

DISCUSSION PAPER SERIES

IZA DP No. 15887

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Grading Policy**

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**Mehlika Ozsoy**

*CUNY and The Graduate Center*

**Núria Rodríguez-Planas**

*CUNY, Queens College and IZA*

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**IZA – Institute of Labor Economics**

Schaumburg-Lippe-Straße 5–9  
53113 Bonn, Germany

Phone: +49-228-3894-0  
Email: [publications@iza.org](mailto:publications@iza.org)

[www.iza.org](http://www.iza.org)

## ABSTRACT

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# Unintended Effects of the Flexible Grading Policy\*

Using an unbalanced panel of 23,007 academic records spanning from Spring 2019 to Spring 2022 representing one fourth of Queens College student population; and estimating event study analyses with individual fixed effects to control for time-invariant unobserved heterogeneity, we find unintended effects of the flexible grading policy (FGP), which allowed students to exercise the pass/fail option during the first academic year of the pandemic. Once the policy was no longer available, students who had used it underperformed relative to their own pre-pandemic performance relative to the change in performance of students who had never used the policy. FGP users earned 5.3% lower GPA in Spring 2021 and 4.7% lower GPA in Fall 2021 relative to Fall 2019 relative to the change observed among FGP non-users. This pattern is robust to sensitivity analysis and holds across tiers of the 2019 cumulative GPA distribution, as well as across various socio-demographic groups. Furthermore, these detrimental effects increased with the intensity of the policy use. Students' response to a survey rules out that these findings may be driven by pandemic-related health shocks, childcare disruptions, or challenges with online learning, financial aid, or job loss. We estimate that using the FGP is associated with a 16% lower likelihood of graduating and a 18% lower likelihood of graduating on-time by Spring 2022.

**JEL Classification:** I2, I23

**Keywords:** flexible grading policy, unbalanced panel of academic records, transcript data, event analysis, individual fixed effects, survey data, GPA, college graduation and on-time graduation, COVID-19

**Corresponding author:**

Núria Rodríguez-Planas  
Powdermaker Hall  
65-30 Kissena Blvd.  
Queens  
New York 11367  
USA

E-mail: [nuria.rodriquezplanas@qc.cuny.edu](mailto:nuria.rodriquezplanas@qc.cuny.edu)

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## I. Introduction

In mid-March 2020, New York City (NYC) experienced its first COVID-19 outbreak. Colleges around the US were quick to react, closing campuses and moving to online learning (Rodríguez-Planas 2020). Understanding the disruptive and exceptional nature of the Spring 2020 semester on students' lives and their learning (Aucejo et al. 2020; Jaeger et al. 2021; Rodríguez-Planas 2022a), most colleges in the US were quick to implement some form of flexible grading policy (FGP hereafter) allowing students to exercise the Credit/No Credit (CR/NC) flexible grading options, which allowed students to opt-out of receiving a letter grade for a course and receive credit (CR option) or no credit (NC option) instead. Both elite universities (Basken 2020), state universities (Venable 2020), and community colleges (Bird, Castleman, & Lohner 2022) took on some form of FGP either in one or a combination of semesters spanning from Spring 2020 to Spring 2021.

Colleges offered the FGP in the best interest of their students' academic success. However, it is plausible that the policy may have backfired if those students who used the FGP ended up underperforming academically in subsequent semesters. If most students used the FGP to convert low grades (mostly C-s and Ds) into a pass (CR option), they would have been allowed to progress without having accumulated the necessary knowledge, potentially hurting their performance in subsequent, more advanced courses. Note that, in the absence of the FGP, a C- or D grade in major-core courses may not be sufficient to enroll in the more advanced courses.<sup>1</sup> Similarly, if students underperformed in common-core (general education) required courses, it is plausible that this may have set them up to be less prepared to succeed in subsequent courses. At the same time, the potential to convert a grade into a CR/NC option may have been harmful to students' learning if they were unmotivated to put the extra effort needed to get a good grade (Lipman 2022). In either case, we would observe that the grades of students who used the policy decreased after the policy ended relative to their pre-pandemic performance relative to the change in performance of students who did not use the FGP. We would also observe lower graduation and on-time graduation rates for students who used the FGP relative to those who did not.

The main objective of this paper is to estimate whether the FGP had such medium-term unintended effects on students' academic performance, graduation, and on-time graduation by Spring 2022. To do so, we use an unbalanced panel of close to 23,007 academic records spanning from Spring 2019 to Spring 2022 representing one fourth of all 20,000 students attending Queens College (QC), an urban minority-serving four-year college in New York City (NYC). Crucially, we have access to transcript records to identify the prevalence and incidence of FGP usage among these students. Twenty nine percent of our sample used the

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<sup>1</sup> For example, it is not uncommon to require a minimum grade (of say a C or C-) to pass most core courses for a particular major.

FGP in either Spring or Fall 2020, which were the only two semesters where the policy was available at QC. Among FGP users, in Spring (Fall) 2020, about 29.5% (27.5%) used the policy to convert a D grade into a pass (CR option).

Using data on graduation and controlling for a large battery of pre-pandemic observable characteristics, including Fall 2019 cumulative GPA, we first document that the likelihood of graduating and graduating on time by Spring 2022 among students who used the FGP policy was 16% and 18.2% lower, respectively, than that of students who did not use the FGP and whose average graduation and on-time graduation was 46.2% and 18.7%, respectively. Yet, these graduation differences may be driven by intrinsic differences between students who chose the FGP and those who did not. Furthermore, choosing the FGP is endogenous and potentially related to students' intrinsic motivation and academic strengths, as well as to other shocks that the student may have experienced during the first months of the pandemic. Below we explain how we address these concerns.

Using event study analyses from Spring 2019 to Spring 2022 to compare the academic performance (semester GPA and credits taken, earned, and failed) of students who used the FGP with that of those who did not, we first assess the validity of the pre-existing parallel trends assumption in academic performance between FGP users and non-users. Using transcript data, we also measure academic performance with the letter grade the student receives in each course. To control for students' time-invariant unobserved heterogeneity, our models exploit within-student variation with student fixed effects models. To address concerns that differential performance between FGP users and non-users may be due to COVID-19-related shocks (other than the flexible grading policy), we complement the empirical analysis of academic records and transcripts with evidence from a survey conducted in the second half of 2020 on the extent to which students were hit by various pandemic-driven shocks during Spring and Fall 2020. This study provides novel evidence on the unintended effects of the FGP on students' academic performance during the school year 2021 and Spring 2022 semester, as well as students' graduation and on-time graduation by Spring 2022.

We find that in the short run, the FGP was very successful in its goal of providing the flexibility students needed to overcome the challenges of the first months of the pandemic. Students who underperformed during Spring 2020 semester used both the CR/NC options to erase their lower grades from the transcript. As a result, their Spring and Fall 2020 GPAs increased by 9.6% and 7.3%, respectively, relative to their pre-pandemic performance, mimicking the grade inflation observed among their peers who did not use the FGP.

However, the benefits of the FGP ended with the policy: students who used the FGP underperformed a year later relative to their own pre-pandemic performance relative to the change in performance of FGP non-users before and after the pandemic. FGP users earned 5.3% lower GPA in Spring 2021 and 4.7%

lower GPA in Fall 2021 relative to their Fall 2019 GPA relative to the change observed among FGP non-users. This pattern is robust to sensitivity analysis and holds across tiers of the pre-pandemic 2019 cumulative GPA distribution. We also find that using the FGP more intensively was associated with lower academic success once the policy was no longer available. We find that a one-standard deviation increase in the average number of credits the student took in 2020 under the FGP reduced both the Spring and Fall 2021 semester GPAs by 9.3 percentage points, a 3% decrease relative to the pre-pandemic GPA of non-users (a GPA of 3.239). Students' responses to a survey rule out that these findings may be driven by pandemic-related health shocks, childcare disruptions, or challenges with online-learning, financial aid, or job loss.

Results are stronger for students in the lower-class levels, especially for freshmen, suggesting that inadequate preparation for future courses is one of the key driving mechanisms. We also observe that the accumulated negative gap four semesters after the FGP was first available is one third higher for students who took the FGP in their major-core courses than those who took the FGP in non-major-core courses. Similarly, the gap is two fifths higher for students who took the FGP in common-core courses than those who used the FGP in non-common-core courses. Nonetheless, a negative GPA gap between FGP users who did not use the FGP in major-core or general-education courses and non-users remains, suggesting that students' lower effort and learning was widely widespread.

Finally, the study also documents the pattern of academic performance before and after the pandemic for students who never used the FGP. To the best of our knowledge, we are the first to document that the grade inflation observed in the Spring 2020 semester<sup>2</sup> persisted over the following two years, albeit it progressively declined from a 10.1% increase in GPA in Spring 2020 to a 4.5% increase in Spring 2022 (relative to Fall 2019 GPA). As these estimates are for students who never used the FGP, this improvement in grades was most likely related to instructors' greater flexibility to and lenience in grading or students' violation of academic integrity as online teaching made cheating easier. In addition, it may have been driven by a lower course load as there was a progressive decline in credits taken reaching an average of 1.9 less credits per semester by Spring 2022 (a 17% decline relative to Fall 2019). A complementary explanation is that students may have had more time to study as they were under lockdown or "online-mode"<sup>3</sup> as Hao et al. (2023) find for an online asynchronous college in China.

This paper contributes to a nascent literature on how the pandemic has impacted college students. While studies using survey data find that students were hard hit during the first months of the pandemic, decreasing their expectations on academic performance (Aucejo et al., 2020; Barnum and Bryan, 2020;

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<sup>2</sup> Others documented the semester GPA increase in Spring 2020 (Rodríguez-Planas 2022b; Altindag et al. 2021; Bird et al. 2022), but their datasets and analysis ended in Spring 2020.

<sup>3</sup> In New York, life did not return to "normal" until Fall 2022 with a lot of business functioning mostly online, which reduce commuting time significantly, giving everybody more "down time" to do other things.

Rodríguez-Planas, 2022a; Jaeger et al., 2021); analysis of academic records reveals widespread grade inflation during spring 2020 semester (Rodríguez-Planas 2022b; Altindag et al. 2021) due to faculty's leniency and the greater flexibility in grading. At the same time, there is evidence that the unexpected switch from in-person to online learning during Spring 2020 decreased students' academic performance and course completion relative to in-person learning (Kofoed et al. 2021; Bird et al. 2022; Altindag et al. 2021).

Rodríguez-Planas (2022b) used similar data as in the current study for a smaller sample of QC students to document a differential effect of the pandemic on students' Spring 2020 semester GPA based on students' pre-COVID19 income and academic performance. She also estimates that, during the Spring 2020 semester, the FGP was responsible for two thirds of the grade inflation observed in the Spring 2020 semester at QC. Yet, Rodríguez-Planas (2022b) does *not* study the differential academic performance of FGP users and non-users before and after the pandemic as is the focus in the current paper. Importantly, her analysis ends in Spring 2020, whereas we study the medium-term consequences of having chosen the FGP on both academic success and graduation once the FGP is no longer available. To the best of our knowledge, we are the first to study the efficacy of the FGP and to find that, despite its short-run success, the policy backfired in the medium run as students who chose the FGP struggled academically in subsequent semesters, with consequences on their likelihood to graduate and graduate on time. We expect our findings to inform college administrators and offer guidance on how to best assist students who experience unexpected population crises or disasters.

## II. Queens College and the Flexible Grading Policy

Located in a working-class neighborhood in the borough of Queens, QC is one of the 12 four-year colleges in the City University of New York (CUNY), the public university system in NYC. QC is recognized as one of the most affordable public colleges in the country<sup>4</sup> with many of its students coming from economically disadvantaged groups including first-generation students<sup>5</sup>, low-income students, transfer students, non-native-English speakers, and under-represented minorities.

Understanding the great uncertainty that CUNY students were experiencing in spring 2020, CUNY decided to loosen their grading policy in the best interest of their students' academic success through the Flexible Grading Policy (FGP). Under this policy, students were able to convert the passing letter grade they earned in *any and all* of their courses (A- to D for undergraduate students, B+ to C- for graduate students) into a grade of Credit ("CR") for the course; or a grade of F into a grade of No Credit ("NC").

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<sup>4</sup> The median undergraduate tuition at QC is \$6,930, which is \$14,203 less than the national average for Master Colleges and University (\$20,733).

<sup>5</sup> First-generation students are the first in their family to attend college.

Both CR/NC grades did not factor into the student's GPA. At QC, the FGP was offered both in Spring and Fall 2020 semesters.<sup>6</sup> In both semesters, the CR/NC option was a choice that students could make after having seen the letter grades they earned. Students had until June 25<sup>th</sup> 2020 (January 12<sup>th</sup> 2021) to elect CR/NC, that is twenty business days (twenty days) after the University's final grade submission deadline of May 28<sup>th</sup> 2020 (December 23<sup>rd</sup> 2020).

The policy was widely announced as soon as it was instituted mid-semester.<sup>7</sup> Importantly, major efforts were put in place so that students understood both how the policy worked as well as the fact that it was the students' choice, not that of the faculty—in fact, the student did not have to inform their professors about their FGP decision. Starting Spring 2021 semester, the CR/NC flexible grading option was no longer available to students. Students were informed in Fall 2020 that the FGP would not be available moving forward.

### **III. Data**

We merged individual administrative academic records with transcript records data resulting in an unbalanced panel of 23,007 records from 4,969 QC students spanning from Spring 2019 to Spring 2022 semesters, both included.<sup>8</sup> From the academic records, we observe students' semester GPA and credits taken and earned, and date of graduation (if the student has graduated). Credits taken do not include courses officially withdrawn as they do not affect the GPA. By subtracting credits earned from credits taken, we get credits failed, which include credits from: (1) courses unofficially withdrawn (where the student stopped attending and never withdrew); (2) courses with an F grade; and (3) courses with a grade of Failed Incomplete, which is the grade assigned when an incomplete is not resolved by the following semester. However, in Spring and Fall 2020, this category also includes credits for courses with a grade of No Credit (NC). Administrative records also collect information on students' sex, age, race, and ethnicity, as well as the following information collected at the beginning of Spring 2020: students' major, class level (indicating whether the student is a freshman, sophomore, junior, senior, or in graduate school), Fall 2019 cumulative

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<sup>6</sup> In contrast with Spring 2020 FGP which included any and all of CUNY courses, in Fall 2020 some courses were excluded from the CR/NC option predominantly because certification or license requirements.

<sup>7</sup> Students did not expect the policy when they registered for classes in Spring 2020 nor Fall 2020 as CUNY's intention was for the policy to only be available for the Spring 2020 semester when they announced it on April 1<sup>st</sup> 2020. On December 14<sup>th</sup> 2020, QC President announced the extension of the FGP for the Fall 2020 semester, effective immediately.

<sup>8</sup> Rodríguez-Planas received IRB approval (IRB file #2020-0475) on July 21<sup>st</sup> 2020 to collect academic records and conduct a student online survey on COVID-19 related challenges. In Spring 2021, she amended the IRB to also have access to students' transcripts.

GPA, part-time student status, and whether the student had ever received the federal Pell grant or was a transfer student.

Transcript data contain all the courses students took each semester and the grades they earned, including whether the student exercised the Credit (CR) option or took the No Credit (NC) option in Spring and Fall 2020 semesters. Hence, they allow us to identify which students used the FGP, during which semester, and the number of credits they converted to CR or NC. We use such information to estimate both the prevalence and intensity of the FGP. Importantly, since transcript data also include the initial grade received before changes were made, and the credits each course was worth, we use such information to calculate the students' GPA prior to using the FGP.

Students in our sample gave us authorization to access their records and responded to an online survey on COVID-19 related challenges fielded in summer and fall 2020.<sup>9</sup> They add to 4,969 students, close to one fourth of all QC student population, which is short of 20,000 enrolled students. Our response rate is higher than that obtained around the same time in 28 other universities worldwide (Jaegger et al. 2021), which ranged between 10% and 12%.<sup>10</sup> Comparing columns 1 and 5 in Panel A in Table 1, we observe that, overall, our sample is representative of the QC student population in terms of its minority and ethnic composition, age distribution, share of US born and part-time students, and share of Pell recipients. The share of freshmen and seniors in our sample is comparable to that of the college, but sophomores are under-represented and juniors are over-represented in our sample. We also observe a higher share of females and a lower share of transfer students in our sample relative to that of the college population. Higher female response rates to online surveys are not uncommon (Porter & Umbach 2006; Smith 2008). The lower response rate of students who transferred (mostly) from two-year college is explained by these students' lower engagement to regular college life due to their family and work responsibilities.

We define as FGP users those students who used the policy to convert either any passing letter grade in a grade of CR or any grade of F into a grade of NC (or both) in Spring and/or Fall semesters 2020. In the robustness section, we present results for whether they used the policy in Spring or Fall 2020 semesters. Twenty nine percent of our sample used the FGP in either Spring or Fall 2020, 13.1% used it only in Spring 2020 semester, 9.59% only used it only in Fall 2020 semesters, and 6.50% used it in both semesters. Among FGP users, in Spring (Fall) 2020, about 29.5% (27.5%) used the policy to convert a D grade into a pass (CR option); 48.9% (43.5%) used it to convert a C grade into the CR option, and 19.3% (19.1%) used it to

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<sup>9</sup> The first survey (with 3,148 respondents) was sent to all QC students enrolled in Spring 2020 semester and fielded between July 24<sup>th</sup> 2020 and September 18<sup>th</sup> 2020. The second survey (with 2,827 respondents) was sent to all QC students registered in Fall 2020 and fielded between November 24<sup>th</sup> 2020 and January 18<sup>th</sup> 2021. Close to one third of the students (976) responded to both surveys. Final data includes 4,969 students when we exclude the students who have missing data points on essential variables (such as class level) or inconsistent Semester GPAs.

<sup>10</sup> Our student sample size is also five times larger than that of other post-COVID-19 higher-education survey studies which took the first 1,000 students to respond the survey (Aucejo et al. 2020).

convert a B grade option. On any given semester, FGP users converted an average of 4.4 credits to CR and 1.82 credits to NC

Comparing the socio-demographic characteristics of students who never used the FGP (hereafter FGP non-users) with those who did (hereafter FGP users), columns 2 and 3 in Panel A in Table 1 reveal that the latter are less likely to be female, white, 25-years old and older, part-time student, and graduate student than the former.<sup>11</sup> Consistent with the fact that students who used the FGP are younger than those who did not use it, FGP users are also less likely to work (both before and after the pandemic) than FGP non-users. Interestingly, they are also more likely to be minority students, namely Asians and African American, and socio-economically vulnerable as reflected by a higher share of Pell recipients, transfer students, and first-generation students among FGP users. FGP users are also more likely to be majoring in science majors and less likely to major in social sciences or non-STEM majors.<sup>12</sup>

On average, FGP users have lower academic performance prior to the pandemic than FGP non-users as their 2019 Fall GPA is 13% (or 0.414 points) lower—shown at the end of Panel A in Table 1. Table 2 shows that, prior to the pandemic, FGP users enrolled in 13% more credits than FGP non-users (Panel B). As they only earned an average of 5.5% more credits per semester, FGP users failed, on average, close to one (0.867) more credit per semester than FGP non-users pre-pandemic.

Column 1 in Appendix Table A.1 regresses the indicator of using the FGP in Spring or Fall 2020 on all the pre-pandemic characteristics. When all covariates are included in the regression, we observe that FGP users are less likely to be women, older, white, graduate students, and part-time students than FGP non-users. They also have a lower Fall 2019 GPA than non-users and are more likely to be sophomores and graduate in a STEM major. Yet, there are no longer statistically significant differences in employment status, and measures of socio-economic vulnerability such as transfer student, first-generation student, or Pell recipient.

#### **IV. *FGP and the Graduation and On-Time Graduation***

In this section, we document whether students who used the FGP were less likely to graduate and graduate on time by Spring 2022 than students who did not use the FGP. Even though we control for a battery of pre-pandemic students' characteristics, including students' Fall 2019 cumulative GPA, the estimates below only capture an association between the use of the FGP and the likelihood of graduating by Spring 2022, not causality. To identify whether there is a gap in graduation between FGP users and non-users, we estimate the following equation using ordinary least squares (OLS):

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<sup>11</sup> The lower FGP intake among graduate students is likely the result of the CR/NC option being valid for certification or license requirements.

