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Institutional and Student Responses to Free College: Evidence From Virginia

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Abstract

More than half of states have implemented tuition-free college policies aimed at reducing attendance costs and incentivizing enrollment. We review the academic literature on the design features and impacts of these tuition-free policies, and we analyze an initiative Virginia implemented in 2021 called Get a Skill, Get a Job, Get Ahead (G3), which provides tuition-free community college to students enrolled in eligible associate degree, certificate, and noncredit occupational training programs in five high-demand fields. Our descriptive analysis of G3 from 2016-17 through 2022-23 shows that both institutions and students responded to the tuition-free messaging and eligibility criteria. Specifically, G3-eligible institutional program offerings and student enrollment in such programs both increased by roughly 30% within the first two years of program implementation. While Virginia's tuition-free policy promotes enrollment in targeted occupational programs, overall enrollment effects are partially offset by a 3% enrollment reduction in aid-ineligible transfer-oriented programs. To promote skill development and improve labor market outcomes, policymakers should ensure that programs eligible for tuition-free college include pathways to longer term credentials.

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1. Introduction

Tuition-free college programs are an increasingly popular avenue for policymakers to address significant college affordability challenges. Over a 30-year period, inflation-adjusted tuition and fees have risen by 50% at public two-year colleges, 78% at private four-years, and an astounding 109% at public four-year colleges (Ma & Pender, 2023). Recent widely publicized public opinion polls have tracked declining public perceptions of the worth of a college degree. Nearly half of American adults believe a bachelor's degree is beneficial only if the graduate can avoid student debt (Fry et al., 2024). To combat rising costs and growing skepticism about the value of a college degree, by 2024, 33 states had implemented financial aid initiatives to cover tuition expenses for community college students (College Promise, 2023). The design of such initiatives varies substantially across states, and there is limited research on how the eligibility criteria and design choices of these programs impact institutional and student decision-making.

Funding tuition-free college programs presents challenges. Nearly 62% of recent high school graduates enroll in postsecondary institutions shortly after graduation, representing a substantial public investment that can strain state and federal budgets particularly when tuition-free college eligibility is universal (NCES, 2024). States have responded to these constraints by limiting free-tuition eligibility in numerous ways, including imposing income thresholds and restricting free access to public two-year college students (Perna & Leigh, 2018). Because tuition-free policies may increase educational attainment and stimulate economic growth, alignment of postsecondary training with workforce needs is another avenue policymakers have considered to ensure that public investments in postsecondary training are responsive to local labor market needs. One such tuition-free program is Get a Skill, Get a Job, Get Ahead (G3), which was implemented in Virginia in 2021 as a pandemic recovery strategy to address declining community college enrollment and regional worker shortages in high-demand fields.

In this working paper, we contextualize the diversity of tuition-free college programs and draw on data from the implementation of Virginia's unique tuition-free community college initiative to provide evidence on student and institutional responses to

a tuition-free program for students pursuing credentials in targeted, high-demand occupational fields. We provide descriptive evidence on trends in Virginia community college program offerings and the enrollment patterns of students from 2016-17 to 2022-23. Despite overall enrollment losses of 12% from 2016-17 to 2020-21, during the height of the COVID-19 pandemic, we find that students increased their enrollment in tuition-free-eligible programs by 4 percentage points (a 30% increase, .04/.133), and experienced a 2-percentage-point decline in ineligible programs (a 3% reduction, .02/.667). We discuss key considerations in designing free college policies with program-specific eligibility criteria.

2. The Literature on Tuition-Free College

Tuition-free college programs commonly share three defining features. First, most are last-dollar programs; they cover tuition and fees not covered by other federal and state sources. Second, they are means-tested with income-eligibility thresholds that are verified through an application process. Lastly, policymakers and colleges emphasize tuition-free initiatives by using transparent, "free-college" messaging to communicate the benefit to students. Numerous research studies have documented how tuition-free policies and their accompanying free-college messaging are generally associated with increases in college enrollment from 5 to 10 percentage points (Anderson et al., 2024; Gurantz, 2020; Klasik et al., 2024; Miller-Adams & Iriti, 2022). Statewide promise programs with simple and transparent messaging and limited "red tape" tend to have larger enrollment effects (Dynarski et al., 2022). Tennessee's promise program is limited to community and technical college students but has no income- or program-eligibility criteria and is associated with a 40-percentage-point enrollment increase after implementation in 2015 through 2018 (Nguyen, 2020). New York's Excelsior Scholarship, on the other hand, has more extensive eligibility requirements, including income eligibility, and requires employment in the state of New York post-graduation. Unsurprisingly, programs with these more complex criteria are associated with no discernible impact on enrollment (Miller-Adams & Iriti, 2022; Nguyen, 2019). We document program design elements and estimated enrollment effects, when available, for select statewide promise programs in

the appendix to further highlight variation in eligibility criteria and underscore Virginia's unique approach in limiting eligibility to high-demand workforce programs (see Appendix Table A1).

