Essays on Financial Aid Application and Distribution Policies

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A Dissertation

Presented to

The Faculty of the Curry School of Education

University of Virginia

In Partial Fulfillment

Of the Requirements for the Degree

Doctor of Philosophy

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by

Kelli Bird

May 2016

Educational Policy Studies
Curry School of Education
University of Virginia
Charlottesville, Virginia

APPROVAL OF THE DISSERTATION

This dissertation, *Essays on Financial Aid Application and Distribution Policies*, has been approved by the Graduate Faculty of the Curry School of Education in partial fulfillment of the requirements for the degree of Doctor of Philosophy

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Benjamin L. Castleman (chair)

_____
Sandy Baum (GWU)

_____
Sarah E. Turner

_____
James H. Wyckoff

_____
Vivian C. Wong

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DEDICATION

I dedicate this dissertation to my husband, Alex, who inspires me with the hard work and perseverance he applies to his own research. Alex, thank you for the indescribable amount of support you have offered as I try to follow the impressive example you set for me when you finished your degree.

ACKNOWLEDGEMENTS

I express an immense amount of gratitude to my advisor, Ben Castleman, for the superb advising I received while writing this dissertation. For their helpful comments, I also thank Sandy Baum, Alex Smith, Sarah Turner, Catherine Alford, Kelly Rosinger, Jim Wyckoff, participants at EdPolicyWorks seminars, AEFP and APPAM conference presentations, and two anonymous referees.

This research was supported by the Institute of Education Sciences, U.S. Department of Education, through Grant #R305B090002 to the University of Virginia. The opinions expressed are those of the author and do not represent views of the Institute or the U.S. Department of Education. Any errors or omissions are my own.

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The topic of college affordability is more important and salient than ever before. Over the past several decades, the cost of higher education and the characteristics of the population of students participating in higher education have changed dramatically. Inflation adjusted tuition prices increased by 169% percent from 1983 to 2013.[1] During this same period, the share of low-income students who attend college has increased by nearly 50%.[2] Despite this increase in participation, the college graduation rate for low-income students is at best stagnant (Bailey & Dynarski, 2011; Baum, Ma, & Payea, 2013; Cahalan & Perna, 2015).

With widening employment and earnings gaps between college and high school graduates, ensuring that low-income students access and succeed in higher education is critical to mitigate broader income inequality and to increase social mobility. Financial aid is one of the most prominent policy strategies to improve postsecondary outcomes for economically-disadvantaged students. Each year, over 80 percent of full-time, first-time degree/certificate-seeking undergraduate students received some form of financial aid.[3] Collectively, the federal government, state governments, and individual institutions distribute hundreds of billions of dollars in financial aid each year. The majority of these aid dollars are targeted at lower-income students, with the goals of promoting better college access and success for these disadvantaged populations. A large and growing body of rigorous research examines the degree to which financial aid has achieved this

[1] Source: Digest of Education Statistics 2014, Table 330.10.
[2] Source: Digest of Education Statistics 2014, Table 302.30. Based on recent high school completers (individuals ages 16 to 24 who graduated from high school or completed a GED in the past twelve months) in the bottom quintile of family income.
[3] Source: Digest of Education Statistics 2014, Table 331.20.

goal. The overarching consensus of this research is that financial aid can indeed improve students' propensity to enroll in college, increase likelihood of persisting beyond their first year, and eventually completing a degree.

Despite the successes of financial aid, there still remain legitimate concerns regarding access to financial aid. The most prominent barrier to financial aid access is the Free Application for Federal Student Aid (FAFSA). A complex form with over 100 questions on individual and household income and assets, leading researchers have argued that the FAFSA is a significant obstacle for many prospective low-income students. For every nine college students who received a Pell grant in 2011-12, there was one student who would have received a Pell grant had they applied, but did not submit a FAFSA. Still, more prospective who did not file the FAFSA did not enroll at all. While prior research has documented the barrier imposed by initial FAFSA filing (Dynarski & Scott-Clayton; Bettinger et al, 2012), I examine two connected yet previously understudied additional obstacles which stem from the FAFSA: deadlines for state grant programs (Chapter 1), and the requirement to refile the FAFSA each year (Chapter 2). I also explore a separate complexity of the financial aid: the decision by institutions of which students receive financial aid. Actors in the higher education market have various and often contradictory motivation to providing financial aid to students. In Chapter 3, I investigate the consequences of two actors interacting – the federal government and individual colleges and universities – on the distribution of an understudied form of financial aid.

There is no federal deadline by which students must file the FAFSA in order to receive federal financial aid. However, most states require students to file the FAFSA in

order to receive state grant aid – an important part of many students' financial aid packages – and the majority of states mandate FAFSA filing deadlines. These deadlines are not arbitrary: most state deadlines occur several months before a student matriculates. However, no prior study has examined at how these state deadlines affect the distribution of financial aid among students. This is my goal in Chapter 1. I use variation in aid application deadlines that occur within states, over time to identify the effect of an earlier deadline on the distribution of state grant dollars. Overall, I find that earlier state deadlines lead to a more regressive distribution of state need-based grants. Specifically, I find that a thirty day earlier deadlines results in a 20 percent decrease in the relative probability that a Pell eligible student receives a state need-based grant, compared to Pell ineligible students. This effect is concentrated among lower-achieving low-income students, who in absolute terms are 10 percent less likely to receive a state need-based grant when facing a thirty day earlier deadline. This first chapter speaks not only to the potential barrier caused by earlier state deadlines, but also the importance of considering the distributional effects of financial aid policies – a topic often not considered in this line of research.

While researchers and policy makers have given considerable attention to the barriers to enrollment created by the FAFSA for prospective college, relatively little attention and few resources have been devoted to helping students refile the FAFSA once they are in college, despite the fact that this must be done each year to maintain eligibility for most financial aid. The goal of my second chapter – joint with Ben Castleman – is to document the rates and patterns of FAFSA renewal for low-income college students, as well to estimate the academic outcomes associated with failure to refile. We find that

roughly 16 percent of freshmen Pell Grant recipients in good academic standing do not refile a FAFSA for their sophomore year. Even among Pell Grant recipients in good academic standing who return for sophomore year, nearly 10 percent do not refile a FAFSA. Consequently, we estimate that these non-refilers are forfeiting $3,500 in federal student aid as a result. Failure to refile a FAFSA is strongly associated with students dropping out later in college and not earning a degree within six years, particularly for students at two-year institutions. These results suggest that interventions designed to increase FAFSA refiling may be an effective way to improve college persistence for low-income students.

In Chapter 3, I focus on a less well-known and understudied form of federal aid: campus-based aid. Campus-based aid consists of three need-based programs: Perkins loans, Federal work-study, and the Federal Supplementary Education Opportunity grant. Unlike other federal aid, funding allocations for these programs are supplied directly to participating colleges and universities, who in turn distribute the aid to students. The process by which institutions distribute funds is both flexible under regulatory guidelines, and opaque to students and researchers. In Chapter 3, my goal is to provide critical information for policy decisions regarding the future of campus-based aid, as well as gain a better understanding of how institutions make complex decisions regarding aid distribution. Consistent with prior research, I find, through an analysis of institution-level data, that campus-based aid is concentrated among students attending higher-cost private institutions, where per student disbursements are as much as five times greater than lower-cost institutions. Overall, I find that a minority of eligible students receive campus-based aid. My results suggest that institutions are using campus-based aid –

particularly Federal work-study – to supplement the financial aid packages of students who they view as more desirable.

The research covered in these three chapters is novel and makes significant contributions to the existing literature. First, I identify and describe potential barriers to financial aid access that have previously received little attention in the financial aid literature. Second, I investigate not only the impacts of aid but important questions of how aid is distributed among students. In other words, should we care about equity in the distribution of financial aid? Given the current conditions in the higher education and job markets described in this introduction, I presume that many policy makers and student advocates would answer these questions with an emphatic "yes." While I do not pass judgment on these normative questions in the text of the following three chapters, they were written with the intention to inform future debates and decision-making on the topic.

Chapter 2 is forthcoming in the journal *Research in Higher Education*. For the remaining two chapters, I plan to revise the text according to feedback from the committee and peers. For Chapter 3 specifically, I plan to more focus the writing or separate into two papers. I will then submit to field journals such as *Economics of Education, Research in Higher Education, The Journal of Policy Analysis and Management*. I plan to submit drafts to journals in late 2016.

CHAPTER 1
Early bird gets the worm?
The impact of application deadlines on the distribution of state grant aid

ABSTRACT

Financial aid is a prominent policy tool for mitigating income inequality and improving social mobility. While research evaluating the impact of financial aid shows promising impacts on college entry and completion, understanding how policies affect *who receives aid* may be as important as understanding the degree to which students benefit from aid. Certain policies, such as requiring students to complete complex applications, create barriers to financial aid access. Such barriers are more pronounced for lower-income households that lack the time, resources, and financial literacy to successfully navigate the financial aid system. However, there is a dearth of research on how other key details of financial aid programs affect the distribution of aid dollars across different student groups. The contribution of this paper is to explore how a specific characteristic of financial aid policy—the date by which states require students to submit the FAFSA to qualify for state aid—affects the distribution of aid dollars across income groups. Using within-state, over-time variation in state FAFSA deadlines, I estimate the effect of a later state deadline on the probability that a low-income student will receive the state grant, compared to higher-income students. Overall, my results show that earlier deadlines cause a redistribution a state grant aid, with lower-income students becoming relatively less likely to receive a state grant compared to their higher-income peers. I also find that this effect is concentrated among lower-achieving students.

I. INTRODUCTION

Ensuring that low-income students access and succeed in higher education is critical to mitigate broader income inequality and to increase social mobility. Financial aid is perhaps the most prominent policy strategy to improve postsecondary outcomes for economically-disadvantaged students. During the 2014 fiscal year, the federal government supplied $32 billion in need-based grant aid to college students (Federal Student Aid, 2014). Collectively, state governments provided an additional $9.5 billion in grant aid, which accounted for 13.3% of total state spending on higher education (NASSGAP, 2013). The majority of grant aid (99.7% of federal and 75% of state disbursements) is targeted to low-income students with financial need. Among higher education researchers, there is a growing consensus that financial aid positively impacts college access and success for low-income students (e.g. Castleman & Long, forthcoming; Deming & Dynarski, 2009; Goldrick-Rab et al, 2012). These results notwithstanding, there remain legitimate concerns regarding the equity of access to financial aid.

Prior research documents that the process of applying for financial aid—completing the complex Free Application for Federal Student Aid (FAFSA)—deters prospective students from pursuing postsecondary education (Bettinger et al, 2012; Dynarski & Scott-Clayton, 2006). Such barriers may be more pronounced for lower-income households that lack the time, resources, and financial literacy to successfully navigate the financial aid system. As such, barriers to aid can result in lower-income students being disproportionately less likely to complete all eligibility requirements, thereby exacerbating income gaps in college enrollment and graduation. While there has

been substantial attention given to the barriers to college access and success created by the FAFSA, there has been very little research on how other aspects of financial aid policy design affect the distribution of aid dollars across student groups. As a result, the distributional impacts of financial aid policies are not well understood. Given that a goal of financial aid programs is to reduce education inequalities and improve social mobility, it is important to consider how policies may affect the distribution of aid dollars across different income groups.

I contribute to this gap in the literature by investigating how FAFSA filing deadlines for state grant programs—an important but understudied aspect of financial aid policy—affect the equity of financial aid distribution. The vast majority of states' grant aid programs, including some state grants based solely on merit, require prospective recipients to file the FAFSA.[4] While there is no FAFSA filing deadline for the Federal Pell Grant or Stafford Loans, most states set deadlines by which students must file the FAFSA in order to be considered for state grant programs.[5] For students enrolled between July 1st, 2015 and June 30th, 2016 (i.e. the 2015-16 award year), state deadlines range from February 15th, 2015 to June 30th, 2016.[6] The modal deadline, March 1st, 2015, is a full month and a half prior to the deadline for submitting federal income tax returns (April 15th). As January 1st is the first date students can file the FAFSA and

[4] I estimate the number of state grant programs that require the FAFSA using the NPSAS:12. Limiting the sample to grants with at least twenty recipients in the data, I calculate the percent of grant recipients who filed a FAFSA. If over 95% of grant recipients filed the FAFSA, then I assume the grant requires the FAFSA. Using this method, I find that 86% of grant programs require FAFSA filing as an eligibility requirement.

[5] In 2011-12, 31 out of the 50 states and District of Columbia had specific deadlines listed for their state grant programs directly on the FAFSA (see Figure 1.2). Other states listed under heading "Check with your financial aid administrator" also have application deadlines not listed on the FAFSA. For example, the Alabama Student Grant Program currently has an application deadline of September 15th (source: http://www.ache.alabama.gov).

[6] Figure A1.1 shows the distribution of state deadlines for the 2015-16 award year. For illustrative purposes, the states with deadlines after December 31st, 2015 have been omitted.

employers are not legally mandated to provide W-2 forms until January 31st, these deadlines give students as few as seventeen days to file the FAFSA.[7] Furthermore, there has been a marked trend toward states mandating earlier deadlines: since 1999-00, the average state deadline has moved five weeks earlier. If an eligible student does not meet an application deadline, he may forfeit thousands of dollars in state-provided financial aid. For example, students in California who filed the FAFSA between February 1st and March 2nd, 2011 received 243 percent more in state need-based grant dollars per student than those who filed between March 3rd and March 31st.

On average, low-income students file the FAFSA substantially later than their high-income peers. For the 2011-12 award year, the average filing date for college freshmen in the bottom income quartile was nearly seven weeks later than for students in the top income quartile. After controlling for differences in academic achievement, the gap in average filing date by income was still three weeks.[8] This pattern, combined with the steady advance of state deadlines to earlier in the calendar year, may have led low-income students being less likely to receive state grants.

I test this hypothesis by estimating the effect of changes in state deadlines on the distribution of state grant aid. Specifically, I estimate the effect of a thirty day earlier state deadline on the probability that a low-income student will receive a state grant, compared to higher-income students. I identify this effect using within-state, over-time variation in states' FAFSA deadlines. Overall, my results show that earlier deadlines

[7] It is possible to file the FAFSA prior to receiving tax forms (i.e. W-2, 1098, 1099) or filing federal income taxes by using the last pay stub from the previous year and account statements. Source: http://www.fastweb.com/financial-aid/articles/how-do-i-file-the-fafsa-in-january-when-tax-returns-can-t-be-filed-that-early

[8] Source: author's calculations using the NPSAS:12. To control for academic achievement, I regress FAFSA filing date on entrance exam scores, including indicators for if the student has no valid entrance exam score. I then compute the mean predicted value of the application date for the top and bottom income quartile.

create a more regressive distribution of need-based financial aid, with a larger proportion of state grants awarded to higher-income students. Specifically, the relative probability that a low-income student receives a state need-based grant decreases by 20 percent if a state deadline occurs one month earlier. I find that the distributional effect is not due to an increase in total state grant funding, meaning that the effect is driven by grant receipt shifting from lower-income to higher-income students. I also find that the negative effect of earlier state deadlines is concentrated among lower-achieving low-income students – particularly those attending community colleges – a population that is at the highest risk of dropping-out of college. While I am unable to estimate how this redistribution of state grant aid impacts student outcomes due to data limitations, the results from previous literature suggest that low-income students receiving relatively less state grant aid could widen the college completion gaps between low- and higher- income students.

The remainder of this paper is organized as follows. In Section II, I provide background on state grant programs and review the relevant literatures on the effectiveness of financial aid, barriers to financial aid access, and the distribution of financial aid. In Section III, I discuss how earlier deadlines may lead to a redistribution of financial aid by income. In Section IV, I detail the data I use for my analysis. In Section V, I outline my empirical strategy to estimate the distributional effect of state deadlines. In Section VI, I present my results from this analysis. In Section VII, I discuss policy implications of my results and considerations for future research, and conclude.

II. BACKGROUND AND LITERATURE REVIEW

A. Background on financial aid

To subsidize the price of education, encourage enrollment, and bolster student success, the federal government, state governments, individual institutions, and private sources spend billions of dollars on grant aid. The largest single grant program available to college students is the federal Pell grant, with over $31 billion distributed to 8.7 million students in 2013-14.[9] The Pell grant is means-tested: eligibility and award amount are based on a student's expected family contribution (EFC), a measure of student financial capacity determined by a complex formula using income, assets, and family composition information students provide on the FAFSA.[10]

While not as large as the Pell grant program, states governments provide close to $10 billion in grant aid to students. Approximately one out of three college freshmen receives some form of state grant aid, with an average award of $2,910 (Digest of Education Statistics 2013, Table 331.20). For many recipients, state grant aid represents a significant portion of their financial aid packages. For the average recipient in 2011-12, state grants made up over 40 percent of their total grant package. This translates to state grants covering 14 percent of the average recipient's total cost of attendance. Among the top decile of recipients, state grants covered more than one-third of recipients' total cost of attendance. To provide a comparison, Pell awards covered 17 percent of the recipients' total cost of attendance in this population (author's calculations using NPSAS:12).[11]

While the stated purpose of the Pell grant program is to promote access to higher education for low-income students, state grant programs vary considerably in their

[9] Source: http://www2.ed.gov/finaid/prof/resources/data/pell-institution.html
[10] Pell awards differ for full-time and part-time students with the same EFC. A student's Pell award cannot exceed their financial need, equal to total cost of attendance minus EFC.
[11] Based on sample including all undergraduate students enrolled in Fall 2011 at a four-year or two-year institution.

missions (Baum et al).[12] On average, 64% of dollars that states spend on financial aid are allocated to need-based grant programs, but this percentage ranges from 100% in Wyoming and Rhode Island, to less than 4% in Washington DC and Utah (NASSGAP, 2014). In addition, there is substantial variation in funding of grant programs across states. For example, the mean dollar amount of grant aid disbursed per full-time equivalent undergraduate (including grant recipients and non-recipients) was $558 in 2012-13, with a maximum of $1,871 in South Carolina and a minimum of $40 in Alabama (NASSGAP, 2014). To provide a comparison, the average Pell award per undergraduate was $1,707 in 2011-12 (author's calculation using NPSAS:12).[13]

Variation in state funding and program missions leads to considerable heterogeneity in the generosity of and eligibility requirements for state grants. To illustrate this point, I show measures of grant generosity and eligibility in Table 1.1 for eight of the largest state grant programs. The grant programs described in columns (1) through (4) are need-based programs; that is, eligibility for the grant is based on family income or expected family contribution. The grant programs described in columns (5) though (7) are merit-based programs; that is, eligibility for the grant is based on entrance exam scores or high school GPA). The grant program described in column (8) has both need and merit based eligibility requirements. Using data from the National Postsecondary Student Aid Survey of 2011-12 (NPSAS:12), I estimate the 10^{th}, 50^{th}, and 90^{th} percentiles of the distributions of: grant dollars awarded to recipients; the expected

[12] Source for purpose of Pell grant program: http://www2.ed.gov/programs/fpg/index.html
[13] Based on sample including all undergraduate students enrolled in Fall 2011 at a four-year or two-year institution.

family contribution of recipients; and the entrance exam percentile scores.[14] I convert SAT and ACT scores to percentile scores (ranging from 1 to 100) for ease of comparison between students who did not take the same test. First to note from Table 1.1 is variation in the size of the grant awards. The median grant award ranges from $672 (Ohio College Opportunity Grant) to $4,136 (Georgia's HOPE Scholarship). There is also substantial variation in eligibility requirements, and as such, the characteristics of the students who receive these grants. For three of the grants with need-based components, the median EFC of recipients is $0. To put this statistic in perspective, in 2011-12 the average household income for students with zero EFC was $16,395.[15] Still, need-based grant programs can reach students from higher-income backgrounds. For example, ten percent of recipients of Illinois' Tuition Assistance Program have an EFC above $11,208, which on average corresponds to a household income of $72,438.

As expected, students who receive merit-based grants are from significantly higher-income households than need-based grant recipients. Still, at least ten percent of recipients of the three merit-grants shown here have an EFC equal to $0, showing that merit-based grants do reach a non-negligible number of low-income students. Also as expected, merit-based grant recipients have better records of academic performance. The median entrance exam percentile score of recipients of Tennessee's HOPE Scholarship and Florida's Bright Futures Scholarship is 63, which translates to an ACT score of 23 or an SAT score of 1070. The top ten percent of these merit grant recipients score at or above the 96th or 94th percentile, respectively.

[14] Because the NPSAS:12 is not representative at the state level, I caution against interpreting the information in Table 1.1 as precise estimates the characteristics state grant recipients; I report these distributions for illustrative purposes only.
[15] Source: author's calculations using NPSAS:12. Based on sample including enrolled in Fall 2011 at a four-year or two-year institution.

B. Financial aid and student success

While a considerable amount of research has investigated the impact of aid on whether students enroll in college, the conclusions are surprisingly mixed and are highly dependent on the context. Most studies have found that Pell grants have had no effect on the enrollment of low-income students (Hansen, 1983; Kane, 1995; Rubin, 2011), with the exception of older students (Seftor & Turner, 2002). Similarly, when looking at the merit-based Georgia HOPE Scholarship, Dynarski (2000) found that the availability of this state grant did not affect enrollment of low-income students. In contrast, two seminal studies find positive enrollment effects of other financial aid programs targeted at low-income populations. Using a regression-discontinuity design, Kane (2003) found that the Cal Grant, a generous need- and merit-based program awarded to California residents, increased college enrollment of eligible students by three to four percentage points. Using the elimination of the Social Security Student Benefit Program, Dynarski (2003) found that an additional $1,000 of aid (in $1998) increased the probability of college attendance by four percentage points among beneficiaries.

More recent studies using student-level data also tend to find no enrollment effect on the extensive margin, and instead find effects on students' college choices. Castleman & Long (forthcoming) used a regression discontinuity design to estimate the impact of the need-based Florida Student Access Grant (FSAG). Like the federal Pell grant, eligibility for the FSAG is determined by an EFC cutoff. Castleman & Long found that the additional $1,300 in financial aid provided by the FSAG made students 12 percent more likely to enroll at a public, four-year university, but had no impact on overall enrollment at a Florida public college or university. Focusing on a high-achieving

population, Goodman (2008) found that while the Massachusetts's Adams Scholarship had no effect on overall enrollment, the program increased the probability of a student attending an in-state public four-year institution (as opposed to a private four-year institution) by nearly 20 percent. Compared to the average effect across all students, the effect size for low-income students was roughly double in magnitude. Similarly, Kane (2007) found that the D.C. Tuition Assistance Grant Program, which subsidized the out-of-state portion of tuition for D.C. residents, increased the enrollment of low-income D.C. residents at eligible out-of-state public schools.

While the enrollment of low-income students has increased substantially in recent decades, the graduation rate of this population has not (Bailey & Dynarski, 2013). For this reason, researchers are now focusing more on the college success margin: does financial aid help students persist in and graduate from college? In general, the empirical evidence suggests that it does. Using both within-student variation in Pell grant receipt and exploiting a discontinuity in the Pell grant award formula, Bettinger (2004) found that the Pell grant reduces likelihood of stopping-out after the first year by four percent for every $1,000 of aid received. Dynarski (2008) used the introduction of generous merit-based tuition subsidies in Arkansas and Georgia to estimate the impact of these scholarship programs on college completion, and found that both programs increased graduation rates in these states. Scott-Clayton (2011a) used both an eligibility cutoff in college entrance test score and a gradual program roll-out to demonstrate that West Virginia's merit-based PROMISE scholarship improved recipients' grades and credit accumulation. Castleman & Long (forthcoming) found that eligibility for the FSAG

increased the probability of earning a bachelor's degree within six years of initial enrollment by nearly 22 percent.

The studies discussed above all use quasi-experimental methods to evaluate the efficacy of financial aid programs, as financial aid is rarely distributed at random. There are a few exceptions to this rule. Brock & Richburg-Hayes (2006) evaluated a program that provided financial aid and advising to randomly-assigned low-income parents attending Louisiana community colleges, and found that the program improved credit accumulation and persistence. In a more recent experiment, researchers randomly assigned Pell recipients at Wisconsin public four-year institutions to receive an additional $3,500 in grant aid.[16] Preliminary evaluation of this experiment showed that the additional financial aid increased persistence to the second year and total credit accumulation, particularly for the lowest-income students (Goldrick-Rab et al, 2012). Angrist et al (2014) also used random assignment to evaluate the efficacy of Nebraska's Susan Thomson Buffett Foundation grant, and similarly found increased persistence to second-year.[17]

The line of research examining the effectiveness of financial aid and student outcomes provides important motivation for this study. It shows that financial aid is important for the success of college students – particularly those from low-income

[16] Angrist, Lang, & Oreopoulus (2009) and Patel et al (2013) also randomly assigned students to scholarship programs, and find positive impacts on college success. However, the programs studied in these papers differed significantly from traditional financial aid. Current college students were randomly assigned to the opportunity to earn future merit-based financial aid, to be disbursed during the subsequent year. To qualify for the future scholarship, students were required to meet certain academic benchmarks (i.e. maintain a 3.0 GPA).

[17] However, a condition of this grant is that students participate in Learning Communities, therefore the effect of the financial aid offer cannot be separately identified from the Learning Communities requirements. In subsequent versions of this paper, the authors will report findings from an "aid-only" group during the second wave of their experiment.

backgrounds. However, as the next section details and as I demonstrate in this paper, there are significant barriers to accessing financial aid, beginning with the FAFSA.

C. FAFSA as a barrier to college

In order to graduate from college, students must overcome numerous barriers. Many of these obstacles are administrative, including navigating the financial aid application process. Critics of the FAFSA argue that this complex form, which contains over 100 detailed questions, is a significant barrier to low-income students accessing financial aid and thereby stands in their way of entering college (Dynarski & Scott-Clayton, 2006).[18] As I discuss in more detail in Section III, low-income families may not have the time, cognitive bandwidth, or financial literacy to complete the FAFSA, effectively disqualifying themselves from thousands of dollars in financial aid. Another deterrent to filing the FAFSA is the *a priori* uncertainty regarding how much financial aid a student will qualify for. A fifty-one step statutory formula uses responses from the FAFSA to compute a student's expected family contribution (EFC), which in turn determines Pell grant eligibility as well as eligibility for many other aid programs.[19] Due to the complexity of the EFC formula, prospective students cannot know with much certainty how much financial aid they may receive until they complete applications for admission and financial aid application processes; this uncertainty may make prospective students less likely to invest the time and cognitive energy necessary to complete the FAFSA (Dynarski & Scott-Clayton, 2007). In addition, students cannot file the FAFSA

[18] It is worth noting that in the past decade or so, it has become easier to file the FAFSA. Virtually all students file online, allowing the use of skip logic and an IRS data retrieval tool to auto-populate some fields. Indeed, FAFSA completion rates have increased from 50 percent to 70 percent of undergraduates from 1999 to 2011 (Page & Scott-Clayton, 2015). However, despite these technological improvements, researchers and policy-makers still commonly view the FAFSA as a significant barrier to college access and success.

[19] Based on EFC formula for a dependent student. Source: http://ifap.ed.gov/efcformulaguide/attachments/090214EFCFormulaGuide1516.pdf

until January of their senior year of high school.[20] Because colleges do not offer financial aid awards until after the FAFSA is filed, students and families may not have enough time to plan far enough in advance how they will cover the gap between their costs of attendance and their financial aid packages (Dynarski & Scott-Clayton, 2013).[21]

Recent evidence confirms that the FAFSA is indeed a significant barrier to accessing financial aid, and in turn, succeeding in college. For every nine college students who received a Pell grant in 2011-12, there was one student who would have received a Pell grant had they applied, but did not submit a FAFSA.[22] Bettinger et al (2012) tested the hypothesis that the FAFSA acts as a barrier to college entry empirically. These researchers conducted a field experiment in which low-income families were provided with professional assistance filing the FAFSA; in turn, this assistance increased college enrollment of dependent students by 34%. However, as is also apparent from rigorous research on the topic, the FAFSA continues to be a barrier to financial aid for students even after they enroll for the first time. Students must refile the FAFSA each year in order to maintain eligibility for the vast majority of financial aid; this policy may contribute to the disproportionately low retention rate of low-income students. (Bird & Castleman, forthcoming). Castleman & Page (forthcoming) showed that the negative effect on retention can be mitigated by offering reminders and assistance with re-filing the FAFSA.

[20] This timeline has been altered starting with the 2017-18 academic year. Students can now file the FAFSA beginning on October 1st, 2016 using information from their prior-prior year income taxes (2015 fiscal year). I discuss the interpretation of my results in light of this change in Section VII.
[21] Also contributing to the uncertainty of financial aid is the fact that the maximum Pell award and the maximum EFC eligible for a Pell award are typically not disclosed until six months prior to the award year. For example, the Pell grant schedule for the 2016-17 award year was released on January 29th, 2016.
[22] Source: author's calculations using NPSAS:12, using IES imputed expected family contributions for students who did not file the FAFSA. King (2004, 2006) and Kofoed (2015) found similar rates of non-filing.

Two recent studies consider the barrier created by FAFSA deadlines at the state or institutional level. Using data from the Beginning Postsecondary Students Study (BPS:04/09), McKinney & Novak (2015) found that students who file the FAFSA later are also more likely to enroll part-time or delay enrollment for one semester. While these relationships are strictly correlational, they highlight some of the potential negative consequences of not meeting FAFSA deadlines. Another recent study conducted by ideas42 highlighted the specific barrier created by institutional FAFSA filing deadlines (ideas42, 2015). At Arizona State University (ASU), less than one-third of continuing students file the FAFSA in time to meet ASU's priority deadline of March 1st. ideas42 launched a messaging campaign to encourage early FAFSA filing, and found that their behaviorally-targeted nudges substantially increased the likelihood of on-time FAFSA filing by 72 percent.