<sup>12</sup> While sciences majors refer to mathematics, biology, chemistry, physics, geology; majors in social sciences refer to accounting, economics, business, political science, psychology etc. The third group includes non-STEM majors.

$$Y_i^{Spring\ 2022} = \alpha_0 + \alpha_1 Flexible\ Grading_i + X_i^{Fall\ 2019'} \alpha_2 + Z_i^{Fall\ 2020'} \alpha_3 + \varepsilon_i \quad (1)$$

where  $Y_i^{Spring\ 2022}$  is the student's  $i$  graduation status as of the end of Spring 2022.  $X_i^{Fall\ 2019'}$  is a vector of baseline characteristics observed pre-pandemic and listed (mostly in Panel A) in Table 1. It is important to underscore that we control for students' pre-pandemic academic performance with the Fall 2019 cumulative GPA.  $Z_i^{Fall\ 2020'}$  is a vector of student's characteristics collected during the survey in the second half of 2020. They indicate students' self-reported health shocks, childcare disruptions, or challenges with online-learning, financial aid, or job loss during Spring and Fall 2020. Because these covariates are potentially endogenous, they will not be used in our preferred specification. However, we include them in some specifications to explore the extent to which COVID-19 shocks may be driving the FGP differential in graduation rates. The coefficient  $\alpha_j$  captures the association between using the FGP and the students' outcome relative to students who did not use the FGP. In the next section, the event study analysis shows that the parallel trends assumption between FGP users and non-users holds prior to the policy.

Results shown in Column 2, Panel A in Table 3 document that using the FGP is associated with a 16% lower probability of graduating by Spring 2022 relative to the average graduation rate of FGP non-users of 46.2%, even after controlling for many socio-demographic characteristics, including Fall 2019 cumulative GPA, pre-pandemic full-time student status, and pre-pandemic employment status. Similarly, Column 2, Panel B shows that using the FGP is associated with an 18.2% lower probability of graduating *on time* by Spring 2022 relative to the average graduation rate of FGP non-users of 18.7%. Focusing only on the cohorts of students who began QC between 2016 and 2018 (both years included) and hence who ought to have graduated by Spring 2022, Panel C documents that using the FGP is associated with a 13.4% lower four-year graduation rate relative to the average four-year graduation rate of 49.2% of FGP non-users.

Columns 3 to 5 in Table 3 present results by whether the students were in the top, medium, or bottom tier of the Fall 2019 cumulative GPA distribution. The association between FGP use and graduating by Spring 2022 is 6.4 percentage points lower for FGP users than non-users across the three tiers of the distribution (shown in Panel A). Yet, the percentual effect is smaller for students in the top tier of the distribution (-9%) than those in the medium tier (-12%) than those in the bottom tier (-17%) as the average graduation rate of FGP non-users is directly related to students' pre-pandemic performance. In contrast, if we focus on on-time graduation (Panel B) or graduating in four years for cohorts 2016 to 2018 (Panel C), we find that using the FGP is associated with a 25% lower on-time graduation rate for students in the medium tier of the distribution and a 24% and 17% lower four-year graduation rates for students in the top

and medium tier of the distribution. All these estimates are statistically significant at 10% level or lower. Yet, there is no FGP differential for on-time or four-year graduation rates among students in the lower tier.

Columns 6 and 7 in Table 3 show the association between using the FGP and graduating after controlling for students' own or family COVID-19 sickness (column 6) and other pandemic-related shocks such as challenges with online learning, employment losses due to the lockdown, financial aid challenges due to the pandemic, and childcare responsibilities due to online school (column 7). Interestingly, the association between FGP and graduating does not change much when we add the pandemic-related controls (relative to the specification in column 2) suggesting that it is not driven by health, educational, or economic COVID-19 related shocks, even though FGP users are more likely to have been sick with COVID-19, have had childcare responsibilities during the first year of the pandemic, or have had online challenged because of COVID-19 as shown in Columns 2 and 3 in the Appendix Table A.1. Finally, Column 8 adds to the controls in column 7 an indicator of whether the student was a STEM major, a Social Sciences major, or a non-STEM major. Even though the coefficients on the FGP indicator become a tad smaller once we control for major type, there is still a negative gap in graduation and on-time graduation between FGP users and non-users (albeit only statistically significant at the 10% level for on-time graduation).

The negative association between the graduation rate and use of the FGP could be the result of: (1) FGP users delaying graduation because of the pandemic; (2) FGP non-users graduating sooner because of the pandemic (due to grade inflation during Spring 2020 as documented by Rodríguez-Planas 2022b); or (3) a combination of both. The four-year graduation rate for the cohorts 2016 to 2018 in our sample averages 44.4%, distributed between 49.2% for students who did not use the FGP and 35.2% for students who used the FGP. In comparison, the QC population four-year graduation rates for the 2013 to 2015 cohorts were steady at 40%.<sup>13</sup>

Using administrative and transcript longitudinal data, in the rest of the paper we estimate event study models to assess the validity of the pre-existing parallel trends assumption in academic performance between FGP users and non-users and understand the dynamics behind the FGP gap in graduation rates. To control for students' time-invariant unobserved heterogeneity, our models exploit within-student variation with student fixed effects models. To address concerns that differential performance between FGP users and non-users may be due to COVID-19-related shocks (other than the flexible grading policy), we use students' survey responses on how the pandemic impacted their health and that of their family, their online

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<sup>13</sup> Combining data from [6. Graduation Rates - freshmen | Tableau Public](#) and [7. Graduation Rates - transfers | Tableau Public](#), the authors estimate that the four-year graduation rate are 40.90% for cohort 2013; 40.16% for cohort 2014, 40.92% for cohort 2015, and 46.11% for cohort 2016.

learning, and their financial situation during Spring and Fall 2020. Ultimately, the analysis below will provide robust evidence of the unintended effects of the FGP on students' academic success.

## V. Statistical Methods

To estimate the differential effect of choosing the FGP on any course during Spring and Fall 2020 semesters on students' academic performance, we estimate the following event-study with individual fixed effects:

$$Y_{is} = \alpha_0 + \sum_{j=-2}^5 \beta_j (S_{sj}) + \sum_{j=-2}^5 \gamma_j (S_{sj} * Flexible\ Grading_i) + \varphi_i + \varepsilon_{is} \quad (2)$$

where  $Y_{is}$  is the outcome of interest (such as semester GPA) for student  $i$  in semester  $s$ .  $Flexible\ Grading_i$  is equal to 1 if student  $i$  chose the FGP for any of his or her courses in either Spring or Fall 2020 (or both semesters) and 0 if the student never used the FGP.  $S_{sj}$  is a dummy which takes value 1 if the outcome is observed in  $j^{\text{th}}$  semester before ( $-j$ ) or after ( $+j$ ) January 27<sup>th</sup> 2020, which is when Spring 2020 began, and 0 otherwise. The Fall 2019 dummy is the omitted semester.  $\varphi_i$  represents the individual fixed effects. Standard errors are clustered at the student level.

The coefficients of interest,  $\gamma_j$  (starting at  $j=1$ ) capture the differential post-pandemic effect on the outcome,  $Y_{is}$ , for students who used the FGP relative to their peers who did not use it, relative to each student's pre-pandemic performance. The individual fixed effects,  $\varphi_i$ , absorb the *Flexible Grading* indicator (as well as all the other time-invariant observable and unobservable characteristics). The coefficients  $\gamma_1$  and  $\gamma_2$  capture how the academic performance of students who used the FGP changed in Spring and Fall 2020, semesters in which the FGP was available, relative to Fall 2019 relative to the change experienced by FGP non-users. Similarly, the coefficients  $\gamma_3$  to  $\gamma_5$  capture how the academic performance of students who used the FGP changed from Spring 2021 to Spring 2022 relative to Fall 2019 relative to the change experienced by FGP non-users. The sum of  $(\gamma_3 + \gamma_4 + \gamma_5)$  captures the cumulative effect of using the FGP once it is no longer available, that is from Spring 2021 to Spring 2022, both included. The coefficients  $\beta_j$  capture how the academic performance of students who did not use the FGP evolved over time. The sum of  $\beta_j$  and  $\gamma_j$ ,  $(\beta_j + \gamma_j)$ , captures the change in outcome during semester  $j$  experienced by FGP users relative to their Fall 2019 performance.

The main objective of this paper is to analyze whether those students who chose the FGP for any of their courses during Spring or Fall 2020 were subsequently impacted negatively in their academic performance. As identification comes from comparing outcomes from the same student before and after the pandemic (through student fixed effects), there is no need to control for time-invariant observable (and unobservable) characteristics. To put it differently, because we use an individual fixed effects model, time-invariant individual observed and unobserved heterogeneities are held constant. Furthermore, to control for

any other factors that may have impacted students' performance over time and that are not directly related with the FGP, we use as comparison group students who did not use the FGP. The critical identifying assumption is that there are parallel trends in the outcome variable across both groups (FGP users versus FGP non-users) prior to the institution of the policy. In the absence of any pre-existing differential pre-trends between students who used the FGP and those who did not, the estimated coefficients  $\gamma_{-2}$  and  $\gamma_{-1}$  corresponding to the semesters prior to the Spring 2020 would not be statistically different from zero. In some specifications, the outcome of interest will be measured at the course level ( $Y_{ics}$ ) instead of the student level ( $Y_{is}$ ).

We do not model endogenous choice of the FGP. Therefore, we do not strictly identify the causal impact on academic performance of the FGP. However, longitudinal estimates more closely approximate average treatment effects among the treated than among random draws from the population addressing unobserved ability differences and pre-pandemic differences in performance. Moreover, our estimates bring new evidence on how the FGP impacted students' academic success in both the short and medium run. Furthermore, the event study analysis enables us to observe the trajectories of students' performance and look for anomalous breaks in patterns that differ with the choice of the FGP, noting whether changes in academic performance preceded or followed the FGP. Finally, by presenting the analysis by whether the student is in the bottom, medium, and top tier of the cumulative 2019 GPA distribution, we reduce pre-pandemic academic differences across our treated and comparison groups and identify potential heterogeneity effects by pre-pandemic performance. Finally, survey data on students' perceived challenges allow us to rule out alternative mechanisms such as challenges due to online learning, children's responsibilities, financial aid and employment shocks, or health shocks.

Equation (2) is also estimated at the *intensive margin* where instead of the dummy variable, *Flexible Grading<sub>i</sub>*, we use the total number of credits converted with flexible grading during the year 2020. This alternative specification allows us to estimate whether a higher use of FGP has a more detrimental effect on the academic performance a year later than a lower use of flexible grading.

## VI. Results

Table 4 shows results from estimating the event study analysis with individual fixed effects described in equation (2). Each column displays estimated coefficients from a regression using a different outcome, namely semester GPA (column 1), credits taken (column 2), credits earned (column 3), credits for which a failing grade (or NC in 2020) was earned (column 4), and semester GPA prior to using the flexible grading policy (column 5).

***Academic Performance of Students Who Did Not Choose the FGP.*** Estimates  $\widehat{\beta}_1$  in Table 4 show that the academic performance of students who did not choose the FGP improved in Spring 2020 as they earned 2.5% more credits and failed 69.3% less credits<sup>14</sup> resulting in a 10.1% higher GPA relative to their pre-pandemic means (shown in Table 2). They also took 1.4% less credits. All four effects are statistically significant at the 5% level or lower. As credits failed can be either a grade of F or an unofficially withdrawn course, Table 5 (columns 7 and 8) and Table 6 (column 5) show that the decrease in credits failed is not driven by a higher share of courses unofficially withdrawn, but instead a 75% lower share of Fs in their courses. Column 1 in Table 6 shows that the increase in GPA is also driven by an improvement in grades as these students earned a 33.5% higher share of As in their Spring 2020 courses relative to before the pandemic and a lower share of B (17.7% less) to D (68% less) grades (shown in columns 2 to 4 in Table 6).

Estimates  $\widehat{\beta}_2$  to  $\widehat{\beta}_5$  in Table 4 show whether these academic improvements persisted or faded away in the following four semesters. Interestingly, FGP non-users no longer earned more credits in the following academic year (Fall 2020 and Spring 2021), and they earned 11.1% and 16.7% *less* credits in Fall 2021 and Spring 2022, respectively, relative to Fall 2019. However, because they also took less credits each semester and increasingly so as the pandemic progressed, FGP non-users continued to fail less credits in the subsequent semesters relative to before the pandemic, although this effect declined with time from 76.1% less credits failed in Fall 2020 to 22.6% less credits failed in Spring 2022 (relative to credits failed in Fall 2019).

Perhaps more noteworthy is the progressive decline in credits taken and credits earned, which is mostly driven by students at the top two tiers of the distribution (shown in Panels E and D in Figure 3, respectively). FGP non-users took 3.4% less credits in Fall 2020, 12.4% less credits in Fall 2021 and 17% in Spring 2022 relative to the credits taken in Fall 2019. By Spring 2022, two years after the beginning of the pandemic, FGP non-users were taking an average of 1.9 less credits per semester.

To provide additional flexibility to students during Spring 2020, the university extended the deadline to withdraw officially from a class from the original date of April 1<sup>st</sup> 2020 to the end of regular classes (May 14<sup>th</sup> 2020). This extension was available to all students regardless of whether they used the FGP or not—and hence, it is not part of the FGP that we evaluate. In addition, this extension became permanent across CUNY colleges in September 2020. As credits taken do not include credits officially withdrawn, the decrease in credits taken during Fall 2020 and 2021 and Spring 2022 is partly driven by CUNY’s extension of the deadline to officially withdraw a course from mid-semester to the end of regular classes as the share of officially withdrawn courses increased during the aforementioned semesters relative to Fall 2019 (shown

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<sup>14</sup> The large percent decrease in credits failed is partly due to a low average of credits failed per semester pre-pandemic: 0.612 credits.

in column 5 in Table 5) and the number of credits officially students withdrew also increased in Fall and Spring 2021 relative to Fall 2019 (shown in column 6 in Table 5).

While the grade inflation that began with the pandemic persisted, it progressively declined from a 10.1% higher GPA in Spring 2020, to 7.1% in Spring 2021, to 4.5% in Spring 2022 relative to that of Fall 2019 (shown in Table 4). Panel A in Figure 1 displays the event study analysis for students who never used the FGP. It shows there is a sharp improvement in semester GPA in Spring 2020 that persist over time, although it smoothly declines. Column 1 in Appendix Table A.2 shows that this pattern persists even as we exclude students who were close to graduation, hence it is not driven by those who did not graduate on time. Column 8 in Appendix Table A.2 shows that grade inflation persists even if we control for students enrolling into specific courses with a course fixed effect model. Others have found that academic performance increased during Spring 2020 semester (Rodríguez-Planas 2022b; Altindag et al. 2021; Bird et al. 2022), but to the best of our knowledge, we are the first to document that the grades continued to be higher during the two first years of the pandemic than before. Table 6 shows that this improvement in the GPA is driven by a higher share of As and a lower share of B to F grades, that smoothly declines with time.

***Short-Term Effects of the FGP.*** Did the FGP succeed in giving students the flexibility they needed to overcome the disruptions brought upon them by the COVID-19 pandemic? The answer is yes: the FGP was very successful in its goal of providing the flexibility students needed to overcome the challenges of the first months of the pandemic as we observe no statistically significant difference between the Spring and Fall 2020 GPA of FGP users and non-users ( $\hat{\gamma}_1$  and  $\hat{\gamma}_2$  shown in column 1 in Table 4). Yet, column 5 in Table 4 shows that, prior to using the policy, FGP users would have earned 12.7% and 9.3% *lower* GPA in Spring and Fall 2020 semesters, respectively, than before the pandemic relative to their peers' change in performance.<sup>15</sup> To put it differently, FGP users underperformed relative to their peers who did not use the FGP during Spring and Fall 2020. As they were lower achievers prior to the pandemic than FGP non-users<sup>16</sup>, this underperformance is consistent with evidence that the switch to online learning, which requires more discipline and self-regulated learning than traditional in-person learning, widened the educational gap between high- and low-performers during the early months of the pandemic (Kofoed et al. 2021; Bird et al. 2022).<sup>17</sup> Indeed, Column 3 in Appendix Table A.1 shows that reporting online-learning challenges is associated with a 8.2 percentage points higher likelihood to use the FGP, a 28% increase relative to the average share of FGP users of 29%.

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<sup>15</sup> We use FGP non-users' pre-pandemic average GPA of 3.239 to calculate the percent change.

<sup>16</sup> This statement is based on their pre-pandemic GPA and credits failed prior to the pandemic shown in Table 2 and discussed at the end of the Data section.

<sup>17</sup> This lower performance would be explained by the need of basic skills to acquire additional skills (Cunha et al., 2007)

Importantly, the policy allowed students whose Spring 2020 GPA dropped below their Fall 2019 performance to increase it to the point of eliminating their underperformance relative to their peers who did not choose FGP. Similarly, in Fall 2020 students used the FGP to boost their grades and eliminate any negative gap with their higher-performing peers. Indeed,  $(\widehat{\beta}_1 + \widehat{\gamma}_1)$  and  $(\widehat{\beta}_2 + \widehat{\gamma}_2)$  show that FGP users earned a 9.6% and 7.3% higher GPA in Spring and Fall 2020 semesters relative to their pre-pandemic performance (shown in at the bottom of column 1 in Table 4). This improvement is close to that of non-users over the same period: 10.1% and 9%, respectively. However, had they not used the flexible grading policy, FGP users would have, instead, earned a 2.8% *lower* Spring 2020 GPA relative to that of Fall 2019 and would have not experienced any increase in the Fall 2020 GPA relative to their Fall 2019 GPA.

This improvement in grades is driven by FGP users' choice of both the NC and CR options. Column 1 in Table 5 shows that the share of FGP users choosing the NC option increased by 6 and 3.3 percentage points in Spring and Fall 2020, respectively, relative to Fall 2019—see  $(\beta_1 + \gamma_1)$  and  $(\beta_2 + \gamma_2)$ . Column 2 shows that FGP users also increased their average number of NC credits taken by 0.78 credits in Spring 2020 and 0.45 credits in Fall 2020 relative to Fall 2019. At the same time, column 3 in Table 5 shows that the share of FGP users choosing the CR option increased by 22.9 and 13 percentage points in Spring and Fall 2020, respectively, relative to Fall 2019.<sup>18</sup> Hence, FGP users chose close to four times more the CR option than the NC option.

Just like their FGP non-user peers, FGP users also experienced grade inflation during academic year 2020, but to a lesser extent as shown by estimates  $(\widehat{\beta}_1 + \widehat{\gamma}_1)$  and  $(\widehat{\beta}_2 + \widehat{\gamma}_2)$  in columns 1 to 5 in Table 6. FGP users' share of As increased by 7 and 6 percentage points in Spring and Fall 2020, respectively, as shown in column 1 in Table 6. However, this increase was 20% and 15% lower than that of their peers who did not choose the FGP ( $\widehat{\gamma}_1 = -0.104$  for Spring 2020 and  $\widehat{\gamma}_2 = -0.078$ ).

During Spring and Fall 2020 semesters, FGP users failed 63.2% and 43% more credits (or earned more NC credits as seen above), respectively, than FGP non-users relative to FGP non-users' pre-pandemic mean (shown in column 4 in Table 4). This is driven by a 3.94% higher intake of credits in Spring 2020 (shown in column 2 in Table 4) and a lower (albeit only marginally significant) 2.7% earned credits in Fall 2020 relative to their FGP non-user peers (shown in column 3 in Table 4). The lower share of earned credits in Fall 2020 is driven by a higher share of both NC and officially withdrawn courses as shown in columns 1 and 2 and 5 and 6 in Table 5.<sup>19</sup>

As we noted earlier, FGP users were lower performing students than FGP non-users before the pandemic. Because we estimate event study analyses with individual fixed effects, the latter will control

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<sup>18</sup> This option was not chosen by the counterfactual, by definition, nor was it available outside of Spring and Fall 2020. In contrast, the option of NC, while unusual, may be used by students in normal times.