Despite the net positive enrollment effects observed, a concern persists about the potential of statewide promise programs to divert students who might otherwise attend four-year colleges (Mountjoy, 2022; Rouse, 1995). This concern could be reduced were tuition-free programs to prioritize workforce certificates and applied associate degrees aligned with labor force demands. Motivated students aiming for bachelor's degrees might then be less swayed by the offer of tuition-free college and less likely to opt for applied workforce training programs in, for instance, medical administrative support or electronics technology over transfer-oriented programs. However, previous research indicates that low-income and first-generation students are more cost sensitive and responsive to tuition-free messaging, potentially shifting their enrollment from four-year to two-year eligible programs (Dynarski et al., 2021). With the recent proliferation of statewide tuition-free policies and varying program designs, there is limited research on how specific program-eligibility criteria might influence student enrollment behavior. This includes whether students enroll, at what intensity, and which programs and credentials they ultimately pursue.

In addition to grappling with issues of affordability, community colleges face increasing pressure from policymakers to respond swiftly to changes in local labor market demand. As broad-access institutions, community colleges serve multiple functions, from preparing students to transfer to four-year colleges to (re)training and credentialing workers. In acknowledging the critical role that community colleges play in supporting local labor markets, Strohl et al. (2024) find that the distribution of certificate and associate degree programs is misaligned with the distribution of job openings for middle-skill workers. Despite this misalignment, Grosz (2022) suggests that some California community colleges were moderately responsive to labor market changes from the early 1990s to 2016 by reallocating resources to increase credential completion in high-demand fields. Other work highlights the range of approaches community colleges take in their response to local labor market needs, including the use and analysis of state

and federal labor market data to review and develop programs, adapt curricula, and strategically plan and engage with employers (Cleary et al., 2017; Van Noy et al., 2023).

To date, there is a lack of evidence on how community colleges react to tuition-free policies with specific program-eligibility criteria. While institutions and students can adjust to labor market conditions, they often lack precise and timely labor market data to guide their decisions on program offerings and enrollment (Acton, 2021; Baker et al., 2018). Virginia's approach—combining free-college messaging with program-specific eligibility criteria—may provide useful information for institutions and students. Our study aims to measure the extent of institutional and student responses to Virginia's tuition-free policy and to explore its implications.

3. Virginia's Tuition-Free G3 Initiative

Virginia's tuition-free community college initiative, G3, was enacted in 2021 by the state legislature as a strategy for pandemic recovery, aimed at addressing declining enrollment in community colleges and regional shortages of workers in high-demand fields. Similar to other programs, Virginia's initiative operates as a statewide last-dollar scholarship specifically for community college students, with eligibility based on income thresholds (i.e., up to 400% of the federal poverty level). As of 2022, just over 50% of Virginians lived in households eligible under this income criterion, indicating broad potential eligibility for tuition-free college (KFF, 2022). Unlike many other tuition-free programs, Virginia's initiative is unique in its focus on targeted workforce training certificates and applied associate degrees in one of five key fields: early childhood education, health care, information technology and computer science, manufacturing and skilled trades, and public safety. The Virginia Office of Education Economics (VOEE) determined program eligibility by assessing whether regional job opportunities in these sectors were projected to outpace those in other industries (VOEE, 2023). Eligible students have their "unmet" (i.e., remaining) tuition and fee expenses covered by program funds. For those students who qualify for state and federal aid that covers tuition and fees, the initiative also provides up to $900 per semester if they enroll full-time to assist with other educational and living expenses.

4. Data and Methods

The Virginia Community College System (VCCS) administrative records include student transcript and financial aid records as well as year-over-year program offerings at the 23 community colleges. For this study, we include first-time-in-college (FTIC) students who enrolled in VCCS colleges from academic year 2016-17, our baseline year, through 2022-23. Our student-level information includes typical demographic information on race/ethnicity, gender, and age, in addition to first-generation status, household income, financial aid application status, course enrollment, and degree completion information.

Our student sample includes more than 175,000 FTIC students across seven entry cohorts and is racially and socioeconomically diverse: One in two students identified as a person of color, and more than half of students who completed the FAFSA reported a family income within 200% of the federal poverty line (Table A2). About half of students enrolled full-time, and three-quarters of students pursued a transfer-oriented associate degree program. Community colleges in VCCS offer 117 programs on average, though the number of offerings varies widely across colleges. Certificate programs comprise just about half of all program offerings despite serving only 17% of all students enrolled. Tuition-free-eligible G3 programs comprise over a third of programs and serve 22% of enrolled students on average; there is, again, significant variation across campuses, with some community colleges enrolling as little as 4% or as much as 46% of students in tuition-free-eligible programs (Table A3).

We rely on event studies to describe institutional and student responses to the tuition-free initiative. Specifically, we compare the year-over-year trends in enrollment prior to and after the adoption of the tuition-free policy of students in eligible G3 programs (i.e., treated students) and those in ineligible programs (i.e., comparison students). Our institutional-level outcomes include the number of eligible and ineligible programs offered as well as the number of certificates, applied associate degrees, and transfer-oriented associate degrees offered. We define tuition-free-eligible programs using six-digit Classification of Instructional Program (CIP) codes that were included in the original legislation. For all our outcomes of interest, we show the changes from the