D. Distribution of financial aid

All financial aid programs target recipients by creating eligibility requirements. The two largest need-based financial aid programs, the Pell grant and subsidized Stafford loans, are precisely targeted, with eligibility sharply determined by students' expected family contributions and costs of attendance. However, despite states' preference to target aid at financially needy or academically high-achieving students, relatively little research has considered who *actually* receives state grant dollars, and how policies may affect this distribution. A number of researchers have commented on the regressive nature of higher education funding compared to the allocation of funds for K-12 education or welfare programs (Bishop, 1977; Doyle, 2007; Hansen, 1969; Jackson and Weathersby, 1975; Peltzman, 1973; Radner and Miller, 1970). For example, Doyle

(2007) argues that because access to state-sponsored higher education is "rationed" to students with higher academic achievement – which is correlated with family income – higher education subsidies most benefit students from high-income families. However, these studies only discuss the inequity of the higher education system as a whole relative to other publicly-provided services, and do not consider the distribution of funding within the higher education system.

Other studies discuss the distributional nature of specific financial aid programs. Dynarski (2004) detailed the tax incentives and realized benefits of college savings plans (529 and Coverdell accounts), and showed that the benefits of these plans sharply increase with income. Similarly, Long (2004b) documented the regressive nature of education tax credits, finding that most beneficiaries of the Hope and Lifetime Learning tax credits have household incomes well above the median. Dynarski, Long, and other researchers point to merit-based aid programs as disproportionally benefiting middle- and high-income students (Dynarski, 2000; Heller and Marin, 2002; Long, 2004a; Long & Riley, 2007; Stranahan & Borg, 2004). Stranahan and Borg (2004) specifically estimated the net benefit of Florida's Bright Futures scholarship by income. Because low-income students are less likely to receive the scholarship (consistent with findings for other merit-based programs), and low-income households pay more in lottery taxes, Stranahan and Borg argued that low-income households suffer a net loss due to the Bright Futures program.

The literature described in this section provides important insights as to how barriers to financial aid may affect the distribution of aid dollars. Because this paper is centered around the fact that FAFSA filing behavior differs across income lines, I next

provide a discussion of the hypotheses explaining this pattern, before turning to my analysis.

III. EXPLAINING FAFSA FILING BEHAVIOR

Consider a traditional economic model comparing the costs of filing the FAFSA (i.e. time, cognitive energy, etc.) to the benefits of filing the FAFSA (i.e. financial aid awards). This model would predict that low-income students would be more likely to file the FAFSA, and file it in time to meet state grant deadlines, as low-income students typically qualify for larger grant awards. However, in practice, low-income students file the FAFSA later than their peers. To illustrate this fact, Figure 1.1 plots the histogram of FAFSA filing dates for low- versus high-income freshmen in 2011-12, restricted to states with March 1st deadlines. Figure 1.1 shows that students in the highest income quartile are significantly more likely to meet their state's March 1st deadline than students in the lowest-income quartile. In order to develop potential policy solutions to this problem, it is first important to consider why delayed filing occurs in this population.

In the traditional economic model, delayed filing could be the result of low-income students incurring a higher cost of filing the FAFSA. This hypothesis is supported by the fact that low-income households are less financially literate, and thus may find filling out the FAFSA to be a more difficult task (Amromin et al, 2010; Gale & Levine, 2010; Mullainathan & Shafir, 2013).[23] However, given the potential gain from filing the FAFSA (thousands of dollars for most low-income students), the effort cost would have to be sufficiently large to outweigh the benefit in a rational cost-benefit analysis. For example, Pell eligible freshmen who filed the FAFSA for 2011-12 received

[23] On the other hand, low-income households typically have simpler tax filings (due to fewer asset holdings), making the effort cost potentially lower, particularly when using the IRS retrieval tool.

on average $5,220 in grants, while students who likely would have been eligible for a Pell grant but did not apply received on average $658 in grants.[24]

Alternatively, a market failure such as imperfect information could explain this phenomenon. Researchers have documented that low-income families often lack correct information regarding the availability of financial aid (Avery & Kane, 2004; Horn, Chen, & Chapman, 2003; Grodsky & Jones, 2007) or specific program details (De La Rosa & Tierney, 2006; Scott-Clayton, 2011b). This information deficit results, in part, from lower-income students having access to fewer advising resources. High-school advisors working in low-income areas have average caseloads of 1,000 to 1, more than double the national average (Haskins, Hozler, & Lerman, 2009; Ramsey, 2008). The advising gap remains once low-income students enter college. Colleges that low-income students are most likely to attend have similarly incredible advising caseloads, and students are often not assigned an academic or financial advisor at all (Scott-Clayton, 2015). These advising gaps may affect low-income students' success at initially applying for aid and in maintaining their financial aid packages during subsequent years. Other structural failures, such as low-income students historically having poorer internet access, also create additional difficulties for low-income students filing the FAFSA to meet state deadlines (Dettling, Goodman, & Smith, 2015).

In a related strand of literature, sociologists document the importance of social capital for college access, and the associated income disparities in social capital (McDonough, 1997; Nagaoka, Roderick, & Coca, 2009; Perna & Titus, 2005; Tierney & Venegas, 2006). Low-income students are more likely to come from families, neighborhoods, and social circles where fewer people attend college, and thus less likely

[24] Source: author's calculations using the NPSAS:12.

to know someone who has been through the process of applying for aid. Low-income students may receive less active support with college planning from their parents, either because their parents are working long hours or do not feel confident in their ability to navigate the financial aid system (De La Rosa & Tierney, 2006).[25] Fewer support networks likely contribute to low-income students being less likely to successfully complete the FAFSA at all, or in accordance with their state's deadline.

On-time FAFSA filing is also likely influenced by a student's college choice. Selective four-year institutions commonly set their own deadline by which students must file the FAFSA in order to be considered for institutional grants and scholarships; these institutions also have more resources for advising and outreach to help students file the FAFSA. However, prior research shows that there are considerable disparities in college choice by income. Conditional on academic achievement, low-income students apply to less selective and lower quality schools (Hoxby & Avery, 2013; Hoxby & Turner, 2015). This pattern exists despite the fact that the net price to low-income students is typically comparable – often times lower – at the more selective, high-quality institutions to which they do not apply.

Behavioral economics also offers theories as to why low-income students may file the FAFSA later than optimal (Castleman, 2015; Castleman, Schwartz, & Baum, 2015; ideas42, 2015). From this literature, we know that individuals are prone to procrastination and avoidance of complicated tasks, even if these tasks have significant future payoffs (Beshears et al, 2012; Chabris, Laibson, & Schuldt, 2007; Madrian &

[25] Even if parents do not plan on helping students pay for college, all students classified as dependent for financial aid purposes must include their parents' income and asset information on the FAFSA in order to file, making parental cooperation crucial. Students are classified as dependents for financial aid purposes unless: they are orphans or wards of the state; they are over the age of 24; they are married; they have dependents of their own; or they are serving or have served in the military.

Shea, 2001). Students are particularly sensitive to small additional costs during the college application process, resulting in sub-optimal choices (Pallais, forthcoming). Low-income students and their parents may be particularly prone to these sub-optimal behavioral responses. Shah, Mullainathan, & Shafir (2012) and Mani et al (2013) suggest that the additional stresses that come along with being poor (e.g. concerned with how to make ends meet), exacerbates attentional neglect and can impede cognitive function. Therefore, even if low-income students and their families have the best intention to apply for financial aid in a timely manner, they may not have the cognitive attention or bandwidth to follow through on this intention.

These combined factors contribute to low-income students filing the FAFSA later than their higher-income peers, making them at higher risk for missing state aid application deadlines.

IV. DATA

A. Sources and Sample Construction

For this study, I primarily use data from the National Postsecondary Student Aid Studies (NPSAS). These data are collected and maintained by the National Center for Education Statistics, and are available through restricted-use data licenses. Since 1987, survey waves have been administered approximately every four years. For this study, I use the NPSAS waves corresponding to the academic years 1999-00, 2003-04, 2007-08, and 2011-12 (NPSAS:00, NPSAS:04, NPSAS:08, and NPSAS:12, respectively). Each NPSAS wave provides student-level data for a large, nationally representative sample of

students enrolled at a higher education institution during the academic year surveyed.[26] Each wave contains tens of thousands of undergraduate student observations. I observe basic demographic and academic background information for students, including race, gender, age, household income, parental education, and state of residence, as well as entrance exam scores (SAT or ACT), if taken. For students who file the FAFSA, I also observe all information gathered on the FAFSA (measures of income, assets, family composition) as well as filing date. Most importantly, I observe all financial aid awarded to the student from all sources (i.e. federal, state, institutional, or private), by aid program. If a state has multiple grant programs, I observe awards for each individual program. This information gives a full picture of each student's financial aid packages during the NPSAS academic year.

I use additional data from other sources in my analysis. For each state, I compute the average in-state tuition at four-year public institutions from the Integrated Postsecondary Education Data System (IPEDS) for each academic year corresponding to a NPSAS wave. I also use data on state spending for grant programs from the National Association of State Student Grant & Aid Programs (NASSGAP) annual surveys. From these surveys, I observe state grant aid spending by program type (i.e. need-based versus merit-based) as well as total grant aid spending and full-time equivalency student enrollment. I also use annual unemployment rates and poverty rates as time-variant measures of state economic conditions from the Bureau of Labor Statistics. Finally, I calculate states' college enrollment rates of 18- and 19-year olds from the Current Population Survey (CPS) October supplement.

[26] The NPSAS data also provides analysis weights, equal to the inverse probability of that student being included in the sample. I use these survey weights in all regression analyses and other statistical computations.

For all my analyses, I limit my sample to first- through fourth-year undergraduates who enrolled during the fall term of the survey year at a two- or four-year institution. I exclude students at less-than two-year institutions as most state grants cannot be used to pay tuition or fees at these schools. Even though students enrolled in less-than two-year institutions typically come from low-income backgrounds – 80% are eligible for a Pell grant – only 2.9% of students at less-than two-year institutions receive a state need-based grant. Similarly, only 0.2% of students at less-than two-year institutions receive a state merit-based grant. In addition, while most state deadlines coincide with the traditional academic schedule, less-than two-year institutions are typically vocational or technical training schools and often do not operate on the traditional academic schedule.

Table 1.2 shows the means for all variables used in analysis for the samples of: (1) all undergraduate students in my analysis sample (n=111,000); (2) students who received a state need-based grant (n=16,860); and (3) students who received a state merit-based grant (n=5,190). In compliance with IES reporting standards, these and all other sample sizes are rounded to the nearest ten. As expected, students who receive state need-based grants come from lower-income backgrounds than the average student in my sample, being 61% more likely to qualify for a federal Pell grant. Similarly, state need grant recipients have significantly lower expected family contributions (EFC) and household income. Compared to the average student, state need grant recipients are more likely to be female and categorized as dependent students for financial aid purposes, and have slightly lower entrance exam scores. While state need grant recipients have higher costs of attendance (19% higher than the full sample), need-based grant recipients also

receive more financial aid awards from other sources (federal, institutions, private sources).

On the other hand, students who receive state merit-based grants come from relatively higher-income backgrounds, are much more likely to be dependent students, and perform better on college entrance exams, compared to the average student and need-based grant recipients. Merit grant recipients also receive more financial aid from colleges, universities, and private sources, though not from the federal government.

B. Deadline Definition

The key independent variable of interest for my analysis is the FAFSA deadline for the students' state of residence. The measure of this variable comes from the actual FAFSA form from the relevant NPSAS year (i.e. 1999-00, 2003-04, 2007-08, and 2011-12 award years). As shown in Figure 1.2, the FAFSA displays state deadlines for the majority of states. For some states, there are separate deadlines for incoming versus returning students (e.g. New Jersey and Pennsylvania); in this case, I code the incoming student deadline for all freshman student observations and the returning student deadline for all sophomores, juniors, and seniors. In my main set of analyses, I treat deadlines the same for states with the indication that the deadline is for priority consideration (states with hashtag subscripts in Figure 1.2) as with those that do not. Similarly, I treat deadlines the same for states with the indication that the deadline may require a separate form (i.e. states with asterisk subscripts in Figure 1.2) as with those that do not. For those states under the heading "Check with your financial aid administrator" (i.e. Alabama, Arizona, etc.), I code the state's deadline as missing. Similarly, for those states with a listed deadline as "As soon as possible after January 1," I code the deadline as

missing.[27] Therefore, students in states under the heading "Check with your financial aid administrator" or with deadlines listed as "As soon as possible after January 1" are not included in the regression analysis.[28]

I restrict my analytic sample to students subjected to deadlines that occur on or before July 1th prior to the academic year. For instance, for the 2011-12 academic year, I restrict my sample to students in states with deadlines on or before July 1th, 2011. I make this restriction for two important reasons. First, all within-state variation in deadline changes are isolated within the window of January 1st to July 1st (with the exception of Oregon, which moved its deadline 426 days earlier, from May 1st, 2000 to March 1st, 2003). Eliminating states from the sample with deadlines after July 1st increases the relative amount of identifying variation occurring due to states changing their deadlines between NPSAS waves.

The restriction to deadlines on or before July 1st is further informed by the relationship between the predicted probability of grant receipt and state deadlines. I show this relationship in Figure 1.3. For each possible deadline (i.e. February 15th, March 1st, etc.), I estimate the average probability of state grant receipt, controlling for relevant student characteristics (gender, dependency status, and entrance exam scores) and state characteristics (average tuition at public four-year institutions; college-going rate of 18-24 year olds; the poverty rate; the unemployment rate; and total state grant awards in

[27] I attempted to collect data on these states' deadlines during the NPSAS years using google search, internet archival sites (i.e. "the way back machine") and state financial aid reports. However, this attempt was unsuccessful. I also attempted to infer state deadlines using the NPSAS data which specifies the FAFSA submission date for each student. However, for most grant programs, there are too few grant recipients per program for these inferred measures to have meaningful precision.

[28] It is possible that these excluded states differ significantly from the states in my sample in terms of their financial aid programs. For example, the "As soon as possible after January 1" states likely have a fixed dollar amount to distribute each year and award grants on a first-come, first-served basis. This is the case with Illinois' Monetary Award Program (MAP).

dollars), and state and year fixed effects. I plot these predicted probabilities against state deadlines on the y-axis, with the size of the circle proportional to the number of students in each state by deadline cell. The vertical red line in Figure 1.3 delineates deadlines before and after July 1st. There are two patterns of note that appear in Figure 1.3: (1) most state deadlines occur in the first several months; and (2) there is a strong, positive relationship between predicted grant receipt and state deadline during the first several months, while there is no discernible relationship for the later months. This relationship is as expected: by August or September, students following the traditional academic calendar have begun classes and received their tuition bills. Therefore, deadlines that occur after this point are presumably less likely to affect students' decisions about when to file the FAFSA.

V. RESEARCH DESIGN

A. Main Empirical Analysis

The goal of my empirical analysis is to understand how states' FAFSA filing deadlines affect the distribution of state grant aid across socio-economic lines. Using variation in FAFSA deadlines that occurs within-state over time, I estimate the effect of a thirty day earlier deadline on the probability that a student receives a state grant, and the dollar amount of state grant received. I interact the effect of an earlier deadline with socio-economic status, as to identify the effect of deadlines separately for lower-income students and their higher-income counterparts. I focus my discussion on the estimated differential effect of earlier deadlines for lower-income students (i.e. the difference between the effect of an earlier deadline on lower-income students and the effect of an

earlier deadline on higher-income students), as this estimate speaks to how deadlines affect the distribution of state grants by income groups.

I begin by estimating the effect of deadlines on the probability of state grant receipt. Specifically, I estimate the following probit regression equation:

$$\Pr(ReceiveStateGrant_{ist}) = \Phi(\beta_0 + \beta_1 Deadline_{st} + \beta_2 SES_{ist} * Deadline_{st} + \beta_3 StudChar_{ist} + \beta_4 StateChar_{st} + \mu_s + \delta_t + \epsilon_{ist}) \quad (1)$$

where $\Phi(.)$ is the cumulative distribution function of the standard normal distribution.[29] $ReceiveStateGrant_{ist}$ is an indicator equal to one if student i receives a state grant in state s during year t. I estimate Equation (1) separately for state need-based grants and state merit-based grants. The population of students who qualify for state need grants is quite different from the population of students who qualify for state merit grants (as demonstrated in Table 1.2), and thus I expect deadlines to affect the distribution of these two type of programs differently.

For most analyses, I use Pell grant eligibility to measure socio-economic status, so that SES_{ist} is in indicator equal to one of a student's expected family contribution (EFC) is at or below the Pell grant eligibility threshold.[30] For select analyses, I show that my results are robust to four other measures of a student's socio-economic status: an

[29] All probit estimates are robust to using a logistic regression model instead. Estimates of Equation (1) are also robust to using a linear probability model (LPM) when the dependent variable is receipt of a state need grant. However, when the dependent variable is receipt of a state merit grant, LPM does not perform well. Specifically, using for example the socio-economic status measure of Pell grant eligibility, the predicted probability of receiving a state merit grant is less than zero for 17% of the sample. This failure is due to the sample mean of the dependent variable being low: less than 4 percent of students in the sample receive a state merit-based grant.

[30] The thresholds for the four relevant award years are: $2925 in 1999-00; $3850 in 2003-04; $4110 in 2007-08, and $5273 in 2011-12. For students who did not file a FAFSA (and therefore do not have an EFC computed), I use the imputed EFC provided in the NPSAS data.

indicator if the student's EFC is at or below the median EFC of Pell grant recipients; an indicator if the student's EFC is equal to zero; expected family contribution (EFC); and household income.

$Deadline_{st}$ is defined the FAFSA deadline in state s and time t, which I transform to:

$$Deadline_{st} = \frac{-(Days\ after\ Jan.\ 1st\ of\ state\ deadline)}{30}$$

For example, a deadline of March 1st, 2011 (60 days after January 1st, 2011) would correspond to a value of -2. I use this transformation of $Deadline_{st}$ for ease of interpretation; an increase in $Deadline_{st}$ by one (1) is comparable to the state's deadline moving one month earlier. The size of the deadline shift is also policy relevant: the median within-state deadline change in my sample is 30 days.[31] $StudChar_{igst}$ is a vector of student-level characteristics; including gender; socio-economic status (SES_{ist}); dependency status; full-time student status; and entrance exam scores. In all analyses, I use students' percentile score (taking on values 1 through 100) on the SAT and ACT entrance exams as a measure of academic achievement. For observations with no SAT or ACT score on record, I code the value for the entrance exam percentile score variable as zero and include a missing variable indicator in a regression models. $StateChar_{st}$ is a vector of time-varying state controls: average tuition at public four-year institutions (natural log); the college-going rate of 18-24 year olds; the poverty rate; the

[31] Excluding deadline changes less than one week and Oregon's deadline change of 427 days. See Figure 1.4 for more information.

unemployment rate; and total state grant awards in dollars (natural log). The state fixed effects, μ_s, account for time-invariant observable and unobservable characteristics of states which may be related to states' choice of deadlines or preferences for distributing state grants. Finally, δ_t represents year fixed effects, which control for national trends that may affect students' probability of receiving a state grant. For example, δ_t controls for the changes in the student population due to the Great Recession that were common across all states.

In Equation (1), I identify β_1 and β_2 using variation in aid application deadlines that occurs within-states, over-time. Figure 1.4 shows the states that changed their deadlines between NPSAS waves, as well as the magnitude of the change, for all deadline changes larger than seven days. A positive change corresponds to a deadline that was moved earlier (closer to January 1st); a negative change corresponds to a deadline that was moved later (further from January 1st). For example, between 1999-00 and 2003-04, Iowa's deadline was moved from June 1st, 1999 to July 1st, 2003 (thirty days later). In all, there were twelve deadline changes in eight separate states across these NPSAS waves.

The estimates β_1 and β_2 in Equation (1) quantify the changes in grant aid received due to a thirty day earlier deadline, by socio-economic status. When using the SES measure of Pell grant eligibility, then $\widehat{\beta_1}$ is equal the percentage point change in the probability that Pell ineligible students receive a state grant when the deadline occurs thirty days earlier. Similarly, $\widehat{\beta_1} + \widehat{\beta_2}$ is equal to the percentage point change in the probability that Pell eligible students receive a state grant when the deadline occurs thirty days earlier. The sign of $\widehat{\beta_2}$ indicates the direction of the distributional effect of an

earlier deadline. Consider the inference of $\widehat{\beta_2}$ <0; that is, earlier deadlines cause Pell eligible students to be relatively less likely to receive a state grant in comparison to Pell ineligible students.

To complement this analysis, I also estimate how state FAFSA filing deadlines affect grant dollars received, by socio-economic status. Specifically, I estimate the following regression equation using ordinary least squares:

$$StateGrantAward_{ist} = \beta_0 + \beta_1 Deadline_{st} + \beta_2 SES_{ist} * Deadline_{st} + \beta_3 StudChar_{ist} + \beta_4 StateChar_{st} + \mu_s + \delta_t + \epsilon_{ist} \quad (2)$$

where $StateGrantAward_{ist}$ is the dollar amount that student i receives of either state need-based or merit-based grants.

B. Test for Endogeneity of Deadlines

From Equation (1), $\widehat{\beta_1}$ and $\widehat{\beta_2}$ are interpreted as the causal effect if $Deadline_{st}$ is uncorrelated with ϵ_{igst} – that is, a state's deadline is unrelated to $ReceiveGrant_{igst}$ after controlling for all other independent variables in Equation (1). There are several plausible stories as to why this identifying assumption would not hold. First, if changes in funding for state grant programs are correlated with changes in deadlines, then I would be unable to identify the true effect of state deadlines on the distribution of grant aid separately from the effect of changes in program funding. For example, suppose that states with decreased funding for financial aid programs set earlier deadlines to limit the eligible applicant pool. In this situation, the effect of the deadline would be conflated with the effect of state fund availability. Similarly, if a deadline change happened

simultaneously with the introduction of a new merit-based grant program in the state, then I would not be able to attribute an estimated change in the distribution of aid to the deadline change alone. I test this endogeneity concern empirically by estimating the conditional association between funding and deadline timing using data from the NASSGAP surveys. Specifically, I estimate the following equation:

$$Funding_{st} = \beta_0 + \beta_1 Deadline_{st} + \beta_2 StateChar_{st} + \mu_s + \delta_t + \epsilon_{st} \quad (3).$$

I estimate Equation (3) with the following definitions of $Funding_{st}$: total spending on need-based grants (natural log); total spending on merit-based grants (natural log); percent of spending on need-based grants; spending per full-time equivalent undergraduate on need-based grants; and spending per full-time equivalent undergraduate on merit-based grants. I estimate this equation using available data from the NASSGAP surveys 2002 through 2012, for the sample of states with deadlines that occur on or before July 1st. Table 1.3 shows the results. I find no significant relationship between state deadlines and funding of state grant programs. These results suggest that my findings are not driven by states moving their deadlines earlier due to funding cuts, or simultaneous program changes.[32]

I also test whether changes in deadlines are related to changes in grant eligibility requirements, i.e. maximum family income to be eligible for a need-based grant, or

[32] I repeat this analysis using lagged and lead deadline variables. Table A1.1 shows the results with the lagged deadline (i.e. substituting $Deadline_{s,t+1}$ in Equation 3); and Table A1.2 shows the results with the lead deadline (i.e. substituting $Deadline_{s,t-1}$ in Equation 3). These tables show that there may be some significant relationship between changes in deadlines and state funding levels in surrounding years. Compared with the sample mean of the dependent variables, the magnitude of the relationships are relatively small (less than 5 percent increase in state funding for a deadline moved thirty days earlier).

minimum entrance exam score to be eligible for a merit-based grant. For example, consider the hypothetical situation in which a state moves its deadline earlier while simultaneously raising its qualifying EFC threshold for a need-based grant (i.e. more higher-income students become eligible), or simultaneously lowering its qualifying ACT/SAT threshold for a merit-based grant (i.e. more lower-achieving students become eligible). In these situations, my estimates of the distributional effect of state deadlines would be conflated with the changes in eligibility requirements. I test this hypothesis empirically by testing for correlation between state deadline changes and changes in states' grant programs' eligibility requirements. For each state by year, I calculate the 90^{th} and 75^{th} percentile of the EFC distribution of state need-based grant recipients; this measures the extent to which states extend their need-based programs to students of increasing socio-economic status. Similarly, for each state by year, I calculate the 10^{th} and 25^{th} percentile of the entrance exam percentile score distribution of state merit-based grant recipients; this measures the extent to which states extend their merit-based programs to students of decreasing academic performance. To ensure a minimum level of precision with these estimates, I calculate these measures of grant eligibility for only state by year cells where I observe at least ten recipients of the relevant type of grant.[33] I estimate Equation (3) with these measures of program eligibility as the dependent variable. Columns (1) though (3) of Table 1.4 show that there is no meaningful relationship between state deadlines and need-based eligibility requirements or median need-based grant award. However, the estimates in columns (4) and (5) show that earlier deadlines may be associated with more lenient eligibility requirements for merit-based

[33] As discussed above, these variables describing state grant programs cannot be measured precisely using the NPSAS data, as the NPSAS sample is not representative by state. Understanding this limitation, these measures of grant eligibility are still the best available for these purposes.

grants. Specifically, a thirty day earlier deadline shifts the distribution of ACT scores for merit-grant recipients by roughly ten percentile points. Specifically, the estimate in columns (5) shows that a thirty day earlier deadline is associated with the entrance exam score of the 25th percentile of recipients decreasing by twelve percentile points. To give a concrete example, this translates to a shift from one quarter of a state merit-grant program's recipients scoring below 1010 on the SAT score (47th percentile), to one quarter of recipients scoring below 950 (35th percentile). While this result is marginally significant, it provides suggestive evidence that the estimates presented below for merit-based grants are confounded with changes in eligibility requirements. I will discuss the implications of this result in more detail in Section VI.

C. Test for sample selection bias

As a consequence of the nature of the NPSAS data, I only observe students once they enroll in college. If changes in state deadlines affect whether a student attends college or not, then this data limitation would create a sample selection bias for my analysis. For instance, if low-income students are less likely to enroll due to an earlier state deadline, then my results would *understate* the degree to which earlier state deadlines redistribute aid to higher-income students. This downward bias would result from not observing all potential grant recipients who did not receive a grant due to the earlier deadline.

As I discussed in Section II above, prior research finds mixed evidence as to whether grants affect the extensive enrollment margin. Some studies find positive extensive margin enrollment effects (Dynarski, 2000; Dynarski, 2003; Kane, 2003; and Seftor & Turner, 2002), while others do not (Hansen, 1983; Kane, 1995; Rubin, 2011).

Three recent studies find no effect of eligibility for state grant programs on whether a prospective student enrolls in any college, but moderate to large effects of students' college choice (Castleman & Long, forthcoming; Goodman, 2008; and Kane, 2007).

I conduct several tests and do not find evidence that state grant deadlines affect the extensive enrollment margin. First, I use the October Population Survey to construct an individual-level sample of 18- and 19-year-olds for the years 1999-2012. With these samples of college-aged individuals, I estimate the following equation:

$$\Pr(Enroll_{ist}) = \Phi(\beta_0 + \beta_1 Deadline_{st} + \beta_2 StateChar_{st} + \mu_s + \delta_t + \epsilon_{ist}) \quad (3)$$

where $Enroll_{ist}$ is an indicator equal to one if individual i in state s at time t is enrolled in college, and $Deadline_{st}, StateChar_{st}, \mu_s,$ and δ_t are defined as above (with the exclusion of total college enrollment of state residents and college-enrollment rate in $StateChar_{st}$).

Second, using institution-level data from IPEDS, I aggregate college enrollment by state of residence for the academic years 1999-00 through 2012-13 and estimate the following equation:

$$Enrollment_{st} = \beta_0 + \beta_1 Deadline_{st} + \beta_2 StateChar_{st} + \mu_s + \delta_t + \epsilon_{st} \quad (4)$$

where $Enrollment_{st}$ is the count of first-time, first-year students residents of state s in year t. Table 1.5 shows the results from Equations (3) and (4), with the results in column

(1) being the marginal effect and pseudo R-squared from the probit model.[34] I find no significant relationship between state deadlines and (1) the probability that college-aged individuals enroll in college and (2) total enrollment of state residents at higher education institutions.

Given data limitations of the CPS and IPEDS, the two specifications above do not test if deadlines affect the enrollment probability for low-income students in particular. An earlier state deadline could lead to fewer low-income students enrolling yet more higher-income students enrolling, thereby creating a null effect on total enrollment. To test for this, I use data from the same NPSAS waves as in my main analysis. Using the student observations in the undergraduate sample at four- and two-year institutions, I construct measures of socio-economic status for the populations of enrolled college students, by their state of residence. These socio-economic measures are: percent of students who are Pell eligible; percent of students with an EFC of zero; percent of students with EFC at or below the median of Pell eligible students; average expected family contribution, and average household income. I then estimate Equation (4) with the dependent variable SES_{st} as a measure of the socio-economic status for the population of state s resident undergraduates enrolled during year t. Table 1.6 shows that state deadlines are unrelated to socio-economic status of the population of state residents who enroll in college.