<sup>19</sup> NC could not affect credits earned as the student is not awarded credit with this option.

for students' time invariant observed and unobserved heterogeneity. Importantly, our event study analyses show parallel trends prior to Spring 2020 in all our specifications as shown in Figure 1 (Panels D and E) and Figure 2..

***Medium-Term Effects of the FGP.*** How did the use of the FGP during Spring or Fall 2020 impact students' academic performance in the subsequent semesters? Even though the FGP was no longer available starting Spring 2021 semester, the pandemic was ongoing and an 87.8% of courses were still online.<sup>20</sup> While students and faculty had already transitioned to online or hybrid learning or returned to in-person learning, some of the higher leniency in grading as well as the greater opportunities for cheating relative to pre-pandemic persisted as observed by the higher GPA earned during Spring and Fall 2021 and Spring 2022 by students who had never used the flexible grading policy. Hence, to evaluate how students who chose the FGP did in subsequent semesters (relative to their pre-pandemic performance), we compare them to the counterfactual: students who did not chose the FGP.

Estimates  $\widehat{\gamma}_3$  to  $\widehat{\gamma}_5$  in Table 4 measure the differential effect of choosing the FGP during either Spring and Fall 2020 (or both) on students' change in academic performance up to two years after the beginning of the pandemic (relative to Fall 2019) relative to the change observed among non-users. Students who used the FGP underperformed a year later relative to their own pre-pandemic performance relative to the change in performance of FGP non-users. More specifically, FGP users earned 5.3% lower GPA in Spring 2021 and 4.7% lower GPA in Fall 2021 relative to Fall 2019 relative to the change observed among FGP non-users. Both estimates are statistically significant at the 1% level. Two years later, FGP users continued to underperform relative to FGP non-users, albeit the gap is smaller as their Spring 2022 GPA is only 2.6% lower than that of FGP non-users relative to pre-pandemic. This estimate is statistically significant at the 10% level. Panel D in Figure 1 shows the parallel trends prior to the pandemic, as well as the widening of the gap once the FGP is no longer available beginning Spring 2021.

Table 6 shows that this underperformance is driven by FGP users earning a 1.7 and 1.3 percentage points higher share of Fs (an increase of 71% in Spring 2021, and 54.2% in Fall 2021 and Spring 2022) relative to the change observed among FGP non-users over the same period. Columns 7 and 8 in Table 5 also show that FGP users were more likely to unofficially withdraw a course (which translates in a failed course) and to unofficially withdraw more credits than FGP non-users beginning Fall 2020 and forward. Table 6 also shows a relative decrease in FGP users' share of As in Spring and Fall 2021 of 3.7 and 2.5 percentage points (a 7.1% and 4.8% decrease relative to FGP non-users pre-pandemic mean), respectively; and a decrease in the share of Cs in Spring and Fall 2021 of 1.7 and 2.1 percentage points (a 19% and 24%

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<sup>20</sup> The share of online courses offered during Spring 2021 has been retrieved from "<https://apps.qc.cuny.edu/courses/>" for Course Section and Number classification.

decrease relative to FGP non-users pre-pandemic mean), respectively, in Fall 2021 relative to Fall 2019 relative to the observed changes among FGP non-users.

It is important to underscore that FGP users' relative decline in performance would have been even greater in the absence of CUNY's policy to indefinitely extend the deadline to withdraw officially from a class from the eighth week to the end of regular classes because these students took more advantage of this additional flexibility than FGP non-users. For example, FGP users withdrew officially a higher share of courses and a higher number of credits from Spring 2021 to Spring 2022 than their peers relative to pre-pandemic (shown in the columns 5 and 6 in Table 5).

Hence, the benefits of the FGP ended with the policy: students who used the FGP underperformed a year later relative to their own pre-pandemic performance relative to the change in performance of FGP non-users. Indeed, during the year following the end of the FGP, they earned a 5.3% lower GPA than before the pandemic relative to their counterfactual—shown in Panel D in Figure 1. However, as the counterfactual (FGP non-users) continued to earn higher GPA a year after the beginning of the pandemic than before the pandemic (as discussed above and shown in Panel A in Figure 1), the overall GPA of FGP users ( $\widehat{\beta}_3 + \widehat{\gamma}_3$ ) increased by 1.9% in Spring 2021 relative to FGP non-users' pre-pandemic mean. This effect is statistically significant at the 10% level. Thereafter—Fall 2021 ( $\widehat{\beta}_4 + \widehat{\gamma}_4$ ) and Spring 2022 ( $\widehat{\beta}_5 + \widehat{\gamma}_5$ )—the GPA of FGP users was not statistically significantly different from their Fall 2019 GPA. This is shown in Panel B in Figure 1.

**Robustness Checks.** Appendix Table A.2 displays some sensitivity analysis. Column 1 presents estimates excluding students close to graduation. The widening of the gap between FGP users and non-users a year after the end of the FGP is even larger ruling out that our findings would be driven by students who take longer to graduate. Column 2 excludes from the sample graduate students. Again, the results hold. Columns 3 to 6 show a similar pattern if we define FGP users as those who chose FGP in Spring 2020 (columns 3 and 4) or in Fall 2020 (columns 5 and 6), albeit the pattern is more salient among those who used the FGP in Fall 2020. Columns 7 and 8 use courses as the unit of analysis, with column 8 replacing the student fixed effects with course fixed effects, addressing concerns that students may be sorting in different types of courses or faculty. Doing so, again does not change the main result that students who used the FGP underperformed relative to the comparison group once the policy was no longer available.

**Was the Penalty Larger for Those Who Used the Policy More Intensively?** Table 7 presents intensive margin results from estimating equation (1) but replacing the FGP indicator with a continuous variable measuring the total number of credits a student took under the FGP in Spring or Fall 2020. Estimates  $\widehat{\gamma}_3$  to  $\widehat{\gamma}_5$  in Table 7 show that a greater use of the FGP is associated with lower academic performance once

the policy is no longer available. A one-standard deviation increase in the average number of credits the student took in 2020 under the FGP reduces Spring or Fall 2021 semester GPA by 9.3 percentage points, a 3% decrease relative to the pre-pandemic GPA of non-users (a GPA of 3.239). This is calculated as  $(\widehat{\gamma}_3 = -0.025) * (FGP Credits_{StDev} = 3.718) = -0.093$  and  $\frac{-0.093}{Pre-pandemic GPA non-users_{mean}(3.239)} = -0.029$ . Columns 4 and 5 show that this widening of the negative gap is driven by an increase in the share of Fs and unofficially withdrawn courses by 466%<sup>21</sup> and 1,057%,<sup>22</sup> respectively.<sup>23</sup> Columns 2 and 3 also show that one-standard deviation increase in the average number of FGP credits the student took in 2020 under the FGP reduces Spring 2021 semester credits taken and earned by 17 and 23 percentage points, respectively, a 1.5%<sup>24</sup> and 2.2%<sup>25</sup> decrease relative to the counterfactual's pre-pandemic GPA means.

**Reverse Causality.** Another important identification challenge is the endogeneity of choosing the FGP (or the danger of reverse causation). Since students chose the FGP, it may be that pre-pandemic low grades "cause" choosing the FGP, instead of the FGP "causing" low grades. While we do not instrument for the FGP, in this section we present results by whether the student was in the bottom, medium or top tier of the Fall 2019 cumulative GPA. Doing so provides a cleaner identification strategy as we are now comparing students who used the FGP and students who did not with similar pre-pandemic academic performance since they are all in a particular tier of the pre-pandemic cumulative GPA. Furthermore, this analysis may bring to light potential heterogenous effects based on pre-pandemic academic performance. Results are displayed in Figure 3.<sup>26</sup>

Panel A in Figure 3 shows that the FGP negative gap holds across the three tiers. It also undercovers a differential impact by whether FGP users were in the two top tiers of the 2019 cumulative GPA distribution or not. Medium and top performers who chose the FGP earned lower semester GPAs once the policy was no longer available relative to their pre-pandemic performance. In contrast, bottom performers earned higher semester GPAs during the pandemic relative to their pre-pandemic performance. Panel F shows that FGP users' underperformance once the policy is no longer available is driven by a higher share of failed courses relative to their peers who did not use the FGP. Students in the top and medium tiers of

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<sup>21</sup>  $(\widehat{\gamma}_3 = 0.03) * (3.718) = 0.112$  and  $\frac{0.112}{Pre-pandemic F share non-users_{mean}(0.024)} = 4.66$

<sup>22</sup>  $(\widehat{\gamma}_3 = 0.02) * (3.718) = 0.074$  and  $\frac{0.074}{Pre-pandemic Unoff. withdrawn non-users_{mean}(0.007)} = 10.57$

<sup>23</sup> These percentages are large because of the low share of non-users with Fs or unofficially withdrawn courses.

<sup>24</sup>  $(\widehat{\gamma}_3 = -0.046) * (3.718) = -0.17$  and  $\frac{-0.17}{Pre-pandemic Credits Taken non-users_{mean}(11.187)} = -0.015$

<sup>25</sup>  $(\widehat{\gamma}_3 = -0.063) * (3.718) = -0.23$  and  $\frac{-0.23}{Pre-pandemic Credits Earned non-users_{mean}(10.575)} = -0.022$

<sup>26</sup> The analysis by tiers excludes 1,426 students for whom we do not observe their Fall 2019 semester GPA as they were not registered at QC during that semester or as they had not yet enrolled at QC.

the distribution have mostly a higher share of Fs than their peers (Panel G), while those in the bottom tier of the distribution have mostly a higher share of unofficially withdrawn courses than their peers (Panel H). Appendix Figure A.1 shows that for students in the top tier of the distribution, the lower performance is also the result of a lower share of As and a higher share of Bs than their counterfactual, whereas for those in the medium and bottom tiers, their underperformance is explained by a lower share of As than their counterfactual. Panel I in Figure 3 shows that FGP users (regardless of where they fall in the pre-pandemic performance distribution) also end up officially withdrawing more courses than non-users starting in Fall 2020 than their peers, suggesting that, in the absence of the added flexibility to allow students to officially withdraw a course until the end of the semester, the academic penalty for using the FGP would have been even harsher.

***Alternative Mechanisms.*** It may well be that the underperformance of FGP users relative to non-users once the policy is no longer available is caused by pandemic disruptions related to the unexpected switch to online learning, employment losses due to the lockdown, financial aid challenges due to the pandemic, childcare responsibilities due to online school, or own or family COVID-19 sickness. In this section, we present evidence showing that it is unlikely that the FGP relative underperformance is driven by such pandemic related shocks. As we surveyed students in the second half of 2020, we have information on their self-reported COVID-19 challenges and disruptions during the first months of the pandemic. If our findings were driven by pandemic disruptions to students' lives, we would not expect to find a negative FGP gap among students who reported *not* experiencing such disruptions.

Panels A and B in Figure 4 show event-study analyses of the FGP accumulated gap on semester GPA for students who reported *not* having experienced different COVID-19 related challenges by type of shock. Panels C and D show event-study analyses of the FGP accumulated gap on semester GPA for students who experienced *none* of the health-related (Panel C) or non-health-related (Panel D) COVID-19 challenges. Since we plot the accumulated gap due to FGP, in Spring 2021 we plot  $\widehat{\gamma}_3$ , in Fall 2021 we plot  $\widehat{\gamma}_3 + \widehat{\gamma}_4$ , and in Spring 2022 we plot  $\widehat{\gamma}_3 + \widehat{\gamma}_4 + \widehat{\gamma}_5$ .

For Spring 2021 semester, Panel A shows a negative and statistically significant GPA gap between FGP users and non-users for students who (1) did not have COVID-19 symptoms or did not test positive for COVID-19, (2) did not have someone who was sick with COVID-19 and/or had symptoms of COVID-19, or (3) did not take care of a family member who was sick with COVID-19 or had symptoms. The accumulated gap grows in Fall 2021 and Spring 2022. Similarly, Panel B shows a negative GPA gap between FGP users and non-users for students who did not have (1) online-learning challenges, (2) childcare responsibilities, (3) job losses, or (4) financial-aid challenges in Spring 2021, Fall 2021, and Spring 2022, although in some cases we lose precision either due to small sample size or as we move to

Spring 2022 semester. Nonetheless, these results rule out that our findings may be driven by pandemic related health shocks, childcare disruptions, or challenges with online learning or financial aid happening at the early stages of the pandemic.<sup>27</sup> Panels C and D also shows that the FGP gap is salient among students who experienced *none* of the health-related (Panel C) or non-health-related (Panel D) COVID-19 challenges, albeit small sample sizes reduce the precision of our estimates.

***Inadequate Preparation for Future Courses.*** Inadequate preparation for future courses is likely to be primarily relevant for students who were relatively early in their degree progress. Hence, we ought to find that the GPA gap between FGP users and non-users ought to be stronger among freshmen and sophomores than among juniors and seniors. Indeed, Appendix Figure A.2 shows that the results are mostly driven by Freshmen and Sophomores.

To explore whether the use of FGP in required major-core courses or required common-(general-education) courses is driving our findings, Columns 2 to 4 in Appendix Table A.3 re-estimate our main specification by whether students used the FGP in required major-core courses, which (in the absence of the FGP) require a C- or higher to pass, or in required common courses, which set the foundations for further academic success. More specifically, in Column 2 we compare the academic performance measured with semester GPA of 800 students who used the FGP for at least one major-core required course in Spring or Fall 2020 to that of 1,983 FGP-non-user students who also took a major-core required course in Spring or Fall 2020. In contrast, in Column 3 we compare the academic performance of 421 FGP-user students who used the FGP in a non-major-core required course (even though they took such type of required course) with that of the previously defined 1,983 non-FGP user students. Similarly, in Column 4, we compare the academic performance of 549 students who used the FGP for at least one general-education required course in Spring or Fall 2020 to that of 1,361 FGP-non-user students who took a general-education required course in Spring or Fall 2020. In Column 5 we compare the academic performance of 451 FGP-user students who used the FGP in a non-general-education required course (even though they took such type of required course in Spring or Fall 2020) with that of the previously defined 1,361 non-FGP user students. Column 1 replicates analysis for the whole sample for comparison purposes (shown in Column 1 in Table 4).

Comparing the  $\hat{\gamma}_j$  in columns 2 and 3, and those in columns 4 and 5, we observe slightly larger negative effects when the student used the FGP in a required course then when he did not. For example, the accumulated negative gap four semesters after the FGP was first available ( $\gamma_2 + \gamma_3 + \gamma_4 + \gamma_5$ ) is one third higher for students who took the FGP in their required major-core courses than those who took the FGP in non-major-core courses (column 2 versus column 3). Similarly, the gap is two fifths higher for

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<sup>27</sup> In the case of childcare responsibilities, we have large standard errors as the sample of students who responded to the childcare question is quite small.

students who took the FGP in common-core courses than those who used the FGP in non-common-core courses (column 4 versus column 5). Nonetheless, as a negative GPA gap between FGP users who did not use the FGP in major-core or general-education courses and non-users (shown in columns 3 and 5, respectively) remains, it suggests that students' lower effort and learning was widely widespread.

## **V. Conclusion**

This paper analyzes the short- and medium-term impacts of the flexible grading policy on students' academic success estimating an event-study analysis with individual fixed effects. Students' academic records and transcripts from Spring 2019 to Spring 2022 show that the policy was successful in the short term as it gave students the flexibility to use the CR/NC options to erase their lower grades from their transcript during Spring and Fall 2020. However, FGP users continued to underperform in subsequent semesters, when the policy was no longer available, with a higher share of Fs (among students in the top two tiers of the Fall 2019 cumulative GPA distribution), a higher share of unofficially withdrawn courses (among students in the bottom tier), and a lower share of As (regardless of their pre-pandemic performance) than non-users. Concerningly, this underperformance would have been even greater had it not been for the indefinite extension of the deadline to officially withdraw a course from mid-semester to the end of regular classes as FGP users took more advantage of this additional flexibility than FGP non-users.

Among FGP non-users, our analysis also documents a persistent grade inflation spanning from Spring 2020 to Spring 2022, driven by a higher share of As (relative to pre-pandemic) among students in the bottom two tiers of the Fall 2019 cumulative GPA distribution; and an increasing decline in credits taken, mostly driven by students at the top two tiers of the distribution.

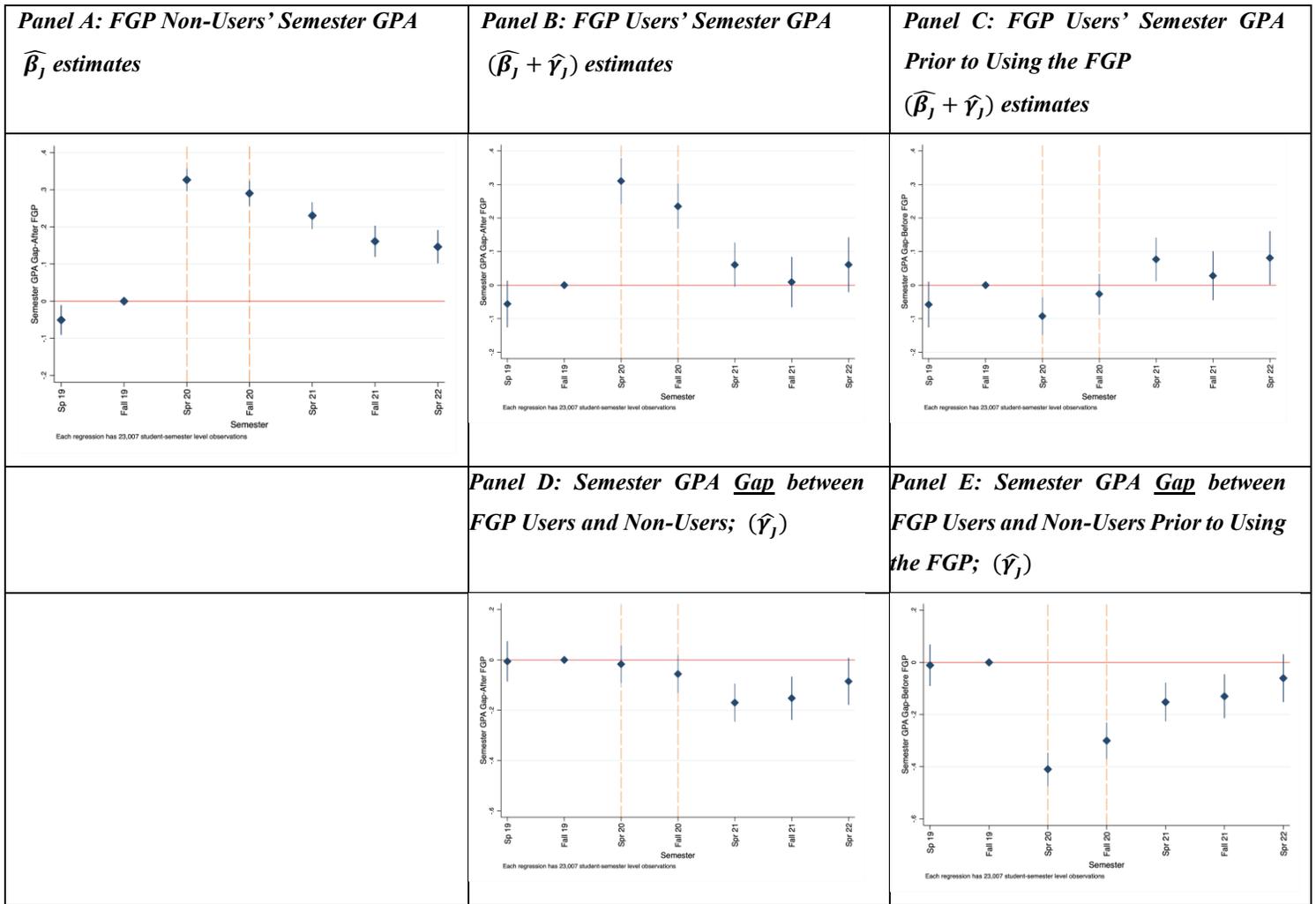
Our findings show that the flexible grading policy was only able to counteract negative shocks during the semesters it was enacted but was unable to remediate the longer-term academic challenges students endured during the COVID-19 pandemic. Using students' survey responses, we rule out that FGP users' relative underperformance is driven by students' challenges with online learning, childcare responsibilities due to primary school online learning, pandemic challenges with financial aid and employment, or health shocks to students or their families. Importantly, we document that this underperformance represented a 16% and 18% lower graduation and on-time graduation rate among FGP users (relative to non-users). Our findings suggest that while the FGP is a good device to buffer unexpected population crises, the policy needs to be offered with additional support services such as remedial classes, tutoring, or mentoring services.