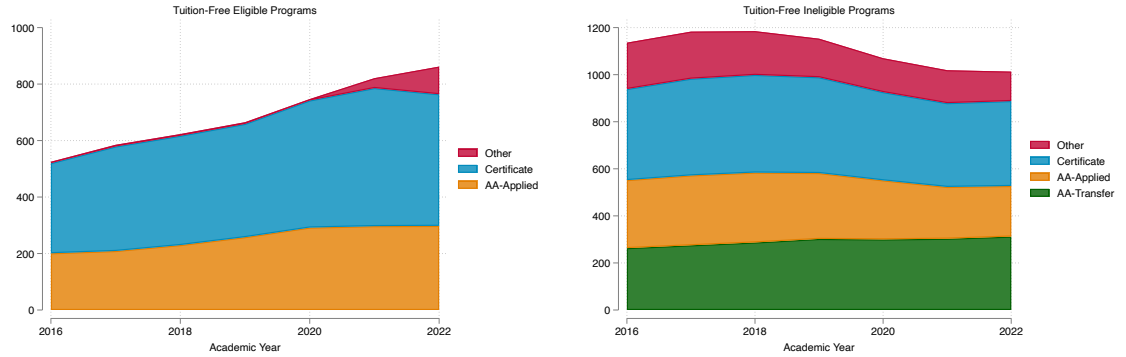
baseline year (2016-17) through 2022-23, two years after the adoption of the tuition-free policy in 2021-22. We describe the data and methods in more detail in Appendix B.

5. Findings

5.1 How did community colleges respond to the tuition-free policy?

Figure 1 highlights trends in tuition-free-eligible programs (i.e., programs that became eligible G3 programs in 2021-22) and tuition-free-ineligible programs by credential type. Eligible programs accounted for more than a third of total community college program offerings in 2016. The number of programs that ultimately received a G3-eligibility designation increased leading up to the adoption of the targeted tuition-free college policy in 2021. Prior to the initial disbursement of the initiative's tuition-free aid in 2021-22, community colleges increased tuition-free-eligible program offerings by 30% compared to baseline program offerings in 2016. The growth in eligible program offerings was mostly driven by new career-oriented certificate programs, particularly in the health and engineering (which is included under skilled trades) and information technology sectors. In contrast, declines in ineligible offerings were mostly driven by a reduction in career studies certificates in ineligible fields. Overall, the number of tuition-free-ineligible programs that were transfer oriented remained unchanged. We find that, while there were no changes in the number of transfer-oriented programs offered, community colleges offered 10 more tuition-free-eligible programs, on average, leading up to and after policy implementation (see Appendix Figure A1). The policy's implementation also coincided with a decrease in the number of ineligible program offerings. These results suggest that community colleges are responding to the targeted tuition-free policy by aligning their programming more closely with local labor market needs.

Figure 1. VCCS Program Offerings by Credential Type



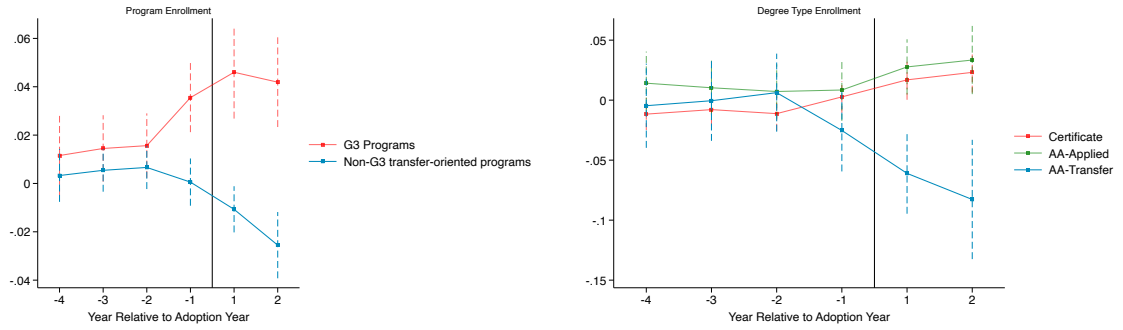
(a) (b)

Note. Panel (a) shows the number of tuition-free-eligible G3 program offerings by credential type and panel (b) shows the number of tuition-free-ineligible program offerings by credential type across all 23 community colleges in VCCS from academic years 2016-17 through 2022-23.

5.2 How did students respond to the tuition-free policy?

Our findings focus on the enrollment responses of two distinct groups of students. The first is FTIC students. Prior to the adoption of the policy, there was a discernible increase in FTIC students enrolling in eligible programs. The proportion of students enrolled in eligible programs doubled from 12% to approximately 25% from 2016-17 to 2022-23 (see Figure A2 in the Appendix). Event study results illustrated in Figure 2 indicate that FTIC students increased their enrollment in tuition-free-eligible programs by 4–5 percentage in the year leading up to 2020-21 and in the years following the implementation. These estimates correspond to a more than 30% increase in tuition-free-eligible program enrollment compared to baseline year 2016-17. Conversely, these students decreased their enrollment in ineligible transfer-oriented programs by 2 percentage points. The results from Figure 2 suggest that these increases in targeted program enrollment were driven by nearly equivalent increases in enrollment in certificate and applied associate programs.