These three tests from different data sources lend support to the premise that state deadlines do not affect the extensive margin enrollment decision (i.e. whether a student enrolls at any college), either for all students or low-income students in particular. This

[34] The result in Table 1.4, column (1) is robust to using a logistic regression model or linear probability model.

conclusion is consistent with the recent literature showing that state grants do not affect the probability that students attend any college. It is also an intuitive result when considering students' financial aid options if they miss their state deadline. Since there is no deadline for filing the FAFSA to receive federal aid, students can still receive federal financial aid if they file the FAFSA after their state's deadline. For many low-income students, the Pell grant is sufficient to cover tuition and fees at a public two-year institution. In 2013-14, the maximum Pell grant award was $5,645, which more than covered the average tuition and fees at a public two-year institution of $3,655.

VI. RESULTS

A. Main Results

1. Need-based grants

The goal of this paper is to understand the effect of earlier FAFSA deadlines on the distribution of state grants. Therefore, I estimate both the absolute changes in probability of state grant receipt by SES, as well as the relative change in probability of state grant receipt for lower- versus higher-SES students Overall, I find that earlier state deadlines result in lower-income students receiving a relatively smaller share of state need-based grant awards. Table 1.7 shows the results for my main specification. The first row of column (1) shows the percentage point change in the probability that a Pell ineligible students receives a state need-based grant due to a thirty day earlier deadlines ($\widehat{\beta_1}$ from Equation 1); the second row shows the corresponding standard error in parentheses. The estimate in the first row of column (1) shows that a thirty day earlier deadline leads to Pell ineligible students being 2.2 percentage points (36%) more likely to receive a state need-based grant. The next row of estimates in column (1) of Table 1.7

shows the interaction effect between an earlier deadline and Pell eligibility ($\widehat{\beta_2}$). The sum of $\widehat{\beta_1} + \widehat{\beta_2}$ percentage points indicates that a thirty day earlier deadline increases the probability of state need-based grant receipt for Pell eligible student by 0.4 percentage points, which is 2 percent of the Pell eligible sample mean.[35] While the overall effect of an earlier deadline is to slightly increase state need-based grant receipt among Pell eligible students, the negative estimate of the differential effect ($\widehat{\beta_2} = -0.018$) shows that earlier state deadlines cause low-income students to be relatively less likely to receive a state need-based grant.

To illustrate this distributional effect of earlier deadlines, I use my results from the probit model (Equation 1) to estimate the predicted probabilities of grant receipt for various deadlines in my sample window, separately for Pell eligible and Pell ineligible students. For example, the predicted probability I estimate for a February 1st deadline is equal to:

$$\Phi(\widehat{\beta_0} + \widehat{\beta_1}(Feb\ 1st) + \widehat{\beta_2}SES_{ist} * Feb\ 1st\ + \widehat{\beta_3}StudChar_{ist} + \widehat{\beta_4}StateChar_{st} + \widehat{\mu_t} + \widehat{\delta_t})$$

[35] The positive estimates of β_1 and $\beta_1 + \beta_2$ are counter to what I hypothesized would be the absolute effect of earlier state deadlines on the probability of grant receipt, particularly for low-income students. There are three possible explanations for this result. First, perhaps earlier deadlines actually increase awareness of the state deadline, even among low-income students, and thus increases the probability that a student will file on time. Second, perhaps there are unobservable differences in states that choose earlier deadlines which are not captured by state fixed effects or state by year level control variables. Finally, as I discuss below, the results in Table 1.16 and Figure 1.5 suggest that the positive coefficient estimates for $\beta_1 + \beta_2$ is driven by a high predicted probability of state grant receipt in March 1st.

with $StudChar_{ist}$, $StateChar_{st}$, μ_t, and δ_t taking on their observed values.[36] I estimate this predicted probability separately for Pell eligible and Pell ineligible students, and separately for state deadlines on the firsts of February, March, April, May, June, and July. Table 1.8 shows the results. Column (1) shows that if all states in my sample had a deadline of February 1st, then my model predicts that 22.4 percent of Pell eligible students and 9.8 percent of Pell ineligible students would receive a state need-based grant. In other words, Pell eligible students would be nearly 2.29 times more likely to receive a state need-based grant if each state's deadline were February 1st. The predicted probabilities of grant receipt decrease for later deadlines (consistent with $\widehat{\beta_1} > 0$ and $\widehat{\beta_1} + \widehat{\beta_2} > 0$), but the probability of grant receipt decreases more rapidly for Pell ineligible students. So, the predicted probabilities of state need-based grant receipt for a March 1st deadline would 21.9 percent for Pell eligible students, and 8.1 percent for Pell ineligible students; in other words, Pell eligible students would be 2.7 times more likely to receive a state need-based grant. Therefore, state deadlines *decrease* the relative probability that Pell eligible students receive a state need-based grant compared to Pell ineligible students.

Columns (2) through (5) of Table 1.7 show that distributional effect of earlier state deadlines is consistent across various measures of socio-economic status: an indicator equal to one if the student is in the lower-half of the EFC distribution for Pell grant recipients; an indicator equal to one if the student has an EFC of zero; a linear expression of the student's EFC, converted to tens of thousands of dollars for ease of interpretation; and the student's household income (also converted to tens of thousands of

[36] Results using the mean values of $StudChar_{ist}$, $StateChar_{st}$, μ_t, and δ_t are very similar.

dollars). Note that the last two variables are increasing in socio-economic status, so the positive estimates of β_2 in columns (4) and (5) are consistent with the interpretation from columns (1) through (3). For example, the estimates in column (4) show that earlier state deadlines had no effect on the probability of need-based grant receipt for students with an EFC equal to zero; as a student's EFC increases by $10,000, his probability of receiving a state need-based grant increases by 1.4 percentage points. Overall, the results of Table 1.7 show that while earlier state deadlines only slightly increase the probability that a low-income student receives a state need-based grant, earlier deadlines do shift the distribution of state need-based grants, so that more grants are awarded to higher-income students. This result provokes questions regarding the overall welfare implications of earlier state deadlines; i.e. if low-income students are not made less likely to receive state need-based grants, then does the distributional effect matter? I comment on these questions in Section VII.

To complement this analysis, I also estimate the effect of earlier state deadlines on state grant dollars received. Table 1.9 shows these results for state need-based grants. The coefficient estimates in column (1) show that a thirty day earlier deadlines leads to, on average, Pell ineligible students receiving an additional $124 in state need-based grant awards, and Pell eligible students receiving an additional $97 (18 percent) in state need-based grant awards. While the overall effect of an earlier deadline is to increase the state need-based grant awards to Pell eligible students, the negative estimated differential effect ($\widehat{\beta_2} = -\$27$) shows that earlier state deadlines cause low-income students to receive relatively less state grant aid. Again, these results are consistent across the alternative measures of student socio-economic status, as seen in columns (2) through (5).

The result that earlier state deadlines actually *increase* grant receipt among low-income and high-income students (with the increase concentrated among higher-income students) is unexpected.[37] One possible explanation for these results is that if a state moves its deadline earlier, then students become more aware of the deadline due to increased media coverage or more pressure from high school guidance counselors or college financial aid offices to file the FAFSA on time. Higher-income students being more receptive to the increased attention toward the earlier state deadline would explain the pattern of results in Tables 1.7 and 1.9. Unfortunately, information regarding FAFSA filing outreach is difficult to observe for recent years; obtaining this information for the year 1999 would be virtually impossible. Still, I discuss this hypothesis in more detail in Section VII.

2. Merit-based grants

Table 1.10 shows the estimates for the effect of state deadline changes on the probability that a student receives a merit-based grant. Similar to need-based grants, earlier deadlines cause higher-income students to be more likely to receive a state merit-based grant. The first coefficient estimate from column (1) of Table 1.10 shows that Pell ineligible students are 0.65 percentage points (12%) more likely to receive a merit-based grant when facing a thirty day earlier deadline. In contrast to need-based grants, however, is that earlier deadlines make lower-income students even *more* likely to

[37] Aside from being unexpected, the results in Table 1.7 and 8 are inconsistent with those in Table 1.4, which show that state deadlines are unrelated to funding for state grant programs, as reported by NASSGAP annual surveys. It is difficult to reconcile these two sets of conflicting results, as deadlines are also unrelated to total enrollment of states' residents (Table 1.5). I also test whether earlier deadlines result in more grant recipients but smaller average grant awards by repeating the analysis in Table 1.9 restricting the sample to grant recipients. Table A1.3 shows that state earlier state deadlines *do not* lead to a decrease in average grant award per recipient. Finally, I test whether the discrepancy is driven by the exclusion of spring enrollees and students at less than two-year institutions. Table A1.4 shows that my main results are robust to the inclusion of these students. This discrepancy remains a limitation of this study.

receive state merit-based grants. The second coefficient estimate from column (2) shows that the effect of a deadline change is even larger (an additional 0.56 percentage points) for Pell eligible students. The sum of these coefficients (1.21 percentage points) indicates that Pell eligible students are 37% more likely to receive a state merit-based grant when facing a thirty day earlier deadline. These estimates are quite similar across measures of socio-economic status, as seen in columns (2) through (5) of Table 1.10. I also estimate the effect of earlier state deadlines on state merit-based grant dollars received. The results in Table 1.11 are consistent with those in Table 1.10: on average, state merit-based grant dollars awarded to Pell eligible students increase, both overall and relative to Pell ineligible students, when states move their deadlines earlier.

The results in Tables 1.10 and 1.11 suggest that earlier deadlines may actually benefit lower-income students, by making the distribution of state merit-based grants more progressive. However, I am skeptical of this conclusion. As I show above in Section V.B., state shifts to earlier deadlines are correlated with lower entrance exam score eligibility requirements for state merit programs. On average, Pell-eligible students score lower on college entrance exams: the average Pell-eligible student in my sample scores at the 42nd percentile, while the average Pell-ineligible student scores at the 55th percentile. Therefore, the relationship between deadline changes and state merit grant eligibility requirements could explain the results in Table 1.10. A separate fact to support this hypothesis is that, while some states do require students to file the FAFSA in order to receive a merit-based grant (e.g. Tennessee's HOPE Scholarship, West Virginia's PROMISE Scholarship), most do not. Only one quarter of students in my sample are residents of states that require FAFSA filing for merit-based grant eligibility, compared

with ninety percent of students who are residents of states that require FAFSA filing for need-based grant eligibility (see footnote #4 for more information on how I observe states' FAFSA filing requirements). If a state does not require the FAFSA as part of its merit-based grant application, then that state's deadline listed on the FAFSA should not affect the distribution of merit-based grants in that state. In the Appendix, I test two additional hypotheses that could explain the results for merit-based grants: (1) that state merit-based grants are crowded out of low-income students' financial aid packages by state need-based grants when deadlines occur later; or (2) earlier state deadlines result in low-income students being more likely to attend institutions where state merit-based grants can be used. However, I find no evidence in support of these hypotheses. Therefore, in the remaining main body of this paper, I focus analysis and discussion solely on the distributional effect of state need-based grant programs. In the following sub-section, I test the robustness of these estimates.

B. Robustness checks

To show that my estimates for state need-based grants are consistent across a variety of populations, I now perform a series of robustness checks. First, I show that my results are consistent when I vary the deadline threshold for selecting states to include in my analysis. In my main results, I limit my sample to states with deadlines on or before July 1st; I re-estimate my model limiting my sample to states with deadlines on or before April 30th, May 31st, June 30th, July 31st, August 31st, and September 30th. Table 1.12 shows that my results are quite consistent whether I focus on the first four, five, six, seven, eight, or nine months of the calendar year, with the largest effect sizes occurring in first five months (column 2).

Next, I test how my results differ when using a specification that does not include state fixed effects (μ_s in Equation 1). The inclusion of μ_s in my main model means that the effect of state deadlines on grant receipt is identified by variation in deadlines within states, over time. As seen in Figure 1.4, this type of variation occurs for nine states. For example, the FAFSA deadlines for Delaware and Maryland remained constant throughout my sample (April 15th and May 1st, respectively); thus the difference in deadlines between these two states do not contribute toward identifying my main set of estimates using the fixed-effects model. Excluding state fixed-effects (i.e. a cross-sectional model) allows for cross-state variation to also contribute towards identifying the effect of state deadlines on grant receipt. Therefore, although an arguably less compelling strategy for identifying the true causal effect of state deadlines, the results of a cross-sectional model may be more generalizable. Specifically, states who choose to change their FAFSA deadline may be quite different from those who do not; for example, states that did not change their deadlines during my study period may have longer established grant programs than those that did. Luckily, the need to weigh the relative merits of these two strategies is unnecessary in this paper, as the results from the two models are remarkably similar. Table 1.13 displays the results from the cross-sectional model. The magnitudes of the coefficient estimates and standard errors are consistent with those in the main set of results from the fixed-effect model (Table 1.7). Using the cross-sectional model, I also estimate the predicted probabilities of state grant receipt for Pell eligible versus Pell ineligible students. Table 1.14 displays similar results to its fixed-effect counterpart (Table 1.8), with the notable exception that the likelihood of state grant receipt is slightly decreasing as deadlines move earlier in Table 1.14, compared to

slightly increasing as deadlines move earlier in Table 1.8. As noted above, the pattern for Pell eligible students in Table 1.8 may be driven by the fact that earlier deadlines may also be associated with more outreach encouraging students to file the FAFSA. The reversal of this pattern in Table 1.14 provides further support for this hypothesis, as states which did not change their FAFSA deadline are presumably less likely to alter their levels of outreach.

Next, I test how my results differ by student characteristics by estimating Equation (1) for various sub-samples. First, I test whether the distributional effect of deadlines differs for new versus returning students. One might expect the effect to be larger for freshmen students, as it is their first time navigating the financial aid system. In addition, returning students have successfully completed their first year of college, meaning these students have a minimum combination of motivation, organization, or social capital to persist past their first year. However, the estimates in columns (1) and (2) of Table 1.15 show that the effect size is very similar for freshmen and returning students. This result suggests that state deadlines continue to affect the distribution of state grant aid beyond students' first year. Next, I test whether the distributional effect of deadlines differs by institution type. Columns (3)-(8) of Table 1.15 show that the distributional effect indeed differs by institution type. The point estimates are largest for students at public four-year and two-year institutions, with Pell eligible students being 2.5 percentage points relatively less likely to receive a state need-based grant when facing a thirty-day earlier deadline. When comparing these point estimates to the percent of students at these different types of institutions who receive a state need-based grant, these distributional effects are largest for students at community colleges (where 8% of

students receive a state need-based grant), and smallest at private non-profit four-year institutions (where 20% of students receive a state need-based grant).

Next, I test how the distributional effect differs by two additional state grant application policies listed on the FAFSA. First, some states specify that their deadline is "for priority consideration", taken to mean that grant receipt is still possible after the priority deadline, but not guaranteed (see states marked with a hashtag in Figure 1.2). One might expect that the "strict" non-priority deadlines would have a larger distributional effect for need-based grants. However, as seen in columns (1) and (2) of Table 1.16, there is a larger distributional effect for the priority deadlines. This result may be driven by the fact that higher-income students are even more likely to comply with priority deadlines, compared with lower-income students. The second financial aid policy on the FAFSA is that some states require an additional application form for their grant program (see states marked with an asterisk in Figure 1.2). As seen in columns (3) and (4) of Table 1.16, the distributional effect of deadlines is slightly larger in states that do not require an additional form.

Finally, I test if my results are driven by any one state. I do this by eliminating one state a time from my analysis. Table 1.17 show these results. The coefficient estimates for the distributional effect range between -1.43 and -2.27 percentage points (main effect = -1.9 percentage points). While these results do indicate that there is heterogeneity across states in the distributional effect of state deadlines, they also show that my main results are not driven by any one state. In general, my estimates of the distributional effect of deadlines for state need-based grants prove to be quite robust.

C. Non-linear effects of deadlines

1. Quartic Deadline Specification

In my main specification, the variable $Deadline_{st}$ enters into the regression equation as a linear term. This functional form inherently assumes that the effects of the state deadline on the absolute and relative likelihoods of grant receipt are the same for a deadline shift from March 1st to February 1st as for a deadline shift from July 1st to June 1st. Given the large difference in available time to file the FAFSA for a February 1st versus June 1st deadline (one month versus five months, respectively), it may not be reasonable to assume that the deadline effect is linear within my sample window. To explore non-linearities in the effect of state deadlines, I estimate a more flexible version of my main specification by substituting a quartic function of the deadline variable $(Deadline_{st} + Deadline_{st}^2 + Deadline_{st}^3 + Deadline_{st}^4)$ in Equation (1). Table 1.18 and Figure 1.5 display the resulting predicted probabilities of state need-based grant receipt for deadlines in my sample window, estimated separately for Pell eligible and Pell ineligible students. There are two interesting patterns to note from Table 1.18 and Figure 1.5. First, for Pell eligible students, the predicted probability of state need-based grant receipt appears to increase as deadlines move later, with the exception of March 1st. March 1st is the modal deadline in my sample, and as a consequence, more students are subject to a March 1st state deadline than any other deadline. The relatively high probability of state grant receipt at March 1st (24.7 percent) may be driving the pattern in Table 1.8, where the predicted probability of state need-based grant receipt *decreases* as deadlines occur later. This spike in predicted probability of state grant receipt at March 1st may be explained by the fact that this date is also the most common deadline that colleges and universities use for financial aid consideration. Perhaps the commonality of

the March 1st deadline improves the awareness of this program detail among low-income families.

The second pattern to note in Table 1.18 and Figure 1.5 is that predicted probabilities of state need-based grant receipt from this alternative specification are still decreasing as deadlines occur later, particularly for deadlines before June 1st. As a result, the ratio between the proportion of Pell eligible students and the proportion of Pell ineligible students who receive state need-based grants steeply increases from February 1st to May 1st. Therefore, while the non-linear deadline specification results is not entirely consistent with the absolute effects of earlier deadlines found in my main set of results, the interpretation for the *distributional* effect of earlier deadlines remains the same.

2. Deadlines before and after April 15th

I also explore how the effect of state FAFSA deadlines may differ directly before or after April 15th. While it is possible to file the FAFSA prior to filing federal income taxes, it is arguably considerably easier to file the FAFSA simultaneously with or after filing federal income taxes. In addition, if a student files the FAFSA prior to filing federal income taxes, the student must revise the FAFSA after filing taxes. Therefore, lower-income households may be relatively more likely to complete the FAFSA in compliance with their states' deadlines if the deadline occurs on or after April 15th. I test this hypothesis explicitly by limiting my sample to states with deadlines occurring between March 15th and May 15th, a range that accounts for nearly half of my main sample. I re-estimate Equation (1) specifying the key independent variable such that $Deadline_{st} = 1$ if the deadline in state s in year t occurred between March 15th and

April 14th, and $Deadline_{st} = 0$ if the deadline in state s in year t occurred between April 15th and May 15th. Panel A of Table 1.19 shows the estimated marginal effects from the probit model; Panel B shows the resulting predicted probabilities. The results in Table 1.19 show that the effect of moving a deadline from the month prior to April 15th to on or just after April 15th increases the probability that a Pell eligible student receives a state need-based grant by 7.6 percentage points (34 percent), while decreasing the probability that a Pell ineligible student receives a state need-based grant by 36 percent (although this latter result is not statistically significant). The result is that the ratio of the predicted rates of state need-based grant receipt between Pell eligible and Pell ineligible students increases by 66 percent if the state deadline occurs on or after April 15th. This increase in ratio is larger than the increase in ratios during the March to May window in either Table 1.8 or Table 1.18, suggesting that April 15th is indeed of particular significance in the financial aid calendar.

D. Distributional effects by achievement

Informed by the supplemental analysis in the Appendix, I hypothesize that deadlines may affect students differently by academic achievement. Specifically, I expect that earlier deadlines would most negatively affect the financial aid awards for lower-achieving students. This hypothesis is informed by a few characteristics of the higher education system. First, lower-achieving students are more likely to attend community colleges or less selective four-year institutions which have fewer resources to help students through the financial aid process. In contrast, higher-achieving students are more likely to attend more selective four-year college and institutions, which often set their own priority FAFSA filing deadlines. Second, high-achieving, low-income students

have a greater incentive to comply with FAFSA filing deadlines. For example, the highest-achieving Pell eligible students receive on average $8,835 in total grant awards, compared to the overall sample average of $3,171.

I test how deadlines affect the distribution of state need-based grant aid differently by achievement in two ways. First, I estimate the income distributional effect of deadlines separately by student achievement. That is, I re-estimate Equations (1) and (2) for three different sub-samples: (1) students in the top quartile of the distribution of entrance exam scores; (2) students in the middle half of the distribution of entrance exam scores; and (3) students in the bottom quartile of the distribution of entrance exam scores *or* students with no valid entrance exam score. I refer to these categories as the highest-achieving, mid-achieving, and lower-achieving students, respectively. Columns (1) through (3) of Table 1.20 show estimates of the effect of earlier deadlines on the probability of receiving a state need-based grant; columns (4) through (6) show estimates of the effect of earlier deadlines on state need-based grant dollars received.

Overall, the results in Table 1.20 show that the negative effect of earlier state deadlines is concentrated among lower-achieving students. Column (1) shows that the highest-achieving students – Pell eligible and Pell ineligible – are 3.3 percentage points *more* likely to receive a state need-based grant when deadlines occur thirty days earlier. Column (4) confirms this result, showing that these high-achieving Pell eligible students receive on average an additional $400 in state need-based grants when their state deadline occurs thirty days earlier. Columns (3) and (6) show that lower-achieving Pell eligible students are both absolutely and relatively less likely to receive a state need-based grant, and receive on average fewer grant dollars, when facing earlier deadlines. The results in

Table 1.20 highlight that there the fact the distributional effects of state deadlines occur not only across income levels, but also achievement levels. I discuss the questions regarding equity and efficiency this result raises below in Section VII.

I also estimate how deadlines affect the distribution by achievement and socio-economic status. Specifically, I estimate the following equation:

$$\begin{aligned}\Pr(ReceiveStateNeedGrant_{ist}) = \Phi(&\beta_0 + \beta_1 Deadline_{st} + \beta_2 Deadline_{st} * Pell_{ist} \\ &+\beta_3 Deadline_{st} * MidAchiever_{st} + \beta_4 Deadline_{st} * HighestAchiever_{st} \\ &+\beta_5 Deadline_{st} * Pell_{ist} * MidAchiever_{st} + \beta_6 Deadline_{st} * Pell_{ist} * HighestAchiever_{ist} \\ &+\beta_7 StudChar_{ist} + \beta_8 StateChar_{st} + \mu_s + \delta_t + \epsilon_{ist}) \end{aligned} \quad (6)$$

where $MidAchiever_{ist}$ and $HighestAchiever_{ist}$ are indicators equal to one for students who I classify as mid-achievers and highest-achievers, respectively. $MidAchiever_{ist}, HighestAchiever_{ist}$, and these variables interactions with $Pell_{ist}$ are also included in $StudentChar_{ist}$.

Column (1) of Table 1.21 shows the marginal effect estimates of β_1 through β_6 from Equation (6) for my full analytic sample. The estimate in the first row, $\widehat{\beta_1} = 0.0135$, is interpretated to mean that lower-achieving Pell ineligible students (the omitted category) are 1.4 percentage points (31 percent) more likely to receive a state need-based grant when facing a thirty day earlier state deadline. Along with $\widehat{\beta_1}$, the estimate $\widehat{\beta_2} = -0.0177$ shows that lower-achieving Pell eligible students are 0.4 percentage points (2.3 percent) less likely to receive a state need-based grant when facing a thirty day earlier deadline. The estimates of β_3 through β_6 show that the positive impact of state deadlines

is enhanced – or the negative impact of state deadlines is mitigated – for higher achieving students. For example, the sum of $\widehat{\beta_1} + \widehat{\beta_4} = 0.0349$ shows that higher-achieving Pell ineligible students are 3.5 percentage points (46 percent) more likely to receive a state need-based grant when facing a thirty day earlier deadline; and the sum of $\widehat{\beta_1} + \widehat{\beta_2} + \widehat{\beta_6} = 0.0075$ shows that higher-achieving Pell eligible students are 0.75 percentage points (3 percent) more likely to receive a state need-based grant when facing a thirty day earlier deadline. Overall, consistent with Table 1.20, the results in column (1) of Table 1.21 show that the negative impact of state deadlines is concentrated among lower-achieving, low-income students, and that this negative impact is overall fairly small. In fact, earlier state deadlines actually increases likelihood of state need-based grant receipt for all other higher-achieving or higher-income students, although this benefit is relatively small for lower-income students. Indeed, higher-income students, particularly higher-achieving higher-income students, appear to benefit a great deal from earlier state deadlines. This result raises interesting questions regarding the equity and efficiency of earlier state deadlines, which I will discuss in more detail in Section VII.

I also estimate Equation (6) separately by institution type. There is strong sorting by student achievement and income level across institution types, with lower-achieving and low-income students being more likely to attend two-year and for-profit institutions. Estimating Equation (6) by institution type will show the degree to which the redistribution of state need-based grants is occurring within institution type or across institution type. In the case of public four-year institutions (column 2 of Table 1.21) the pattern is similar to that for all institutions described above: low-achieving Pell eligible students are 3 percent less likely to receive a state need-based grant when facing a thirty

day earlier deadline, while all other students at public four-year institutions – particularly Pell ineligible students – benefit from earlier deadlines.

Column (3) of Table 1.21 shows the estimates of Equation (6) for public two-year institutions, i.e. community colleges. These estimates show that state deadlines affect the distribution of state grant aid quite differently for the community college population. Pell ineligible students receive no apparent gain from an earlier deadline, while there is a larger, negative impact of earlier deadlines on state need-based grant receipt for Pell eligible students (12 percent). This negative impact is consistent across achievement levels (although the community college population is dominated by lower-achieving students). Column (4) shows the results for private non-profit four-year institutions, where earlier deadlines increase the likelihood of state need-based grant receipt for students of all income and achievement levels, although again the largest gains are realized by the highest-achieving higher-income students. Columns (5) through (7) of Table 1.21 also show the results for private non-profit two-year institutions, for-profit four-year institutions, and for-profit two-year institutions; I refrain from discussing these results as relatively few students attend these institutions and even fewer receive state need-based grants.

In sum, I find that earlier state FAFSA filing deadlines leads lower-achieving, low-income students to be relatively less likely to receive state need-based grants. While higher-achieving low-income students do receive a small increase in the likelihood of state grant receipt due to earlier deadlines, this benefit is much larger for higher-income students – causing a shift in the distribution a state grant aid by both income and

achievement levels. In the final section, I conclude with an in-depth discussion of how these results should be interpreted in the context of today's financial aid system.

VII. DISCUSSION AND CONCLUSION

While most of the existing literature on financial aid has focused on understanding the effectiveness of financial aid at improving college access and success (an indisputably worthy topic), the question of whether financial aid is equitably distributed among targeted students is understudied. If a goal of financial aid – particularly need-based grants – is to reduce income inequality and increase social mobility, then it is also important to understand how policies affect who receives aid. Previous literature has found that the federal financial aid application process is a significant barrier to financial aid access for low-income students, and as a result, creates a barrier to college access and success. I contribute to this strand of literature by focusing on a specific aspect of financial aid policy: state FAFSA filing deadlines. For a variety of reasons (imperfect information, lack of resources, behavioral obstacles), these deadlines also affect the distribution of financial aid across income groups.

My results show that state deadlines actually increase overall state grant receipt earlier state deadlines, an unexpected finding. My results also show that earlier deadlines cause a distributional effect of state grants, by causing low-income students to be relatively less likely to receive state grants compared to their higher-income counterparts. Specifically, I find that a thirty day earlier deadlines results in a 20 percent decrease in the relative probability that a Pell eligible student receives a state need-based grant, compared to Pell ineligible students. This result is not due to an increase in available state grant funding (as I show in Table 1.3), meaning that the distributional effect is

driven by grant receipt shifting from lower-income to higher-income students. I also find that lower-achieving low-income students, particularly those attending community colleges, lose the most from early state deadlines. That is, earlier state deadlines reduce the probability that a lower-achieving low-income student will receive a state need-based grant both in absolute terms and relative to all other types of students.

Given the desire to close the income gap in educational attainment, the results of this analysis may be concerning. However, these results are difficult to judge from equity and efficiency standpoints. In my main set of results, I show that, on average, earlier deadlines increase state grant receipt. Should it concern us that those who benefit most from earlier state deadlines are higher-income students who attend private non-profit four-year institutions? While not from the lowest socio-economic backgrounds, surely many Pell ineligible students also experience difficulties paying for college. In addition, increased access to state grants may improve the college options for this population, allowing middle-income students to attend higher quality institutions. Interpreting the welfare implications of the results by student achievement is perhaps more complex. On one hand, prior research shows that higher-achieving students benefit the most from financial aid in terms of improving retention and graduation (Castleman & Long, *forthcoming*). Therefore, because earlier deadlines result in state need-based grant dollars being more concentrated within higher-achieving students, earlier deadlines may actually improve retention and graduation rates. Alternatively, some may argue that lower-achieving low-income students as a population particularly deserving of policy focus. Lower-achieving low-income students are at the highest risk of dropping out of

college and have access to limited financial aid resources from institutions and private sources.

A natural question that follows this analysis is whether earlier deadlines affect student outcomes. Due to data limitations – the NPSAS provides only a snapshot of students for one year while they are enrolled – I cannot address this question. Extrapolating from the results of previous literature on the impact of state grant aid on student outcomes, a reasonable hypothesis is that earlier state deadlines would increase student success relatively more for higher-income students. In other words, earlier state deadlines may widen the already large gap in college completion between low- and high-income students.