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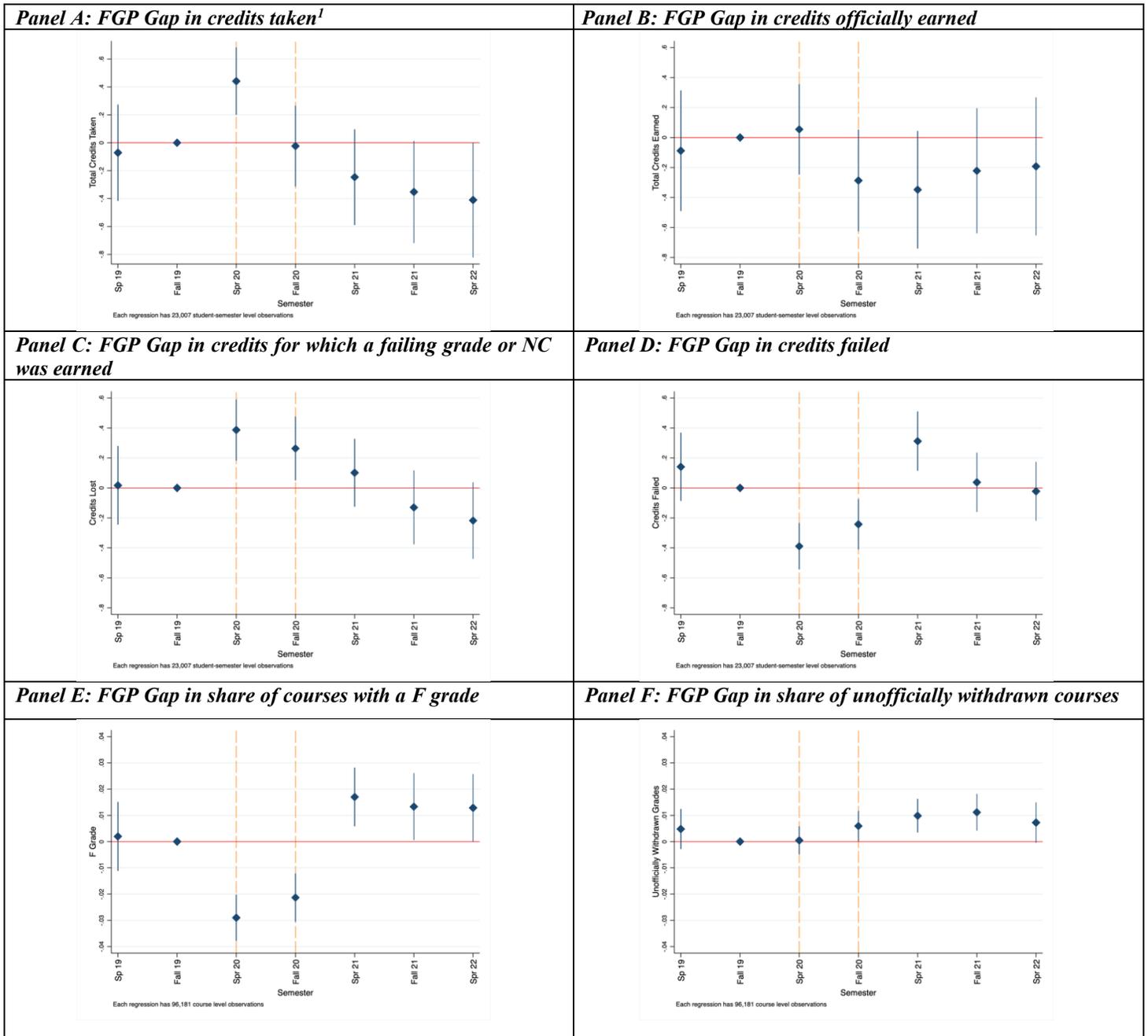
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FIGURE 1. FGP Users' and non-Users' Semester GPA and FGP GPA Gap, Individual Fixed Effects Event Analysis



Notes: Panel A plots the coefficients on the semester dummies ( $\widehat{\beta}_j$ ) to show the dynamics for semester GPA of FGP non-users. Panels B and C plot the summation of coefficients on semester dummies and the interactions between the semester dummies and the treatment dummy ( $\widehat{\beta}_j + \widehat{\gamma}_j$ ) to show the dynamics for semester GPA for FGP users. Panels D and E plot the coefficients on the interaction between the semester dummies and the FGP dummy ( $\widehat{\gamma}_j$ ) to show the gap between FGP users' and non-users' semester GPA. In Panels A, B and D, the outcome is the official semester GPA. In Panels C and E, the outcome is the official semester GPA except for the Spring and Fall 2020, in which case we have replaced the official GPA with the GPA the student would have earned had the flexible grading policy not been available. We estimated this GPA using the courses the student enrolled in, and the grades originally earned in those courses from transcript data. Estimates from all panels are obtained from estimating an individual fixed-effects event-study model as in equation (2). All outcomes are at student-semester level. The Fall 2019 semester dummy is the omitted semester. Standard errors are clustered at the individual level. All figures show 95% confidence intervals.

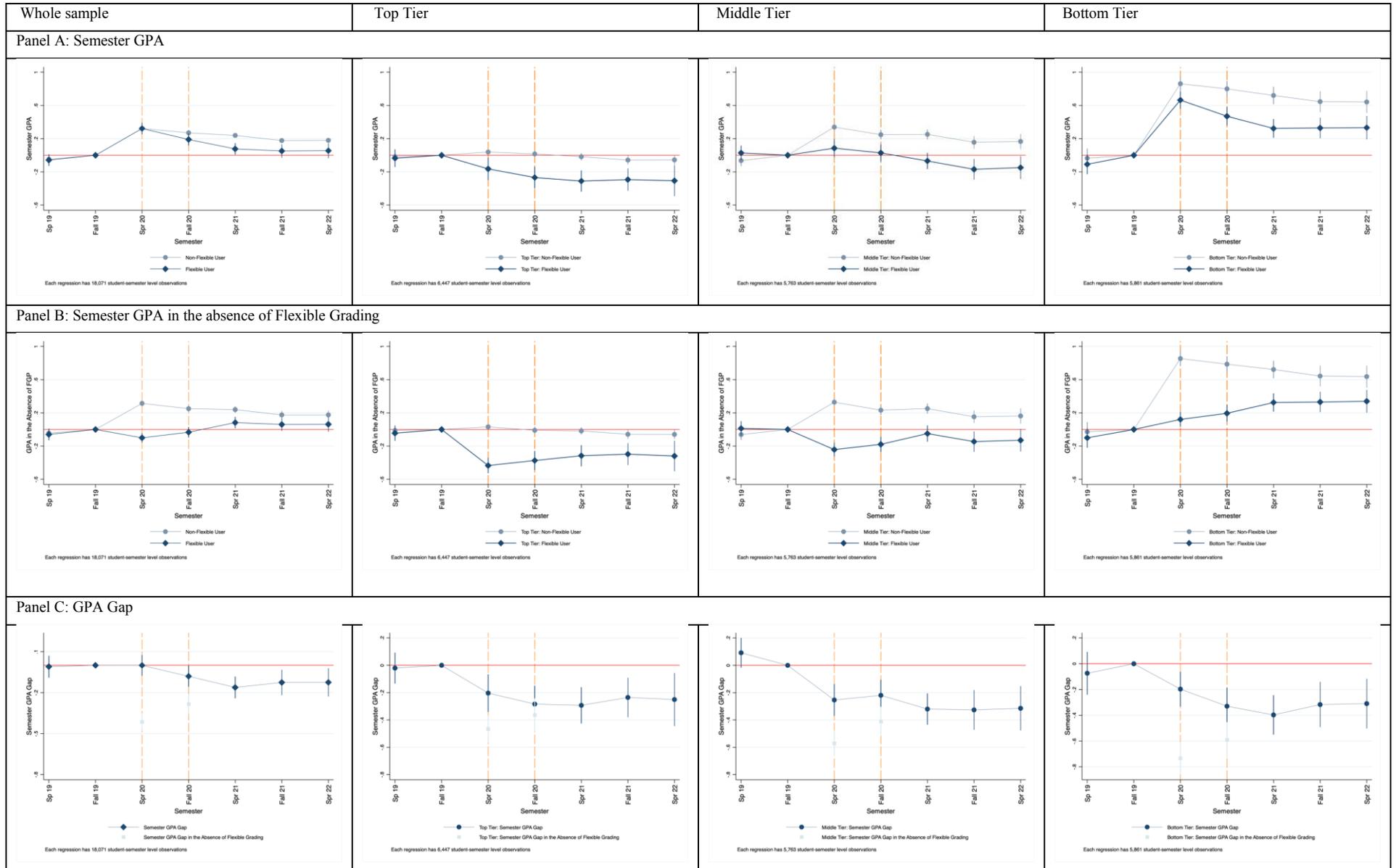
FIGURE 2: FGP Gaps in Credits Taken, Earned and Failed  
Between FGP Users and Non-Users, Individual Fixed Effects Event Analysis

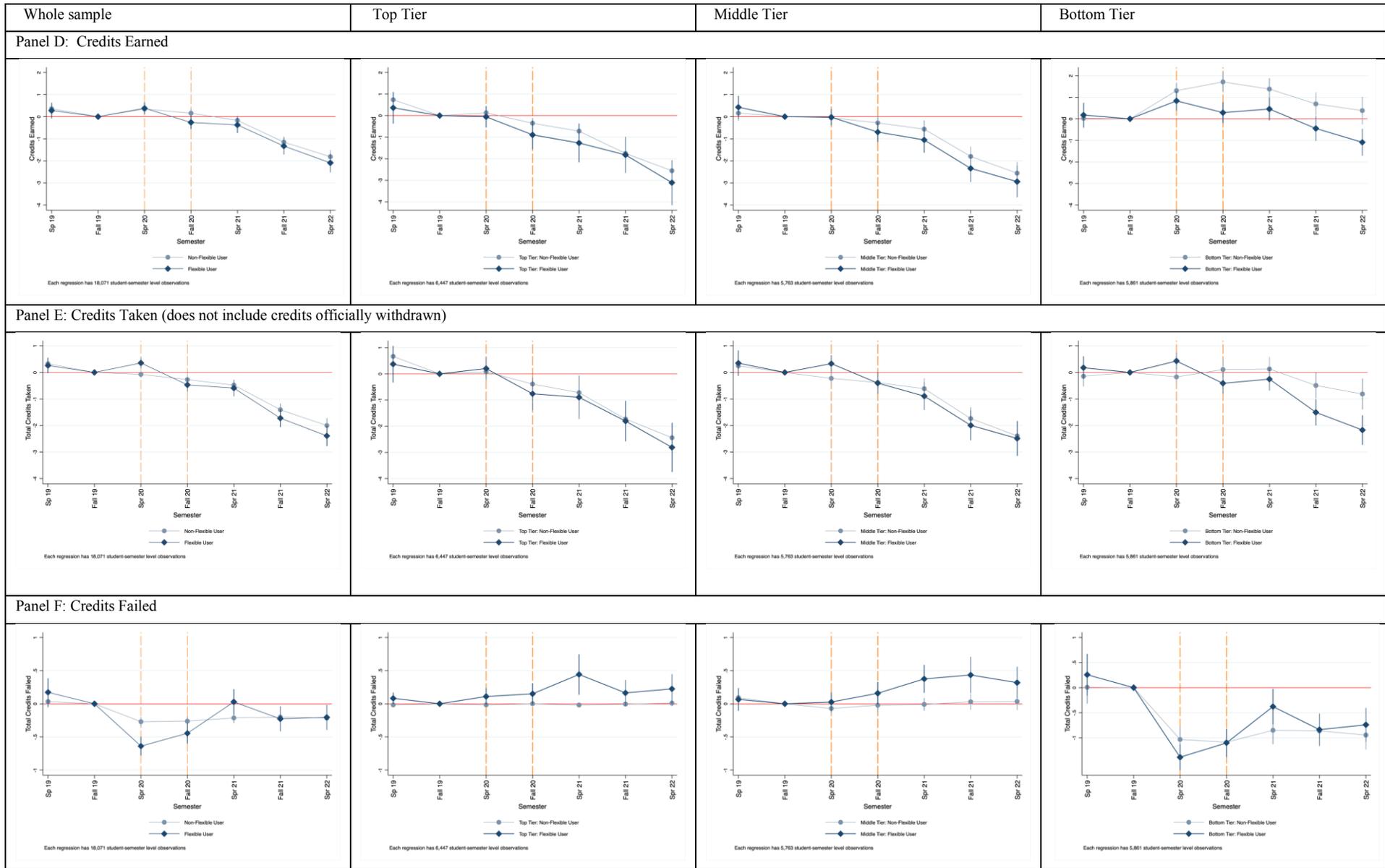


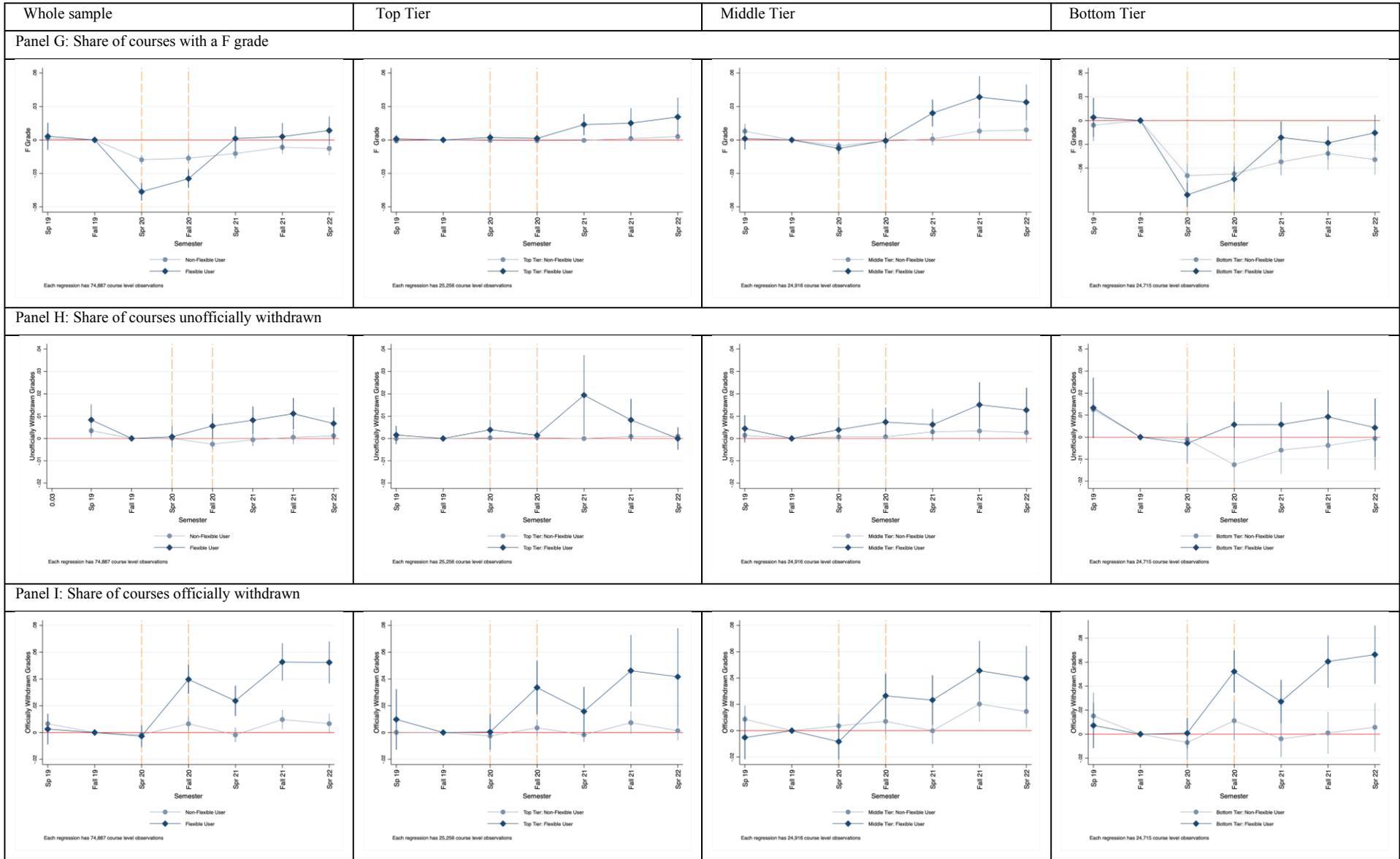
*Notes:* These figures plot the coefficients on the interaction between the semester dummies and the FGP dummy ( $\hat{\gamma}$ ) to show the gap between FGP users' and non-users' semester academic outcomes. Estimates from all panels are obtained from estimating an individual fixed-effects event-study model as in equation (2). The Fall 2019 semester dummy is the omitted semester. Standard errors are clustered at the individual level. In Panels A and B, the outcome is credits taken and credits earned, respectively. Panel C is the difference between credits taken and credits earned. In Panel D, the outcome is the sum of credits that represent the student failing a course, namely F, failed incompletes, and unofficially withdrawn courses. While Panel D includes the credits for only failing grades; Panel C includes the credits for the grades of NC, Pending Grade, WN (Never Attended) and Incompletes in addition to failing grades. In Panel E, the outcome is one if the student got an F in a course, 0 otherwise. In Panel F, the outcome is one if the student unofficially withdrew from a course, 0 otherwise. Panels A to D are estimated at the student-semester level. Panels E and F are estimated at the course-semester level. All figures show 95% confidence intervals.

<sup>1</sup> Credits taken after removing officially withdrawn courses.