Figure 2. Student Enrollment in Tuition-Free-Eligible Programs and Credential Types

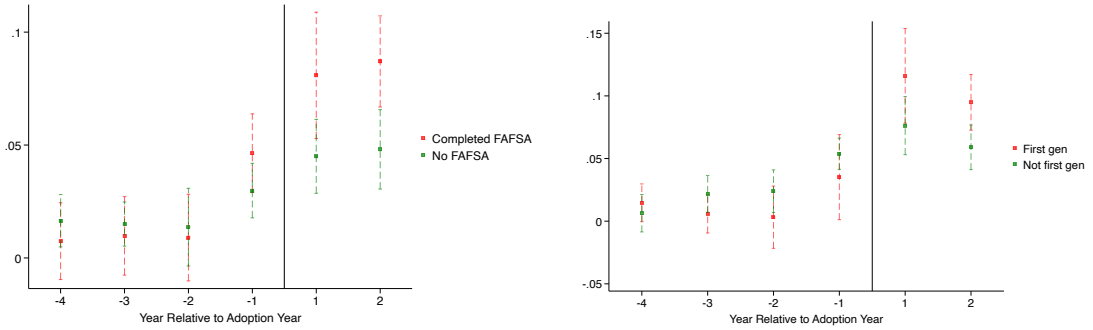


(a) (b)

Note. Panel (a) shows coefficient estimates (with standard error bars) from our event study model as described in the Data and Methods section, where program enrollment in tuition-free-eligible (G3) and non-G3 transfer-oriented programs are the outcomes of interest. Panel (b) similarly shows estimated year-over-year changes in enrollment in programs leading to certificates, applied associate degrees, and transfer-oriented associate degrees. Year 1 on the x-axis corresponds to academic year 2021-22, the first year G3 was implemented. The sample is limited to FTIC entry cohorts from academic years 2016-17 through 2022-23.

One concern regarding targeted tuition-free programs that emphasize workforce training is that they may divert students away from transfer-oriented programs that typically lead to higher lifetime earnings. This concern is especially important for students underrepresented in postsecondary education who research has shown to be more sensitive to college costs and to rely on institutional guidance for making postsecondary enrollment decisions (Baker et. al., 2018). We explore these student responses further by analyzing year-over-year enrollment changes based on FAFSA completion status and for students identifying as first-generation college students (see Figure 3). The results indicate that effects for both FAFSA completers and first-generation college students on enrollment in tuition-free-eligible programs were even larger compared to the average enrollment effects. This is unsurprising, as students must complete the FAFSA to qualify for free tuition, and messages promoting a free college education are likely to resonate with lower income and first-generation college students.

Figure 3. Student Enrollment in Tuition-Free-Eligible Programs by Student Subgroups



(a) (b)

Note. Panel (a) shows coefficient estimates (with standard error bars) from our event study model as described in the Data and Methods section, where enrollment in tuition-free-eligible (G3) programs specifically for FAFSA completers versus non-FAFSA completers is the outcome of interest. Panel (b) similarly shows estimated year-over-year changes in tuition-free-eligible (G3) program enrollment for students who identified as a first-generation college student versus not. Year 1 on the x-axis corresponds to academic year 2021-22, the first year G3 was implemented. The sample is limited to FTIC entry cohorts from academic years 2016-17 through 2022-23. Sixty-seven percent of the sample (n = 146,287) completed the FAFSA in their initial year of enrollment, and 32% of the sample identifed as a first-generation college student (n = 68,816).

We also examine the effects of targeted tuition-free college on program enrollment for other student subgroups, including race/ethnicity, reported family income level, and age group (see Appendix Figures A3-A5). Across the board, we observe similar trends in which students were more likely to enroll in eligible programs and less likely to enroll in ineligible transfer-oriented programs. Notably, these effects were most pronounced among lower income students, Black students, and those aged 25 or older.

Our second population of interest is students who were enrolled in VCCS prior to the tuition-free-policy implementation in 2021. Students who enrolled prior to the policy may have been incentivized to switch into eligible programs to obtain the tuition benefit. To explore this, we track enrollment and completion outcomes for students who entered college in fall 2019, two years prior to implementation, and were unlikely to be influenced by the policy proposal in their initial enrollment decisions. In Table 1, we observe that approximately 15% of these students opted for programs that eventually became eligible for tuition-free status, whereas 75% of these students enrolled in ineligible transfer-oriented programs. Over subsequent years, the proportion of this cohort who enrolled in any program declined as more students either earned credentials or stopped out before completing a degree. Among those who continued their enrollment

without earning a credential, however, there was a notable shift towards enrollment in tuition-free-eligible programs. For example, by 2021, the proportion of enrollees in eligible programs had risen to 22% (from 15% at entry), while those enrolled in ineligible transfer-oriented programs had decreased to 69%. These enrollment trends show that students who enrolled prior to the introduction of targeted tuition-free college and who persisted in college switched into eligible programs.

Table 1. Enrollment and Credential Completion, 2019 FTIC Cohort

Outcomes	2019	2020	2021	2022
Enrolled in G3 program	.152	.103	.079	.051
Among students enrolled	.152	.175	.222	.264
Enrolled in transfer-oriented program	.746	.452	.246	.121
Among students enrolled	.746	.764	.693	.623
Earned credential	.032	.166	.258	.290
Not enrolled	0	.408	.643	.804
N	25,363	14,994	9,038	4,955

Note. The sample is restricted to the 2019 FTIC entry cohort. The "among students enrolled" rows indicate enrollment in G3 or transfer-oriented programs more specifically for students in the 2019 FTIC entry cohort who were still enrolled and had yet to earn a degree. Earned credentials include certificates and associate degrees.