A separate issue is that I am unable to answer in this paper is *why* states choose earlier deadlines.[38] Perhaps later deadlines come with larger administrative costs, or perhaps states are sensitive to the benefit to students and their families of having full information on their financial aid earlier. Without understanding the costs of having later deadlines, I cannot perform even a cursory cost-benefit analysis. Therefore, the policy recommendations from this paper cannot be as simplistic as "states should (or should not) set aid application deadlines later." However, what I can recommend now is that states (as well as institutions) think creatively surrounding the design of financial aid policy to ensure deadlines or other program details are not causing unintended consequences for the distribution of financial aid. I discuss a few such examples below.

[38] I attempted to gain a better understanding as to why states change their FAFSA deadlines, if unrelated to state-level program funding or eligibility requirements as demonstrated in Tables 1.3 and 1.4. Extensive web searches provided no insight as to how states choose their FAFSA deadlines, or why states change their FAFSA deadlines. This includes the searches targeted at the District of Columbia, which has changed its FAFSA deadline twice in the past four years. In fact, I found no record of this deadline change in either press reports District of Columbia documentation of its grant programs.

Two states have chosen to set two separate deadlines for students attending four-year versus two-year institutions. While the primary FAFSA filing deadline is March 2nd for the Cal-Grant program, California sets a secondary deadline of September 2nd specifically for community college students. This policy allows an eligible student who applies by the secondary deadline to receive a fee waiver at a community college, and holds the student's Cal-Grant award in reserve for two years until the student transfers to a four-year college. However, there are a limited number of these awards, so students are still encouraged to apply by the March 2nd primary deadline, so this policy may not have the full desired effect. [39] The state of Pennsylvania has a similar policy, in which first-time community college students have until August 1st to file the FAFSA in order to be eligible for the PHEAA grant (compared to May 1st deadline for all other students).[40] Because my results show that the negative effects of state deadlines is most pronounced for low-income community college students (Table 1.13), these policies in California and Pennsylvania have the potential to improve financial aid access for this population.

Individual institutions and private organizations have also launched initiatives to help students file the FAFSA on time to meet state (and institutional) deadlines. College Goal Sunday, a "state-based volunteer program" managed by the National College Access Network, targets FAFSA filing resources to high school students, and hosts hundreds of FAFSA completion events in January and February nation-wide. Unfortunately, the effectiveness of College Goal Sunday's efforts has not yet been rigorously evaluated. As I briefly described in Section II, Arizona State University (ASU) partnered with ideas42 to rigorously test a messaging intervention designed to

[39] Source: http://www.csac.ca.gov/doc.asp?id=1372
[40] Source: https://www.pheaa.org/about/press-releases/2013/apr-22.shtml

increase timely FAFSA filing among returning students. By sending a series of behaviorally oriented emails to current students, encouraging them to apply before the March 1st priority deadline, this messaging intervention dramatically increased on-time FAFSA submissions. For the treatment arm where emails were sent to the students only, the number of on-time FAFSA submissions increased by 38% compared to the control group. The treatment effect was nearly twice as large (72%) for the treatment arm where emails were sent to both students and parents. This latter result is particularly interesting, as it shows the importance of familial participation in the FAFSA process. In a similar vein, the Common Application is currently working with researchers at the University of Virginia and elsewhere to launch a messaging campaign to increase timely FAFSA filing among low-income students who use the Common Application to apply for college admission. With an experimental sample of nearly half a million prospective students, the evaluation of this intervention will provide a clear picture of the importance of filing the FAFSA early on student success outcomes. While these programs will almost surely improve financial aid access, it is unclear what distributional effects these programs may have. As I suggested above, higher-income students may be more receptive to these types of outreach; if indeed the case, then these programs may also affect the distribution of financial aid across income lines. So, depending on the goal of the program, it may prove to be important to tailor outreach toward lower (or the lowest) income populations – as was done in the case of the Common App messaging campaign – in order to achieve maximum financial aid access.

A very recent announcement of an upcoming policy change has the potential to dramatically affect the distribution of financial aid. Beginning with the 2017-18 award

year, students will be able to file the FAFSA a full three months earlier, starting on October 1st, 2016 (instead of January 1st, 2017, as would be the case under the current system).[41] This change in policy doubles the amount of time students have to file a FAFSA before the modal state deadline of March 1st. The results from my paper suggest that this policy should make the distribution of state grant aid (and perhaps federal and institutional grant aid) more progressive. While this policy has the potential of steering the financial aid system in the right direction – toward greater access to aid among low-income students and their families – the complexity of the system necessitates careful consideration by policy makers and further research on the topic.

[41] In conjunction with this change to the calendar, there will also be a shift toward a "prior-prior-year" FAFSA form. A prior-prior year FAFSA will ask questions about a household's income and assets from two tax years before the award year. For example, for students who enroll during the 2017-18 award year, the FAFSA will ask questions about the 2015 tax year (instead of the 2016 tax year, as would be the case under the current prior-year system). Many researchers, advocates, and policy makers have argued for a move toward this prior-prior year FAFSA (e.g. Kelchen & Jones, forthcoming).

Table 1.1: Variation in generosity and eligibility requirements of state grant programs

	Tuition Assistance Program	Monetary Award Program	PHEEA	Ohio College Opportunity Grant	HOPE Scholarship	HOPE Scholarship	Bright Futures Scholarship	Cal Grant B
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
State	NY	IL	PA	OH	TN	GA	FL	CA
Grant Type	Need-based	Need-based	Need-based	Need-based	Merit-based	Merit-based	Merit-based	Need- and merit-based
Grant dollars awarded								
10th	$500	$527	$532	$144	$2,000	$1,367	$912	$1,163
50th	$2,242	$2,202	$2,220	$672	$4,000	$4,136	$1,900	$1,551
90th	$4,900	$4,720	$4,348	$1,872	$4,000	$7,282	$2,727	$11,259
EFC of Recipients								
10th	$0	$0	$0	$0	$0	$0	$0	$0
50th	$90	$0	$1,730	$0	$9,006	$10,282	$6,613	$0
90th	$11,208	$4,040	$10,138	$1,578	$41,616	$38,835	$43,816	$1,178
Entrance exam percentile score of Recipients								
10th	7	8	12	13	23	29	27	7
50th	46	46	41	41	65	63	65	32
90th	90	86	83	85	96	93	94	89

Data: National Postsecondary Student Aid Survey of 2011-12. Notes: statistics calculated from a sample consisting of students enrolled at an in-state institution during the 2011-12 academic year and received a state grant. SAT and ACT scores were converted to percentile scores for ease of comparison. All relevant variables are in 2011$.

Table 1.2: Summary Statistics

	All Students (1)	State need grant recipients (2)	State merit grant recipients (3)
Student SES Measures			
Pell eligible	46.9%	75.4%	34.1%
Lower Hall Pell	30.7%	48.8%	18.8%
Zero EFC	24.6%	37.5%	14.0%
EFC	$10,044	$3,781	$15,078
Household income	$64,474	$38,471	$83,690
Student Characteristics			
Female	57.2%	63.3%	60.4%
Dependent	58.4%	64.7%	91.2%
Full-time	67.3%	84.8%	89.7%
Entrance exam percentile score	22.1	21.5	23.8
Missing entrance exam score	53.3%	40.7%	16.9%
Student Financial Aid			
Cost of Attendance	$16,972	$20,213	$18,122
Total grants (all sources)	$3,506	$8,696	$6,824
Total Federal grants	$1,143	$2,747	$1,013
All State Grants	$520	$2,988	$3,046
State Need Grants	$371	$2,804	$382
State Merit Grants	$114	$136	$2,554
Institutional aid	$1,480	$2,552	$2,271
Private aid	$232	$357	$451
State Characteristics			
Average in-state tuition	$5,898	$6,204	$5,377
% in college	47.1%	46.4%	44.9%
Poverty rate	12.9%	12.7%	14.2%
Unemployment rate	6.3%	6.2%	6.4%
State aid per FTE UG	$480	$437	$367
N	111,000	16,860	5,190

Data: NPSAS waves 1999-00, 2003-04, 2007-08, and 2011-12; state-level data from additional sources, see text for details. Sample sizes rounded to the nearest ten in compliance with IES reporting standards. All relevant variables are in 2011$. Sample includes students who are first-through fourth-year undergraduate students enrolled at a four-year or two-year institution in Fall 1999, 2003, 2007, or 2011, and are residents of a state with a FAFSA deadline on or before July 1st of that year.

Table 1.3: Relationship between state deadlines and grant funding

	Total Aid (natural log $)	Need aid (natural log $)	Merit aid (natural log $)	% Need aid	Need aid $ per FTE UG	Merit aid $ per FTE UG
	(1)	(2)	(3)	(4)	(5)	(6)
State Deadline	0.107	0.071	0.063	-0.015	10.271	7.394
(+1=30 days earlier)	(0.083)	(0.067)	(0.204)	(0.036)	(16.322)	(53.927)
R-squared	0.952	0.959	0.862	0.752	0.819	0.847
N	267	267	267	267	267	267

Data: NASSGAP Annual Surveys, 2002 through 2012. Notes: each column displays estimates from a separate regression model. All regression models include year fixed effects, state fixed effects, and the following state by year level controls: average in-state tuition at public four-year colleges and universities (natural log); state unemployment rate; state poverty rate. All relevant variables are in 2011$.

Table 1.4: Relationship between state deadlines and eligibility requirements

	Need-based grants			Merit-based grants		
	EFC 90th percentile ($10k)	EFC 75th percentile ($10k)	Median award ($)	Entrance Exam 10th percentile	Entrance Exam 25th percentile	Median award ($)
	(1)	(2)	(3)	(4)	(5)	(6)
State Deadline *(+1=30 days earlier)*	0.3178	0.1956	-35.31	-8.68	-12.32*	-168.5
	(0.3433)	(0.1959)	(244.20)	(7.37)	(7.00)	(464.58)
R-squared	0.652	0.69	0.865	0.775	0.821	0.853
N	100	100	100	50	50	50

Data: NASSGAP Annual Surveys, 2002 through 2012. Notes: each column displays estimates from a separate regression model. All regression models include year fixed effects, state fixed effects, and the following state by year level controls: average in-state tuition at public four-year colleges and universities (natural log); state unemployment rate; state poverty rate. All relevant variables are in 2011$. All sample sizes are rounded to the nearest ten to comply with IES reporting standards

Table 1.5: The effect of state deadlines on college enrollment

	CPS	IPEDS
	(1)	(2)
State Deadline	0.016	-0.012
(+1=30 days earlier)	(0.012)	(0.014)
R-squared	0.013	0.98
N	15612	334

Data: Current Population Survey (Source: Integrated Public Use Microdata Series, University of Minnesota); Integrated Postsecondary Education Data System. Notes: each column displays estimates from a separate regression model. All regression models include state fixed effects, year fixed effects, and the following state by year level controls: average in-state tuition at public four-year colleges and universities (natural log); state unemployment rate; state poverty rate; total funding for state grant programs (natural log). All relevant variables are in 2011$. See text for more information on these control variables.

Table 1.6: Relationship between state deadlines and average socio-economic status of state resident students

	Pell Eligible	Lower-Half Pell	Zero EFC	EFC ($10K)	Household Income ($10K)
	(1)	(2)	(3)	(4)	(5)
State Deadline	-0.017	-0.0186	-0.032	-0.055	0.0329
(+1=30 days earlier)	(0.021)	(0.019)	(0.022)	(0.066)	(0.205)
R-squared	0.755	0.823	0.882	0.594	0.673
N	100	100	100	100	100

Data: NPSAS waves 1999-00, 2003-04, 2007-08, and 2011-12; state-level data and institution-level data from additional sources, see text for details. Notes: each column displays estimates from a separate regression model. All regression models include year fixed effects, state fixed effects, and the following state by year level controls: average in-state tuition at public four-year colleges and universities (natural log); state unemployment rate; state poverty rate; total funding for state grant programs (natural log). All relevant variables are in 2011$. See text for more information on these control variables. Sample sizes rounded to the nearest ten in compliance with IES reporting standards.

Table 1.7: Effect of state deadlines on the probability of state need-based grant receipt

	Pell Eligible	Lower-Half Pell	Zero EFC	EFC ($10K)	Household Income ($10K)
	(1)	(2)	(3)	(4)	(5)
State Deadline	0.0222***	0.0112***	0.0097**	0.0034	-0.0021
(+1=30 days earlier)	(0.0044)	(0.0043)	(0.0044)	(0.0043)	(0.0044)
SES * Deadline	-0.0184***	-0.0099***	-0.0075***	0.0135***	0.0026***
	(0.0022)	(0.0021)	(0.0022)	(0.0029)	(0.0004)
R-squared	0.1603	0.1093	0.0939	0.1649	0.1531
N	111,000	111,000	111,000	111,000	111,000

Data: NPSAS waves 1999-00, 2003-04, 2007-08, and 2011-12. Notes: each column displays estimates from a separate regression model. All regression models include student gender, dependency status, and entrance exam score, year fixed effects, state fixed effects, and the following state by year level controls: average in-state tuition at public four-year colleges and universities (natural log); state unemployment rate; state poverty rate; total funding for state grant programs (natural log). All relevant variables are in 2011$. See text for more information on these control variables. Sample sizes rounded to the nearest ten in compliance with IES reporting standards. Sample includes students who are first- through fourth-year undergraduate students enrolled at a four-year or two-year institution in Fall 1999, 2003, 2007, or 2011, and are residents of a state with a FAFSA deadline on or before July 1st of that year.

Table 1.8: Predicted probabilities of receiving state need-based grants

	February 1st (1)	March 1st (2)	April 1st (3)	May 1st (4)	June 1st (5)	July 1st (6)
Pell Eligible	22.4%	21.9%	21.3%	20.8%	20.2%	19.7%
Pell Ineligible	9.8%	8.1%	6.5%	5.3%	4.1%	3.2%
Ratio	2.29	2.70	3.26	3.96	4.94	6.09

Data: NPSAS waves 1999-00, 2003-04, 2007-08, and 2011-12; state-level data and institution-level data from additional sources, see text for details. Notes: the first two rows display the predicted probabilities of state need-based grant receipt for at the specified state deadlines, with all other student-, state-, and institution-level variables held at their observed values. Derived from the results of estimating Equation (1), as partially shown in Table 7. Sample includes 57,700 Pell eligible and 53,300 Pell ineligible students who are first- through fourth-year undergraduate students enrolled at a four-year or two-year institution in Fall 1999, 2003, 2007, or 2011, and are residents of a state with a FAFSA deadline on or before July 1st of that year.

Table 1.9: Effect of state deadlines on state need-based grant dollars received

	Pell Eligible	Lower-Half Pell	Zero EFC	EFC ($10K)	Household Income ($10K)
	(1)	(2)	(3)	(4)	(5)
State Deadline	124.10***	117.29***	116.65***	107.21***	99.79***
(+1=30 days earlier)	(12.93)	(12.66)	(12.59)	(12.37)	(12.59)
SES * Deadline	-27.21***	-27.07***	-26.90***	0.22	1.54***
	(7.87)	(9.18)	(9.84)	(2.07)	(0.58)
R-squared	0.087	0.068	0.061	0.077	0.078
N	111,000	111,000	111,000	111,000	111,000

Data: NPSAS waves 1999-00, 2003-04, 2007-08, and 2011-12. Notes: each column displays estimates from a separate regression model. All regression models include student gender, dependency status, and entrance exam score, year fixed effects, state fixed effects, and the following state by year level controls: average in-state tuition at public four-year colleges and universities (natural log); state unemployment rate; state poverty rate; total funding for state grant programs (natural log). All relevant variables are in 2011$. See text for more information on these control variables. Sample sizes rounded to the nearest ten in compliance with IES reporting standards. Sample includes students who are first- through fourth-year undergraduate students enrolled at a four-year or two-year institution in Fall 1999, 2003, 2007, or 2011, and are residents of a state with a FAFSA deadline on or before July 1st of that year.

Table 1.10: Effect of state deadlines on the probability of state merit-based grant receipt

	Pell Eligible	Lower-Half Pell	Zero EFC	EFC ($10K)	Household Income ($10K)
	(1)	(2)	(3)	(4)	(5)
State Deadline	0.0065***	0.0074**	0.0076***	0.0100***	0.0106***
(+1=30 days earlier)	(0.0021)	(0.0020)	(0.0020)	(0.0020)	(0.0021)
SES * Deadline	0.0056***	0.0052***	0.0050***	-0.0008**	-0.0002***
	(0.0010)	(0.0012)	(0.0013)	(0.0003)	(0.00007)
R-squared	0.3885	0.3890	0.3890	0.3875	0.3876
N	109,730	109,730	109,730	109,730	109,730

Data: NPSAS waves 1999-00, 2003-04, 2007-08, and 2011-12. Notes: each column displays estimates from a separate regression model. All regression models include student gender, dependency status, and entrance exam score, year fixed effects, state fixed effects, and the following state by year level controls: average in-state tuition at public four-year colleges and universities (natural log); state unemployment rate; state poverty rate; total funding for state grant programs (natural log). All relevant variables are in 2011$. See text for more information on these control variables. Sample sizes rounded to the nearest ten in compliance with IES reporting standards. Sample includes students who are first- through fourth-year undergraduate students enrolled at a four-year or two-year institution in Fall 1999, 2003, 2007, or 2011, and are residents of a state with a FAFSA deadline on or before July 1st of that year.

Table 1.11: Effect of state deadlines on state merit-based grant dollars received

	Pell Eligible	Lower-Half Pell	Zero EFC	EFC ($10K)	Household Income ($10K)
	(1)	(2)	(3)	(4)	(5)
State Deadline	-60.84***	-48.76***	-45.66***	-0.01	17.28
(+1=30 days earlier)	(11.52)	(11.25)	(11.17)	(10.98)	(11.03)
SES * Deadline	75.88***	76.14***	79.01***	-20.44***	-6.49***
	(5.24)	(5.09)	(5.28)	(1.71)	(0.44)
R-squared	0.159	0.158	0.158	0.157	0.16
N	109,730	109,730	109,730	109,730	109,730

Data: NPSAS waves 1999-00, 2003-04, 2007-08, and 2011-12. Notes: each column displays estimates from a separate regression model. All regression models include student gender, dependency status, and entrance exam score, year fixed effects, state fixed effects, and the following state by year level controls: average in-state tuition at public four-year colleges and universities (natural log); state unemployment rate; state poverty rate; total funding for state grant programs (natural log). All relevant variables are in 2011$. See text for more information on these control variables. Sample sizes rounded to the nearest ten in compliance with IES reporting standards. Sample includes students who are first- through fourth-year undergraduate students enrolled at a four-year or two-year institution in Fall 1999, 2003, 2007, or 2011, and are residents of a state with a FAFSA deadline on or before July 1st of that year.

Table 1.12: Effect of Deadlines for need-based grants, varying deadline timing restriction

	April 30th	May 31st	June 30th	July 31st	August 31st	Sept. 30th
	(1)	(2)	(3)	(4)	(5)	(5)
State Deadline	-0.0020	0.0516***	0.0387***	0.0199***	0.0283***	0.0272***
	(0.0092)	(0.0059)	(0.0052)	(0.0044)	(0.0025)	(0.0023)
Pell * Deadline	-0.0096	-0.0340***	-0.0222***	-0.0188***	-0.0143***	-0.0150***
	0.0069	(0.0028)	(0.0024)	(0.0022)	(0.0016)	(0.0014)
R-squared	0.1402	0.1494	0.1446	0.1422	0.1434	0.1457
N	71090	98830	107420	111000	119820	122970

Data: NPSAS waves 1999-00, 2003-04, 2007-08, and 2011-12. Notes: each column displays estimates from a separate regression model. All regression models include student gender, dependency status, and entrance exam score, year fixed effects, state fixed effects, and the following state by year level controls: average in-state tuition at public four-year colleges and universities (natural log); state unemployment rate; state poverty rate; total funding for state grant programs (natural log). All relevant variables are in 2011$. See text for more information on these control variables. Sample sizes rounded to the nearest ten in compliance with IES reporting standards. Sample includes students who are first- through fourth-year undergraduate students enrolled at a four-year or two-year institution in Fall 1999, 2003, 2007, or 2011, and are residents of a state with a FAFSA deadline on or before the specified date in the column.

Table 1.13: Effect of state deadlines on the probability of state need-based grant receipt (cross-sectional model)

	Pell Eligible	Lower-Half Pell	Zero EFC	EFC ($10K)	Household Income ($10K)
	(1)	(2)	(3)	(4)	(5)
State Deadline	0.0162***	0.0089***	0.0071***	-0.0013	-0.0048**
(+1=30 days earlier)	(0.0017)	(0.0013)	(0.0012)	(0.0017)	(0.0020)
SES * Deadline	-0.0167***	-0.0089***	-0.006***	0.0131***	0.0024***
	(0.0020)	(0.0020)	(0.0021)	(0.0028)	(0.0004)
R-squared	0.1384	0.0878	0.0729	0.1425	0.1307
N	111,000	111,000	111,000	111,000	111,000

Data: NPSAS waves 1999-00, 2003-04, 2007-08, and 2011-12. Notes: each column displays estimates from a separate regression model. All regression models include student gender, dependency status, and entrance exam score, year fixed effects, and the following state by year level controls: average in-state tuition at public four-year colleges and universities (natural log); state unemployment rate; state poverty rate; total funding for state grant programs (natural log). All relevant variables are in 2011$. See text for more information on these control variables. Sample sizes rounded to the nearest ten in compliance with IES reporting standards. Sample includes students who are first-through fourth-year undergraduate students enrolled at a four-year or two-year institution in Fall 1999, 2003, 2007, or 2011, and are residents of a state with a FAFSA deadline on or before July 1st of that year.

Table 1.14: Predicted probabilities of receiving state need-based grants (cross-sectional model)

	February 1st (1)	March 1st (2)	April 1st (3)	May 1st (4)	June 1st (5)	July 1st (6)
Pell Eligible	21.2%	21.2%	21.3%	21.3%	21.4%	21.4%
Pell Ineligible	8.6%	7.5%	6.4%	5.4%	4.6%	3.8%
Ratio	2.45	2.83	3.33	3.93	4.68	5.58

Data: NPSAS waves 1999-00, 2003-04, 2007-08, and 2011-12; state-level data and institution-level data from additional sources, see text for details. Notes: the first two rows display the predicted probabilities of state need-based grant receipt for at the specified state deadlines, with all other student-, state-, and institution-level variables held at their observed values. Derived from the results of estimating Equation (1) without state fixed effects, as partially shown in Table 1.7A. Sample includes 57,700 Pell eligible and 53,300 Pell ineligible students who are first- through fourth-year undergraduate students enrolled at a four-year or two-year institution in Fall 1999, 2003, 2007, or 2011, and are residents of a state with a FAFSA deadline on or before July 1st of that year.

Table 1.15 Distributional deadline effect for need-based grants, by student level and institution sector

	Freshmen	Returning Students	Public, four-year	Public, two-year	Non-profit, four-year	Non-profit, two-year	For-profit, four-year	For-profit, two-year
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
State Deadline	0.0147**	0.0215***	0.0258***	0.0095	0.0597***	-0.0232	0.0031	-0.1656*
	(0.0065)	(0.0060)	(0.0065)	(0.0076)	(0.0136)	(0.0699)	(0.0198)	(0.0905)
Pell * Deadline	-0.0180***	-0.0181***	-0.0250***	-0.0250***	-0.0146***	-0.0188	-0.0147**	0.0227
	(0.0037)	(0.0028)	(0.0038)	(0.0196)	(0.0055)	(0.0316)	(0.0072)	(0.0191)
R-squared	0.1515	0.1425	0.1935	0.1807	0.1476	0.2961	0.2167	0.1588
N	39920	70760	43050	29650	22010	1240	9170	3810

Data: NPSAS waves 1999-00, 2003-04, 2007-08, and 2011-12. Notes: each column displays estimates from a separate regression model. All regression models include student gender, dependency status, and entrance exam score, year fixed effects, state fixed effects, and the following state by year level controls: average in-state tuition at public four-year colleges and universities (natural log); state unemployment rate; state poverty rate; total funding for state grant programs (natural log). All relevant variables are in 2011$. See text for more information on these control variables. Sample sizes rounded to the nearest ten in compliance with IES reporting standard. Sample includes students who are first- through fourth-year undergraduate students enrolled at a four-year or two-year institution (except as otherwise specified in the column header) in Fall 1999, 2003, 2007, or 2011, and are residents of a state with a FAFSA deadline on or before July 1st.

Table 1.16: Distributional deadline effect for need-based grants, by deadline definitions

	Priority Deadline	Strict deadline	Additional Form Required	No Additional Form Required
	(1)	(2)	(3)	(4)
State Deadline	-0.0051	0.0002	-0.0736***	0.0236***
	(0.0126)	(0.0095)	(0.0208)	(0.0050)
Pell * Deadline	-0.0491***	-0.0141***	-0.0135***	-0.0205***
	(0.0070)	(0.0023)	(0.0050)	(0.0027)
R-squared	0.1671	0.1363	0.1663	0.1339
N	24990	85970	35400	75600

Data: NPSAS waves 1999-00, 2003-04, 2007-08, and 2011-12. Notes: each column displays estimates from a separate regression model. All regression models include student gender, dependency status, and entrance exam score, year fixed effects, state fixed effects, and the following state by year level controls: average in-state tuition at public four-year colleges and universities (natural log); state unemployment rate; state poverty rate; total funding for state grant programs (natural log). All relevant variables are in 2011$. See text for more information on these control variables. Sample sizes rounded to the nearest ten in compliance with IES reporting standards. Sample includes students who are first- through fourth-year undergraduate students enrolled at a four-year or two-year institution in Fall 1999, 2003, 2007, or 2011, and are residents of a state with a FAFSA deadline on or before July 1st.

Table 1.17: Distributional deadline effect for need-based grants, eliminating single state from analysis

	AK	AR	CA	CT	DC	DE	FL	ID
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Pell * Deadline	-0.0188***	-0.0227***	-0.0218***	-0.0184***	-0.0188***	-0.0190***	-0.0173***	-0.0187***
	(0.0022)	(0.0023)	(0.0026)	(0.0022)	(0.0022)	(0.0022)	(0.0024)	(0.0022)
R-squared	0.1418	0.1449	0.1353	0.1434	0.1421	0.1421	0.1456	0.1423
N	110700	109630	85660	110160	110680	109410	98450	110540
	IL	IN	IA	KS	KY	LA	ME	MD
	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
Pell * Deadline	-0.0162***	-0.0210***	-0.0239***	-0.0189***	-0.0199***	-0.0181***	-0.0185***	-0.0183***
	(0.0022)	(0.0022)	(0.0022)	(0.0023)	(0.0022)	(0.0023)	(0.0022)	(0.0023)
R-squared	0.1397	0.1406	0.1448	0.1424	0.1410	0.1394	0.1418	0.1449
N	109610	104900	108830	108370	108360	108070	109990	106970
	MA	MI	MS	MO	MT	NH	NJ	NC
	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)
Pell * Deadline	-0.0154***	-0.0155***	-0.0189***	-0.0188***	-0.0186***	-0.0189***	-0.0143***	-0.0183***
	(0.0022)	(0.0023)	(0.0022)	(0.0022)	(0.0022)	(0.0022)	(0.0024)	(0.0022)
R-squared	0.1377	0.1484	0.1406	0.1460	0.1437	0.1416	0.1397	0.1430
N	105990	104110	110460	106670	109840	110140	106770	107390
	ND	OK	OR	PA	RI	SC	TN	WV
	(25)	(26)	(27)	(28)	(29)	(30)	(31)	(32)
Pell * Deadline	-0.0186***	-0.0187***	-0.0202***	-0.0189***	-0.0189***	-0.0240***	-0.0155***	-0.0184***
	(0.0022)	(0.0022)	(0.0023)	(0.0022)	(0.0022)	(0.0023)	(0.0022)	(0.0022)
R-squared	0.1426	0.1423	0.1428	0.1393	0.1419	0.1457	0.1438	0.1429
N	110280	108310	107990	106380	110170	108500	107910	109800

Data: NPSAS waves 1999-00, 2003-04, 2007-08, and 2011-12. Notes: each column displays estimates from a separate regression model. All regression models include student gender, dependency status, and entrance exam score, year fixed effects, state fixed effects, and the following state by year level controls: average in-state tuition at public four-year colleges and universities (natural log); state unemployment rate; state poverty rate; total funding for state grant programs (natural log). All relevant variables are in 2011$. See text for more information on these control variables. Sample sizes rounded to the nearest ten in compliance with IES reporting standards. Sample includes students who are first- through fourth-year undergraduate students enrolled at a four-year or two-year institution in Fall 1999, 2003, 2007, or 2011, and are residents of a state with a FAFSA deadline on or before July 1st, excluding the state in the column header.

Table 1.18: Predicted probability of state need-based grant receipt, quartic deadline model

	February 1st (1)	March 1st (2)	April 1st (3)	May 1st (4)	June 1st (5)	July 1st (6)
Pell Eligible	14.6%	22.0%	15.8%	17.9%	31.1%	27.2%
Pell Ineligible	10.6%	8.8%	4.6%	3.8%	6.7%	13.2%
Ratio	1.37	2.52	3.44	4.69	4.65	2.06

Data: NPSAS waves 1999-00, 2003-04, 2007-08, and 2011-12; state-level data and institution-level data from additional sources, see text for details. Notes: the first two rows display the predicted probabilities of state need-based grant receipt for at the specified state deadlines, with all other student-, state-, and institution-level variables held at their observed values. Derived from the results of estimating Equation (1) with a quartic term of the deadline variable. Sample includes 57,700 Pell eligible and 53,300 Pell ineligible students who are first- through fourth-year undergraduate students enrolled at a four-year or two-year institution in Fall 1999, 2003, 2007, or 2011, and are residents of a state with a FAFSA deadline on or before July 1st of that year.