FIGURE 3: Semester GPA, Credits Taken, Earned, Failed and Withdrawn by Pre-Pandemic Performance, Individual Fixed Effects Event Analysis





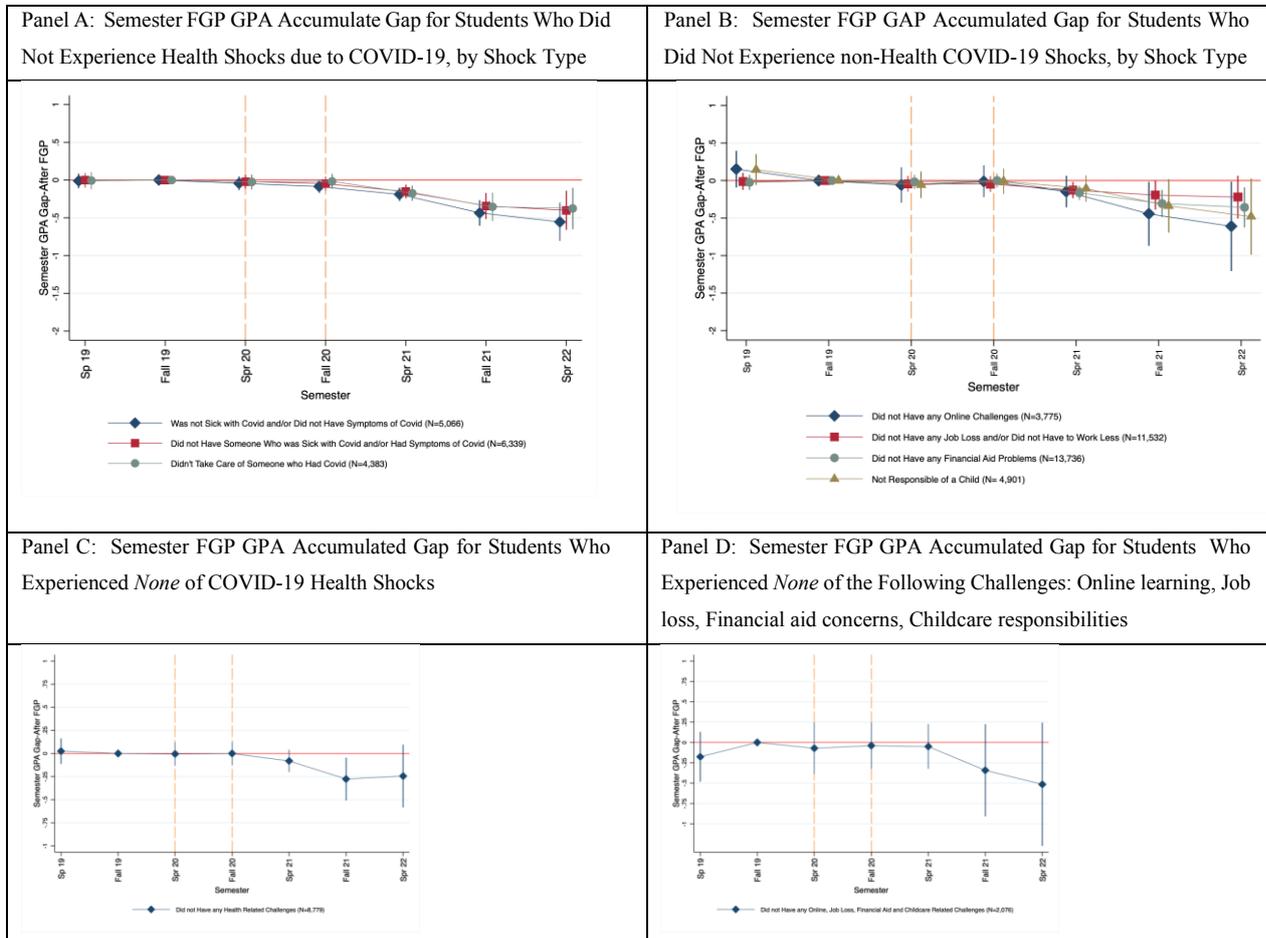


Notes: All Panels except for Panel C plot the coefficients on the semester dummies ( $\hat{\beta}_j$ ) to plot the dynamics for NFP non-users, and the summation of coefficients on semester dummies and the interactions between the semester dummies and the treatment dummy ( $\hat{\beta}_j + \hat{\gamma}_j$ ) to plot the dynamics for FGP users from an individual fixed-effects event-study model as in equation (2) in the main text. Panel C plots the coefficients on the interactions between the semester dummies and the treatment dummy only ( $\hat{\gamma}_j$ ) instead. The Fall 2019 semester dummy is the omitted semester. Standard errors are clustered at the individual level. In Panels A, B, C, D, E and F the outcome is semester GPA, semester GPA in the absence of flexible grading, Gap in semester GPA between FGP users and non-users, credits earned, credits taken, and credits failed, respectively. In Panel F, the outcome is the sum of credits that represents the student failing a course, namely F, failed incompletes, WN (Never Attended), and unofficially withdrawn. In Panels A through E, outcomes are at student-semester level. In panels G, H

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and I, the outcome is a dummy equal one if the student earned an F, or withdrew a course unofficially or officially, respectively. Panels A to F are estimated at the student-semester level. Panels G to I are estimated at the course-semester level. All figures show 95% confidence intervals.

FIGURE 4. FGP GPA Accumulated Gap for Students Who Did Not Experienced Pandemic-Related Shocks



*Notes:* These figures plot the coefficients on the interaction between the semester dummies and the treatment dummy ( $\hat{\gamma}_j$ ) and the 95% confidence intervals from an individual fixed-effects model as in equation (2) in the main text under different subgroups. The outcomes are Semester GPAs, measured at the student-semester level. The Fall 2019 semester dummy is the omitted semester. Standard errors are clustered at the individual level. Since we plot the accumulated gap due to FGP, in Spring 2021 we plot  $\hat{\gamma}_3$ , in Fall 2021 we plot  $\hat{\gamma}_3 + \hat{\gamma}_4$ , and in Spring 2022 we plot  $\hat{\gamma}_3 + \hat{\gamma}_4 + \hat{\gamma}_5$ .

TABLE 1. Descriptive Statistics

| <i>Queens College</i>   |                         |   |                                      |                                     |  |  |
|---|-------------------------|---|--------------------------------------|-------------------------------------|--|--|
|   | <i>Whole<br/>sample</i> | <i>Did not use<br/>flexible<br/>grading</i> | <i>Used<br/>flexible<br/>grading</i> | <i>Difference<br/>(3) minus (2)</i> |  | <i>Registered<br/>at QC in<br/>Fall 2019<sup>a</sup></i> |
|   | <i>(1)</i>              | <i>(2)</i>                                  | <i>(3)</i>                           | <i>(4)</i>                          |  | <i>(5)</i>   |
| <b><i>Panel A: From administrative records (measured before the pandemic)</i></b>             |                         |   |                                      |                                     |  |  |
| Female  | 0.679                   | 0.720                                       | 0.578                                | -0.143*** (0.015)                   |  | 0.568  |
| Black   | 0.092                   | 0.087                                       | 0.106                                | 0.019** (0.009)                     |  | 0.086  |
| Asian   | 0.268                   | 0.240                                       | 0.334                                | 0.094*** (0.014)                    |  | 0.285  |
| Hispanic  | 0.289                   | 0.286                                       | 0.294                                | 0.008 (0.014)                       |  | 0.284  |
| White   | 0.204                   | 0.228                                       | 0.145                                | -0.083*** (0.012)                   |  | 0.269  |
| 18 years old  | 0.161                   | 0.144                                       | 0.203                                | 0.059*** (0.012)                    |  | 0.163  |
| 19 years old  | 0.107                   | 0.090                                       | 0.148                                | 0.058*** (0.010)                    |  | 0.098  |
| 20 to 22 years old  | 0.264                   | 0.247                                       | 0.306                                | 0.060*** (0.014)                    |  | 0.312  |
| 23 to 24 years old  | 0.124                   | 0.122                                       | 0.126                                | 0.004 (0.010)                       |  | 0.136  |
| 25 to 29 years old  | 0.162                   | 0.181                                       | 0.117                                | -0.064*** (0.011)                   |  | 0.158  |
| 30 to 44 years old  | 0.141                   | 0.166                                       | 0.083                                | -0.083*** (0.010)                   |  | 0.105  |
| Over 45 years old   | 0.041                   | 0.051                                       | 0.017                                | -0.033*** (0.005)                   |  | 0.028  |
| US born   | 0.681                   | 0.686                                       | 0.669                                | -0.018 (0.018)                      |  | 0.677  |
| Ever Pell receipt   | 0.458                   | 0.423                                       | 0.542                                | 0.119*** (0.016)                    |  | 0.469 <sup>b</sup>                                       |
| First-generation  | 0.440                   | 0.429                                       | 0.469                                | 0.040** (0.019)                     |  | ---  |
| Transfer student  | 0.436                   | 0.429                                       | 0.452                                | 0.023 (0.016)                       |  | 0.555  |
| Part-time student   | 0.333                   | 0.397                                       | 0.178                                | -0.219*** (0.013)                   |  | 0.351  |
| Freshman  | 0.198                   | 0.183                                       | 0.235                                | 0.051*** (0.013)                    |  | 0.27 <sup>b</sup>  |
| Sophomore   | 0.146                   | 0.122                                       | 0.204                                | 0.083*** (0.012)                    |  | 0.24 <sup>b</sup>  |
| Junior  | 0.223                   | 0.205                                       | 0.268                                | 0.064*** (0.013)                    |  | 0.22 <sup>b</sup>  |
| Senior  | 0.262                   | 0.265                                       | 0.255                                | -0.010 (0.014)                      |  | 0.28 <sup>b</sup>  |
| Graduate  | 0.171                   | 0.226                                       | 0.038                                | -0.188*** (0.009)                   |  | ---  |
| Sciences Major  | 0.191                   | 0.134                                       | 0.329                                | 0.195*** (0.014)                    |  | ---  |
| Social Sciences Major   | 0.268                   | 0.275                                       | 0.251                                | -0.025* (0.014)                     |  | ---  |
| Non-STEM Majors   | 0.541                   | 0.591                                       | 0.420                                | -0.171*** (0.015)                   |  | ---  |
| Fall 2019 Cumulative GPA  | 3.058                   | 3.187                                       | 2.773                                | -0.414*** (0.027)                   |  | ---  |
| <b><i>Panel B: From survey (information at survey collection unless otherwise stated)</i></b> |                         |   |                                      |                                     |  |  |
| Employed in Fall 2019   | 0.595                   | 0.619                                       | 0.533                                | -0.086*** (0.018)                   |  | ---  |
| Employed at survey date   | 0.475                   | 0.502                                       | 0.406                                | -0.096*** (0.018)                   |  | ---  |
| Essential worker  | 0.329                   | 0.328                                       | 0.331                                | 0.003 (0.017)                       |  | ---  |
| CARES Act funds recipient   | 0.513                   | 0.517                                       | 0.504                                | -0.013 (0.019)                      |  | ---  |
| Childcare responsibilities  | 0.302                   | 0.274                                       | 0.404                                | 0.130*** (0.030)                    |  | ---  |
| Sample size   | 4,969                   | 3,520                                       | 1,449                                | 4,969                               |  |  |

*Note:* Students who used flexible grading used the policy for at least one course in Spring or Fall 2020 semesters. Standard errors are reported in parentheses in column 4. Column 3 presents the coefficient on the flexible grading dummy from a regression model with no other controls.

Significant at the: \*\*\*1 percent level, \*\* 5 percent level, \*10 percent level.

<sup>a</sup> Source: <https://www.qc.cuny.edu/about/research/Pages/CP-Enrolled%20Student%20Profile.aspx>.

<sup>b</sup> Excludes graduate students.

<sup>c</sup> Excludes graduate students to make it comparable to column 5

TABLE 2. Outcome Variables

|   | <i>Whole sample</i> | <i>Did not use flexible grading</i> | <i>Used flexible grading</i> | <i>Difference (3) minus (2)</i> |         |
|---|---------------------|-------------------------------------|------------------------------|---------------------------------|---------|
|   | (1)                 | (2)                                 | (3)                          | (4)                             |         |
| <b>Panel A: Graduation Outcomes by Spring 2022</b>  |                     |                                     |                              |                                 |         |
| Graduated by Spring 2022  | 0.410               | 0.462                               | 0.287                        | -0.174***                       | (0.015) |
| Graduated on Timeby Spring 2022   | 0.178               | 0.187                               | 0.156                        | -0.032**                        | (0.013) |
| Sample size (# of students)   | 4,841 <sup>1</sup>  | 3,400                               | 1,441                        |                                 |         |
| Graduated within Four Years <sup>2</sup>  | 0.444               | 0.492                               | 0.352                        | -0.140***                       | (0.027) |
| Sample size (# of students)   | 1,425               | 937                                 | 488                          |                                 |         |
| <b>Panel B: Administrative records' outcomes measured using only Spring and Fall 2019 (at Baseline)</b> |                     |                                     |                              |                                 |         |
| Semester GPA  | 3.087               | 3.239                               | 2.743                        | -0.495***                       | (0.025) |
| Semester credits taken <sup>3</sup>   | 11.619              | 11.187                              | 12.600                       | 1.413***                        | (0.113) |
| Semester credits earned   | 10.742              | 10.575                              | 11.122                       | 0.546***                        | (0.129) |
| Number of credits for which a failing grade or NC was earned <sup>4</sup>                               | 0.876               | 0.612                               | 1.479                        | 0.867***                        | (0.071) |
| Number of credits Failed  | 0.604               | 0.417                               | 1.028                        | 0.611***                        | (0.059) |
| Number of credits officially withdrawn  | 0.476               | 0.369                               | 0.720                        | 0.351***                        | (0.047) |
| Number of credits unofficially withdrawn  | 0.115               | 0.083                               | 0.186                        | 0.102***                        | (0.027) |
| Number of "no credits" (NC) taken   | 0.129               | 0.076                               | 0.250                        | 0.174***                        | (0.030) |
| Number of "credits" (CR) taken  | 0.000               | 0.000                               | 0.000                        | 0.000                           | (0.000) |
| Sample size (# student-semester obs.)   | 5,467               | 3,798                               | 1,669                        |                                 |         |
| <b>Panel C: Transcript records' outcomes measured using only Spring and Fall 2019 (at Baseline)</b>     |                     |                                     |                              |                                 |         |
| Officially withdrew a course  | 0.036               | 0.030                               | 0.049                        | 0.019***                        | (0.003) |
| Unofficially withdrew a course  | 0.009               | 0.007                               | 0.013                        | 0.006***                        | (0.001) |
| Failed a Course   | 0.045               | 0.032                               | 0.068                        | 0.036***                        | (0.003) |
| Letter Grade of "A+, A or A-"   | 0.441               | 0.520                               | 0.287                        | -0.233***                       | (0.006) |
| Letter Grade of "B+, B or B-"   | 0.251               | 0.237                               | 0.279                        | 0.041***                        | (0.006) |
| Letter Grade of "C+, C or C-"   | 0.115               | 0.089                               | 0.164                        | 0.074***                        | (0.005) |
| Letter Grade of "D+, D or D-"   | 0.032               | 0.025                               | 0.044                        | 0.019***                        | (0.003) |
| Letter Grade of "F"   | 0.034               | 0.024                               | 0.054                        | 0.030***                        | (0.003) |
| Letter Grade of "NC"  | 0.009               | 0.006                               | 0.016                        | 0.010***                        | (0.002) |
| Letter Grade of "CR"  | 0.000               | 0.000                               | 0.000                        | 0.000                           | (0.000) |
| Sample size (# student-course obs.)   | 23,350              | 15,368                              | 7,982                        |                                 |         |
| Average course grade  | 3.128               | 3.293                               | 2.786                        | -0.507***                       | (0.016) |
| Sample size (# student-course obs.)   | 20,616 <sup>5</sup> | 13,893                              | 6,723                        |                                 |         |

*Note:* Students who used flexible grading used the policy for at least one course in spring or fall 2020.

While Panel A outcomes are at student level, Panel B outcomes are at student-semester level, and Panel C outcomes are at student-course level. Panels B, and C only include pre-pandemic semesters (that is, spring and fall 2019). Column (3) presents the coefficient on the flexible grading dummy from a regression model with no other controls. Standard errors are reported in parentheses in Column (4).

Significant at the: \*\*\*1 percent level, \*\* 5 percent level, \*10 percent level.

<sup>1</sup>The sample size is 128 observations smaller than the sample size in our data set because 128 students graduated before Spring 2020 and are taking courses without seeking another degree.

<sup>2</sup> Using only students who started undergraduate in 2016, 2017 or 2018, and whose expected on-time graduation date was Spring 2022 or sooner.

<sup>3</sup>Credits taken after removing officially withdrawn courses.

<sup>4</sup> Credits for which a failing grade or NC was earned are calculated by subtracting credits earned from credits taken.

<sup>5</sup> Sample size is smaller for avg course grade because only numeric grades are considered (i.e. withdraws or passes are not calculated as numeric grades).

TABLE 3: Likelihood to Graduate by Spring 2022 by Whether Student Used Flexible Grading in Spring or Fall 2020

|  | Whole sample         | Whole sample         | Pre-COVID-19 top tier | Pre-COVID-19 medium tier | Pre-COVID-19 bottom tier | Whole sample         | Whole sample         | Whole sample         |
|--|----------------------|----------------------|-----------------------|--------------------------|--------------------------|----------------------|----------------------|----------------------|
|  | (1)                  | (2)                  | (3)                   | (4)                      | (5)                      | (6)                  | (7)                  | (8)                  |
| <b>Panel A: Graduated or Not by Spring 2022</b>  |                      |                      |                       |                          |                          |                      |                      |                      |
| <i>Used Flexible Grading</i>   | -0.066***<br>(0.013) | -0.074***<br>(0.013) | -0.064*<br>(0.034)    | -0.064**<br>(0.028)      | -0.065**<br>(0.026)      | -0.073***<br>(0.013) | -0.070***<br>(0.013) | -0.060***<br>(0.013) |
| <i>Mean for Non-FGP User</i>   | 0.462                | 0.462                | 0.694                 | 0.557                    | 0.385                    | 0.462                | 0.462                | 0.462                |
| <i>% effect</i>  | -14.29%              | -16.02%              | -9.22%                | -11.49%                  | -16.88%                  | -15.80%              | -15.15%              | -13%                 |
| <i>Observations</i>  | 4,841                | 4,841                | 1,223                 | 1,085                    | 1,151                    | 4,841                | 4,841                | 4,841                |
| <i>R<sup>2</sup></i>   | 0.384                | 0.392                | 0.394                 | 0.316                    | 0.232                    | 0.392                | 0.393                | 0.403                |
| <b>Panel B: Graduated on Time or Not by Spring 2022</b>  |                      |                      |                       |                          |                          |                      |                      |                      |
| <i>Used Flexible Grading</i>   | -0.033**<br>(0.014)  | -0.034**<br>(0.014)  | -0.055<br>(0.037)     | -0.062**<br>(0.030)      | -0.017<br>(0.025)        | -0.035**<br>(0.014)  | -0.032**<br>(0.014)  | -0.027*<br>(0.015)   |
| <i>Mean for Non-FGP User</i>   | 0.187                | 0.187                | 0.243                 | 0.253                    | 0.163                    | 0.187                | 0.187                | 0.187                |
| <i>% effect</i>  | -17.65%              | -18.18%              | -22.63%               | -24.51%                  | -10.43%                  | -18.72%              | -17.11%              | -14.44%              |
| <i>Observations</i>  | 3,863                | 3,863                | 1,117                 | 967                      | 989                      | 3,863                | 3,863                | 3,863                |
| <i>R<sup>2</sup></i>   | 0.058                | 0.058                | 0.047                 | 0.011                    | 0.026                    | 0.059                | 0.059                | 0.068                |
| <b>Panel C: Graduated within Four Years or Not, Students who Started Undergraduate in 2016, 2017 or 2018</b> |                      |                      |                       |                          |                          |                      |                      |                      |
| <i>Used Flexible Grading</i>   | -0.059**<br>(0.027)  | -0.066**<br>(0.027)  | -0.152**<br>(0.069)   | -0.086*<br>(0.048)       | -0.008<br>(0.039)        | -0.059**<br>(0.027)  | -0.062**<br>(0.027)  | -0.053*<br>(0.028)   |
| <i>Mean for Non-FGP User</i>   | 0.492                | 0.492                | 0.622                 | 0.52                     | 0.341                    | 0.492                | 0.492                | 0.492                |
| <i>% effect</i>  | -11.99%              | -13.41%              | -24.44%               | -16.54%                  | -2.35%                   | -11.99%              | -12.60%              | -10.77%              |
| <i>Observations</i>  | 1,425                | 1,425                | 361                   | 534                      | 507                      | 1,425                | 1,425                | 1,425                |
| <i>R<sup>2</sup></i>   | 0.155                | 0.169                | 0.091                 | 0.103                    | 0.197                    | 0.171                | 0.172                | 0.182                |
| <i>Socio-demographic controls &amp; Fall 2019 cum. GPA</i>   |                      |                      |                       |                          |                          |                      |                      |                      |
|  | X                    | X                    | X                     | X                        | X                        | X                    | X                    | X                    |
| <i>Pre-COVID-19 employment status &amp; full-time student status</i>   |                      |                      |                       |                          |                          |                      |                      |                      |
|  |                      | X                    | X                     | X                        | X                        | X                    | X                    | X                    |
| <i>COVID-19 own and family health shocks</i>   |                      |                      |                       |                          |                          |                      |                      |                      |
|  |                      |                      |                       |                          |                          | X                    | X                    | X                    |
| <i>COVID-19 educational and economic shocks</i>  |                      |                      |                       |                          |                          |                      |                      |                      |
|  |                      |                      |                       |                          |                          | X                    | X                    | X                    |
| <i>STEM, Social Sciences, and non-STEM dummies</i>   |                      |                      |                       |                          |                          |                      |                      |                      |
|  |                      |                      |                       |                          |                          |                      |                      | X                    |

Notes: Each column displays the coefficients from estimating student level regressions where outcomes are indicated as in Panel titles. In Panel A, the outcome is a dummy equal 1 if the student graduated by Spring 2022, and 0 otherwise. In panel B, the outcome is a dummy equal 1 if the student graduated on time by Spring 2022, and 0 otherwise. In Panel C, the outcome is a dummy equal 1 if the student graduated within four years, and 0 otherwise for students who began their undergraduate in 2016, 2017 or 2018. Column (1) controls for dummies indicating students' sex, age categories, race categories, class level categories and, indicators for being born in the USA (or not), being a pell-recipient (or not), being first-generation student (or not), being a transfer student (or not), and Fall 2019 cumulative GPA as a continuous variable. Specification in Column (2) adds to the specification in Column (1) and, an indicator of whether the student is a full-time student and, an indicator whether he was employed before the pandemic. Columns (3) to (6) present estimates from specification in Column (2) for students in the top tier of the Fall 2019 cumulative GPA distribution (Column 3), middle tier (Column 4), and bottom tier (Column 5). Specification in Column (6) adds to the specification in Column (2) students' own or family COVID-19 sickness (dummies indication whether the student was sick with Covid, whether the student had someone who was sick with Covid, whether the student took care of someone who was sick with Covid). Specification in Column (7) adds to the specification in Column (6) other pandemic-related shocks (dummies indication whether the student had any online challenge during courses, whether student was furloughed, or worked less, whether student had any financial aid problems, or whether student had childcare responsibilities due to online school). Specification in Column (8) adds to the specification in Column (7) control variables for major categories (Sciences Major, Social Sciences Major, Non-STEM Majors). All panels and columns are specified for students who graduated Spring 2020 and after (i.e. 128 (4,969-4,841)=128) students who graduated before Spring 2020 are excluded from all Panels and specifications). 128 students out of 4,969 are excluded from graduation outcome analysis since they are graduated before Spring 2020. Also, Columns (3), (4) and (5) are students who have Fall-19 Cumulative GPA (i.e. summation of number of observations in Columns (3), (4) and (5) are not equal to Columns (1), (2), (6), (7) or (8)). Standard errors are clustered at the individual level \*, \*\*, \*\*\*, \*\*\* Estimate significantly different from zero at the 0.1 level, 0.05 level, or 0.01 level.