6. Discussion and Policy Options

The responses of students and institutions to targeted tuition-free college hold significant implications for community colleges' ability to attract and serve students, as well as for students' educational and labor market outcomes. In Virginia, the tuition-free G3 legislation prioritized community college workforce programs in high-demand sectors, and community colleges appear to have followed through on using simplified messaging on eligibility tied to family income (i.e., 400% of the federal poverty level) (Cormier et al., 2024). These program design features and implementation led community colleges to expand their offerings of eligible workforce credentials. Students responded by enrolling in eligible programs at higher rates. This tuition-free initiative has initially succeeded in enhancing institutional capacity to train and certify workers in local high-

demand fields, further strengthening incentives for community colleges in a post-pandemic era of depressed enrollment.

Still, Virginia's specific eligibility criteria for tuition-free college pose potential tradeoffs. While aligning program offerings with workforce needs can increase community college enrollment, it risks reducing enrollment in non-workforce-related programs. Our analysis shows that increasing the number of tuition-free-eligible programs did not significantly reduce program offerings in ineligible transfer-oriented programs; declines were observed primarily in other workforce training programs that were ineligible for free tuition (see Figure A1). Notably, while students were more likely to enroll in eligible programs, they showed a decreased interest in transfer-oriented paths, reflecting the policy's emphasis on immediate workforce entry over vertical transfers to four-year colleges.

Given the multifaceted roles community colleges play, states adopting a similar model should ensure access to a variety of programs and support mechanisms for students in transitioning between programs. Assuming labor market analysis used by the state to determine program eligibility is accurate and reflects high-wage, high-growth opportunities for students, Virginia's model may dispel student and institution misconceptions about the benefits of occupational training and assist both in making informed enrollment decisions. Yet, it is critical for institutions and policymakers to monitor student success in eligible programs and mitigate unintended diversion.

Despite the higher earnings associated with bachelor's degrees, completion rates among community college entrants remain low. Importantly, returns from occupation-specific training can diminish over time (Andrews et al., 2022). Thus, states must balance workforce training and transfer opportunities to maximize students' educational investments and career prospects. This is particularly important given the large proportion of first-generation and low-income students served by community colleges, who may be particularly responsive to tuition-free messaging.

Virginia's community colleges responded to program-based eligibility criteria in tuition-free policies by realigning credential offerings with local job market demands. However, these adjustments may divert students from pursuing longer term degrees. Policymakers must continually assess degree and labor market outcomes to ensure that

students benefit from pursuing eligible occupational training, while maintaining viable transfer pathways for those interested in extending their training beyond entry-level credentials.

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Appendix A. Supplementary Tables and Figures

Table A1. Select Statewide Promise Programs: Design Elements and Enrollment Effects

Statewide program	Implementation year	Funding type	Credential level	Income eligibility threshold	Key eligibility criteria	Enrollment effects
Michigan Reconnect	2021	Last dollar	Certificate or associate	None, but must complete FAFSA	21 or older	N/A
New York Excelsior scholarship	2017	Last dollar	Associate or bachelor's	<$125,000	Must work in state post-degree	Null
Oregon Promise	2016	Last dollar	Associate	Tentative limits based on EFC, depending on funding availability	2.0 or higher high school GPA	4–5 percentage points
Tennessee Promise	2014	Last dollar	Technical diploma or associate	None	Must complete community service hours prior to start of semester	40 percentage points
Virginia G3	2021	Last and middle dollar	Certificate or associate	400% FPL (~$100,000 for a family of 4)	Enrolled in high-demand workforce field	N/A

Note. Data are gathered from College Promise's (2023) interactive map. Reported enrollment effects for New York, Oregon, and Tennessee are from Nguyen (2019), Gurantz (2020), and Nguyen (2020), respectively.

Table A2. Student Sample Descriptives

Student demographic	Overall proportion
Gender	
Female	.523
Male	.476
Race/ethnicity	
Asian	.068
Black	.184
Hispanic	.156
White	.504
Two or more	.054
Age	
18–24	.777
25–34	.061
> 35	.044
Income	
Completed FAFSA	.662
0–200% FPL	.366
200–400% FPL	.169
>400% FPL	.088
Enrollment	
Full-time	.535
Enrolled in G3 program	.165
Credential pursued	
Certificate	.108
Applied associate degree	.167
Associate degree–transfer	.726
N	175,194

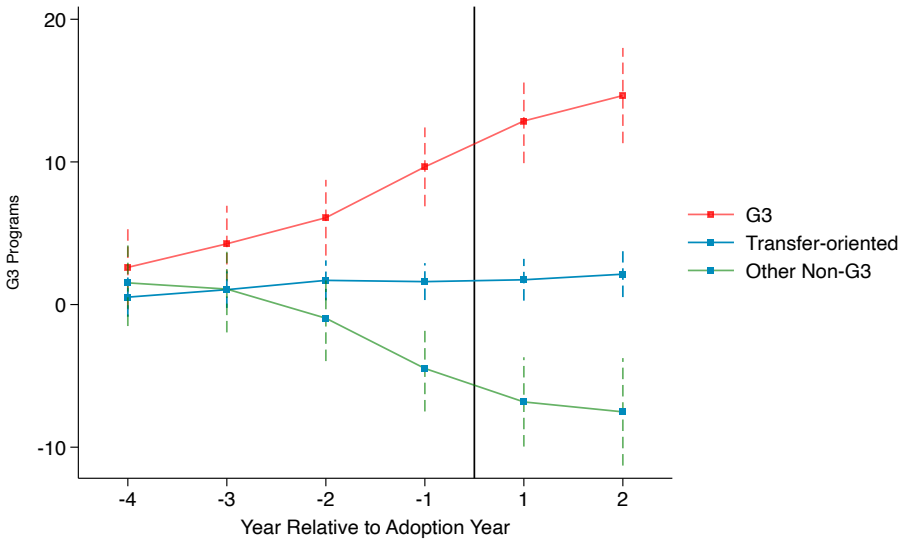
Note. Data include FTIC entry cohorts for academic years 2016-17 through 2022-23. We exclude students who only enrolled in VCCS through dual enrollment, students who are missing critical administrative records such as transcripts or initial cohort entry information, students who are ineligible to file a FAFSA due to their non-permanent resident/citizenship status, and non-residents of Virginia who are ineligible for G3 financial aid. Credential pursued may not add to 1 since some students pursue multiple degree types.