Table 1.19: Comparing states with deadlines before/after April 15th

Panel A: Regression results

Deadline Before April 15th	0.0256
	(0.0181)
Pell * Deadline before April 15th	-0.0758***
	(0.0082)
R-squared	0.1738
N	47,960

Panel B: Predicted probabilities

	March 15th - April 14th (1)	April 15th - May 15th (2)
Pell Eligible	20.3%	27.5%
Pell Ineligible	7.8%	6.2%
Ratio	2.61	4.45

Data: NPSAS waves 1999-00, 2003-04, 2007-08, and 2011-12. Notes: each column displays estimates from a separate regression model. All regression models include student gender, dependency status, and entrance exam score, year fixed effects, state fixed effects, and the following state by year level controls: average in-state tuition at public four-year colleges and universities (natural log); state unemployment rate; state poverty rate; total funding for state grant programs (natural log). All relevant variables are in 2011$. See text for more information on these control variables. Sample sizes rounded to the nearest ten in compliance with IES reporting standard. Sample includes students who are first- through fourth-year undergraduate students enrolled at a four-year or two-year institution in Fall 1999, 2003, 2007, or 2011, and are residents of a state with a FAFSA deadline consistent with the column header.

Table 1.20: Distributional effect of deadlines on probability of grant receipt, by academic achievement

	Pr(Receive need-based grant)			State Need Grant $		
	Highest-Achieving	Mid-Achieving	Lower-Achieving	Highest-Achieving	Mid-Achieving	Lower-Achieving
	(1)	(2)	(3)	(1)	(2)	(3)
State Deadline	0.0325***	0.0119	0.0029	161.71***	141.37***	41.79***
	(0.0114)	(0.0081)	(0.0063)	(47.27)	(24.21)	(12.94)
Pell * Deadline	0.0009	-0.0068	-0.0188***	238.14***	81.74***	-60.06***
	(0.0058)	(0.0044)	(0.0029)	(35.85)	(21.12)	(8.33)
R-squared	0.1757	0.1727	0.1646	0.136	0.132	0.077
N	14,200	28,990	67,390	14,270	29,030	67,710

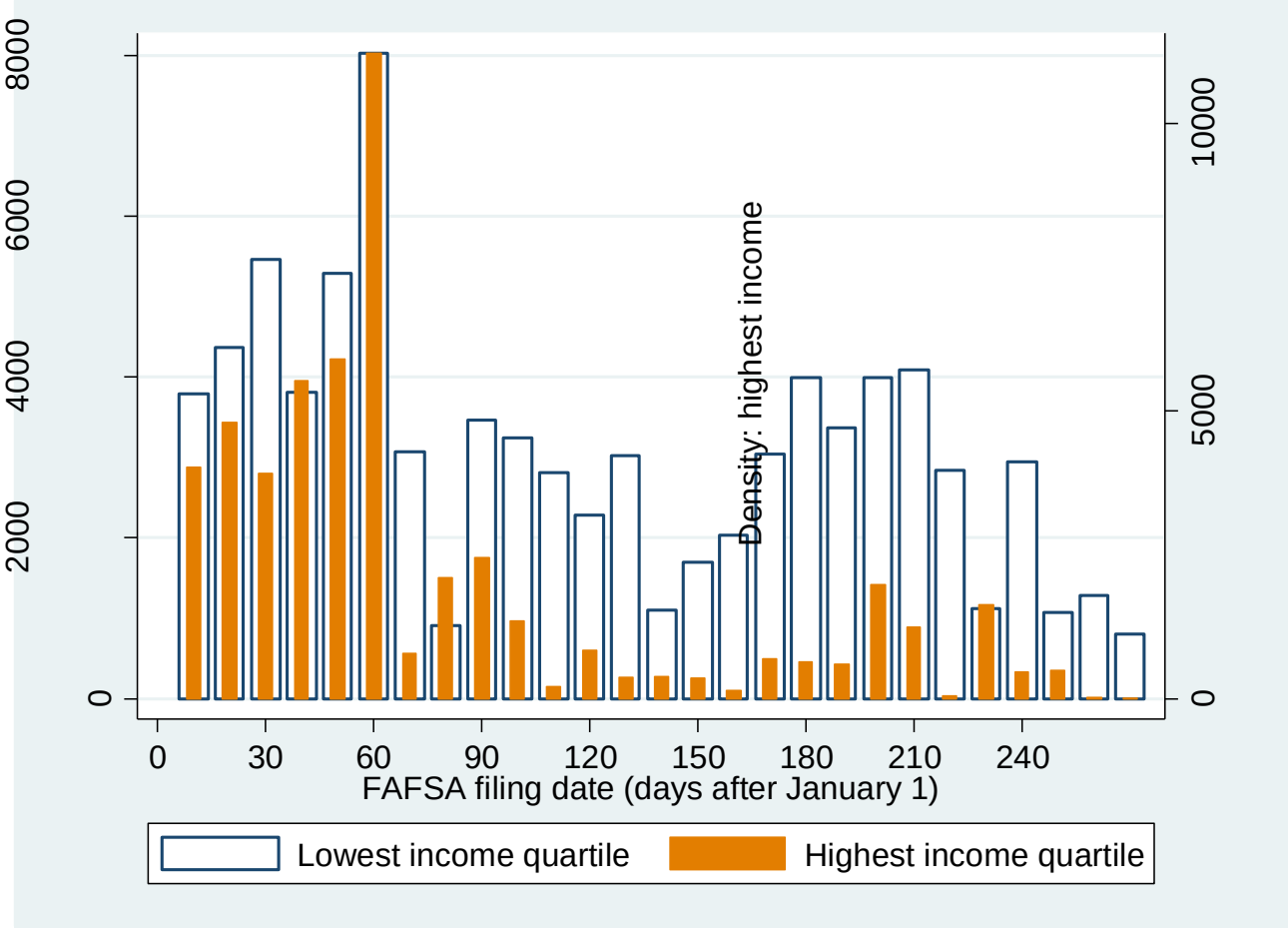
Data: NPSAS waves 1999-00, 2003-04, 2007-08, and 2011-12. Notes: each column displays estimates from a separate regression model. All regression models include student gender, dependency status, and entrance exam score, year fixed effects, state fixed effects, and the following state by year level controls: average in-state tuition at public four-year colleges and universities (natural log); state unemployment rate; state poverty rate; total funding for state grant programs (natural log). All relevant variables are in 2011$. See text for more information on these control variables. Sample sizes rounded to the nearest ten in compliance with IES reporting standards. Sample includes students who are first- through fourth-year undergraduate students enrolled at a four-year or two-year institution in Fall 1999, 2003, 2007, or 2011, and are residents of a state with a FAFSA deadline on or before July 1st.

Table 1.21: The distributional effect of deadline with achievement interaction

	All institutions	Public 4-year	Public 2-year	Private non-profit 4-year	Private non-profit 2-year	For-profit 4-year	For profit 2-year
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
State Deadline	0.0135***	0.0272***	0.0083	0.0543***	0.0042	0.0038	-0.1670**
	(0.0048)	(0.0077)	(0.0062)	(0.0145)	(0.0697)	(0.0191)	(0.0820)
Deadline * Pell	-0.0177***	-0.0335***	-0.0253***	-0.0207***	-0.0267	-0.015*	0.0216
	(0.0030)	(0.0058)	(0.0045)	(0.0079)	(0.0379)	(0.0079)	(0.1988)
Deadline * Mid-achieving	0.0098**	-0.0009	0.0021	0.0085	-0.1435**	0.0328	0.0246
	(0.0039)	(0.0067)	(0.0083)	(0.0087)	(0.0709)	(0.0217)	(0.0267)
Deadline * Highest-achieving	0.0214***	0.0094	-0.0083	0.0216**	0.1497***	-0.0291	0.095***
	(0.0049)	(0.0084)	(0.0156)	(0.0094)	(0.0571)	(0.0219)	(0.0278)
Deadline * Pell * Mid-achieving	0.0096**	0.0189**	0.0037	0.0190	0.0286	-0.0187	0.0036
	(0.0047)	(0.0080)	(0.0092)	(0.0126)	(0.0846)	(0.0226)	(0.0352)
Deadline * Pell * Highest-achieving	0.0117*	0.0235**	0.0018	0.0203	0.0616	0.0555**	-0.0918**
	(0.0066)	(0.0108)	(0.1859)	(0.0148)	(0.1189)	(0.0259)	(0.0434)
R-squared	0.1628	0.2055	0.202	0.1612	0.343	0.2202	0.1827
N	111,000	43,050	29,650	22,010	1,240	9,170	3,810

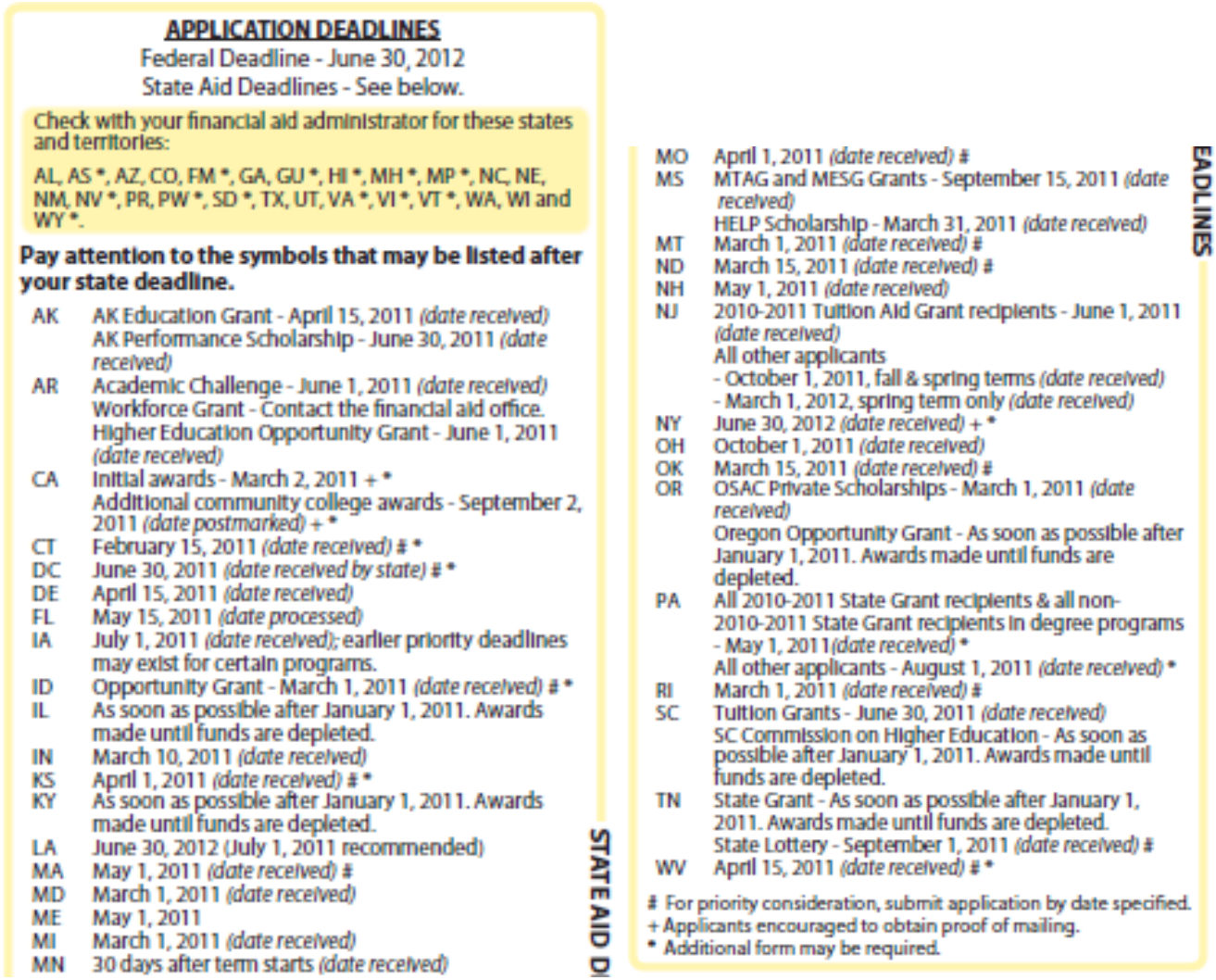
Data: NPSAS waves 1999-00, 2003-04, 2007-08, and 2011-12. Notes: each column displays estimates from a separate regression model. All regression models include student gender, dependency status, and entrance exam score, year fixed effects, state fixed effects, and the following state by year level controls: average in-state tuition at public four-year colleges and universities (natural log); state unemployment rate; state poverty rate; total funding for state grant programs (natural log). All relevant variables are in 2011$. See text for more information on these control variables. Sample sizes rounded to the nearest ten in compliance with IES reporting standards. Sample includes students who are first- through fourth-year undergraduate students enrolled at a four-year or two-year institution in Fall 1999, 2003, 2007, or 2011, and are residents of a state with a FAFSA deadline on or before July 1st.

Figure 1.1: Distribution of FAFSA filing dates, by income



Data: NPSAS:12. Notes: plots the density of students in states with a FAFSA filing deadline of March 1st, 2011, for students in the lowest income quartile (left axis) and the highest income quartile (right axis).

Figure 1.2: State aid application deadlines as shown on the FAFSA (2011-12)



APPLICATION DEADLINES

Federal Deadline - June 30, 2012

State Aid Deadlines - See below.

Check with your financial aid administrator for these states and territories:

AL, AS *, AZ, CO, FM *, GA, GU *, HI *, MH *, MP *, NC, NE, NM, NV *, PR, PW *, SD *, TX, UT, VA *, VI *, VT *, WA, WI and WY *.

Pay attention to the symbols that may be listed after your state deadline.

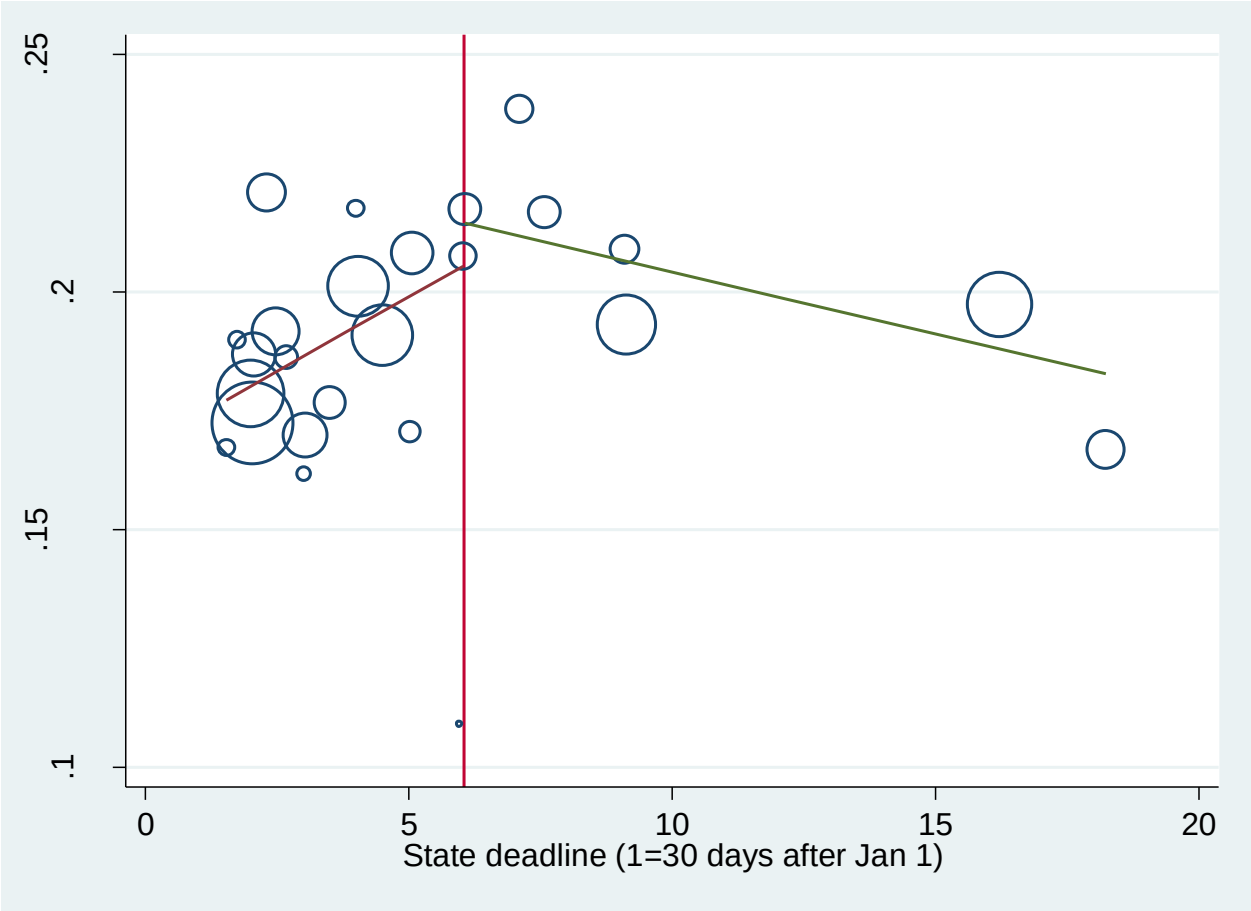
AK	AK Education Grant - April 15, 2011 *(date received)* AK Performance Scholarship - June 30, 2011 *(date received)*
AR	Academic Challenge - June 1, 2011 *(date received)* Workforce Grant - Contact the financial aid office. Higher Education Opportunity Grant - June 1, 2011 *(date received)*
CA	Initial awards - March 2, 2011 + * Additional community college awards - September 2, 2011 *(date postmarked)* + *
CT	February 15, 2011 *(date received)* # *
DC	June 30, 2011 *(date received by state)* # *
DE	April 15, 2011 *(date received)*
FL	May 15, 2011 *(date processed)*
IA	July 1, 2011 *(date received)*; earlier priority deadlines may exist for certain programs.
ID	Opportunity Grant - March 1, 2011 *(date received)* # *
IL	As soon as possible after January 1, 2011. Awards made until funds are depleted.
IN	March 10, 2011 *(date received)*
KS	April 1, 2011 *(date received)* # *
KY	As soon as possible after January 1, 2011. Awards made until funds are depleted.
LA	June 30, 2012 (July 1, 2011 recommended)
MA	May 1, 2011 *(date received)* #
MD	March 1, 2011 *(date received)*
ME	May 1, 2011
MI	March 1, 2011 *(date received)*
MN	30 days after term starts *(date received)*
MO	April 1, 2011 *(date received)* #
MS	MTAG and MESG Grants - September 15, 2011 *(date received)* HELP Scholarship - March 31, 2011 *(date received)*
MT	March 1, 2011 *(date received)* #
ND	March 15, 2011 *(date received)* #
NH	May 1, 2011 *(date received)*
NJ	2010-2011 Tuition Aid Grant recipients - June 1, 2011 *(date received)* All other applicants - October 1, 2011, fall & spring terms *(date received)* - March 1, 2012, spring term only *(date received)*
NY	June 30, 2012 *(date received)* + *
OH	October 1, 2011 *(date received)*
OK	March 15, 2011 *(date received)* #
OR	OSAC Private Scholarships - March 1, 2011 *(date received)* Oregon Opportunity Grant - As soon as possible after January 1, 2011. Awards made until funds are depleted.
PA	All 2010-2011 State Grant recipients & all non-2010-2011 State Grant recipients in degree programs - May 1, 2011 *(date received)* * All other applicants - August 1, 2011 *(date received)* *
RI	March 1, 2011 *(date received)* #
SC	Tuition Grants - June 30, 2011 *(date received)* SC Commission on Higher Education - As soon as possible after January 1, 2011. Awards made until funds are depleted.
TN	State Grant - As soon as possible after January 1, 2011. Awards made until funds are depleted. State Lottery - September 1, 2011 *(date received)* #
WV	April 15, 2011 *(date received)* # *

For priority consideration, submit application by date specified.
+ Applicants encouraged to obtain proof of mailing.
* Additional form may be required.

STATE AID D

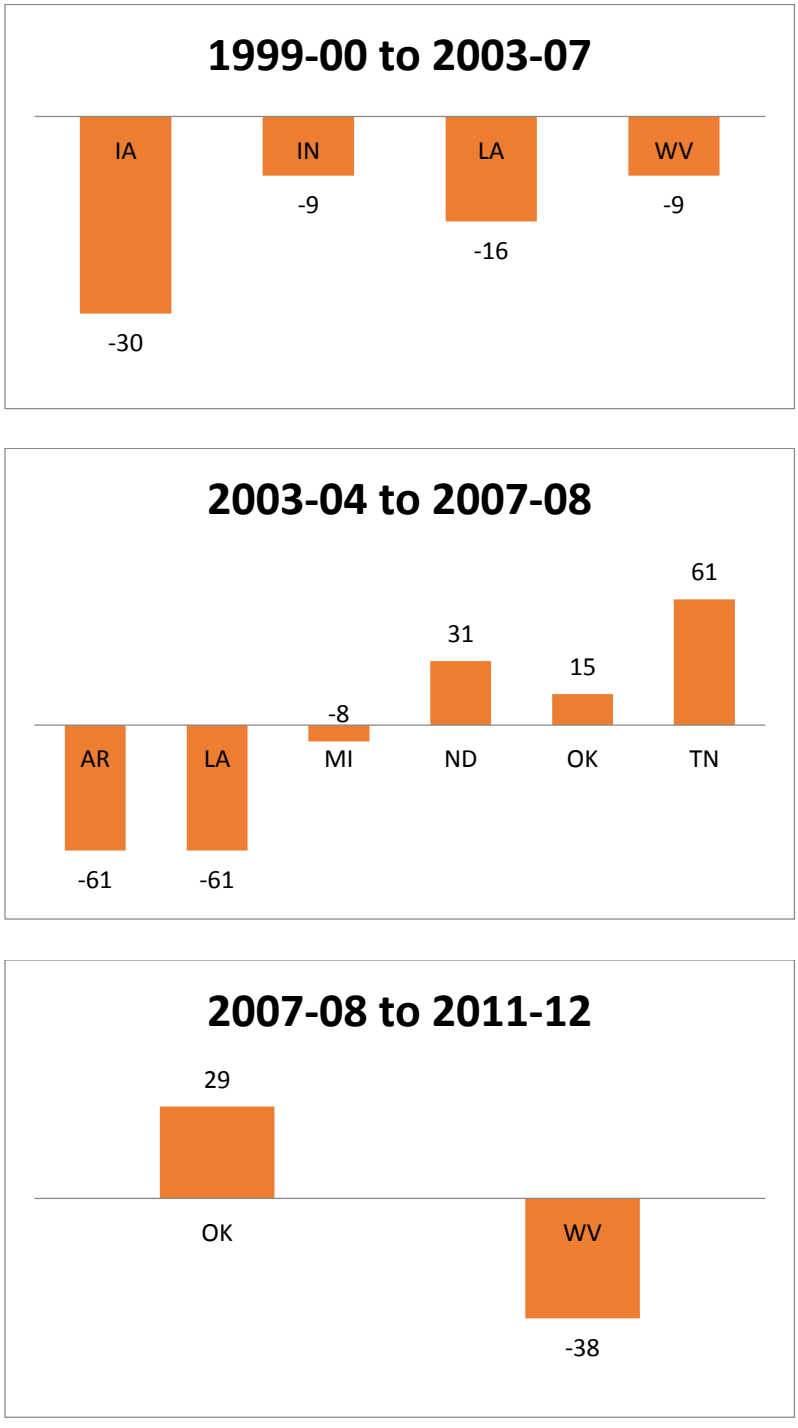
EADLINES

Figure 1.3: Predicted probability of receiving a state grant and state application deadline



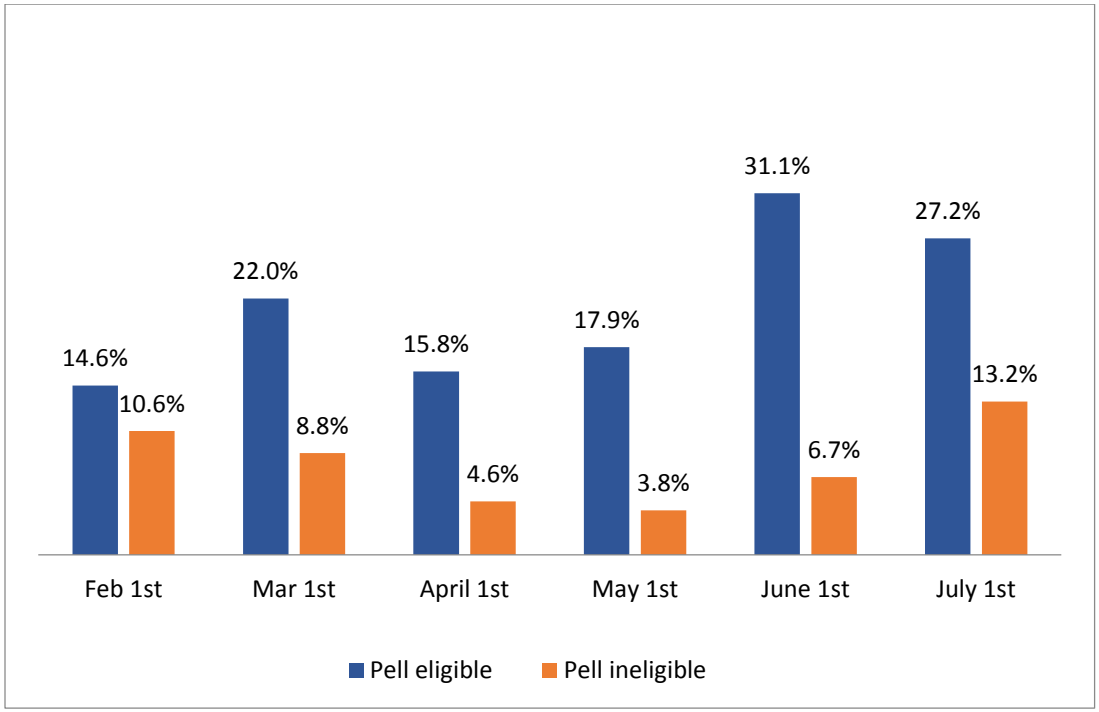
Data: NPSAS waves 1999-00; 2003-04; 2007-08; 2011-12. Predicted probabilities generating using a probit regression model with the following control variables: student gender, dependency status, and entrance exam scores, state average tuition at public four-year institutions; college-going rate of 18-24 year olds; the poverty rate; the unemployment rate; and total state grant awards in dollars), and state and year fixed effects. I then collapse the predicted probabilities by state, year, and deadline (i.e. February 15th, March 1st, March 10th, etc.). I plot these predicted probabilities, weighted by the number of student observations in each state x year x deadline cell, against state deadlines on the y-axis.

Figure 1.4: Variation in state aid application deadlines, between NPSAS waves



Notes: each bar represents a within-state change in deadlines between the four NPSAS waves. A positive value of the deadline change corresponds to a deadline that was moved earlier. For example, between 1999-00 and 2003-04, Iowa's deadline was moved from June 1st, 1999 to July 1st, 2003 (thirty days later). This figure excludes Oregon, which moved its deadline from May 1st, 2000 to March 1st, 2003 (a shift of 426 days earlier).

Figure 1.5: Predicted probability of state need-based grant receipt, quartic deadline model



Notes: visual representation of the results in Table 1.16

CHAPTER 2

Here Today, Gone Tomorrow?

Investigating Rates and Patterns of Financial Aid Renewal Among College Freshmen

(with Benjamin L. Castleman)

ABSTRACT

College affordability continues to be a top concern among prospective students, their families, and policy makers. Prior work has demonstrated that a significant share of prospective students forgo financial aid because they did not complete the Free Application for Federal Student Aid (FAFSA); recent federal policy efforts have focused on supporting students and their families to successfully file the FAFSA. Despite the fact that students must refile the FAFSA every year to maintain their aid eligibility, there are many fewer efforts to help college students renew their financial aid each year. While prior research has documented the positive effect of financial aid on persistence, we are not aware of previous studies that have documented the rate at which freshman year financial aid recipients successfully refile the FAFSA, particularly students who are in good academic standing and appear well-poised to succeed in college. The goal of our paper is to address this gap in the literature by documenting the rates and patterns of FAFSA renewal. Using the Beginning Postsecondary Students Longitudinal Study, we find that roughly 16 percent of freshmen Pell Grant recipients in good academic standing do not refile a FAFSA for their sophomore year. Even among Pell Grant recipients in good academic standing who return for sophomore year, nearly 10 percent do not refile a FAFSA. Consequently, we estimate that these non-refilers are forfeiting $3,550 in federal student aid that they would have received upon successful FAFSA refiling. Failure to refile a FAFSA is strongly associated with students dropping out later in college and not earning a degree within six years. These results suggest that interventions designed to increase FAFSA refiling may be an effective way to improve college persistence for low-income students.

I. INTRODUCTION

College affordability continues to be a top concern for prospective students, their families, and policy makers. Gaps in college completion have widened over time, with students from the top income quartile five times more likely to earn a bachelor's degree by age 25 than their peers from the bottom income quartile (Bailey and Dynarski, 2012). A large body of research demonstrates that need-based financial aid can lead to substantial improvements in college entry, persistence, and success among low-income students (Castleman & Long, forthcoming; Deming and Dynarski, 2009; Dynarski, 2003; Kane, 2003).