TABLE 4. Academic Performance by Whether Student Used Flexible Grading in Spring or Fall 2020, Individual Fixed-Effects Estimates

|  | Semester GPA<br>after exercising<br>Flexible<br>Grading Option | Credits<br>taken <sup>1</sup> | Credits<br>earned    | Credits for<br>which a failing<br>grade or NC<br>was earned <sup>2</sup> | Semester GPA<br>before exercising<br>Flexible Grading<br>Option |
|--|--|-------------------------------|----------------------|--|---|
|  | (1)  | (2)                           | (3)                  | (4)  | (5)   |
| Spring 2019 ( $\beta_{-2}$ )                             | -0.051**<br>(0.020)  | 0.340***<br>(0.095)           | 0.373***<br>(0.100)  | -0.033<br>(0.050)  | -0.047**<br>(0.020)   |
| Spring 2020 ( $\beta_1$ )                                | 0.327***<br>(0.016)  | -0.158**<br>(0.069)           | 0.267***<br>(0.075)  | -0.424***<br>(0.039)   | 0.318***<br>(0.016)   |
| Fall 2020 ( $\beta_2$ )                                  | 0.291***<br>(0.017)  | -0.376***<br>(0.081)          | 0.090<br>(0.088)     | -0.466***<br>(0.043)   | 0.274***<br>(0.018)   |
| Spring 2021 ( $\beta_3$ )                                | 0.231***<br>(0.018)  | -0.354***<br>(0.094)          | -0.057<br>(0.101)    | -0.298***<br>(0.045)   | 0.229***<br>(0.018)   |
| Fall 2021 ( $\beta_4$ )                                  | 0.161***<br>(0.021)  | -1.385***<br>(0.104)          | -1.173***<br>(0.111) | -0.212***<br>(0.051)   | 0.158***<br>(0.021)   |
| Spring 2022 ( $\beta_5$ )                                | 0.147***<br>(0.023)  | -1.900***<br>(0.117)          | -1.762***<br>(0.126) | -0.138***<br>(0.053)   | 0.142***<br>(0.023)   |
| Spring 2019 * Used<br>Flexible Grading ( $\gamma_{-2}$ ) | -0.006<br>(0.041)  | -0.072<br>(0.176)             | -0.088<br>(0.204)    | 0.017<br>(0.133)   | -0.011<br>(0.040)   |
| Spring 2020 * Used<br>Flexible Grading ( $\gamma_1$ )    | -0.016<br>(0.038)  | 0.441***<br>(0.123)           | 0.054<br>(0.154)     | 0.387***<br>(0.104)  | -0.410***<br>(0.032)  |
| Fall 2020 * Used<br>Flexible Grading ( $\gamma_2$ )      | -0.056<br>(0.038)  | -0.023<br>(0.147)             | -0.287*<br>(0.173)   | 0.263**<br>(0.109)   | -0.300***<br>(0.035)  |
| Spring 2021 * Used<br>Flexible Grading ( $\gamma_3$ )    | -0.170***<br>(0.038)   | -0.247<br>(0.174)             | -0.348*<br>(0.200)   | 0.101<br>(0.115)   | -0.152***<br>(0.038)  |
| Fall 2021 * Used Flexible<br>Grading ( $\gamma_4$ )      | -0.152***<br>(0.044)   | -0.352*<br>(0.186)            | -0.222<br>(0.212)    | -0.130<br>(0.126)  | -0.130***<br>(0.043)  |
| Spring 2022* Used<br>Flexible Grading ( $\gamma_5$ )     | -0.085*<br>(0.047)   | -0.411*<br>(0.210)            | -0.193<br>(0.234)    | -0.218*<br>(0.130)   | -0.061<br>(0.047)   |
| Constant   | 3.095***<br>(0.011)  | 12.002***<br>(0.047)          | 11.060***<br>(0.054) | 0.942***<br>(0.031)  | 3.093***<br>(0.011)   |
| $(\beta_{-2} + \gamma_{-2})$                             | -0.056<br>(0.035)  | 0.268*<br>(0.148)             | 0.284<br>(0.178)     | -0.016<br>(0.124)  | -0.058*<br>(0.035)  |
| $(\beta_1 + \gamma_1)$                                   | 0.310***<br>(0.035)  | 0.283***<br>(0.102)           | 0.321**<br>(0.134)   | -0.038<br>(0.096)  | -0.092***<br>(0.028)  |
| $(\beta_2 + \gamma_2)$                                   | 0.235***<br>(0.034)  | -0.400***<br>(0.123)          | -0.197<br>(0.148)    | -0.203**<br>(0.100)  | -0.026<br>(0.031)   |
| $(\beta_3 + \gamma_3)$                                   | 0.061*<br>(0.034)  | -0.601***<br>(0.147)          | -0.405**<br>(0.172)  | -0.197*<br>(0.106)   | 0.077**<br>(0.033)  |
| $(\beta_4 + \gamma_4)$                                   | 0.009<br>(0.038)   | -1.738***<br>(0.155)          | -1.396***<br>(0.181) | -0.342***<br>(0.115)   | 0.028<br>(0.037)  |
| $(\beta_5 + \gamma_5)$                                   | 0.061<br>(0.042)   | -2.311***<br>(0.174)          | -1.955***<br>(0.198) | -0.356***<br>(0.118)   | 0.081**<br>(0.041)  |
| <b>Pre-pandemic mean for FGP non-users</b>               | 3.239  | 11.187                        | 10.575               | 0.612  | 3.239   |
| <b>Student Fixed-Effects</b>                             | Yes  | Yes                           | Yes                  | Yes  | Yes   |
| Observations   | 23,007   | 23,007                        | 23,007               | 23,007   | 23,007  |
| Students   | 4,969  | 4,969                         | 4,969                | 4,969  | 4,969   |
| R <sup>2</sup>   | 0.042  | 0.057                         | 0.046                | 0.010  | 0.032   |

Notes: Each column displays the coefficients from estimating equation (2) using as left-hand-side variable the outcome indicated at the top of the column. Spring 2019 is a dummy equal 1 if the outcome is measured during Spring semester 2019, and 0 otherwise. All the other semester dummies are created the same way. Used flexible grading is a dummy equal 1 if the student used flexible grading in spring 2020 or fall 2020, and 0 otherwise. Standard errors are clustered at the student level.

\*, \*\*, \*\*\* Estimate significantly different from zero at the 0.1 level, 0.05 level, or 0.01 level.

<sup>1</sup> Credits taken after removing officially withdrawn courses.

<sup>2</sup> Credits for which a failing grade or NC was earned are calculated by subtracting credits earned from credits taken

TABLE 5. Flexible Grading Options and Withdraws by Whether Student Used Flexible Grading in Spring or Fall 2020, Individual Fixed-Effects Estimates

|  | Exercised<br>the NC<br>option | Number of<br>NC taken | Exercised<br>the CR<br>option | Number<br>of CR<br>taken | Officially<br>withdrew<br>a course | # of credits<br>officially<br>withdrawn | Unofficially<br>withdrew a<br>course | # of credits<br>unofficially<br>withdrawn |
|--|-------------------------------|-----------------------|-------------------------------|--------------------------|------------------------------------|---|--------------------------------------|---|
|  | (1)                           | (2)                   | (3)                           | (4)                      | (5)                                | (6)                                     | (7)                                  | (8)                                       |
| Spring 2019 ( $\beta_{-2}$ )                             | -0.004***<br>(0.001)          | -0.063***<br>(0.016)  | 0.000<br>(0.000)              | 0.000<br>(0.000)         | 0.006*<br>(0.003)                  | 0.098**<br>(0.041)                      | 0.003**<br>(0.002)                   | 0.050**<br>(0.020)                        |
| Spring 2020 ( $\beta_1$ )                                | -0.008***<br>(0.001)          | -0.111***<br>(0.018)  | 0.000<br>(0.000)              | 0.000<br>(0.000)         | -0.002<br>(0.002)                  | -0.069**<br>(0.031)                     | 0.000<br>(0.001)                     | -0.007<br>(0.016)                         |
| Fall 2020 ( $\beta_2$ )                                  | -0.009***<br>(0.001)          | -0.115***<br>(0.018)  | 0.000<br>(0.000)              | 0.000<br>(0.000)         | 0.005*<br>(0.003)                  | 0.031<br>(0.033)                        | -0.003***<br>(0.001)                 | -0.042***<br>(0.014)                      |
| Spring 2021 ( $\beta_3$ )                                | -0.008***<br>(0.002)          | -0.109***<br>(0.019)  | 0.000<br>(0.000)              | 0.000<br>(0.000)         | -0.001<br>(0.003)                  | -0.028<br>(0.033)                       | -0.001<br>(0.001)                    | -0.009<br>(0.017)                         |
| Fall 2021 ( $\beta_4$ )                                  | -0.009***<br>(0.002)          | -0.121***<br>(0.019)  | 0.000<br>(0.000)              | 0.000<br>(0.000)         | 0.010***<br>(0.003)                | 0.095**<br>(0.038)                      | 0.002<br>(0.001)                     | 0.018<br>(0.019)                          |
| Spring 2022 ( $\beta_5$ )                                | -0.010***<br>(0.002)          | -0.124***<br>(0.020)  | 0.000<br>(0.000)              | 0.000<br>(0.000)         | 0.009***<br>(0.003)                | 0.069*<br>(0.040)                       | 0.002<br>(0.002)                     | 0.023<br>(0.022)                          |
| Spring 2019 * Used<br>Flexible Grading ( $\gamma_{-2}$ ) | -0.004<br>(0.003)             | -0.059<br>(0.047)     | -0.002<br>(0.002)             | 0.007<br>(0.008)         | -0.004<br>(0.007)                  | 0.008<br>(0.098)                        | 0.005<br>(0.004)                     | 0.088<br>(0.057)                          |
| Spring 2020 * Used<br>Flexible Grading ( $\gamma_1$ )    | 0.068***<br>(0.005)           | 0.894***<br>(0.072)   | 0.229***<br>(0.006)           | 1.025***<br>(0.029)      | -0.001<br>(0.005)                  | -0.033<br>(0.068)                       | 0.000<br>(0.003)                     | 0.006<br>(0.037)                          |
| Fall 2020 * Used<br>Flexible Grading ( $\gamma_2$ )      | 0.042***<br>(0.004)           | 0.561***<br>(0.062)   | 0.130***<br>(0.005)           | 0.616***<br>(0.024)      | 0.029***<br>(0.006)                | 0.432***<br>(0.084)                     | 0.006**<br>(0.003)                   | 0.081*<br>(0.042)                         |
| Spring 2021 * Used<br>Flexible Grading ( $\gamma_3$ )    | -0.013***<br>(0.003)          | -0.242***<br>(0.050)  | -0.006***<br>(0.002)          | -0.029***<br>(0.007)     | 0.028***<br>(0.006)                | 0.376***<br>(0.086)                     | 0.010***<br>(0.003)                  | 0.142***<br>(0.045)                       |
| Fall 2021 * Used<br>Flexible Grading ( $\gamma_4$ )      | -0.016***<br>(0.003)          | -0.291***<br>(0.050)  | -0.005**<br>(0.002)           | -0.026***<br>(0.009)     | 0.046***<br>(0.007)                | 0.614***<br>(0.102)                     | 0.011***<br>(0.004)                  | 0.147***<br>(0.049)                       |
| Spring 2022* Used<br>Flexible Grading ( $\gamma_5$ )     | -0.017***<br>(0.004)          | -0.288***<br>(0.051)  | -0.005**<br>(0.002)           | -0.031***<br>(0.010)     | 0.046***<br>(0.008)                | 0.583***<br>(0.110)                     | 0.007*<br>(0.004)                    | 0.089*<br>(0.052)                         |
| Constant   | 0.014***<br>(0.001)           | 0.197***<br>(0.015)   | 0.001<br>(0.001)              | 0.004<br>(0.002)         | 0.033***<br>(0.002)                | 0.449***<br>(0.022)                     | 0.007***<br>(0.001)                  | 0.094***<br>(0.011)                       |
| $(\beta_{-2} + \gamma_{-2})$                             | -0.008***<br>(0.003)          | -0.122***<br>(0.044)  | -0.002<br>(0.002)             | 0.007<br>(0.008)         | 0.002<br>(0.006)                   | 0.107<br>(0.089)                        | 0.008**<br>(0.004)                   | 0.138**<br>(0.054)                        |
| $(\beta_1 + \gamma_1)$                                   | 0.060***<br>(0.005)           | 0.783***<br>(0.070)   | 0.229***<br>(0.006)           | 1.025***<br>(0.029)      | -0.003<br>(0.004)                  | -0.102*<br>(0.060)                      | 0.000<br>(0.002)                     | -0.001<br>(0.033)                         |
| $(\beta_2 + \gamma_2)$                                   | 0.033***<br>(0.004)           | 0.446***<br>(0.059)   | 0.130***<br>(0.005)           | 0.616***<br>(0.024)      | 0.034***<br>(0.005)                | 0.463***<br>(0.077)                     | 0.003<br>(0.003)                     | 0.039<br>(0.040)                          |
| $(\beta_3 + \gamma_3)$                                   | -0.022***<br>(0.003)          | -0.351***<br>(0.046)  | -0.006***<br>(0.002)          | -0.029***<br>(0.007)     | 0.027***<br>(0.005)                | 0.348***<br>(0.079)                     | 0.009***<br>(0.003)                  | 0.133***<br>(0.042)                       |
| $(\beta_4 + \gamma_4)$                                   | -0.025***<br>(0.003)          | -0.412***<br>(0.046)  | -0.005**<br>(0.002)           | -0.026***<br>(0.009)     | 0.056***<br>(0.006)                | 0.709***<br>(0.094)                     | 0.013***<br>(0.003)                  | 0.165***<br>(0.046)                       |
| $(\beta_5 + \gamma_5)$                                   | -0.026***<br>(0.003)          | -0.412***<br>(0.047)  | -0.005**<br>(0.002)           | -0.031***<br>(0.010)     | 0.055***<br>(0.007)                | 0.652***<br>(0.102)                     | 0.010***<br>(0.003)                  | 0.112**<br>(0.047)                        |
| <b>Pre-pandemic mean for FGP non-users</b>               | 0.006                         | 0.076                 | 0.000                         | 0.000                    | 0.030                              | 0.369                                   | 0.007                                | 0.083                                     |
| <b>Student Fixed-Effects</b>                             | Yes                           | Yes                   | Yes                           | Yes                      | Yes                                | Yes                                     | Yes                                  | Yes                                       |
| Observations   | 96,181                        | 23,007                | 96,181                        | 23,007                   | 96,181                             | 23,007                                  | 96,181                               | 23,007                                    |
| Students   | 4,969                         | 4,969                 | 4,969                         | 4,969                    | 4,969                              | 4,969                                   | 4,969                                | 4,969                                     |
| R <sup>2</sup>   | 0.033                         | 0.108                 | 0.139                         | 0.411                    | 0.004                              | 0.014                                   | 0.001                                | 0.004                                     |

Notes: Even columns display (student-semester level) estimates from regressing equation (2) using as left-hand side variable the number of credits each student got under each category labeled at the top of the column; the odd columns display (course-level) estimates from regressing equation (2) using as left-hand side variable a dummy indicating whether the grade in a course was the one indicated at the top of each column. Spring 2019 is a dummy equal 1 if the outcome is measured during Spring semester 2019, and 0 otherwise. All the other semester dummies are created the same way. Used flexible grading dummy is a variable equal to 1 if the student used the flexible grading policy in spring 2020 or fall 2020, and 0 otherwise. Standard errors are clustered at the student level.

\*, \*\*, \*\*\* Estimate significantly different from zero at the 0.1 level, 0.05 level, or 0.01 level.