Table A3. VCCS Community College Program Offerings

Student demographics	Number of programs	Proportion of students enrolled in programs
Number of programs	117	
SD	(47)	
Min	57	
Max	273	
Certificate	61	.167
SD	(20)	(.095)
Min	32	.029
Max	128	.332
Applied AA	31	.188
SD	(22)	(.052)
Min	5	.093
Max	109	.274
Transfer AA	15	.501
SD	(9)	.098
Min	5	.294
Max	37	.692
G3 programs	43	.218
SD	(23)	(.116)
Min	7	.037
Max	123	.463
Non-G3 programs	74	.781
SD	(30)	(.116)
Min	30	.536
Max	150	.962
N	23	23

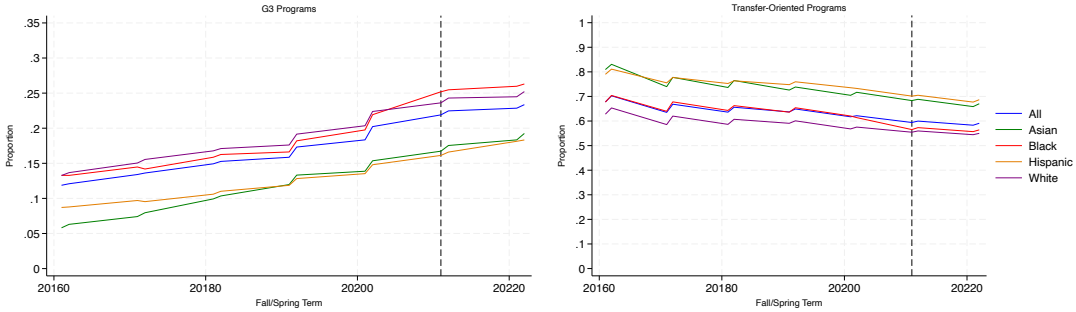
Note. Data include programs offered during the 2016-17 through 2022-23 academic years. Data in the right-hand column is based on enrollment for both FTIC entry cohorts and returning students. The "SD" rows present the standard deviation for each outcome.

Figure A1. Changes in VCCS Program Offerings by Tuition-Free-Eligibility



Note. Coefficient estimates (with standard error bars) indicate year-over-year changes in VCCS program offerings as broken down by G3, transfer-oriented, and other non-G3 programs. Year 1 on the x-axis corresponds to academic year 2021-22, the first year G3 was implemented. Program data include academic years 2016-17 through 2022-23.

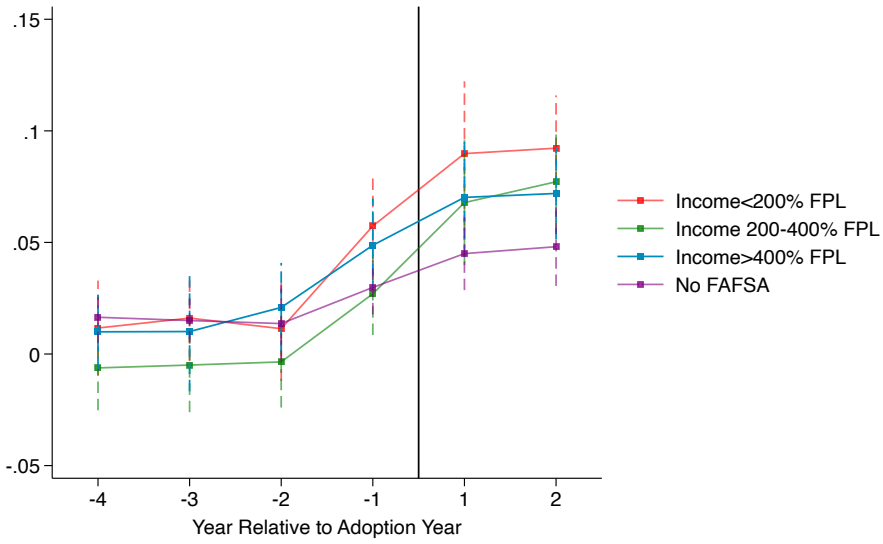
Figure A2. VCCS Student Enrollment in Tuition-Free-Eligible & Transfer-Oriented Programs by Race/Ethnicity



(a) (b)

