in 2004 was 0.613 ($p< 0.01$). First-time freshmen appear to have increased earned credit hours steadily from 2002 to

2004, which was the first year of the spring checkpoint. However, first-time freshmen in 2005 earned 0.1 credit hours less than in 2004, all else equal ($p < 0.01$).

Attempted and earned credit hours in the fall semester did not have uncharacteristic gains from 2003 to 2004 as occurred during the spring semester. In the spring, first-time freshmen between 2003 and 2004 increased attempted and earned credit hours considerably in comparison to 2002 and 2003. This increase may have been due to various institutional effects such as advising changes in response to the checkpoint, an unexpected early matriculation deadline for admitted students, and a new on-campus residency requirement. Appendix II explains these events in greater detail. The intensity of these factors appears to be focused in the spring semester for first-time freshmen.

Comparing the difference in attempted and earned credit hours, attempted hours increased by 0.01 while earned hours decreased by 0.10 credit hours. This decrease in course completion indicates that freshmen may have adjusted course-taking in the fall semester by withdrawing from difficult courses rather than enrolling in fewer courses. Students may have had less flexibility in choosing courses because of early enrollment, strict advising, and little experience in course-taking. As a result, they may have been forced to adjust for the checkpoint by withdrawing from courses instead of enrolling for fewer courses. When registering for spring courses, they decreased their course load to avoid course withdrawals in the spring.

Appendix II: Explanation of the Credit Hour Increases from 2003 to 2004

Several policy and incentive changes specific to GCSU may explain the large increase in attempted and earned credit hours between 2003 and 2004. GCSU instituted an on-campus residency requirement for all incoming freshman with less than 12 transfer hours in fall 2004. Students can apply for exceptions if they are Pell eligible and live in their legal guardian's permanent residence in a surrounding county. To ensure enough beds in the residence halls, GCSU also capped enrollment to about 900 students. This cap decreased first-year student enrollment by 99 students. Enrolled students reached the cap in early April 2004, which was prior to the May 1 deadline. As a result, students who waited until the last minute to decide on a college were not matriculated even though they had been admitted. This decision may have screened out students who procrastinate or are less responsible, which are qualities that may correlate with success in college.

Since the Pell exception is only applicable to students from a surrounding county, the residency requirement also may have screened out low income students from around the state who cannot afford residence halls and a meal plan. Between 2003 to 2004, Pell eligible first-time freshmen decreased from 186 students to 115 students. Stinebrickner and Stinebrickner (2003) found that low income students have a higher college attrition rate than high income students with similar credentials at a liberal arts college with full tuition subsidies. Thus, the decrease in low income students may have increased average attempted and earned credit hours.

The residency requirement also does not allow local students to commute, which creates a disincentive to attend GCSU. This decrease in local students was offset by a 9.6 percent increase in students from the metro Atlanta area. The regression results demonstrate that students from Metro Atlanta have 0.28 more attempted credit hours and 0.95 more earned credit hours

than students with similar credentials from other parts of the state. Therefore, the increase in Metro Atlanta students may have increased attempted and earned credit hours.

Another factor in the increase in earned credit hours may have been a change in advising from 2003 to 2004. Prior to the spring checkpoint, students were advised to enroll in less than 30 credit hours in their first two semesters in order to postpone evaluation for another semester. After the change, faculty advisors no longer had the incentive to encourage students to decrease course loads.

Despite these institutional effects, attempted and earned credit hours still decreased in the second year of the checkpoint. This decrease is probably a combination of the spring checkpoint, a ceiling effect on course load increases, and a regression back to the mean. The idiosyncrasies of a mid-size university like GCSU make estimation of the spring checkpoint's impact difficult to pinpoint. As mentioned in the Further Research Possibilities part of Section VI, data from the 2006-2007 academic year and other University System of Georgia schools would increase the estimation accuracy of the spring checkpoint's impact on course-taking.

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