There are many sources of need-based financial aid (including grants, loans, and work-study programs) offered by the federal government, state governments, and individual colleges and universities. Eligibility for the vast majority of these financial aid programs is determined by the Free Application for Federal Student Aid (FAFSA), which requires prospective students to provide detailed information on their (and their families') income, assets, and family composition. Given the complexity of the current FAFSA filing process, researchers point to the FAFSA as a barrier to financial aid, and thus college access, for many low-income students (Dynarski & Scott-Clayton, 2006; Dynarksi & Scott-Clayton, 2008). One out of every ten first-year college students who would be eligible for need-based financial aid do not complete the FAFSA.[42] The complexity of the FAFSA may deter other academically-prepared but financially-needy students from entering college in the first place.

[42] Source: authors' calculations using the National Postsecondary Student Aid Survey of 2011-12. King (2004, 2006) and Kofoed (2015) estimate similar rates of non-filing for the Pell eligible undergraduate students.

In response to these concerns, there has been substantial policy investment to help high school seniors and their families complete the FAFSA. These efforts include both governmental initiatives like the U.S. Department of Education FAFSA Completion Project, which provides school districts with real-time information about which students have completed the FAFSA, and privately-funded efforts like College Goal Sunday, which provides students in 34 states with free FAFSA completion assistance.[43] Results from a recent experiment show that providing lower-income families with FAFSA filing assistance can generate substantial improvements in both FAFSA filing and college entry, reinforcing that the FAFSA acts as a significant barrier to higher education (Bettinger et al., 2012). While there has been considerable attention to addressing this problem with high school seniors, there are many fewer efforts to help college students renew their financial aid each year, despite the fact that students need to refile their FAFSA on an annual basis to maintain their eligibility for federal, state, and institutional grant and loan aid.

Several prior papers investigate the relationship between need-based financial aid and persistence, and present consistent evidence that access to financial aid increases students' persistence in college (Castleman & Long, forthcoming, Bettinger, 2004; Dunlop, 2013; Goldrick-Rab et al., 2014). However, we are not aware of any study that has documented the rate at which freshman year financial aid recipients successfully refile the FAFSA. The goal of our paper is to address this gap in the literature by documenting the extent of and patterns underlying FAFSA refiling among college students. Our analyses provide new descriptive evidence on whether application barriers

[43] For more information on these programs, see http://www.ed.gov/blog/2012/05/ed-announces-fafsa-completion-project-expansion/ and http://www.collegegoalsundayusa.org/pages/about.aspx

associated with the FAFSA continue to negatively impact postsecondary outcomes among students who already completed the FAFSA, received financial aid, and successfully enrolled in college. These results can help inform future policy efforts to increase college affordability and success among economically-disadvantaged students.

We pay particular attention to the refiling behavior of Pell Grant recipients who are in good academic standing and whose stated expectation is to earn a degree; we view this population as having the most to gain from refiling the FAFSA. The failure of a substantial share of these students to refile would point to the need for greater policy attention to and intervention in this stage in the financial aid process. We use a nationally representative dataset, the Beginning Postsecondary Students Longitudinal Study (BPS:04/09), to document the rate of FAFSA refiling among college freshmen and to investigate whether FAFSA refiling behavior varies by student academic and demographic characteristics. We then estimate the extent to which FAFSA refiling is associated with students' college persistence and degree attainment after controlling for other factors correlated with student success.

To preview our results, we find that a substantial portion of freshmen Pell grant recipients with GPAs of 3.0 or higher do not refile a FAFSA (roughly 16 percent). Conditional on returning for their sophomore year, one in ten of these higher-performing low-income students do not refile the FAFSA, and thus continue on in college without the financial aid they received freshman year. We estimate these non-refilers forfeit $1,930 in Pell grants, $1,620 in federal loan aid, and potentially thousands of dollars

more in state and institutional grant aid.[44] Based on results from our regression analysis, students who do not refile are substantially less likely to persist in college or earn a degree within six years, compared with observationally similar students who do refile. The results of these analyses are informative for the design of financial aid policies as well as the potential importance of targeting resources to assist students with renewing their financial aid.

The remainder of our paper is structured as follows. In Section II, we discuss traditional and behavioral economic theories that inform why freshmen financial aid recipients in good academic standing may not refile a FAFSA. In Section III, we describe the data we use in our analysis, and in Section IV we discuss our methodology in detail. We present our results in Section V, and conclude with a discussion of the importance of our findings and direction for future research and policy in Section VI.

II. LITERATURE REVIEW

Economists have traditionally modeled students' decisions about whether to pursue higher education as a cost-benefit analysis (Becker, 1964). However, the college access literature has documented several failures of this traditional decision-making model. For example, several studies have documented that students and families from disadvantaged backgrounds may struggle to estimate the cost of college tuition, and often overestimate what their actual tuition expenses would be (Avery & Kane, 2004; Grodsky & Jones, 2007; Horn, Chapman, & Chen, 2003).[45] Students may lack information on what aid is available or how to navigate the application processes. For example, of

[44] For more detail on how we obtained these estimates of forgone aid, see Section VI.
[45] Students only realize their true cost of attendance at a specific college after applying for admission and submitting the FAFSA for that institution.

college freshmen who did not apply for aid in 2011-12, 14 percent did not because they had "no information on how to apply", and 43 percent did not because they thought they were ineligible.[46]

A more recent line of work in behavioral economics demonstrates how behavioral responses may interfere with students making well-informed decisions of the higher education investments they pursue (Castleman, 2015; Ross et al, 2013). Applying for college and completing the FAFSA requires students to access and digest a complex array of information, which requires a substantial investment of time and cognitive energy. Various studies also show that near-term costs or an inability to maintain attention on tasks can lead to individuals forgoing investments that they recognize are in their long-term interest to pursue, particularly when balancing multiple commitments in the present (e.g. Karlan et al., 2010; Thaler & Benartzi, 2004). In the context of postsecondary access and success, even small cost obstacles can prevent students from completing important stages of the college application process (Pallais, forthcoming). Furthermore, even students who understand the financial benefits of completing the FAFSA may nevertheless procrastinate or put off indefinitely completing their aid application, or become too frustrated with the complexity of the process to complete all necessary steps (Bettinger et al., 2012; Dynarski & Scott-Clayton, 2006; Dynarksi & Scott-Clayton, 2008).

These behavioral responses—the tendency to become frustrated with or procrastinate in the face of complex information; the tendency to favor near-term costs over longer-term investments; and limited attention—may help explain why a significant

[46] Source: authors' calculations from the National Postsecondary Student Aid Study of 2012.

percentage of potential financial aid recipients do not apply. The tendency to procrastinate in the face of complexity may also explain why over half of students who do file the FAFSA miss state priority deadlines that would have qualified them for additional financial aid (King, 2004; authors' calculations from BPS:04/09).

Recognition of these informational and behavioral barriers has motivated various efforts to increase the visibility of financial aid programs and the assistance available to students to complete the FAFSA, as well as efforts to reduce the complexity of the aid process. These initiatives include the FAFSA completion efforts described in the introduction; the USDOE has also mandated that colleges post net price calculators on their websites to provide students with personalized estimates of the price their families would face at each institution. Researchers have also found that simple text-based nudges reminding students about required tasks for successful college matriculation can increase enrollment among college-intending high school graduates (Castleman & Page, 2015).[47, 48]

While these behavioral theories help explain why financial aid-eligible students who enroll in college may not complete the FAFSA, to what extent do they predict that students who have already received financial aid for freshman year would struggle to refile their FAFSA for the subsequent year? After all, these students—perhaps with parental or school-based assistance—have already successfully navigated the FAFSA while they were in high school. In addition, students who filed a FAFSA the previous

[47] Researchers have also used such text-based nudges to improve other social outcomes, such as increasing flu-vaccination rates and workers' contributions to retirement accounts (Karlan et al., 2010; Stockwell et al., 2013).

[48] Other researchers advocate for a simpler financial aid application process, such as using a much smaller set of financial questions or using prior-prior year information to determine eligibility (Dynarski & Scott-Clayton, 2008; Dynarski, Scott-Clayton, & Wiederspan, 2013; Kelchen & Jones, forthcoming).

year are eligible to complete a "Renewal FAFSA" that auto-populates some of their responses.[49]

On the other hand, many college freshmen are living away from their families for the first time, and thus may be less likely to receive parental assistance when applying for financial aid. College freshmen are also removed from the high school counselors and teachers who may have supported them through the college application process and encouraged them to apply for financial aid. Students who live off-campus or attend non-residential colleges are less likely to be connected to their college community or aware of financial aid renewal supports available on campus. Additionally, college freshmen may be particularly prone to attentional failure given the wide slate of new academic and social commitments that many students maintain. And while both the United States Department of Education and students' college send email reminders about FAFSA re-filing, email is likely not the most effective channel through which to communicate with college students (Castleman & Page, 2015; Castleman & Page, forthcoming).[50] Finally, students may lack accurate information regarding their continued eligibility for financial aid programs. For example, over half of previous Pell grant recipients who were enrolled in 2011-12 did not re-apply for aid because they thought themselves ineligible.[51]

Another possibility for why students do not refile the FAFSA is that they have information to indicate that they are unlikely to continue to receive financial aid, perhaps

[49] However, filing a Renewal FAFSA still requires applicants to fill in responses to the questions regarding income and assets, which are the most onerous to complete.
[50] The U.S. Department of Education sends reminder emails to refile the FAFSA to students who: (1) have previously received a federal PIN; (2) whose name, date of birth, and social security number match with Social Security Administration records; and (3) provided a valid email address on their previously file FAFSA. Source: CollegeUp.org (http://blog.collegeup.org/tips-for-submitting-your-renewal-fafsa)
[51] Source: authors' calculation from the National Postsecondary Student Aid Study of 2012.

because they are not maintaining satisfactory academic progress (SAP) or because their family has experienced a significant change in income, and thus make informed decisions not to refile. During the period of our analyses, however, SAP requirements that can affect students' aid eligibility were not binding until the end of the second year in college, so we would not expect first-year students to choose not to refile because they were not meeting SAP (Scott-Clayton and Schudde, 2014). Furthermore, we demonstrate that refiling rates are substantial even for students with first-year GPAs over 3.0, who were not at risk for failing to meet SAP requirements. And while some students may have experienced family income fluctuations from year to year, the algorithm that is used to calculate families' Expected Family Contribution is sufficiently complex and opaque that few students are likely to be able to precisely map how changes to family income would affect their add receipt. Among freshmen Pell recipients who did refile the FAFSA, 81 percent are again awarded a Pell grant the following year, indicating that a substantial share of non-refilers may also be likely to maintain their eligibility. Finally, as we demonstrate in our results, ten percent of students who re-enroll in college do not refile the FAFSA. Taken collectively, these considerations suggest that informational and behavioral obstacles associated with the FAFSA likely contribute to students' failure to refile, rather than students making fully-informed decisions not to refile the FAFSA.

Thus, there are a variety of informational and behavioral barriers that may prevent students—even those who had received aid freshman year, are in good academic standing, and who plan to return for sophomore year—from successfully refiling their FAFSA. Failure to renew financial aid may be particularly detrimental for lower-income students who intend to continue on in higher education, as research has shown that need-

based financial aid significantly improves students' persistence and success in college (Bettinger, 2004; Castleman & Long, forthcoming; Dunlop, 2013). Despite the potential importance of FAFSA refiling to students' persistence in college, we are not aware of prior studies that document FAFSA renewal rates or investigate whether renewal rates vary by students' academic or demographic background. Nor are we aware of any study that looks at how FAFSA refiling is associated with future academic outcomes. Our paper is therefore organized around the following research questions:

1. At what rate do college freshmen financial aid recipients successfully refile their FAFSA?
2. Does the probability that students refile their FAFSA vary based on student academic and demographic characteristics?
3. How is successful FAFSA refiling associated with future academic outcomes, including persistence beyond freshmen year and degree attainment?

III. DATA

For our analysis, we use data from the Beginning Postsecondary Students Longitudinal Study (BPS:04/09), which is administered by the National Center for Education Statistics (NCES). BPS respondents are first-time students enrolled at postsecondary education institutions during the 2003-04 academic year, and constitute a nationally-representative sample. BPS first interviews students at the end of their first year in college (Spring 2004), and then follows these respondents for six years. In addition to interviewing respondents again in 2006 and 2009, the BPS collects and compiles extensive student-level data from a variety of sources. These data include college entrance exam scores and survey responses from the ACT and College Board;

financial aid information from the FAFSA; aid disbursement information from the National Student Loan Data System; and enrollment and degree attainment records from the National Student Clearinghouse (NSC) for each institution attended during the study period that is covered by NSC.[52] The BPS also collects data on the characteristics of the institution(s) each respondent attended, including the sector (i.e. public, private non-profit, or private for-profit), level (i.e. four-year, two-year, or less-than-two-year), and published tuition and fees of each institution.[53] We supplement the BPS's institutional information with admissions data from the Integrated Postsecondary Education Data System (IPEDS), an NCES-maintained database containing detailed information for all U.S. postsecondary education institutions.[54]

Most variables used in our analysis come from students' FAFSA records. For each FAFSA a student filed for the six academic years in the study, we observe the student's responses to and outcomes from the FAFSA, including: measures of family income and assets, family composition, demographic information, the resulting Expected Family Contribution (EFC), and the federal financial aid the student is offered (i.e. Pell grants, Stafford loans). From the NSC data, we observe BPS respondents' college enrollment status at each institution attended for every month between July 2003 through June 2009; we also observe degree or certificate receipt during the study period. This information gives us a near complete picture of BPS respondents' college persistence and degree attainment up to six years after their initial enrollment. Additional variables of

[52] In Fall 2003, the NSC enrollment data covered 86.5 percent of all postsecondary institutions. In Fall 2009, the coverage rate increased to 92 percent. Source: http://nscresearchcenter.org/workingwithourdata/.
[53] Some students attended more than one institution during the 2003-04 academic year, and some students switch institutions between their first and second year of college. Unless otherwise specified, we use the characteristics of the first institution a student attended during 2003-04 in our analysis.
[54] Using IPEDS, we calculate admissions rates by dividing total number of applicants by admitted students. These data are available for all institutions with no open admission policy.

interest, such as college GPA and employment information, are available for the select survey years (2004, 2006, and 2009).

In all of our analyses, we first limit our sample to students who filed a FAFSA for their first year in college (2003-04), expect to earn a degree (associate or bachelor's), have not yet completed the degree they stated they intended to pursue, and were enrolled during April 2004. These restrictions focus our analyses on students who we can reasonably infer had the intention of continuing their education beyond this first year. We focus most of our analyses on students who received a Pell grant their first year, and thus have the most to benefit in terms of continued grant assistance from refiling a FAFSA.[55] For some of our analyses, we add a third restriction of students who earned a GPA of 3.0 or higher during their first year, as these students appear academically-poised to continue and succeed in college. Finally, we focus some of our analyses on students who re-enroll during the following academic year, 2004-05.[56]

Table 2.1 provides descriptive statistics for five relevant samples of students: All freshmen FAFSA filers (column 1, n=10,740); freshmen Pell grant recipients (column 2, n=5,050); freshman Pell Grant recipients who re-enrolled for sophomore year (column 3, n=4,370); freshmen Pell recipients who earned a 3.0 GPA or higher (column 4, n=2,840); and freshmen Pell recipients who earned a 3.0 GPA or higher and re-enrolled for

[55] The Federal Pell Grant Program awards needs-based grants to low-income students who attend participating postsecondary institutions. The award amount is determined by a student's expected family contribution (EFC), which is calculated using the income and assets data from students FAFSA (source: http://www2.ed.gov/programs/fpg/index.html). In 2003-04, students with EFCs less than or equal to $3,850; and Pell awards for full-time students ranged from $400 to $4,050.

[56] We define "re-enroll" as enrolling at any postsecondary institution during the 2004-05 academic year, not necessarily the institution that the student first attended in 2003-04.

sophomore year (column 5, n=2,500).[57] As expected, Pell recipients differ from the full sample of freshmen FAFSA filers on most measures. Pell recipients receive more need-based grant aid and borrow more in student loans, but receive fewer merit-based grant dollars. Pell recipients are more likely to be female or underrepresented minority (black or Hispanic), and less likely to be classified as dependent for financial aid purposes. Pell recipients score lower on college entrance exams and earn slightly lower GPAs as college freshmen. By construct, Pell recipients are of lower socio-economic status: their total household income is less than half that of the average college student, and they are more likely to be a first generation college student. Pell grant recipients are less likely to live on campus, and more likely to live on their own; they are also much more likely to have dependent children. Interestingly, even though Pell grant recipients are lower-income and have more financial need, Pell grant recipients are no more likely to work at an outside job or for a work-study program, and those who do work similar hours on average to the full sample of students. Pell grant recipients have a lower cost of attendance, largely due to the fact that Pell recipients are less likely to attend four-year institutions and more likely to attend two-year or less-than two-year institutions. Pell grant recipients are significantly less likely to persist after their freshmen year or earn a bachelor's degree within six years of initial enrollment. While these differences are attenuated upon conditioning on high freshmen GPAs (column 3), enrollment in sophomore year (column 4), or both high freshmen GPA and sophomore enrollment (column 5), we still observe significant gaps in persistence and degree attainment between these conditioned samples of Pell grant recipients and the full college freshmen population of FAFSA filers. The

[57] In accordance with IES reporting standards for restricted-use data, all sample sizes are rounded to the nearest ten.

relatively low persistence and graduation rates of Pell recipients make this population a high priority for policy makers, which is one of the reasons we focus on Pell recipients in our analysis.

IV. EMPIRICAL STRATEGY

To address our first research question, we use the BPS to estimate the proportion of college freshmen who refile the FAFSA for the following academic year for the full sample, as well as sub-samples of interest based on freshman Pell grant receipt, freshmen GPA, and re-enrollment as a sophomore. Next, we perform two sets of regression analyses to address our research questions of: (1) how the probability of refiling a FAFSA varies by student and institution characteristics; and (2) the association between successful FAFSA refiling and future success in college. To investigate (1), we estimate a linear probability model in which the dependent variable is an indicator equal to one if the student did not refile a FAFSA for the next academic year (2004-05), and zero if otherwise.[58] Specifically, we estimate the following equation:

$$\Pr(Fail\ to\ Refile_i) = \beta_0 + \beta_1 X_i + \beta_2 Z_s + \epsilon_i \quad (1).$$

X_i is a vector of student characteristics, including demographics (gender, race, household income, and first generation college student status); academic achievement (SAT score, freshman year GPA) [59]; financial aid information (dependency status, Pell grant award, other grant awards, loan borrowing, cost of attendance); employment status (has job

[58] Our results are robust to using probit or logistic regression models in place of the linear probability models.

[59] For student who took the ACT, the BPS converts their ACT score to an SAT score for comparison; we use these converted ACT scores in our analysis. For students with no record of either entrance exam scores, we convert their missing value for SAT score to the sample mean, and include an indicator for missing entrance exam score in the regression.

outside of school, hours worked); household information (has dependent children, has spouse with an income); and living situation (lives on campus, lives with parents, or lives on own). Z_s is a vector of institution characteristics, including level (i.e. four-year, two-year, or less-than two-year); control (public, private non-profit, or private for-profit); and admission rate as a proxy for institutional quality. Together, X_i and Z_s contain all variables shown in Table 2.1 (with the exception of the outcome measures of subsequent enrollment and degree attainment). Each of these variables may be related to a student's probability of refiling the FAFSA for various reasons. For example, some studies find that the demographic characteristics of race, gender, age, and income are significant predictors of FAFSA filing (Kantrowitz, 2009; Kofoed, 2015). These patterns may be explained, in part, by the differences in prospective students' accuracy of information regarding college financial aid (Avery & Kane, 2004; Horn, Chen, & Chapman, 2003; Oreopoulos & Dunn, 2009) or access to the social capital provided by people in their families, neighborhoods, and friend circles familiar with the financial aid process (McDonough, 1997; Nagaoka, Roderick, & Coca, 2009; Perna & Titus, 2005; Tierney & Venegas, 2006). We include variables describing students' financial aid awards to test whether students with larger financial aid packages--and thus strong incentive to renew their aid—are more likely to refile. Our model also takes into account students' differences in available time resources, by controlling for the number of hours the student spends working outside school and family obligations. Students who have more outside responsibilities, such as caring for children or working at an outside job, may have less time or cognitive energy toward the refiling the FAFSA (Castleman, 2015; Mullainathan & Shafir, 2013). Finally, we include institution characteristics as a predictor of refiling.

Institutions vary substantially in the advising resources they provide to students, which likely significantly impacts refiling rates (Scott-Clayton, 2015). ϵ_i is the error term, which in addition to noise absorbs differences in refiling rates explained by unobservable characteristics, such as motivation and organizational skills.

We acknowledge that the decisions to refile and re-enroll are likely inter-related in a complex manner. Some proportion of the students who do not refile a FAFSA likely make this decision because they do not intend to re-enroll for the following academic year. At the same time, it is also likely that some students do not re-enroll because they did not refile a FAFSA and therefore did not receive the aid they needed to continue in college.[60] Unfortunately, given data and methodological limitations we cannot observe the direction of causation of this relationship. What we can do, however, is investigate patterns of FAFSA refiling (or failing to refile) among Pell Grant recipients who re-enroll for sophomore year. We therefore estimate a second set of linear probability models in which we restrict the sample to students who re-enrolled for their sophomore year. Because we are particularly interested in the refiling behavior of students who are academically well positioned to continue in college, we also estimate both sets of models for the sub-sample of students who earned a 3.0 GPA or higher during their freshman year in college.

To quantify the degree to which FAFSA refiling is associated with future outcomes, we estimate the following regression model:

$$Outcome_i = \gamma_0 + \gamma_1 Fail\ to\ Refile_i + \gamma_2 X_i + \gamma_3 Z_s + \delta_i \quad (2)$$

[60] While there is no deadline for filing the FAFSA and receiving a Pell grant, the majority of states and institutions have priority deadlines for their aid programs that are typically no later than April 1st, although some are as early as February 15th.

where $Outcome_i$ is a measure of student $i's$ academic success, and $Fail\ to\ Refile_i, X_i,$ and Z_s are defined as above. We interpret the OLS estimate of the coefficient of interest, γ_1, as the difference in the probability of achieving $Outcome_i$ between students who refile versus those who do not refile the FAFSA, controlling for the host of covariates included in X_i and Z_s.[61] Our goal of including these covariates is to control for other observable predictors of academic success, especially those which are also be correlated with a student's propensity to refile the FAFSA. Previous studies document that the demographic characteristics of race, gender, age, and income are predictors of college persistence and graduation (e.g. Bailey & Dynarski, 2011; Turner, 2004). As discussed above, research shows that financial aid is a determinant of college success. Several descriptive studies and a few recent causal studies shows that a student's probability of graduating varies substantially by the type of college they attend (e.g. Cohodes & Goodman, 2014; Goodman, Hurwitz, & Smith, 2015). While the link between outside work schedules and family obligations are less well documented, there is some evidence that these also influence college outcomes (Scott-Clayton, 2011; Scott-Clayton & Minaya, 2015) The outcomes we use as dependent variables in Equation 2 are enrollment in subsequent years, associate degree (AA) attainment by June 2009, and bachelor degree (BA) attainment by June 2009.[62]

Our regression model does not account for unobservable characteristics that are likely related to both students' propensity to refile a FAFSA and ability succeed in college, such as motivation and organizational skills. For this reason, we do not interpret

[61] Our results are robust to several other specifications of Equation 2, including logit, probit, and propensity score matching models.

[62] We also estimate these models with cumulative GPA in 2006, certificate attainment by 2009, and on-time BA degree attainment (i.e. by June 2007). Across specifications, the associations between refiling and these outcomes are insignificant, and we omit these results from our tables.

our estimates of Equation 2 as the causal effects of not refiling a FAFSA, but instead as associations between failure to refile and student outcomes. However, we believe this analysis is still valuable to understand how the outcomes of observably-similar students diverge after the FAFSA refiling decision is made.

V. RESULTS

A. Probability of refilling the FAFSA

We first report raw means for the share of students that refile the FAFSA for our various samples of interest in Table 2.2. Panel A shows that among our sample of freshmen who initially applied for financial aid (n=10,740), approximately three-fourths of students refile a FAFSA for the following year, while one-quarter do not refile. Refiling rates are higher for Pell grant recipients (83.4 percent) and for Pell grant recipients who earn a 3.0 or higher freshman GPA (84.5 percent). This result is intuitive as higher-income students generally do not qualify for need based aid and many do not borrow student loans, giving these higher-income students less incentive to refile a FAFSA. Still, one in six Pell grant recipients in our sample (who were enrolled through Spring 2004 and expect to earn a degree) did not refile a FAFSA; this is true even among those with good GPAs who appear well positioned to successfully continue their studies.

When we restrict our sample to students who did re-enroll for their second year (Panel B), we find that 10 percent Pell grant recipients do not refile their FAFSA, which is true even of Pell grant recipients with good GPAs. Therefore, one out of ten lower-income students who are in good academic standing enter their second year of college

without receiving the need-based grant aid for which they likely would have been eligible had they refiled their FAFSA. [63]

B. Refiling patterns by student and institutional characteristics

We first explore how FAFSA refilers and non-refilers differ by comparing uncontrolled means of observable characteristics for both groups of students in Table 2.3. The characteristics of student who fail to refile suggest they are substantially more likely to be from populations that have been traditionally underrepresented in higher education.[64] Non-refilers are lower achieving academically, as demonstrated by their lower freshman GPAs and SAT scores. Non-refilers are less likely to be full-time students, and more likely to be female or underrepresented minorities. Non-refilers are less likely to be financially dependent or to come from households with larger incomes, and are more likely to be first-generation college students. Non-refilers are less likely to live on campus, and more likely to live on their own. Non-refilers are more likely to have dependent children or spouses with income. Non-refilers attend less expensive colleges with higher admission rates, are less likely to attend public or private non-profit institutions (compared to private for-profit institutions), are less likely to four-year institutions, and are more likely to attend less-than two-year institutions.[65, 66]

[63] For additional reference, Appendix Table A2.1 shows the refiling rates by institution-level.

[64] Appendix Table A2.2 shows these means comparisons with the sample restricted to Pell recipients with good freshmen GPAs; the patterns we describe in this section are also consistent for that population.

[65] For the subset of students who re-enroll, one question is whether failure to refile is associated with where students enroll for their sophomore year. However, we find that that refilers and non-refilers are similarly likely to remain at the same institution as they were enrolled for their first year (91 percent versus 90 percent, respectively).

[66] As expected, freshmen who fail to refile but remain enrolled are significantly less likely to file a FAFSA for the 2005-06 academic year (17 percent versus 71 percent of freshmen refilers).

In Table 2.4, we formalize this analysis by estimating the association between FAFSA refiling and student and institution characteristics Equation 1. Each column displays results from a separate regression with the following restrictions on our overall sample: all freshmen Pell recipients (column 1); Pell recipients who re-enrolled for their sophomore year (column 2); Pell recipients with freshmen GPAs of 3.0 or above (column 3); and Pell recipients with GPAs of 3.0 or above who re-enrolled sophomore year (column 4). In these regression models, we create categorical variables for freshman GPA, with the reference categories being GPA=0 – 0.99. The reference category for institution control is for-profit institutions; the reference category for institution level is less-than two-year institutions.

In column (1), we find that Pell recipients with strong GPAs (3.0 or higher) are 29.3 percentage points more likely to refile a FAFSA than those with the lowest GPAs (less than 1.0). This result translates to a predicted probability of refiling of 57 percent for low GPA students, compared to 87 percent for high GPA students.[67] Financial aid awards, measured as percent of the student's cost of attendance (COA), also significantly predicts FAFSA refiling. To give an example of the interpretation of these coefficients: all else equal, a student whose Pell award covers 25 percent of his COA is 8.9 percentage points less likely to refile compared to a student whose Pell award covers 75 percent of his COA (predicted probabilities of failure to refile being 16 percent and 7.1 percent, respectively). Even still, 14.8 percent of Pell recipients whose awards are at the 75th

[67] To calculate these predicted probabilities, we set the rest of the control variables in the model at their means.

percentile of the distribution of Pell as a share of COA fail to refile (8.4 percent for students who re-enroll).[68]

Institution level and control are also strong predictors of failure to refiling. For example, Pell recipients at four-year institutions are 34.8 percentage points more likely to refile than students at less-than two-year institutions and 8.3 percentage points more likely to refile than Pell recipients at two-year institutions. Pell recipients at public and private non-profit institutions are 4 to 5 percentage points more likely to refile than Pell recipients at for-profit institutions. Other significant coefficients from column (1) show that underrepresented minorities are slightly (in magnitude and statistical significance) more likely to refile, and that working additional hours at an outside job is associated with a very small decrease in the probability of refiling (i.e. one additional hour of work is associated with a 0.2 percentage point decrease in the probability of refiling). When we restrict the sample to Pell recipients who re-enrolled for their second year for college (column 2), freshman GPA, Pell award, and institution type remain strong predictors of refiling. When we restrict the sample to Pell recipients who earn high GPAs their freshman year (columns 3 and 4), we find similar associations between refiling and institution level, although the associations with institution sector disappear.[69]

Because institution level is consistently the strongest predictor of refiling, and because students who attend four-year, two-year, or less-than two-year institutions are on average quite different from each other, we also estimate the associations between

[68] The 75th percentile corresponds to a Pell award that covers 32 percent of a student's cost of attendance.