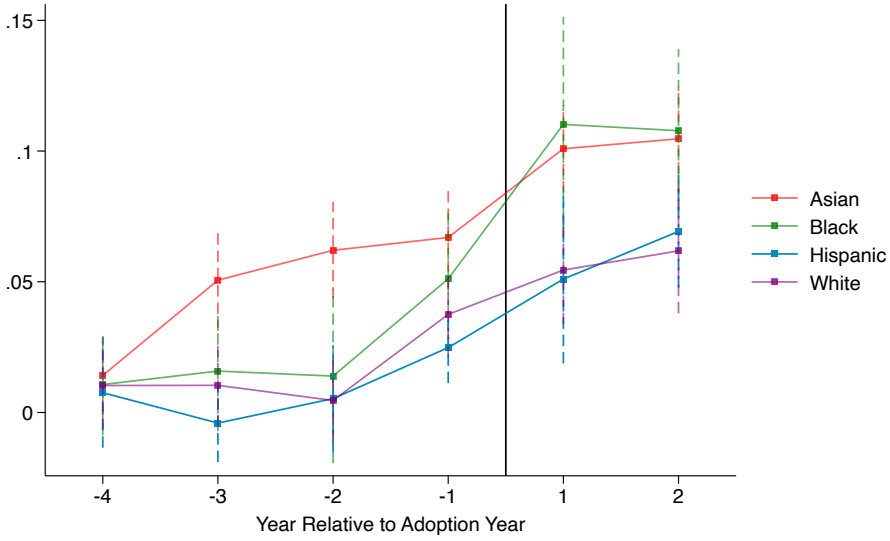
Note. Panel (a) shows the change in FTIC entry cohort enrollment in tuition-free-eligible programs and panel (b) shows the change in FTIC entry cohort enrollment in transfer-oriented programs as broken down by race/ethnicity. The sample is limited to FTIC entry cohorts from academic years 2016-17 through 2022-23.

Figure A3. Student Enrollment in Tuition-Free-Eligible Programs by Income Level



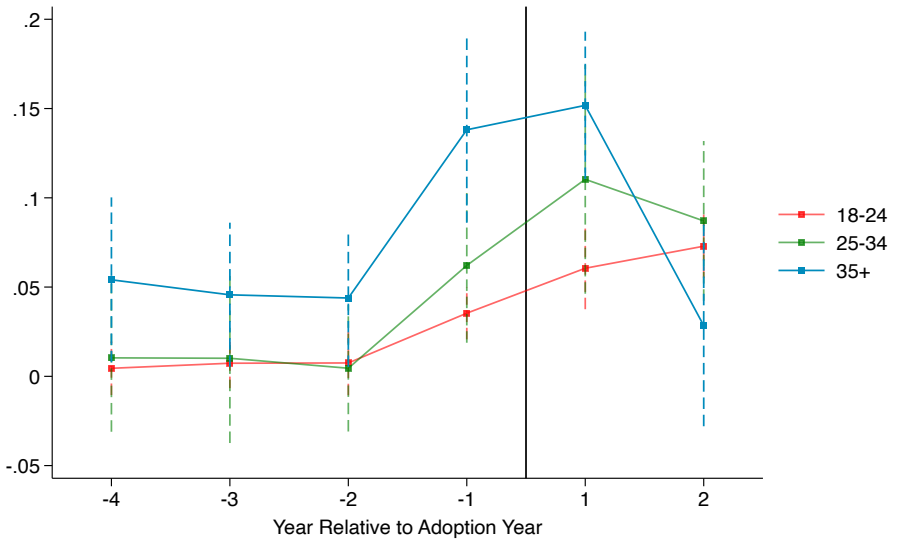
Note. Coefficient estimates (with standard error bars) highlight year-over-year changes in tuition-free-eligible (G3) program enrollment broken down by FAFSA completion status and reported family income. In 2024, the federal poverty level (FPL) for a family of 4 was $31,200. Year 1 on the x-axis corresponds to academic year 2021-22, the first year G3 was implemented. The sample is limited to FTIC entry cohorts from academic years 2016-17 through 2022-23.

Figure A4. Student Enrollment in Tuition-Free-Eligible Programs by Race/Ethnicity



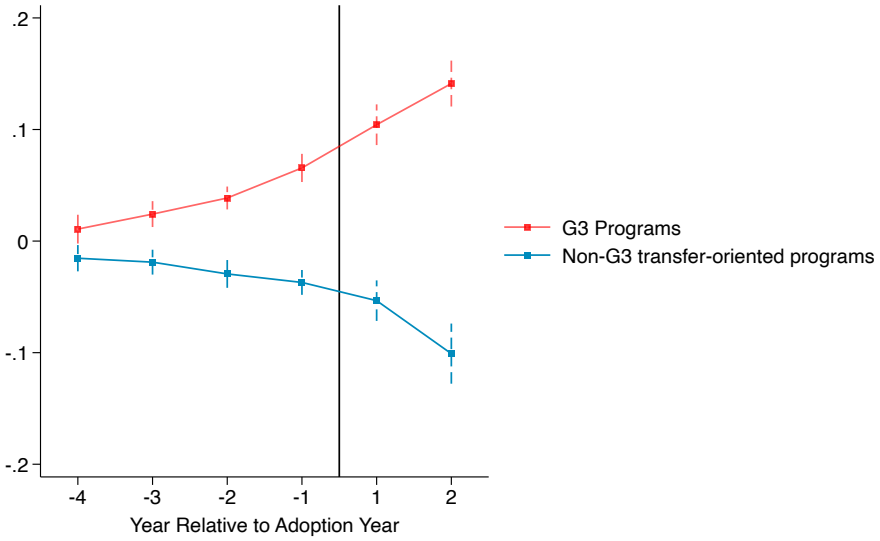
Note. Coefficient estimates (with standard error bars) highlight year-over-year changes in tuition-free-eligible (G3) program enrollment broken down by reported race/ethnicity. Year 1 on the x-axis corresponds to academic year 2021-22, the first year G3 was implemented. The sample is limited to FTIC entry cohorts from academic years 2016-17 through 2022-23.