TABLE 6. Prevalence of Grades by Whether Student Used Flexible Grading in Spring or Fall 2020, Individual Fixed-Effects Estimates

|  | Earned A<br>in course | Earned B<br>in course | Earned C<br>in course | Earned D<br>in course | Earned F<br>in course |
|--|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
|  | (1)                   | (2)                   | (3)                   | (4)                   | (5)                   |
| Spring 2019 ( $\beta_{-2}$ )                             | -0.023***<br>(0.008)  | -0.006<br>(0.008)     | 0.007<br>(0.005)      | 0.009***<br>(0.003)   | 0.001<br>(0.003)      |
| Spring 2020 ( $\beta_1$ )                                | 0.174***<br>(0.007)   | -0.042***<br>(0.006)  | -0.046***<br>(0.004)  | -0.017***<br>(0.002)  | -0.018***<br>(0.002)  |
| Fall 2020 ( $\beta_2$ )                                  | 0.139***<br>(0.007)   | -0.045***<br>(0.006)  | -0.037***<br>(0.004)  | -0.015***<br>(0.002)  | -0.019***<br>(0.002)  |
| Spring 2021 ( $\beta_3$ )                                | 0.113***<br>(0.007)   | -0.055***<br>(0.006)  | -0.037***<br>(0.004)  | -0.012***<br>(0.002)  | -0.012***<br>(0.002)  |
| Fall 2021 ( $\beta_4$ )                                  | 0.073***<br>(0.008)   | -0.053***<br>(0.007)  | -0.030***<br>(0.004)  | -0.012***<br>(0.002)  | -0.005*<br>(0.003)    |
| Spring 2022 ( $\beta_5$ )                                | 0.069***<br>(0.009)   | -0.054***<br>(0.007)  | -0.031***<br>(0.004)  | -0.009***<br>(0.002)  | -0.005<br>(0.003)     |
| Spring 2019 * Used<br>Flexible Grading ( $\gamma_{-2}$ ) | 0.035***<br>(0.013)   | -0.014<br>(0.013)     | -0.031***<br>(0.010)  | -0.002<br>(0.006)     | 0.002<br>(0.007)      |
| Spring 2020 * Used<br>Flexible Grading ( $\gamma_1$ )    | -0.104***<br>(0.011)  | -0.035***<br>(0.011)  | -0.080***<br>(0.007)  | -0.022***<br>(0.004)  | -0.029***<br>(0.004)  |
| Fall 2020 * Used<br>Flexible Grading ( $\gamma_2$ )      | -0.078***<br>(0.012)  | -0.025**<br>(0.011)   | -0.065***<br>(0.008)  | -0.014***<br>(0.004)  | -0.021***<br>(0.005)  |
| Spring 2021 * Used<br>Flexible Grading ( $\gamma_3$ )    | -0.037***<br>(0.013)  | 0.013<br>(0.011)      | -0.006<br>(0.008)     | 0.003<br>(0.005)      | 0.017***<br>(0.006)   |
| Fall 2021 * Used Flexible<br>Grading ( $\gamma_4$ )      | -0.025*<br>(0.014)    | 0.002<br>(0.012)      | -0.017*<br>(0.009)    | 0.006<br>(0.005)      | 0.013**<br>(0.006)    |
| Spring 2022* Used<br>Flexible Grading ( $\gamma_5$ )     | -0.005<br>(0.015)     | 0.014<br>(0.013)      | -0.021**<br>(0.009)   | -0.004<br>(0.005)     | 0.013*<br>(0.007)     |
| Constant   | 0.438***<br>(0.004)   | 0.257***<br>(0.004)   | 0.118***<br>(0.003)   | 0.031***<br>(0.001)   | 0.034***<br>(0.002)   |
| $(\beta_{-2} + \gamma_{-2})$                             | 0.011<br>(0.010)      | -0.020*<br>(0.011)    | -0.025***<br>(0.009)  | 0.007<br>(0.005)      | 0.003<br>(0.006)      |
| $(\beta_1 + \gamma_1)$                                   | 0.070***<br>(0.009)   | -0.076***<br>(0.009)  | -0.126***<br>(0.006)  | -0.039***<br>(0.003)  | -0.047***<br>(0.004)  |
| $(\beta_2 + \gamma_2)$                                   | 0.060***<br>(0.009)   | -0.070***<br>(0.009)  | -0.102***<br>(0.007)  | -0.029***<br>(0.003)  | -0.040***<br>(0.004)  |
| $(\beta_3 + \gamma_3)$                                   | 0.076***<br>(0.010)   | -0.042***<br>(0.010)  | -0.044***<br>(0.007)  | -0.010**<br>(0.004)   | 0.005<br>(0.005)      |
| $(\beta_4 + \gamma_4)$                                   | 0.048***<br>(0.011)   | -0.051***<br>(0.010)  | -0.047***<br>(0.008)  | -0.006<br>(0.004)     | 0.009<br>(0.006)      |
| $(\beta_5 + \gamma_5)$                                   | 0.064***<br>(0.012)   | -0.040***<br>(0.011)  | -0.052***<br>(0.008)  | -0.013***<br>(0.005)  | 0.008<br>(0.006)      |
| <b>Pre-pandemic mean for FGP non-users</b>               | 0.520                 | 0.237                 | 0.089                 | 0.025                 | 0.024                 |
| <b>Student Fixed-Effects</b>                             | Yes                   | Yes                   | Yes                   | Yes                   | Yes                   |
| Observations   | 96,181                | 96,181                | 96,181                | 96,181                | 96,181                |
| Students   | 4,969                 | 4,969                 | 4,969                 | 4,969                 | 4,969                 |
| R <sup>2</sup>   | 0.016                 | 0.003                 | 0.012                 | 0.006                 | 0.010                 |

TABLE 7. Intensive Margin: Academic Performance by Number of Credits Taken Under FGP in Spring or Fall 2020, Individual Fixed-Effects Estimates

|  | Semester GPA<br>after exercising<br>Flexible<br>Grading Option | Credits<br>taken <sup>1</sup> | Credits<br>earned    | Earned F<br>grade in<br>course | Unofficially<br>withdrew<br>course | Semester GPA<br>before exercising<br>Flexible Grading<br>Option |
|--|--|-------------------------------|----------------------|--------------------------------|------------------------------------|---|
|  | (1)  | (2)                           | (3)                  | (4)                            | (5)                                | (6)   |
| Spring 2019 ( $\beta_{-2}$ )                                   | -0.053***<br>(0.019)   | 0.298***<br>(0.090)           | 0.296***<br>(0.096)  | 0.001<br>(0.003)               | 0.006***<br>(0.002)                | -0.051***<br>(0.019)  |
| Spring 2020 ( $\beta_1$ )                                      | 0.356***<br>(0.016)  | -0.149**<br>(0.064)           | 0.292***<br>(0.072)  | -0.020***<br>(0.002)           | -0.000<br>(0.001)                  | 0.312***<br>(0.015)   |
| Fall 2020 ( $\beta_2$ )  | 0.309***<br>(0.017)  | -0.380***<br>(0.076)          | 0.109<br>(0.084)     | -0.021***<br>(0.002)           | -0.003**<br>(0.001)                | 0.275***<br>(0.017)   |
| Spring 2021 ( $\beta_3$ )                                      | 0.229***<br>(0.018)  | -0.336***<br>(0.089)          | -0.033<br>(0.097)    | -0.012***<br>(0.002)           | -0.001<br>(0.001)                  | 0.230***<br>(0.018)   |
| Fall 2021 ( $\beta_4$ )  | 0.164***<br>(0.021)  | -1.346***<br>(0.097)          | -1.125***<br>(0.106) | -0.006**<br>(0.003)            | 0.001<br>(0.002)                   | 0.164***<br>(0.021)   |
| Spring 2022 ( $\beta_5$ )                                      | 0.159***<br>(0.022)  | -1.881***<br>(0.110)          | -1.718***<br>(0.119) | -0.006**<br>(0.003)            | 0.002<br>(0.002)                   | 0.160***<br>(0.022)   |
| Spring 2019 * Credits<br>under flex. grading ( $\gamma_{-2}$ ) | 0.002<br>(0.005)   | 0.012<br>(0.022)              | 0.030<br>(0.028)     | 0.000<br>(0.001)               | -0.000<br>(0.001)                  | 0.002<br>(0.005)  |
| Spring 2020 * Credits<br>under flex. grading ( $\gamma_1$ )    | -0.016***<br>(0.006)   | 0.064***<br>(0.014)           | -0.004<br>(0.021)    | -0.004***<br>(0.001)           | 0.000<br>(0.000)                   | -0.061***<br>(0.004)  |
| Fall 2020 * Credits<br>under flex. grading ( $\gamma_2$ )      | -0.018***<br>(0.006)   | 0.001<br>(0.018)              | -0.052**<br>(0.022)  | -0.003***<br>(0.001)           | 0.001<br>(0.000)                   | -0.047***<br>(0.004)  |
| Spring 2021 * Credits<br>under flex. grading ( $\gamma_3$ )    | -0.025***<br>(0.005)   | -0.046**<br>(0.021)           | -0.063**<br>(0.025)  | 0.003***<br>(0.001)            | 0.002***<br>(0.001)                | -0.024***<br>(0.005)  |
| Fall 2021 * Credits under<br>flex. grading ( $\gamma_4$ )      | -0.025***<br>(0.006)   | -0.072***<br>(0.023)          | -0.056**<br>(0.028)  | 0.003***<br>(0.001)            | 0.002***<br>(0.001)                | -0.022***<br>(0.006)  |
| Spring 2022* Credits<br>under flex. grading ( $\gamma_5$ )     | -0.019***<br>(0.007)   | -0.072***<br>(0.026)          | -0.049<br>(0.031)    | 0.003***<br>(0.001)            | 0.001*<br>(0.001)                  | -0.018***<br>(0.006)  |
| Constant   | 3.094***<br>(0.011)  | 11.998***<br>(0.047)          | 11.056***<br>(0.054) | 0.034***<br>(0.002)            | 0.007***<br>(0.001)                | 3.092***<br>(0.011)   |
| $(\beta_{-2} + \gamma_{-2})$                                   | -0.052***<br>(0.018)   | 0.310***<br>(0.082)           | 0.326***<br>(0.088)  | 0.002<br>(0.003)               | 0.005***<br>(0.002)                | -0.049***<br>(0.018)  |
| $(\beta_1 + \gamma_1)$   | 0.339***<br>(0.014)  | -0.085<br>(0.059)             | 0.288***<br>(0.066)  | -0.023***<br>(0.002)           | -0.000<br>(0.001)                  | 0.251***<br>(0.014)   |
| $(\beta_2 + \gamma_2)$   | 0.291***<br>(0.015)  | -0.379***<br>(0.070)          | 0.057<br>(0.077)     | -0.023***<br>(0.002)           | -0.002**<br>(0.001)                | 0.228***<br>(0.015)   |
| $(\beta_3 + \gamma_3)$   | 0.204***<br>(0.016)  | -0.382***<br>(0.082)          | -0.097<br>(0.089)    | -0.010***<br>(0.002)           | 0.001<br>(0.001)                   | 0.207***<br>(0.016)   |
| $(\beta_4 + \gamma_4)$   | 0.139***<br>(0.019)  | -1.418***<br>(0.089)          | -1.181***<br>(0.097) | -0.003<br>(0.002)              | 0.003**<br>(0.001)                 | 0.141***<br>(0.019)   |
| $(\beta_5 + \gamma_5)$   | 0.140***<br>(0.020)  | -1.953***<br>(0.100)          | -1.767***<br>(0.109) | -0.004<br>(0.003)              | 0.003**<br>(0.002)                 | 0.142***<br>(0.020)   |
| <b>Pre-pandemic mean for FGP non-users</b>                     | 3.239  | 11.187                        | 10.575               | 0.024                          | 0.007                              | 3.239   |
| <b>Student Fixed-Effects</b>                                   | Yes  | Yes                           | Yes                  | Yes                            | Yes                                | Yes   |
| Observations   | 23,007   | 23,007                        | 23,007               | 96,181                         | 96,181                             | 23,007  |
| Students   | 4,969  | 4,969                         | 4,969                | 4,969                          | 4,969                              | 4,969   |
| R <sup>2</sup>   | 0.043  | 0.058                         | 0.046                | 0.012                          | 0.002                              | 0.038   |

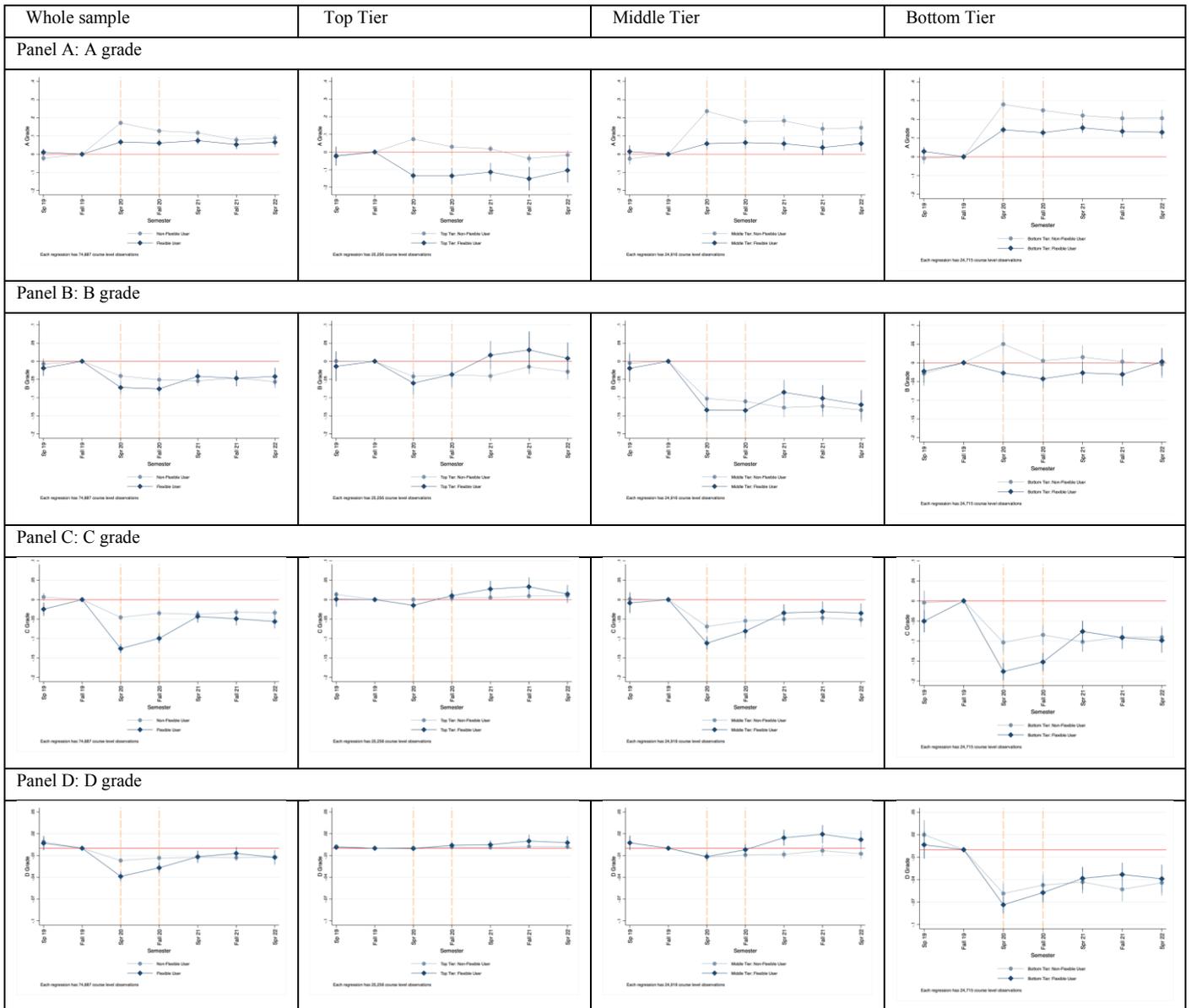
Notes: Each column displays the coefficients from estimating equation 2 using as left-hand-side variable the outcome indicated at the top of the column. Spring 2019 is a dummy equal 1 if the outcome is measured during Spring semester 2019, and 0 otherwise. All the other semester dummies are created the same way. Credits under flexible grading is defined as the total number of credits a student took under the flexible grading policy in spring 2020 or fall 2020, if student did not use any flexible grading, this is equal to 0. Standard errors are clustered at the student level. Columns 1 to 3 and 6 are estimated at the student-semester level. Columns 4 and 5 are estimated at the course level.

\*, \*\*, \*\*\* Estimate significantly different from zero at the 0.1 level, 0.05 level, or 0.01 level.

<sup>1</sup> Credits taken after removing officially withdrawn courses.

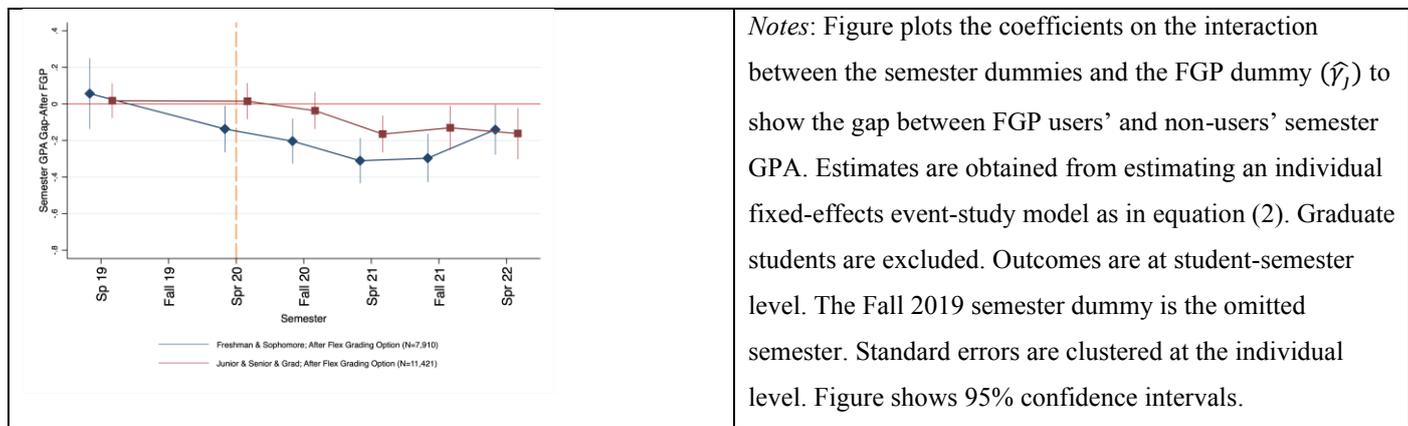
**APPENDIX**  
**(not for publication)**

APPENDIX FIGURE A.1: Grades Earned by Pre-Pandemic Performance, Individual Fixed Effects Event Analysis



Notes: These figures plot the coefficients on the semester dummies ( $\hat{\beta}_j$  as Non-Flexible User) and the summation of semester dummies and the interactions between the semester dummies and the treatment dummy ( $\hat{\beta}_j + \hat{\gamma}_j$  as Flexible User) (and the 95% confidence intervals) from an individual fixed-effects model as in equation (2) in the main text. In Panel A, the outcome is one if the student got an A+, A or A- from a course, 0 otherwise. In Panel B, the outcome is one if the student got a B+, B or B- from a course, 0 otherwise. In Panel C, the outcome is one if the student got a C+, C or C- from a course, 0 otherwise. In Panel D, the outcome is one if the student got a D+, D or D- from a course, 0 otherwise. All outcomes are at course level. All estimations are done with student fixed effects. The Fall 2019 semester dummy is the omitted semester. Standard errors are clustered at the individual level.

APPENDIX FIGURE A.2: FGP Users' and non-Users' Semester GPA and FGP GPA Gap Based on Class Level, Individual Fixed Effects Event Analysis



APPENDIX TABLE A.1. Use of the Flexible Grading Policy by Baseline Socio-Demographic Characteristics and COVID-19 Challenges

|  | (1)                  | (2)                  | (3)                  |
|--|----------------------|----------------------|----------------------|
| <b><i>Pre-pandemic Socio-Demographic Characteristics</i></b> |                      |                      |                      |
| Female   | -0.069***<br>(0.014) | -0.068***<br>(0.014) | -0.077***<br>(0.014) |
| 19 years old   | -0.040<br>(0.031)    | -0.041<br>(0.031)    | -0.037<br>(0.031)    |
| 20 to 22 years old   | -0.076**<br>(0.031)  | -0.076**<br>(0.031)  | -0.074**<br>(0.031)  |
| 23 to 24 years old   | -0.067*<br>(0.035)   | -0.068*<br>(0.035)   | -0.065*<br>(0.035)   |
| 25 to 29 years old   | -0.123***<br>(0.035) | -0.124***<br>(0.035) | -0.123***<br>(0.035) |
| 30 to 44 years old   | -0.129***<br>(0.035) | -0.126***<br>(0.035) | -0.129***<br>(0.035) |
| Over 45 years old  | -0.126***<br>(0.040) | -0.122***<br>(0.040) | -0.111***<br>(0.040) |
| Asian  | 0.054***<br>(0.019)  | 0.053***<br>(0.019)  | 0.047**<br>(0.019)   |
| Black  | 0.081***<br>(0.024)  | 0.083***<br>(0.024)  | 0.073***<br>(0.024)  |
| Hispanic   | 0.046***<br>(0.017)  | 0.042**<br>(0.017)   | 0.033*<br>(0.017)    |
| Other Races  | 0.038*<br>(0.020)    | 0.034*<br>(0.019)    | 0.024<br>(0.019)     |
| US born  | 0.014<br>(0.017)     | 0.013<br>(0.017)     | 0.010<br>(0.017)     |
| Ever Pell receipt  | 0.014<br>(0.014)     | 0.013<br>(0.014)     | 0.007<br>(0.014)     |
| First-generation   | 0.010<br>(0.015)     | 0.006<br>(0.015)     | 0.003<br>(0.015)     |
| Transfer student   | -0.005<br>(0.019)    | -0.008<br>(0.019)    | -0.008<br>(0.019)    |
| Sophomore  | 0.057**<br>(0.029)   | 0.058**<br>(0.029)   | 0.054*<br>(0.029)    |
| Senior   | -0.016<br>(0.032)    | -0.015<br>(0.032)    | -0.021<br>(0.032)    |
| Junior   | 0.033<br>(0.031)     | 0.034<br>(0.031)     | 0.028<br>(0.031)     |
| Graduate   | -0.074**<br>(0.033)  | -0.073**<br>(0.033)  | -0.070**<br>(0.033)  |
| Fall 2019 GPA  | -0.099***<br>(0.011) | -0.097***<br>(0.011) | -0.094***<br>(0.011) |
| Fall 2019 GPA-Unknown  | -0.385***<br>(0.037) | -0.376***<br>(0.037) | -0.366***<br>(0.037) |
| Part-time student  | -0.089***<br>(0.016) | -0.088***<br>(0.016) | -0.085***<br>(0.016) |
| Employed in Fall 2019  | 0.006<br>(0.015)     | 0.002<br>(0.015)     | -0.011<br>(0.016)    |
| Sciences Major   | 0.189***<br>(0.019)  | 0.189***<br>(0.019)  | 0.187***<br>(0.019)  |
| Social Sciences Major  | 0.014<br>(0.015)     | 0.013<br>(0.015)     | 0.016<br>(0.015)     |
| <b><i>COVID-19 challenges</i></b>                            |                      |                      |                      |
| Was sick with COVID-19 and/or had symptoms                   |                      | 0.040**<br>(0.019)   | 0.033*<br>(0.019)    |
| Had Someone who was sick of COVID-19 and/or had symptoms     |                      | 0.007<br>(0.019)     | 0.003<br>(0.019)     |
| Took care of someone who had COVID-19                        |                      | 0.044**<br>(0.019)   | 0.025<br>(0.019)     |
| Had any job loss and/or had to work less because of COVID-19 |                      |                      | 0.020<br>(0.015)     |

|                                |                     |                     |                     |
|--------------------------------|---------------------|---------------------|---------------------|
| Had Online Challenges          |                     |                     | 0.082***<br>(0.031) |
| Had any Financial Aid Problems |                     |                     | 0.020<br>(0.017)    |
| Childcare responsibilities     |                     |                     | 0.060*<br>(0.035)   |
| Constant                       | 0.676***<br>(0.048) | 0.650***<br>(0.048) | 0.574***<br>(0.049) |
| <i>Observations</i>            | 4,969               | 4,969               | 4,969               |
| <i>R</i> <sup>2</sup>          | 0.141               | 0.145               | 0.154               |

Notes: The omitted age category is 18 years old. The omitted race category is white. The omitted major category is Social Sciences. Each column shows a regression of the indicator of using FGP in either Spring or Fall 2020 semesters (or both) on the list of covariates listed in the table.