[69] Also significant in Table 2.4 are the coefficients for the missing variable indicator for cost of attendance (columns 1 and 2). This is likely due to the fact that cost of attendance variable is missing for those students who attend more than one institution during 2003-04. This population of students represents a small percentage of our sample (5%).

student characteristics and refiling separately for each institution level.[70] Table 2.5 shows our estimates from these models. The results in columns (1) – (3) correspond to models estimated with all Pell recipients (four-year, two-year, and less-than two-year, respectively); columns (4) – (6) correspond to models with the sample restricted to Pell recipients who re-enroll for sophomore. We find that the association between higher GPA and refiling is driven by students at four- and two-year institutions, as the coefficients on the GPA categories are not significant for the less-than two-year sample.[71] Interestingly, while other forms of financial aid predict FAFSA refiling for students at four-year institutions, Pell award is predictive of refiling only for students at two-year institutions (columns 2 and 5). We believe this result is driven by the difference in costs of attendance across institution level: the average cost of attendance for Pell students at four-year institutions in 2003-04 was almost double that of Pell students at two-year institutions. Institution sector is also a significant predictor of refiling only for students at two-year institutions.

To emphasize the main takeaways of our analysis thus far, we find that institution type is the strongest predictor of FAFSA refiling, with Pell recipients at four-year

[70] Appendix Table A2.3 shows the means of our analysis variables by institution level for freshmen Pell recipients. Compared to Pell recipients at 2-year and less-than 2-year institutions, Pell recipients at 4-year institutions are higher-achieving academically (as measured by their SAT scores), are less likely to be minority or first generation college students; are more likely to live on campus; are less likely to have dependent children; and are more likely to persist and graduate. Appendix Table A2.4 compares certain characteristics of institutions by level. Two-year and less-than two-year are much more likely to have open admission policies. Less-than two-year institutions are much more likely to have a continuous calendar system. Two-year and less-than two-year institutions share many of the same top degree or certificate programs; less-than two-year institutions also award degrees and certificates in vocational trades, such as "transportation and materials moving", "construction trades", and "precision production."

[71] This pattern may be explained by grade inflation at less-than two-year institutions: 74 percent of students in our base Pell recipient sample who attended less-than two-year institutions earned a GPA or 3.0 or higher, compared to 50 percent of students at four-year institutions and 55 percent at two-year institutions. Similarly, an insufficient number of students at less-than two-year institutions earned a GPA below 1.0, thus necessitating the elimination of this category and making 1.00-1.99 the reference category for columns 3 and 6.

institutions being the most likely to refile (91 percent predicted probability), followed by recipients at two-year institutions (83 percent) and less-than two-year institutions (56 percent). Freshman GPA is also a strong predictor of refiling, but only at four- and two-year institutions. Finally, students with larger financial aid awards are more likely to refile at four- and two-year institutions. This result suggests that students may be responding to their larger incentive to refile, or perhaps are more aware of their need to refile to maintain aid eligibility.

C. Association between FAFSA re-filing and longer-term college success

In Table 2.6, we present our estimates of Equation 2, the associations between FAFSA re-filing during freshman year and longer-term college outcomes. We consider the relationship between FAFSA refiling and subsequent enrollment in columns 1 through 3, and the relationship between refiling and degree receipt in columns 4 and 5. Each grouping of rows corresponds to the coefficient estimate and standard error for a separate model using different samples of students: all freshman Pell recipients, freshman Pell recipients in good academic standing; freshman Pell recipients who returned for sophomore year; and freshman Pell recipients in good academic standing who returned for sophomore year. Consistently across samples, failing to refile the FAFSA is negatively associated with continuing in college and earning a degree. For instance, freshman year Pell recipients who do not refile are 25.2 percentage points less likely to be enrolled in what would be their junior year of college (column 2) and 3.1 percentage points less likely to earn a bachelor's degree within six years (column 5) compared with observationally-similar students who do refile. When using the mean outcomes of the full sample of students as a benchmark, these effects translate to 36 percent and 12

percent decreases in the probability of still being enrolled junior year and earning a degree, respectively. These associations between not refiling and future enrollment and AA degree attainment are similar when the sample is restricted to Pell recipients with GPAs 3.0 or higher and re-enroll although the estimates in column 5 for BA degree attainment decrease in magnitude and significance.

Because we found that institution level is a strong predictor of refiling, we next examine whether the longer-term outcomes of FAFSA non-refilers differ across institution level. We present the results of these models for the four samples of freshmen Pell Grant recipients in Table 2.7. While non-refilers have similar decreased probabilities of re-enrolling for sophomore year across institution levels, a pattern emerges that failure to refile the FAFSA is more strongly associated with negative longer-term outcomes for students at two-year institutions.

VI. DISCUSSION

Prospective college students need to complete a lengthy and complicated application in order to qualify for financial aid for college. A large body of research has demonstrated that the complexity of this application may deter college-ready low-income students from successfully enrolling in college. Both the federal and state governments as well as non-profit and community-based organizations have invested substantial resources to assist students and their families to complete the FAFSA. Yet there has been considerably less attention to helping students successfully re-apply for financial aid once they are in college, despite the fact that they need to complete the same financial aid application each year to maintain grant and loan assistance. While there have been several prior studies demonstrating positive impacts of financial aid on college

persistence and success, our paper is the first of which we are aware that documents rates and patterns of FAFSA refiling for a nationally-representative sample. This evidence is informative for policy efforts to increase college completion among economically disadvantaged students.

We find that a substantial share of freshman year Pell Grant recipients do not successfully refile the FAFSA. This is true for students in good academic standing and who return for sophomore year in college. Roughly 16 percent of Pell recipients with strong freshman year GPAs do not refile, and approximately 10 percent of these students who return for sophomore year do so without the financial aid the received for their first year in college. FAFSA refiling rates are particularly low among students who start out at two-year institutions or less-than two-year institutions.

An important question to consider is how much aid students may be foregoing by not refiling their FAFSA. The answer is difficult to know with precision, as we cannot observe the relevant household income information for students who do not provide refile the FAFSA. Instead, we predict forgone aid of non-refilers using the available data. Specifically, we first estimate a student-level regression model of observed sophomore-year federal aid on freshmen-year characteristics (the same set of control variables used in Equations 1 and 2 above), for the sample of students who did refile the FAFSA. We then use this estimated model to predict the sophomore-year federal aid awards for students who did not refile the FAFSA, and estimate that, had students refilled, they would have received, on average, $1,930 in Pell grant and $1,620 in federal loan awards. These estimates do not include the potential thousands of dollars in forgone state and institutional aid for non-refilers, as we do not observe sophomore-year aid receipts from

these sources for any students in the BPS. While these estimates do not account for the potential cases where students choose not to refile because their household's financial situation significantly improved during their freshmen year in college (and thus would no longer be eligible for need-based financial aid), as we argue earlier, these cases are infrequent and refilers are likely experience similar income and asset volatility to non-refilers.

We also find that among freshman Pell Grant recipients, failure to refile the FAFSA is strongly and negatively associated with staying in college or earning a degree. College sophomores who received a Pell Grant freshman year, had a first year cumulative GPA of at least 3.0, and did not refile the FAFSA were 14 percentage points less likely to still be enrolled junior year and 3.8 percentage points less likely to earn an associate's degree within six years. When we focus on two-year institutions, the relationship between failure to refile and academic success is more pronounced and significant. While we do not interpret these results as the causal effects of not refiling a FAFSA, they do suggest that refiling may be an important factor in students' ability to persist to graduation.

One open question emerging from our paper is what share of students who fail to refile do so as an informed and careful decision rather than failing to refile as a result of the informational and behavioral obstacles we describe earlier. The results of our analyses lend further support to recent studies demonstrating that complex application processes and complicated procedural hurdles can deter academically-ready and college-intending students from successfully matriculating at all or from enrolling at institutions where they are well-positioned for success. Prior research shows, for instance, that

college-bound high school seniors who would be eligible for need-based financial aid do not complete the FAFSA (Bettinger et al, 2012). High-achieving, low-income students do not apply to selective institutions with high graduation rates and low net costs where they appear admissible (Bowen, Chingos, and McPherson, 2009; Hoxby and Avery, 2013; Smith, Pender, and Howell, 2013). College-intending high school graduates who have been accepted to and plan to intend college fail to matriculate as a result of financial and procedural hurdles they encounter in the summer after high school (Castleman & Page, 2013, 2014, 2015). Our results indicate that complex processes such as refiling the FAFSA can continue to pose challenging hurdles for students, even those who have already successfully completed the FAFSA in high school and who have done well academically in college.

Consistent with prior work, one implication of our analyses is that the way information is delivered to students matters substantially. The US Department of Education and many colleges send email reminders to students to refile their FAFSA, but according to data from the Pew Center, only three percent of adolescents report exchanging emails on a daily basis (Lenhart, 2012). Recent interventions demonstrate, on the other hand, that utilizing channels like text messaging that more effectively reach students and families can allow for more effective transmission of education-related information, and in turn, improved outcomes (Castleman, 2015; Castleman & Page, 2015; Bergman, 2014; York & Loeb, 2014). Given the information and behavioral barriers that may contribute to students failing to refile the FAFSA, students may similarly benefit from proactively-delivered prompts to renew their financial aid.

Castleman & Page (forthcoming) conducted a pilot experiment in which they randomly assigned college freshmen in Massachusetts a series of text message reminders to refile the FAFSA. The messages informed students about key deadlines and steps associated with FAFSA refiling and encouraged students to seek help with FAFSA refiling, either from the financial aid office at their college or from uAspire, a community-based organization focused on college affordability. The text campaign led to substantial increases in the probability that community college students persisted into sophomore year, though had no effect on sophomore-year persistence for students who started at four-year institutions. The positive impacts for community college freshmen are consistent with our findings, which indicate that, after controlling for other characteristics, students at two-year institutions are roughly half as likely to refile a FAFSA, and therefore may benefit from additional refiling-related reminders and the offer of assistance.[72] Due to data limitations, Castleman & Page were unable to observe whether students actually refiled their FAFSA, so one clear implication from both their experiment and our analyses is that additional research needs to be conducted to investigate whether personalized refiling messages combined with the offer of assistance leads to increases in successful refiling as well as persistence in college.

One clear appeal of these types of interventions is that they can be conducted at scale and at low cost relative to other more labor-intensive strategies to increase FAFSA re-filing. Colleges or universities could collect students' cell numbers during the college application process and send students personalized refiling reminders in the spring of freshman year, or incorporate FAFSA refiling as part of their re-enrollment process. The

[72] This statistic is based on the results from Table 2.6, which show that students at two-year institutions are roughly 8 percentage points less likely to refile than students at four-year institutions.

Department of Education could collect cell phone numbers as part of the initial FAFSA application and send students similar text reminders to renew their aid. One important point to emphasize is that reminders alone may not be sufficient to increase refiling rates, given the complexity of the FAFSA. Therefore, colleges and universities or state and federal governments should investigate strategies that leverage personalized messaging technologies to connect students to FAFSA refiling assistance (either campus-based or remote) when they need help.

Over the last several years both the Obama Administration and Congress have been exploring proposals to simplify the federal financial aid application process. These proposals range from greatly simplifying the FAFSA or improving students' ability to import much of the information they need for the FAFSA from their income tax returns, to allowing families to apply for federal financial aid based on income from two years' prior. However, much of the debate around these proposals has centered around students who are filing the FAFSA for the first time. The Administration and Congress should consider additional policy levers for increasing the share of students that successfully renew their federal financial aid. One option would be to have students' initial FAFSA automatically qualify them for multiple years of aid if their income and assets were sufficiently low. Another option would be to improve on existing systems that allow students to transfer in information from a prior year's FAFSA submission.

In closing, financial aid remains an integral component of policy efforts to improve postsecondary outcomes for economically-disadvantaged students. In addition to ensuring that state and federal need-based aid programs remain sufficiently funded, policy efforts should continue to focus on supporting students through the complex

financial aid application process—both when they first apply, and just as importantly, when they need to renew their aid.

TABLE 2.1: Summary Statistics

	All students	Received Pell grant first year	Received Pell grant first year, enrolled 2004-05	Received Pell grant first year, GPA>3.0	Received Pell grant first year, GPA>3.0, enrolled 2004-05
	(1)	(2)	(3)	(4)	(5)
First year GPA	2.93	2.88	2.92	3.5	3.49
Received Pell grant in 2003-04	0.49	1.00	1.00	1.00	1.00
Pell award amount	$1,264	$2,575	$2,617	$2,537	$2,562
Other need-based grants	$1,338	$1,504	$1,678	$1,460	$1,619
Merit-based grants	$909	$516	$586	$599	$663
Student Loans	$2,227	$2,523	$2,655	$2,542	$2,647
Full-time	0.78	0.81	0.83	0.81	0.82
Female	0.60	0.64	0.64	0.70	0.68
Underrepresented Minority	0.35	0.50	0.49	0.46	0.44
Dependent	0.76	0.64	0.66	0.58	0.60
SAT score	993	914	921	949	958
First Generation College Student	0.48	0.64	0.62	0.65	0.63
Total income	$51,730	$22,706	$23,310	$22,816	$23,535
Cost of Attendance	$14,580	$13,393	$13,736	$13,567	$13,844
Lives on campus	0.35	0.21	0.24	0.19	0.21
Lives with parents	0.34	0.37	0.37	0.35	0.34
Lives on own	0.31	0.41	0.39	0.46	0.44
Has dependent child(ren)	0.16	0.26	0.25	0.31	0.29

Spouse with income	0.06	0.07	0.64	0.09	0.08
Any outside job	0.6	0.6	0.59	0.58	0.58
Hours worked at outside job	25.1	26.8	26.2	27.7	27.3
Any work study	0.14	0.15	0.16	0.13	0.15
Hours of work study	11.8	12.8	0.16 12.5	12.9	12.8
Four-year institution	0.53	0.43	0.46	0.38	0.46
Two-year institution	0.4	0.46	0.44	0.46	0.45
Less-than two-year institution	0.06	0.12	0.1	0.16	0.13
Public institution	0.66	11.00 0.61	0.61	0.57	0.57
Private, not-for-profit institution	0.19	0.15	0.17	0.15	0.16
Private, for-profit institution	0.14	0.24	0.23	0.28	0.27
Admission Rate	0.84	0.87	0.86	0.87	0.86
Enrolled in 2004-05	0.86	0.84	1.00	0.86	1.00
Enrolled in 2005-06	0.73	0.63	0.71	0.63	0.71
Enrolled in 2006-07	0.63	0.53	0.58	0.54	0.57
GPA as of 2005-06	3.14	3.1	3.09	3.28	3.28
Received Certificate by June 2009	0.03	0.04	0.04	0.04	0.03
Received AA by June 2009	0.05	0.05	0.05	0.05	0.06
Received BA by June 2009	0.36	0.23	0.27	0.28	0.32
On time BA graduation	0.17	0.09	0.11	0.12	0.14
Missing SAT score	0.30	0.42	0.4	0.46	0.43
Missing first generation indicator	0.15	0.22	0.21	0.22	0.21
Missing total income	0.02	0.00	0.002	0.00	0.00

Missing cost of attendance	0.06	0.05	0.05	0.05	0.04
N	10740	5050	4370	2820	2500

Notes: all entries in these tables are based on the authors' calculations from the Beginning Postsecondary Students Longitudinal Study (BPS:04/09). All samples sizes are rounded to the nearest ten to comply with the Institute of Education Sciences' reporting standards.

TABLE 2.2: Distribution of FAFSA refilers, by second year re-enrollment

	A: All Students		B: Re-enrolled in second year	
	Refiled	Did not refile	Refiled	Did not refile
	(1)	(2)	(3)	(4)
All students	75.4%	24.6%	80.2%	19.8%
Received Pell grant first year	83.4%	16.6%	90.0%	10.0%
Received Pell grant first year, GPA>3.0	84.5%	15.5%	90.4%	9.6%

Notes: all entries in these tables are based on the authors' calculations from the Beginning Postsecondary Students Longitudinal Study (BPS:04/09). All samples sizes are rounded to the nearest ten to comply with the Institute of Education Sciences' reporting standards.

Table 2.3: Differences in student characteristics by refiling behavior

	All Pell Recipients		Re-enrolled	
	Refilers	Non-refilers	Refilers	Non-refilers
	(1)	(2)	(3)	(4)
First year GPA	2.91	2.72	2.93	2.77
Pell award amount	$2,598	$2,461	$2,629	$2,513
Pell award as % of COA	0.24	0.23	0.24	0.22
Other grants	$2,298	$624	$2,432	$753
Other grants as % of COA	0.13	0.05	0.14	0.06
Student Loans	$2,540	$2,442	$2,634	$2,845
Student loans as % of COA	0.16	0.17	0.17	0.19
Full-time	0.82	0.76	0.83	0.81
Female	0.63	0.7	0.64	0.71
Underrepresented Minority	0.49	0.55	0.48	0.58
Dependent	0.67	0.49	0.68	0.54
SAT score	922	850	926	854
First Generation College Student	0.63	0.7	0.61	0.67
Total income	$23,184	$20,302	$23,520	$21,433
Cost of Attendance	$13,580	$12,461	$13,804	$13,135
Lives on campus	0.24	0.07	0.26	0.1
Lives with parents	0.37	0.37	0.37	0.38
Lives on own	0.38	0.56	0.37	0.53
Has dependent child(ren)	0.24	0.39	0.23	0.36
Spouse with income	0.06	0.09	0.06	0.07
Any outside job	0.59	0.64	0.59	0.6

Hours worked at outside job	26.1	30	26.1	27.6
Any work study	0.16	0.08	0.17	0.1
Hours of work study	12.7	13.7	12.3	14.5
Four-year institution	0.48	0.17	0.49	0.18
Two-year institution	0.45	0.5	0.44	0.5
Less-than two-year institution	0.08	0.33	0.07	0.32
Public institution	0.63	0.5	0.63	0.43
Private, not-for-profit institution	0.17	0.07	0.18	0.08
Private, for-profit institution	0.2	0.43	0.2	0.5
Admission Rate	0.86	0.91	0.85	0.9
Enrolled in 2004-05	0.91	0.51	1	1
Enrolled in 2005-06	0.7	0.27	0.74	0.4
Enrolled in 2006-07	0.58	0.28	0.61	0.3
GPA as of June 2006	3.09	3.15	3.09	3.19
Received Certificate by June 2009	0.04	0.04	0.04	0.02
Received AA by June 2009	0.06	0.02	0.06	0.02
Received BA by June 2009	0.27	0.05	0.29	0.08
On time BA graduation	0.11	0.02	0.12	0.04
Missing SAT score	0.39	0.62	0.38	0.61
Missing first generation indicator	0.21	0.26	0.2	0.28
Missing total income	0.002	0.003	0.003	0
Missing cost of attendance	0.06	0.05	0.05	0.04
N	4340	710	4020	350

Notes: all entries in these tables are based on the authors' calculations from the Beginning Postsecondary Students Longitudinal Study (BPS:04/09). All samples sizes are rounded to the nearest ten to comply with the Institute of Education Sciences' reporting standards.

Table 2.4: Determinants of failure to refile for Pell recipients

	Pell Recipients		Pell Recipients with 3.0+ GPA	
	All Students	Re-enrolled second year	All Students	Re-enrolled second year
	(1)	(2)	(3)	(4)
3.00-4.00 GPA	-0.296***	-0.157***		
	(0.030)	(0.031)		
2.0-2.99 GPA	-0.263***	-0.146***		
	(0.030)	(0.032)		
1.00-1.99 GPA	-0.185***	-0.064		
	(0.032)	(0.033)		
Pell award: % of COA	-0.178***	-0.168***	-0.135*	-0.075
	(0.048)	(0.043)	(0.064)	(0.056)
Other grants: % of COA	-0.126**	-0.056	-0.084	-0.018
	(0.040)	(0.034)	(0.051)	(0.043)
Student loans: % of COA	-0.060*	-0.016	0.04	0.048
	(0.030)	(0.027)	(0.038)	(0.034)
Full-time	-0.023	0.006	-0.03	-0.002
	(0.014)	(0.013)	(0.019)	(0.017)
Female	0.015	0.016	0.048***	0.032*
	(0.011)	(0.009)	(0.014)	(0.012)

Underrepresented Minority	-0.023*	-0.003	-0.006	-0.006
	(0.011)	(0.009)	(0.014)	(0.012)
Dependent	0.01	0.01	-0.017	-0.031
	(0.021)	(0.019)	(0.027)	(0.024)
SAT score (100 points)	-0.003	-0.001	-0.008	-0.010*
	(0.004)	(0.003)	(0.005)	(0.004)
First generation	0.001	-0.003	0.005	0.008
	(0.012)	(0.010)	(0.015)	(0.014)
Income ($1000s)	0	0	0	0.001
	0.000	0.000	(0.001)	(0.001)
Cost of attendance ($1000s)	-0.002	-0.002*	0	0
	(0.001)	(0.001)	(0.002)	(0.001)
Live on campus	-0.005	-0.009	0.013	-0.011
	(0.019)	(0.017)	(0.027)	(0.024)
Live with parents	-0.023	-0.023	0.004	-0.023
	(0.015)	(0.013)	(0.019)	(0.017)
Has dependent child(ren)	0.023	0.005	0	-0.017
	(0.020)	(0.018)	(0.024)	(0.022)
Spouse has job	-0.012	-0.036	-0.003	-0.048*
	(0.022)	(0.020)	(0.026)	(0.024)
Any outside job	-0.027	0.006	-0.022	0.004
	(0.017)	(0.015)	(0.023)	(0.020)
Hours worked at job	0.002**	-0.001	0	-0.002*
	(0.001)	0.000	(0.001)	(0.001)
Any work study	0.039	0.016	0.02	-0.011
	(0.025)	(0.021)	(0.034)	(0.029)
Work study hours	-0.002	0	0	0.001
	(0.001)	(0.001)	(0.002)	(0.002)

Four-year institution	-0.348***	-0.249***	-0.365***	-0.268***
	(0.021)	(0.019)	(0.026)	(0.024)
Two-year institution	-0.265***	-0.168***	-0.282***	-0.191***
	(0.019)	(0.018)	(0.023)	(0.021)
Public institution	-0.049**	-0.069***	-0.002	-0.019
	(0.018)	(0.016)	(0.023)	(0.020)
Private, non-profit institution	-0.041*	-0.055**	-0.019	-0.016
	(0.020)	(0.018)	(0.026)	(0.023)
Admission rate	-0.008	-0.044	-0.032	-0.071
	(0.033)	(0.029)	(0.043)	(0.038)
Missing variable: SAT score	-0.009	0.005	-0.054	-0.08
	(0.035)	(0.031)	(0.047)	(0.042)
Missing variable: first generation	0.015	0.018	0.025	0.032
	(0.015)	(0.013)	(0.019)	(0.017)
Missing variable: income	0.059	-0.059	0.107	-0.072
	(0.101)	(0.091)	(0.111)	(0.105)
Missing variable: cost of attendance	-0.120***	-0.101***	-0.025	-0.019
	(0.033)	(0.030)	(0.044)	(0.039)
R-squared	0.145	0.108	0.162	0.116
N	5050	4370	2820	2500

Notes: all entries in these tables are based on the authors' calculations from the Beginning Postsecondary Students Longitudinal Study (BPS:04/09). All samples sizes are rounded to the nearest ten to comply with the Institute of Education Sciences' reporting standards.

Table 2.5: Determinants of refiling for Pell recipients, by institution type

	All Pell Recipients			*Pell Recipients who Re-enrolled*		
	Four-year	Two-year	Less-than Two-year	Four-year	Two-year	Less-than Two-year
	(1)	(2)	(3)	(4)	(5)	(6)
3.00-4.00 GPA	-0.243***	-0.349***	-0.111	-0.113***	-0.184***	-0.129
	(0.029)	(0.049)	(0.083)	(0.030)	(0.050)	(0.097)
2.0-2.99 GPA	-0.213***	-0.314***	-0.047	-0.108***	-0.175***	-0.061
	(0.029)	(0.050)	(0.093)	(0.030)	(0.051)	(0.110)
1.00-1.99 GPA	-0.190***	-0.182***		-0.075*	-0.046	
	(0.031)	(0.052)		(0.031)	(0.053)	
Pell award: % of COA	-0.026	-0.294***	0.436	-0.034	-0.268***	0.377
	(0.073)	(0.066)	(0.276)	(0.061)	(0.059)	(0.314)
Other grants: % of COA	-0.132***	-0.148	0.157	-0.093***	0.034	-0.199
	(0.034)	(0.081)	(0.391)	(0.027)	(0.070)	(0.520)
Student loans: % of COA	-0.159***	-0.027	0.092	-0.098***	-0.021	0.228
	(0.031)	(0.054)	(0.120)	(0.026)	(0.049)	(0.132)
Full-time	-0.083***	0.003	-0.026	-0.047**	0.038	0.002
	(0.018)	(0.021)	(0.079)	(0.015)	(0.019)	(0.084)
Female	0.001	0.006	0.134**	0.007	-0.002	0.152**
	(0.011)	(0.018)	(0.049)	(0.009)	(0.016)	(0.058)
Underrepresented Minority	-0.026*	0.002	-0.097*	-0.01	0.02	-0.064
	(0.011)	(0.017)	(0.049)	(0.009)	(0.016)	(0.056)
Dependent	0.033	0.035	-0.202*	0.027	0.041	-0.237**
	(0.025)	(0.034)	(0.083)	(0.020)	(0.031)	(0.091)
SAT score (100 points)	0.006	-0.004	-0.078***	0.004	-0.004	-0.046*

	(0.004)	(0.007)	(0.022)	(0.003)	(0.007)	(0.023)
First generation	0.030*	-0.029	0.008	0.023*	-0.050**	0.143*
	(0.012)	(0.020)	(0.062)	(0.010)	(0.018)	(0.072)
Income ($1000s)	0	0	0.004	0	0	0.006*
	0.000	(0.001)	(0.002)	0.000	(0.001)	(0.003)
Cost of attendance ($1000s)	-0.001	-0.010***	0.023***	0	-0.010***	0.022**
	(0.001)	(0.002)	(0.006)	(0.001)	(0.002)	(0.007)
Live on campus	-0.027	0.098*	-0.237	-0.013	0.052	-0.014
	(0.017)	(0.049)	(1.201)	(0.014)	(0.042)	(1.117)
Live with parents	-0.028	-0.038	0.094	-0.006	-0.054*	0.038
	(0.017)	(0.024)	(0.057)	(0.014)	(0.021)	(0.066)
Has dependent child(ren)	-0.011	0.063*	-0.129	-0.016	0.036	-0.151
	(0.026)	(0.030)	(0.068)	(0.022)	(0.028)	(0.081)
Spouse has job	0.015	-0.06	0.139	-0.023	-0.05	-0.011
	(0.031)	(0.033)	(0.073)	(0.027)	(0.029)	(0.091)
Any outside job	-0.027	-0.041	-0.062	-0.007	-0.003	-0.027
	(0.017)	(0.030)	(0.081)	(0.014)	(0.027)	(0.090)
Hours worked at job	0.002***	0.003**	-0.001	0.001	0	-0.002
	(0.001)	(0.001)	(0.002)	(0.001)	(0.001)	(0.003)
Any work study	0.035	0.077	-0.408	0.014	0.07	-0.501*
	(0.021)	(0.055)	(0.235)	(0.017)	(0.046)	(0.251)
Work study hours	-0.003*	-0.004	0.022*	-0.001	-0.003	0.027**
	(0.001)	(0.003)	(0.009)	(0.001)	(0.003)	(0.010)
Public institution	0.002	-0.098**	0.081	-0.003	-0.139***	-0.05
	(0.019)	(0.034)	(0.083)	(0.016)	(0.030)	(0.096)
Private, non-profit institution	0.028	-0.107*	-0.214*	-0.003	-0.115**	0.036
	(0.019)	(0.048)	(0.103)	(0.016)	(0.041)	(0.117)
Admission rate	0.091**	-0.105	-0.12	0.050*	-0.058	-0.244

	(0.030)	(0.083)	(0.131)	(0.025)	(0.073)	(0.148)
Missing variable: SAT score	0.079*	-0.024	-0.645***	0.077**	-0.022	-0.423*
	(0.036)	(0.064)	(0.189)	(0.030)	(0.057)	(0.205)
Missing variable: first generation	0.036*	-0.018	0.027	0.019	0	0.114
	(0.015)	(0.024)	(0.069)	(0.013)	(0.021)	(0.078)
Missing variable: income	-0.082	0.174	-0.215	-0.046	-0.045	0.155
	(0.121)	(0.145)	(0.625)	(0.095)	(0.139)	(0.587)
Missing variable: COA	-0.078*	-0.259***	0.317	-0.069*	-0.188***	0.183
	(0.038)	(0.051)	(0.201)	(0.032)	(0.047)	(0.225)
R-squared	0.098	0.084	0.116	0.045	0.084	0.143
N	2280	2160	620	2110	1820	430

Notes: all entries in these tables are based on the authors' calculations from the Beginning Postsecondary Students Longitudinal Study (BPS:04/09). All samples sizes are rounded to the nearest ten to comply with the Institute of Education Sciences' reporting standards.