Figure A5. Student Enrollment in Tuition-Free-Eligible Programs by Age Category



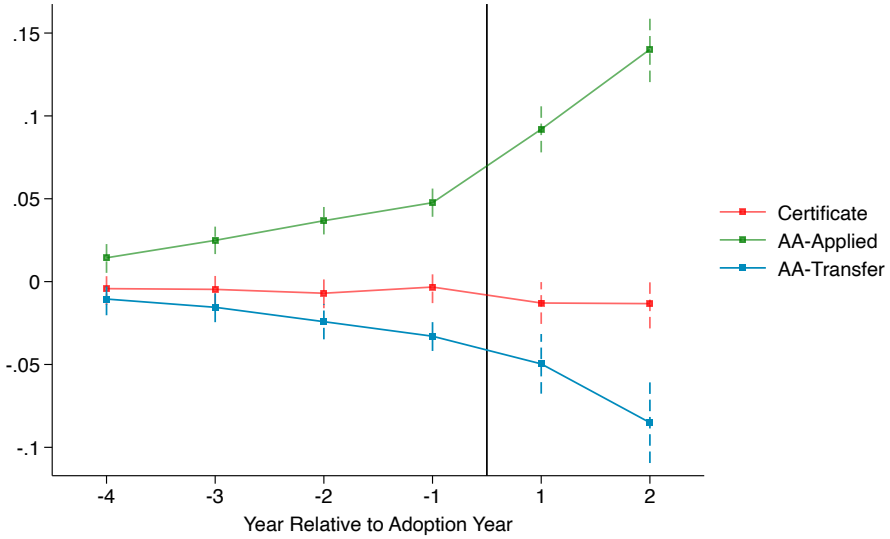
Note. Coefficient estimates (with standard error bars) highlight year-over-year changes in tuition-free-eligible (G3) program enrollment broken down by age category. Year 1 on the x-axis corresponds to academic year 2021-22, the first year G3 was implemented. The sample is limited to FTIC entry cohorts from academic years 2016-17 through 2022-23.

Figure A6. Student Enrollment in Tuition-Free-Eligible Programs Among Students Who Enrolled Pre- and Post-Policy



Note. Coefficient estimates (with standard error bars) highlight year-over-year changes in tuition-free-eligible (G3) program enrollment among students who enrolled both before and after G3 was implemented in fall 2021. We show estimated enrollment effects in tuition-free-eligible (G3) programs as well as in non-G3 transfer-oriented programs. Year 1 on the x-axis corresponds to academic year 2021-22, the first year G3 was implemented.

Figure A7. Student Enrollment by Degree Type Among Students Who Enrolled Pre- and Post-Policy



Note. Coefficient estimates (with standard error bars) highlight year-over-year enrollment changes by degree type among students who enrolled both before and after G3 was implemented in fall 2021. We show estimated enrollment effects in certificate, applied associate, and transfer-oriented associated degrees. Year 1 on the x-axis corresponds to academic year 2021-22, the first year G3 was implemented.

Appendix B. Identifying Institution and Student Responses to G3

Our design compares the year-over-year trends in enrollment prior to and after the adoption of the tuition-free policy of students in eligible G3 programs (i.e., treated students) and those in ineligible programs (i.e., comparison students). Comparison students are those who enrolled in ineligible programs and those who enrolled in community college prior to policy implementation.

We use the following event study framework to estimate year-over-year institution- and student-level changes in outcomes:

$$Y_{it} = \alpha_s + \sum_{\tau=1}^{4} \delta_\tau D_{i,t-\tau} + \sum_{n=0}^{2} \delta_n D_{i,t+n} + \varepsilon_{it}$$

Institutions. For institutions, *Y* represents the change in the number of eligible, ineligible, and transfer-oriented degree programs for institution *i* in year *t*; α is college fixed effects; and δ_n and δ_τ designate the effect of G3 implementation in each pre- $(t - \tau)$ and post-implementation $(t + n)$ period, *D*. Standard errors are clustered at the college by year level.

Students. For student-level outcomes, the model framework is the same except *Y* represents the change in student enrollment in eligible and ineligible programs as well as student enrollment in degree types (e.g., certificate, applied associate, and transfer-oriented associate).

We adjust our student analytic sample to focus on two distinct groups: FTIC students and students who initially enrolled prior to policy implementation. The first approach allows for the estimation of year-over-year changes in entering students' likelihood of pursuing certain types of degrees and program fields. The second approach helps us to estimate changes in students' propensity to switch into eligible programs after the policy was implemented; we can add additional controls for first program at entry to strengthen the validity of these estimates.