APPENDIX TABLE A.2. Robustness Checks: Academic Performance by Whether Student Used Flexible Grading in Spring 2020, Individual Fixed-Effects Estimates

|   | Excluding<br>Seniors<br>Students | Excluding<br>Senior &<br>Graduate<br>Students | Semester GPA where<br>Flexible Grading Defined by<br>its Use Only in Spring 2020 |                               | Semester GPA where<br>Flexible Grading Defined<br>by its Use Only in Fall<br>2020 |                               | Course Grade                 |                              |
|---|----------------------------------|---|--|-------------------------------|---|-------------------------------|------------------------------|------------------------------|
|   |                                  |   | After<br>Flexible<br>Grading   | Before<br>Flexible<br>Grading | After<br>Flexible<br>Grading  | Before<br>Flexible<br>Grading | After<br>Flexible<br>Grading | After<br>Flexible<br>Grading |
| <b>Panel A: Average effect</b>  | <b>(1)</b>                       | <b>(2)</b>                                    | <b>(3)</b>   | <b>(4)</b>                    | <b>(5)</b>  | <b>(6)</b>                    | <b>(7)</b>                   | <b>(8)</b>                   |
| Spring 2019 ( $\beta_{-2}$ )  | -0.037<br>(0.027)                | -0.094***<br>(0.035)                          | -0.054***<br>(0.020)   | -0.052***<br>(0.020)          | -0.055***<br>(0.019)  | -0.053***<br>(0.019)          | -0.049***<br>(0.017)         | -0.034*<br>(0.019)           |
| Spring 2020 ( $\beta_1$ )   | 0.313***<br>(0.020)              | 0.394***<br>(0.025)                           | 0.331***<br>(0.015)  | 0.332***<br>(0.016)           | 0.318***<br>(0.016)   | 0.206***<br>(0.015)           | 0.320***<br>(0.013)          | 0.293***<br>(0.018)          |
| Fall 2020 ( $\beta_2$ )   | 0.279***<br>(0.021)              | 0.362***<br>(0.026)                           | 0.284***<br>(0.017)  | 0.213***<br>(0.017)           | 0.298***<br>(0.016)   | 0.281***<br>(0.016)           | 0.300***<br>(0.014)          | 0.245***<br>(0.018)          |
| Spring 2021 ( $\beta_3$ )   | 0.211***<br>(0.022)              | 0.276***<br>(0.027)                           | 0.202***<br>(0.018)  | 0.206***<br>(0.018)           | 0.219***<br>(0.017)   | 0.220***<br>(0.017)           | 0.256***<br>(0.015)          | 0.197***<br>(0.019)          |
| Fall 2021 ( $\beta_4$ )   | 0.132***<br>(0.025)              | 0.185***<br>(0.030)                           | 0.132***<br>(0.021)  | 0.135***<br>(0.021)           | 0.157***<br>(0.020)   | 0.158***<br>(0.020)           | 0.197***<br>(0.017)          | 0.128***<br>(0.019)          |
| Spring 2022 ( $\beta_5$ )   | 0.111***<br>(0.027)              | 0.156***<br>(0.032)                           | 0.136***<br>(0.022)  | 0.139***<br>(0.022)           | 0.142***<br>(0.021)   | 0.142***<br>(0.021)           | 0.182***<br>(0.019)          | 0.073***<br>(0.023)          |
| Used Flexible Grading   | --                               | --  | --   | --                            | --  | --                            | --                           | -0.361***<br>(0.022)         |
| Spring 2019 * Used<br>Flexible Grading ( $\gamma_{-2}$ )              | -0.020<br>(0.056)                | 0.015<br>(0.061)                              | 0.005<br>(0.044)   | 0.003<br>(0.043)              | 0.014<br>(0.055)  | 0.006<br>(0.054)              | 0.051<br>(0.036)             | 0.028<br>(0.037)             |
| Spring 2020 * Used<br>Flexible Grading ( $\gamma_1$ )                 | -0.035<br>(0.047)                | -0.090*<br>(0.051)                            | -0.036<br>(0.043)  | -0.560***<br>(0.034)          | 0.027<br>(0.052)  | -0.137***<br>(0.045)          | 0.202***<br>(0.028)          | 0.194***<br>(0.030)          |
| Fall 2020 * Used<br>Flexible Grading ( $\gamma_2$ )                   | -0.048<br>(0.045)                | -0.121**<br>(0.049)                           | -0.042<br>(0.041)  | -0.139***<br>(0.039)          | -0.168***<br>(0.054)  | -0.591***<br>(0.046)          | 0.049<br>(0.031)             | 0.095***<br>(0.030)          |
| Spring 2021 * Used<br>Flexible Grading ( $\gamma_3$ )                 | -0.176***<br>(0.046)             | -0.258***<br>(0.049)                          | -0.107***<br>(0.042)   | -0.103**<br>(0.041)           | -0.260***<br>(0.053)  | -0.251***<br>(0.052)          | -0.123***<br>(0.034)         | -0.116***<br>(0.031)         |
| Fall 2021 * Used<br>Flexible Grading ( $\gamma_4$ )                   | -0.150***<br>(0.051)             | -0.223***<br>(0.053)                          | -0.079*<br>(0.048)   | -0.074<br>(0.047)             | -0.274***<br>(0.060)  | -0.259***<br>(0.059)          | -0.102***<br>(0.037)         | -0.068*<br>(0.035)           |
| Spring 2022 * Used<br>Flexible Grading ( $\gamma_5$ )                 | -0.074<br>(0.054)                | -0.138**<br>(0.057)                           | -0.072<br>(0.053)  | -0.067<br>(0.052)             | -0.156**<br>(0.064)   | -0.140**<br>(0.062)           | -0.033<br>(0.039)            | -0.000<br>(0.035)            |
| Constant  | 3.114***<br>(0.014)              | 2.975***<br>(0.017)                           | 3.095***<br>(0.011)  | 3.092***<br>(0.011)           | 3.099***<br>(0.011)   | 3.098***<br>(0.011)           | 3.140***<br>(0.009)          | 3.289***<br>(0.013)          |
| $(\beta_{-2} + \gamma_{-2})$  | -0.057<br>(0.049)                | -0.079<br>(0.050)                             | -0.049<br>(0.039)  | -0.048<br>(0.039)             | -0.040<br>(0.052)   | -0.047<br>(0.051)             | 0.003<br>(0.032)             | -0.006<br>(0.035)            |
| $(\beta_1 + \gamma_1)$  | 0.278***<br>(0.043)              | 0.304***<br>(0.044)                           | 0.295***<br>(0.040)  | -0.229***<br>(0.030)          | 0.344***<br>(0.050)   | 0.068<br>(0.042)              | 0.522***<br>(0.025)          | 0.487***<br>(0.033)          |
| $(\beta_2 + \gamma_2)$  | 0.231***<br>(0.040)              | 0.241***<br>(0.041)                           | 0.242***<br>(0.037)  | 0.074**<br>(0.034)            | 0.130**<br>(0.052)  | -0.310***<br>(0.043)          | 0.349***<br>(0.027)          | 0.340***<br>(0.033)          |
| $(\beta_3 + \gamma_3)$  | 0.035<br>(0.040)                 | 0.017<br>(0.041)                              | 0.095**<br>(0.037)   | 0.102***<br>(0.037)           | -0.041<br>(0.050)   | -0.031<br>(0.049)             | 0.133***<br>(0.030)          | 0.081**<br>(0.035)           |
| $(\beta_4 + \gamma_4)$  | -0.018<br>(0.044)                | -0.038<br>(0.044)                             | 0.053<br>(0.043)   | 0.060<br>(0.042)              | -0.117**<br>(0.057)   | -0.101*<br>(0.055)            | 0.095***<br>(0.033)          | 0.060*<br>(0.035)            |
| $(\beta_5 + \gamma_5)$  | 0.037<br>(0.047)                 | 0.018<br>(0.047)                              | 0.064<br>(0.048)   | 0.072<br>(0.047)              | -0.015<br>(0.060)   | 0.002<br>(0.058)              | 0.150***<br>(0.035)          | 0.073*<br>(0.038)            |
| <b>GPA &amp; Course Grade (7<sup>th</sup><br/>and 8<sup>th</sup>)</b> | 3.45                             | 3.34  | 3.36   | 3.35                          | 3.35  | 3.33                          | 3.48                         | 3.48                         |
| <b>Pre-pandemic mean for FGP non-users</b>                            | 3.28                             | 3.09  | 3.20   | 3.20                          | 3.16  | 3.16                          | 3.29                         | 3.29                         |
| <b>Student Fixed-Effects</b>  | Yes                              | Yes   | Yes  | Yes                           | Yes   | Yes                           | Yes                          | No                           |
| <b>Course Fixed-Effects</b>   | No                               | No  | No   | No                            | No  | No                            | No                           | Yes                          |
| Observations  | 16,949                           | 13,273  | 23,007   | 23,007                        | 23,007  | 23,007                        | 82,633                       | 82,633                       |
| Students  | 3,668                            | 2,818   | 4,969  | 4,969                         | 4,969   | 4,969                         | 4,959                        | 2,408                        |
| R <sup>2</sup>  | 0.035                            | 0.049   | 0.040  | 0.038                         | 0.044   | 0.034                         | 0.033                        | 0.054                        |

Notes: Spring 2019 is a dummy equal 1 if the outcome is measured during Spring semester 2019, and 0 otherwise. All the other semester dummies are created the same way. Used flexible grading is a dummy equal 1 if the student used flexible grading in spring 2020 or fall 2020, and 0 otherwise in Columns 1, 2, 7 and 8. Used flexible grading is a dummy equal 1 if the student used flexible grading in only spring 2020 (only in fall 2020), and 0 otherwise in Columns 3 and 4 (Columns 5 and 6). Except Columns 7 and 8, all outcomes are semester GPAs and all outcomes are estimated at student-semester level with individual fixed effects. Column 1 excludes the senior students and Column 2 excludes the graduate level students in addition to senior students. In Columns 7 and 8, the outcomes are numeric course grades (scaled from 0 to 4). While Column 7 uses individual fixed effects, Column 8 uses Course ID (i.e. ECO 300) fixed effects. Standard errors are clustered at the student level in Columns 1-7, and clustered at Course ID level in Column 8  
\*, \*\*, \*\*\* Estimate significantly different from zero at the 0.1 level, 0.05 level, or 0.01 level.

APPENDIX A.3. Academic Performance by Whether Student Used Flexible Grading in Spring or Fall 2020, Individual Fixed-Effects Estimates

|   | Whole Sample                 | Major-core courses FGP users vs non-users | FGP users in non-major-core courses FGP users vs non-users | Common-core courses FGP users vs non-users | FGP users in non-common-core courses FGP users vs non-users |
|---|------------------------------|---|--|--|---|
|   | (1)                          | (2)                                       | (3)  | (4)  | (5)   |
| Spring 2019 ( $\beta_{-2}$ )                          | -0.051**<br>(0.020)          | -0.072***<br>(0.027)                      | -0.072***<br>(0.027)                                       | -0.084**<br>(0.041)                        | -0.084**<br>(0.041)   |
| Spring 2020 ( $\beta_1$ )                             | 0.327***<br>(0.016)          | 0.372***<br>(0.021)                       | 0.372***<br>(0.021)  | 0.385***<br>(0.027)                        | 0.385***<br>(0.027)   |
| Fall 2020 ( $\beta_2$ )                               | 0.291***<br>(0.017)          | 0.337***<br>(0.023)                       | 0.337***<br>(0.023)  | 0.347***<br>(0.029)                        | 0.347***<br>(0.029)   |
| Spring 2021 ( $\beta_3$ )                             | 0.231***<br>(0.018)          | 0.257***<br>(0.024)                       | 0.257***<br>(0.024)  | 0.246***<br>(0.030)                        | 0.246***<br>(0.030)   |
| Fall 2021 ( $\beta_4$ )                               | 0.161***<br>(0.021)          | 0.182***<br>(0.026)                       | 0.182***<br>(0.026)  | 0.180***<br>(0.033)                        | 0.180***<br>(0.033)   |
| Spring 2022 ( $\beta_5$ )                             | 0.147***<br>(0.023)          | 0.157***<br>(0.029)                       | 0.157***<br>(0.029)  | 0.136***<br>(0.035)                        | 0.136***<br>(0.035)   |
| Spring 2019 * Used Flexible Grading ( $\gamma_{-2}$ ) | -0.006<br>(0.041)            | 0.002<br>(0.055)                          | -0.004<br>(0.071)  | 0.038<br>(0.075)                           | 0.006<br>(0.078)  |
| Spring 2020 * Used Flexible Grading ( $\gamma_1$ )    | -0.016<br>(0.038)            | -0.023<br>(0.051)                         | 0.055<br>(0.058)   | -0.035<br>(0.065)                          | -0.006<br>(0.062)   |
| Fall 2020 * Used Flexible Grading ( $\gamma_2$ )      | -0.056<br>(0.038)            | -0.094*<br>(0.052)                        | -0.060<br>(0.061)  | -0.081<br>(0.062)                          | -0.037<br>(0.062)   |
| Spring 2021 * Used Flexible Grading ( $\gamma_3$ )    | -0.170***<br>(0.038)         | -0.189***<br>(0.051)                      | -0.190***<br>(0.065)                                       | -0.183***<br>(0.061)                       | -0.207***<br>(0.066)  |
| Fall 2021 * Used Flexible Grading ( $\gamma_4$ )      | -0.152***<br>(0.044)         | -0.199***<br>(0.059)                      | -0.112<br>(0.069)  | -0.220***<br>(0.069)                       | -0.149**<br>(0.072)   |
| Spring 2022* Used Flexible Grading ( $\gamma_5$ )     | -0.085*<br>(0.047)           | -0.094<br>(0.063)                         | -0.067<br>(0.079)  | -0.133*<br>(0.075)                         | -0.036<br>(0.077)   |
| Constant  | 3.095***<br>(0.011)          | 2.992***<br>(0.015)                       | 3.090***<br>(0.015)  | 2.953***<br>(0.019)                        | 3.013***<br>(0.020)   |
| $(\beta_{-2} + \gamma_{-2})$                          | -0.056<br>(0.035)            | -0.070<br>(0.048)                         | -0.076<br>(0.065)  | -0.046<br>(0.062)                          | -0.077<br>(0.067)   |
| $(\beta_1 + \gamma_1)$                                | 0.310***<br>(0.035)          | 0.349***<br>(0.047)                       | 0.427***<br>(0.055)  | 0.349***<br>(0.059)                        | 0.379***<br>(0.055)   |
| $(\beta_2 + \gamma_2)$                                | 0.235***<br>(0.034)          | 0.243***<br>(0.047)                       | 0.278***<br>(0.057)  | 0.266***<br>(0.055)                        | 0.310***<br>(0.054)   |
| $(\beta_3 + \gamma_3)$                                | 0.061*<br>(0.034)            | 0.068<br>(0.045)                          | 0.066<br>(0.060)   | 0.063<br>(0.054)                           | 0.039<br>(0.059)  |
| $(\beta_4 + \gamma_4)$                                | 0.009<br>(0.038)             | -0.018<br>(0.053)                         | 0.070<br>(0.064)   | -0.040<br>(0.061)                          | 0.031<br>(0.064)  |
| $(\beta_5 + \gamma_5)$                                | 0.061<br>(0.042)             | 0.062<br>(0.056)                          | 0.090<br>(0.074)   | 0.003<br>(0.066)                           | 0.100<br>(0.069)  |
| $(\gamma_2 + \gamma_3)$                               | -0.225***<br>(0.068)         | -0.282***<br>(0.092)                      | -0.250**<br>(0.114)  | -0.264**<br>(0.112)                        | -0.244**<br>(0.117)   |
| $(\gamma_2 + \gamma_3 + \gamma_4)$                    | -0.378***<br>(0.101)         | -0.481***<br>(0.136)                      | -0.362**<br>(0.166)  | -0.484***<br>(0.165)                       | -0.393**<br>(0.172)   |
| $(\gamma_2 + \gamma_3 + \gamma_4 + \gamma_5)$         | <b>-0.463***<br/>(0.136)</b> | <b>-0.576***<br/>(0.182)</b>              | <b>-0.429*<br/>(0.222)</b>                                 | <b>-0.617***<br/>(0.221)</b>               | <b>-0.429*<br/>(0.230)</b>                                  |
| <b>Student Fixed-Effects</b>                          | Yes                          | Yes                                       | Yes  | Yes  | Yes   |
| Observations  | 23,007                       | 13,322                                    | 11,341   | 9,147                                      | 8,622   |
| Students  | 4,969                        | 2,783                                     | 2,404  | 1,910                                      | 1,810   |
| R <sup>2</sup>  | 0.042                        | 0.054                                     | 0.068  | 0.053                                      | 0.062   |

Notes: Each column presents estimates from estimating equation (2) in the main text using semester GPA as left-hand-side variable. Column 1 replicates results from Column 1 Table 4. The sample in Column 2 compares 800 students who used the FGP for at least one core course in Spring or Fall 2020 (the FGP users) with 1,983 students

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who took a core course in Spring or Fall 2020, but did not use the FGP in any of the courses they took (the FGP non-users). The sample in Column 3 compares 421 students who took the FGP, but not in the core course she took in Spring or Fall 2020 (the FGP users) with 1,983 students who took a core course in Spring or Fall 2020, but did not use the FGP in any of the courses they took (the FGP non-users). The sample in Column 4 compares 538 students who used the FGP for at least one general-education course in Spring or Fall 2020 (the FGP users) with 1,361 students who took at least one general-education course in Spring or Fall 2020, but did not use the FGP in any of the general-education courses they took (the FGP non-users). The sample in Column 5 compares 439 students who took the FGP, but not in the general-education course she took in Spring or Fall 2020 (the FGP users) with 1,361 students who took a general-education course in Spring or Fall 2020 but did not use the FGP in any of the courses they took (the FGP users). The samples in Columns 2 and 3 share the same group of FGP non-users. Columns 4 and 5 share the same group of FGP non-users.

, \* , \*\* , \*\*\* Estimate significantly different from zero at the 0.1 level, 0.05 level, or 0.01 level.