TABLE 2.6: Association between FAFSA refiling and future college outcomes

	Enrolled in 2004-05 (1)	Enrolled in 2005-06 (2)	Enrolled in 2006-07 (3)	Received AA Degree (4)	Received BA Degree (5)
Pell recipients	-0.353***	-0.252***	-0.120***	-0.039***	-0.032**
	(0.029)	(0.026)	(0.028)	(0.009)	(0.012)
Pell recipients, 3.0+ GPA	-0.347***	-0.210***	-0.111**	-0.037**	-0.028
	(0.040)	(0.037)	(0.040)	(0.013)	(0.015)
Pell recipients, enrolled in 2004-05	N/A	-0.147***	-0.109**	-0.034**	-0.01
		(0.036)	(0.034)	(0.012)	(0.017)
Pell recipients, 3.0+ GPA, enrolled in 2004-05	N/A	-0.140**	-0.157***	-0.039**	-0.009
		(0.049)	(0.037)	(0.014)	(0.020)

Notes: each column grouping of two cells represent the results from one OLS regression model. The first cell is the point estimate of the association between not refiling a FAFSA and the dependent variable; the second cell is the standard error. Sample sizes correspond to those reported in Table 4. Data sources: Beginning Postsecondary Students Longitudinal Study (BPS:04/09) and Integrated Postsecondary Education Data System.

TABLE 7: Association between FAFSA refiling and future college outcomes for freshmen Pell recipients, by institution type

Panel A: All Pell recipients

	Enrolled in 2004-05 (1)	Enrolled in 2005-06 (2)	Enrolled in 2006-07 (3)	Received AA Degree (6)	Received BA Degree (7)
Four-year Institutions	-0.360***	-0.268***	-0.164***	0.012	-0.100**
	(0.054)	(0.053)	(0.046)	(0.023)	(0.037)
Two-year Institutions	-0.357***	-0.311***	-0.116**	-0.064***	-0.033**
	(0.040)	(0.037)	(0.043)	(0.013)	(0.012)
Less-than Two-year Institutions	-0.366***	-0.096	-0.100*	-0.029**	0.006
	(0.051)	(0.050)	(0.044)	(0.010)	(0.010)

Panel B: Pell recipients, re-enrolled in 2004-05

	Enrolled in 2004-05 (1)	Enrolled in 2005-06 (2)	Enrolled in 2006-07 (3)	Received AA Degree (6)	Received BA Degree (7)
Four-year Institutions	N/A	-0.113	-0.066	0.014	-0.038
		(0.061)	(0.055)	(0.030)	(0.050)
Two-year Institutions	N/A	-0.228***	-0.141**	-0.057**	-0.031
		(0.053)	(0.051)	(0.018)	(0.017)
Less-than Two-year Institutions	N/A	0.025	-0.099	-0.034*	0.018
		(0.067)	(0.051)	(0.014)	(0.018)

Notes: each column grouping of two cells represent the results from one OLS regression model. The first cell is the point estimate of the association between not refiling a FAFSA and the dependent variable; the second cell is the standard error. Sample sizes correspond to those reported in Table 5. Data sources: Beginning Postsecondary Students Longitudinal Study (BPS:04/09) and Integrated Postsecondary Education Data System.

CHAPTER 3:

Where do the dollars go?

Investigating the distribution of campus-based financial aid

ABSTRACT

Each year, the federal government distributes hundreds of billions of dollars on financial aid. While the larger Pell grant and Stafford programs receive significant attention in the public sphere and among researchers, I focus on a less well-known and under-studied form of federal aid: campus-based financial aid. Campus-based aid consists of three need-based programs: Perkins loans, Federal work-study, and the Federal Supplementary Education Opportunity grant. Unlike other federal aid, funding allocations for these programs are supplied to participating colleges and universities, who in turn distribute the aid to students. The process by which institutions distribute funds is both flexible under regulatory guidelines, and opaque to students and researchers. The purpose of this paper is to provide critical information for policy decisions regarding the future of campus-based aid, as well as gain a better understanding how institutions make the complex decisions regarding aid distribution. Consistent with prior research, I use institution level data to find that campus-based aid is concentrated among students attending higher-cost private institutions, where per student disbursements are as much as five times greater than lower-cost institutions. Overall, I find that a minority of eligible students receive campus-based aid. Using a nationally representative sample of students enrolled in Fall 2011, my results suggest that institutions are using campus-based aid – particularly Federal work-study – to supplement the financial aid packages of students who they view as more desirable. I conclude by describing alternative distributions of campus-based aid using rules more similar to the larger federal programs, the Pell grant and Stafford loans.

I. INTRODUCTION

During the 2013 fiscal year, the federal government delivered $137.6 billion in federal Title IV financial aid to 14 million students attending institutions of higher education (Federal Student Aid, 2014). A large proportion of these dollars provided funding through two well-known programs: the Pell Grant and Stafford Loans. Pell is the largest means-tested grant program in the country, and Stafford loans provide a low-interest borrowing option for a population that may otherwise face credit constraints. These programs are often at the center of public dialogue and political debates surrounding higher education, and a considerable amount of research is devoted to understanding their effectiveness in improving students' access to and success in college (Dunlop, 2014; Hansen, 1983; Kane, 1995; Marx & Turner, 2015; Rubin, 2011; Seftor & Turner, 2002; Wiederspan, 2015).

In this paper, I focus on federal aid programs that are less well-known and much less well-understood: campus-based financial aid. Campus-based aid consists of three programs: Perkins loans, Federal Work-Study (FWS), and the Federal Supplementary Educational Opportunity Grant (FSEOG). While significantly smaller than the Pell grant or Stafford loans programs, campus-based aid still provides a non-trivial amount of financial support to college students. During the 2011-12 academic year, nearly $3.1 billion of campus-based aid were disbursed to millions of students, across thousands of institutions. Twenty-one percent of undergraduates attending public or non-profit private four-year institutions received campus-based aid in 2011-12; for these recipients, campus-based aid dollars accounted for 12.4 percent of their total aid package.[73] Each

[73] Source: author's calculations from NPSAS:12

campus-based aid program is classified as need-based; that is, according to federal statutory guidelines, only students with demonstrated financial need – determined by a student's expected family contribution and cost of attendance – should qualify to receive these funds.[74] This eligibility requirement of financial need is the same as with the two larger need-based federal aid programs, the federal Pell grant and subsidized Stafford Loans. However, as I detail below in Section II, there are critical differences between campus-based aid and Pell grants or Stafford loans. Unlike the Pell grant and Stafford loans that act as voucher systems – that is, a student is eligible for the sample Pell grant or Stafford award that may be used at any participating institution – individual institutions decide a student's campus-based aid award. For each of the three campus-based aid programs, individual higher education institutions apply for and receive lump sum allocations of federal funds. While there are statutory regulations with which institutions must comply regarding the distribution of campus-based aid funds, institutions have a great deal of latitude in choosing which of their students receive the aid, and how much campus-based aid each student receives. What is more, institutions' financial aid webpages typically provide little to no information regarding their specific eligibility requirements for campus-based aid, and instead cite vague regulatory guidelines. This opaqueness has contributed to the lack of information that researchers and policy makers have regarding how campus-based aid is operationalized by individual institutions.

[74] EFC is calculated using a complex formula, accounting for the student's household income, assets, and family composition. This information is collected from students through the Free Application for Federal Student Aid (FAFSA). A student's COA includes tuition and fees as well as other associated costs to attending, including books and living expenses.

In this study, I investigate how institutions distribute campus-based aid. My analysis will inform future policy decisions surrounding the allocation of funds across federal aid programs. President Obama proposed significant changes to campus-based aid policy, such as expanding the Perkins loans program nearly eight-fold, removing institutions as the lenders of Perkins loans, and no longer subsidizing Perkins loans (Lanza, 2015; Lewin, 2012). Most recently, the U.S. Congress allowed the Perkins loan program to expire in September 2015, although a few months later voted to extend the program for an additional two years (Stratford, 2015). An understanding of how the current campus-based aid system operates is critical to making informed decisions about pushing these proposed policies forward, or drafting alternative approaches. Second, this research will inform the broader question of the degree to which institutional policies around the allocation of need-based aid align with the federal priority of using aid to increase access to college for lower-income populations. By setting prices and distributing a substantial amount of their own financial aid – over one-third of college students received institutional grants in 2011-12, with an average award of $8,908 – institutions play a large role in determining college affordability. [75] Given the relatively small size of campus-based aid programs, institutions have very limited funds to distribute to their eligible students – making campus-based aid a particularly meaningful poignant way to examine how institutions allocate scare resources across students. As I discuss in more detail in Section III, institutions face a complex and conflicting array of incentives when deciding how to allocate institutional aid financial aid.

[75] Source: Digest of Education Statistics 2013, Table 331.20.

Using institution-level and student-level data from a large, nationally representative sample, I address several specific questions regarding the distribution of campus-based aid. First, I describe the types of institutions which participate in campus-based aid. While I show that nearly all four-year public and non-profit private institutions participate in FSEOG and FWS, lower-cost institutions that serve the greatest proportion of low-income students are less likely to participate in the Perkins loans program. What is more, I find that per student campus-based aid disbursements are substantially lower at these institutions serving the most low-income students. These results are consistent with a recent study, which documented the patterns of FSEOG and FWS institutional allocations (Kelchen, 2015). Where my study differs from Kelchen's is that I also use detailed student-level data identify students who receive campus-based aid, and compare them to otherwise eligible students who did not receive campus-based aid. Specifically, I estimate the share of eligible students who receive campus-based aid, and explore how this varies by institution type. I find that a minority of eligible students receive campus-based aid, particularly at public and less selective institutions.

I then use student-level analysis to estimate the predictors of campus based-aid receipt. From the analysis, I find that institutions target FSEOG funds at very low-income students; however, institutions award FWS and Perkins quite differently from FSEOG. My results suggest that institutions use FWS and Perkins loan aid to supplement the financial aid packages of their preferred students, instead of supplanting the financial aid packages of other students. The results from these analysis also show that institutions heavily rely on their priority FAFSA deadline to determine campus-based aid eligibility. Finally, I simulate alternative distributions of campus-based aid, whereby

the FSEOG, FWS, and Perkins dollars are distributed to all eligible low-income students. This exercise allows me to compare how differently institutions distribute campus-based aid, compared to a voucher system similar to how Pell grants or Stafford loans are distributed. From this analysis, I conclude that while institutions are currently targeting FSEOG funds to the lowest-income students, this is less true for Perkins and FWS. I conclude the paper with a discussion of considerations for future policy decisions regarding campus-based aid.

II. PROGRAM DETAILS

In this section, I provide in-depth detail on the three campus-based financial aid programs, and compare the structure of these programs with the other federal aid programs. Each of the campus-based aid programs was authorized by Title IV of the Higher Education Act of 1965, making them some of the longest standing in U.S. financial aid.[76] There are many unique aspects of campus-based aid programs. First, institutions apply for and receive federal allocations for each of the three programs.[77] The federal allocations are based on a complex statutory formula detailed in the Higher Education Act of 1965 (HEA), as amended with each new authorization of the HEA. In simplified terms, allocations are largely determined by historical allocations; currently, the base of the allocations is equal to the amount an institution received in 1999.[78] The

[76] Perkins Loan program was previously names the National Direct Student Loan Program, which was a continuation of the National Defense Loan Program as authorized by the National Defense Act of 1958. The Federal Work-Study program was previously named the College Work-Study program.
[77] Institutions may participate in all three programs, one or two of the programs, or none.
[78] If an institution did not participate in the campus-based aid program in 1999, then its current allocation is based on its allocation in its second year of participation. If an institution is in its first or second year of participation, then the allocation is determined by the Secretary of Education. To apply for an allocation of a campus-based aid program, institutions must submit a Fiscal Operations Report and Application to Participate (FISAP) to provide information about campus-based expenditures during the prior year to renew for the following year. If the institution is a new applicant, it must provide information regarding the financial need of the institution's students.

amount an institution received in 1999, in turn, was in large part based on its allocation in 1985. The original historical allocation was a function of "institutional need," which was largely a function of institutional cost. In a given year, any additional federal funds available beyond the base amounts are distributed in proportion to the financial need of eligible students at each institution in the prior year, referred to as the "fair-share" formula. As a result of the historical base and fair-share formula, institutions with higher costs of attendance (i.e. non-profit four-year institutions) receive disproportionately larger allocations, even though these institutions serve fewer low-income students (Kelchen, 2015; Smole, 2005; Scott-Clayton, 2011b). Upon receiving these federal allocations, institutions must make contributions of non-federal funds that equal at least 25% of program expenditures.[79] For example, if an institution receives a federal allocation of $750,000 for a campus-based aid program, the institution must contribute $250,000 in funds toward program expenditures.[80]

While an institution's allocation is set by the federal formula, institutions do have some flexibility in re-appropriating campus-based aid funds. Institutions can choose to transfer up to 25% of allocations from one campus-based program to another, with the exception that no FSEOG funds may be transferred to Perkins Loan funds.[81] In addition, institutions may set aside up to 10% of FWS or FSEOG to pay for expenditures on these programs in the prior year, or reserve this portion to be spent on these programs in the subsequent year.

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[79] Institutions classified as historically minority serving colleges may receive a waiver to contribute the non-federal funds for the FWS and FSEOG programs.

[80] From the federal allocation, institutions may deduct an administrative cost allowance (ACA) to cover costs associated with distributing the campus-based aid. The ACA may be up to: 5% of the first $2.75 million; 4% of the second $2.75 million, and 3% of all additional funds.

[81] In the case of institutions designated as "work-colleges", 100% of Perkins Loans allocations may be transferred to FWS.

It is the responsibility of an institution to distribute campus-based aid to its eligible students. In order to be considered eligible for campus-based aid, students must satisfy the same eligibility requirements as to receive other forms of Title IV aid (such as the Pell grant or Stafford Loans); namely, a student must: be enrolled in an eligible degree or certificate program; not also be enrolled in an elementary/secondary education program; have a high school diploma, GED, or equivalent; be making satisfactory academic progress in their program; not have been convicted of a federal or state drug possession or sale or drugs; not be currently incarcerated; be a U.S. citizen or permanent resident; and meet selective service registration requirements (FSA Handbook, 2014). In addition, eligible students must have financial need. As defined by the HEA, financial need is equal to:

$$FinancialNeed = COA - EFC - OtherAid$$

where COA is the student's cost of attendance (i.e. tuition and fees, books and supplies, living costs, etc.); EFC is the student's expected family contribution; and $OtherAid$ is equal to the estimated amount of financial aid the student will receive from all other aid sources. The amount of campus-based aid the institution awards to a student cannot exceed the student's financial need. Each campus-based aid program has additional eligibility requirements, which I detail below when applicable.

A. Federal Supplemental Educational Opportunity Grant (FSEOG)

Similar to the Pell grant, the FSEOG is a need-based grant that students do not need to pay back. The minimum award for a full-time recipient is $100; the maximum is $4,000. However, most students do not receive an FSEOG close to this maximum; in 2011-12, 90% of undergraduate institutions do not award FSEOGs more than $2,000.[82]

Institutions must give priority to students with exceptional financial need when awarding FSEOG funds. Unlike the two other campus-based aid programs, there is more concrete regulation regarding this requirement for the FSEOG program. An institution first selects the "FSEOG first selection group", which consists of students with the lowest EFCs who will receive a Pell grant during the award year (FSA Handbook, 2014; Volume 3, page 3-130). If all Pell grant recipients are awarded an FSEOG and funds still remain, then an institution then selects the "FSEOG second selection group", consisting of students with the lowest EFCs who will not receive a Pell grant. In practice, most institutions do not select a FSEOG second selection group: less than one percent of FSEOG recipients did not also receive a Pell grant in 2011-12. However, this process is not as stringent as it may appear.[83] Institutions are allowed to categorize students by "class standing, enrollment status, program, date of application, or a combination of factors," and allocate FSEOG differently across these groups without taking into account relative financial need (FSA Handbook 2014-15, page 3-131). This stipulation gives institutions considerable control over the FSEOG funds. For example, an institution may allocate considerably more funds to upper-classmen enrolled in STEM degree programs who submit a FAFSA before March 1st, compared to entering freshmen who have not

[82] Source: author's calculations from NPSAS:12, using a sample of undergraduate students enrolled in Fall 2011 at a public or non-profit private four-year institution.
[83] Source: author's calculations from NPSAS:12.

declared a major and submitted a FAFSA after June 1st. The FSA Handbook cautions that this system does not allow institutions to allocate FSEOG funds on a first-come, first-served basis; however, a simple web search shows that many institutions state that they award FSEOG funds precisely in this disallowed manner.[84]

B. Perkins Loans

Perkins Loans are subsidized loans with a fixed, low-interest rate of five percent.[85] For Perkins Loans, the institution is the lender; this system is in contrast to Stafford Loans, which are originated from U.S. Department of Education.[86] Interest does not accrue while a student is enrolled at least half-time, and there is a nine-month grace period after enrollment during which students are not required to make payments. Perkins Loans must be paid back within ten years of the borrower entering repayment. Perkins Loans may be forgiven in part or in full if the borrower enters a career in public service, such as active-duty military service or full-time teaching at a school serving a low-income population. There are several deferment or forbearance options if the borrower can demonstrate economic hardship.[87] If a borrower consolidates a Perkins Loan, then the resulting Direct Consolidation Loan is eligible for alternative, income-

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[84] Examples include Temple University (http://sfs.temple.edu/financial-aid-types/grants/federal-grants); Southern Methodist University (http://www.smu.edu/EnrollmentServices/FinancialAid/TypesOfAid/Grants/SEOG); University of Maryland University College (http://www.umuc.edu/students/aid/grants/seog.cfm); and Augusta University (http://gru.edu/finaid/ grants.php). Screen shots of these institutions' financial aid webpages are included in the Appendix (Figures A3.3 through A3.7).

[85] The Perkins loan interest rate has been historically lower than that of Stafford loans. However, the interest rate for subsidized Stafford loans has been below 5% since 2010-11. Source: http://www.finaid.org/loans/ historicalrates.phtml, https://www.edvisors.com/college-loans/federal/stafford/interest-rates/

[86] Prior to the 2010-2011 academic year, Stafford Loans were also originated through private lenders (e.g. Sallie Mae) under the Federal Family Education Loan (FFEL) Program. The FFEL Program was terminated with the passage of the Health Care and Education Reconciliation Act of 2010.

[87] See Federal Regulations 34 CFR 674.33 and 34 CFR 674.34 for full list of deferment and forbearance options.

driven repayment plans.[88] These terms are quite similar to those of subsidized Stafford Loans, which had a fixed interest rate of 3.4 percent in 2011-12. Certainly, Perkins loans are more attractive than unsubsidized Stafford loans, which do accumulate interest while students are enrolled, and had a higher interest rate in 2011-12 (6.8%). Through the Perkins Loan program, undergraduate students can borrow up to $5,500 per academic year, with a lifetime aggregate limit of $27,500.[89] These are the mandated federal maximums – individual institutions may decide to offer students less than these maximums. For example, the University of Virginia typically does not award more than a $4,000 Perkins Loan per year to an individual student.[90] In fact, 90% of recipients in 2011-12 received a Perkins award of $3,000 or less.[91]

When awarding Perkins Loans, institutions must "give priority to those students with exceptional financial need" (34 CFR 674.10). However, in the case of Perkins Loans, it is up to the institution to define "exceptional financial need." While institutions are required to put their Perkins Loans selection procedure in writing and uniformly apply the procedure, this information is not readily available to prospective students or other interested parties. Instead, institutions typically report the vague statutory eligibility requirements on their financial aid websites.[92]

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[88] Source: https://studentaid.ed.gov/repay-loans/understand/plans/income-driven. In addition, the individual lenders of Perkins Loans (i.e. the institutions) may offer income-driven repayment plans to their borrowers without the need to consolidate.

[89] Graduate students are also eligible to receive Perkins Loans, with an annual maximum of $8,000 and lifetime maximum of $60,000. Graduate students are also eligible to receive FWS, but not FSEOG funds. In this paper, I focus exclusively on the distribution of campus-based aid to undergraduate students.

[90] Source: http://sfs.virginia.edu/loans/2013-2014

[91] Source: author's calculations from NPSAS:12.

[92] For examples, see: University of Kansas (http://affordability.ku.edu/financialaid/loans); University of Virginia (http://sfs.virginia.edu/new/aid/loans2016); Harvard University (https://college.harvard.edu/financial-aid/types-aid/loans). Screen shots of these webpages are provided in the Appendix (Figures A1, A2, and A3).

C. Federal Work-Study (FWS)

The FWS program subsidizes part-time employment of students. While many FWS participants are employed by the institution and work on-campus, it is possible for a student to earn FWS by working at a public or private organization off-campus.[93] There is no limit to the number of hours worked or total funding received by a student participating in FWS (other than that the award must not exceed financial need); although the vast majority (93%) of FWS participants work no more than 20 hours per week.[94] Students must be paid a wage that meets requirements for federal, state, and local minimum wage laws. Unlike the Perkins Loan and FSEOG programs, participation in FWS does not require the student to have "exceptional" financial need. Instead, institutions may select FWS recipients from the population of students with financial need – as is the case with Perkins Loan selection, institutions must have written selection procedures. While statutory regulations require institutions to "make employment under FWS reasonably available, to the extent of available funds, to *all eligible students*" (34 CFR 675.10, emphasis added), only 16% of FWS participating institutions do in fact award FWS aid to all students with financial need (Scott-Clayton, 2011b). This pattern is likely driven by institutions' preference for work-study participants to work a minimum number of hours per week. As I discuss in more detail in Section V, having more work-study participants each work fewer hours per week would likely result in a decrease in productivity.

[93] If a student works for a public agency or non-profit organization, then the "work that the student performs must be in the public interest"; if a student works for a for-profit organization, then "the work that the student performs must be academically relevant to the student's educational program, to the maximum extent practicable" (34 CFR 675.22-675.23).

[94] Source: author's calculations using NPSAS:12, using a sample of undergraduate students enrolled in Fall 2011 at a public or non-profit private four-year institution.

III. LITERATURE REVIEW

I begin with an overview of campus-based aid, providing relevant program details and regulations. Because campus-based aid is rarely studied and is quite different from the larger, more well-known federal aid programs, this overview is critical to understanding the forthcoming analyses. I then discuss the literature focused on two different hypotheses regarding how higher education institutions incentives: preferential packaging and financial aid capture (the latter commonly referred to as "The Bennett Hypothesis). This literature informs the hypotheses regarding how institutions will choose to distribute campus-based aid.

A. Campus-based financial aid

Despite the long history of campus-based financial aid, researchers have devoted little attention to these programs. Since campus-based aid programs are quite small relative to Pell grant and Stafford loans programs, campus-based aid programs do not draw the attention from the popular press or policy makers (with the exception of the recent coverage of the Perkins loan program expiration, as mentioned above in Section I). The complexity of the statutory formulas determining allocations and the opaqueness of how institutions make their award decisions makes it difficult to develop and test relevant hypotheses regarding the operation of these programs.

There are two major exceptions to this lack of campus-based aid research. First, there are two recent papers focused on evaluating the efficacy of FWS in improving student outcomes. Using variation in FWS funding levels at public institutions in West Virginia, Scott-Clayton (2011b) found that FWS participation significantly improved the academic outcomes (i.e. GPA, credit accumulation, degree completion) of men, but was

detrimental to the academic performance of women. In a complementary analysis, Scott-Clayton & Minaya (2015) showed that FWS participation had positive effects for students who otherwise would have worked at a non-FWS job, but slightly negative effects for students who otherwise would not have worked at an outside job.

The second exception to the lack of campus-based aid research is a recent paper by Robert Kelchen that examined how FSEOG and FWS federal allocations are disbursed across institutions (Kelchen, 2015). Using institution-level data from the Integrated Postsecondary Education Data System (IPEDS) and Title IV financial aid volume reports, Kelchen correlated institutions' disbursements per student with institution-level characteristics. Using regression analysis, he found that institutions that enroll more full-time students, enroll more underrepresented minorities, have higher average net prices, and have larger endowments receive more FWS and FSEOG disbursements per student. He also found that public institutions and those that enroll more undergraduate students have lower FWS and FSEOG disbursements per student. To provide context for the rest of my results, I perform a similar analysis to Kelchen's in Section V.B.

Kelchen critiqued the current campus-based aid allocation formulas for heavily relying on historical allocations and the weight of students' unmet need – which necessarily increases with institutional cost. These details result in institutions that have the highest costs of attendance, while serving the fewest low-income students, receiving disproportionately large disbursements per student. Kelchen offered some alternative allocation formulas to replace the current rules, and simulated what the distribution of campus-based aid funds across institutions would be under these alternative rules. For example, Kelchen tested formulas whereby federal allocations would be based solely on

the number of students at a given institution who receive a Pell grant, or by capping the institutions' cost of attendance that enters into the formula. While these alternative formulas may be more equitable, they do have unintended consequences. For example, as a result of the alternative allocations, Kelchen reported that the University of Phoenix would benefit the most from the alternative allocations. Given concerns surrounding the amount of Title IV financial aid dollars already flowing to for-profit institutions, policy-makers would likely not view this outcome as optimal.

B. Institutional incentives and preferential packaging

Traditional economic theory provides two explanations for how institutions decide to distribute financial aid. First, through financial aid awards, it is possible for institutions to practice price discrimination to maximize tuition revenues, whereby they adjust an individual student's cost of attendance from the "sticker price" to the "net price" he is willing and able to pay. Because institutions have incentives to enroll the highest performing students, the second theoretical explanation is that institutions use financial aid offers to compete for the best students. This argument may explain, at least in part, why Princeton University adopted a no-loan policy in 2001, with several other institutions following suit shortly after (Brownstein, 2001; Kurz, 1995; Long, 2011; Rothstein & Rouse, 2011; Winston, 2001). These two theories are not mutually exclusive, and both sets of incentives likely play significant roles in determining financial aid offers (Baum & Lapovsky, 2006; Ehrenberg & Murphy, 1993; Hoxby & Avery, 2004; Hossler, 2000; Kurz, 1995; McPherson & Schapiro, 1998; Wilkinson, 1998; Winston & Zimmerman, 2004).

Clearly, the awarding of financial aid by institutions is a complex process with multiple layers of incentives. The complexity only increases when introducing different forms of financial aid. Quite relevant to my current study, a strand of literature considers how institutions package different forms of aid: grant versus "self-help" aid (i.e. loans and work-study). These different forms of aid allow institutions to offer various types of aid packages to students, so that institutions may offer more desirable financial aid packages to attract the best students. This practice is known as "preferential packaging," which some argue is "unfair" and often hurts more disadvantaged students (Duffy & Goldberg, 1998; Kurz, 1995; Quirk, 2005; Wilkinson, 1998).

One limitation to the line of research investigating the distribution of institutional aid is that it focuses primarily on the most elite institutions in the country (e.g. Hill, Winston & Boyd, 2005). This focus is likely driven by the high volume of institutional grant aid distributed by these institutions, as well as researcher convenience. While prominent in the public eye, these Ivy-League and elite liberal arts colleges are not representative of the U.S. higher education system as a whole. Elite institutions serve a disproportionally small number of disadvantaged students, while having large endowment and donor bases. They also have the greatest incentives to compete for the best students, and do so on a national (and international) scale. Therefore, one of the major contributions of my study will be to consider the financial aid practices for a nationally representative set of institutions, and to explore how these decisions differ by type of institution.

C. The Bennett Hypothesis

In a 1987 *New York Times* editorial entitled "Our Greedy Colleges", then Secretary of Education William J. Bennett argued that colleges and universities raise their prices of attendance in tandem with increases in federal financial aid availability, thereby capturing the subsidies meant for students. Many studies have tested the Bennett Hypothesis, with mixed results. Several studies found that institutions capture at least part of financial aid from outside sources (Cellini & Goldin, forthcoming; Long, 2004; Rizzo & Ehrenberg, 2004; Singell & Stone, 2007; Turner, 2014; Turner, 2012; Turner, 1998). For example, Long (2004) tests the Bennett Hypothesis in the context of the Georgia HOPE Scholarship, a generous and wide-reaching merit-based scholarship. Long finds that after the introduction of the HOPE, public institutions in Georgia increased room and board charges; private institutions also responded by increasing both list and net tuition prices. Using variation in the number of Pell grant recipients at an institution, Singell & Stone (2007) find that while public institutions are not responsive to increases in total revenues from Pell grants, private institutions capture nearly 100% of increased Pell funding. Cellini & Goldin (forthcoming) focus on the expanding for-profit sector, which is at the center of many recent discussions of college affordability and quality. Cellini & Goldin find that for-profit institutions that participate in Title IV program – and thus whose students are eligible to receive Pell grants and Stafford loans – charge tuition prices 78% higher than for-profit programs that do not participate. However, not all studies have found evidence in support of the Bennett Hypothesis, with some studies even finding a negative relationship between tuition and state grant aid at some public institutions (Curs & Dar, 2010; Doyle, Delaney, & Naughton, 2009; Long, 2008; McPherson & Schapiro, 1991).

The studies discussed above demonstrate that institutions may be price responsive to changes in outside aid availability, and this responsiveness varies by type of institution. However, these papers do not directly examine how institutions' incentives to distribute their own aid awards vary with outside aid receipt. For this reason, Turner (2014) is particularly relevant to my proposed study. Using a regression discontinuity/regression kink design, she estimates the effect of Pell grant awards on institutional aid offered to students. Her results show that while students with EFCs just low enough to qualify for a Pell grant actually receive *more* institutional grant aid than those who just miss receiving Pell, the lowest-income Pell recipients receive *less* institutional grant aid; this pattern is strongest at public and more-selective private institutions. Her findings suggest that institutions value having students identified as Pell recipients and thus offer more aid to students at the higher end of the Pell distribution, while allowing Pell grant dollars to crowd out institutional aid in the case of lowest income students. However, her empirical specification does not account for whether the lowest income students in her sample have any remaining unmet need. For example, if the lowest income students have their full financial need met by federal grants, state grants, and private sources, then institutions would not be able to provide the full amount of institutional aid they otherwise would. Despite this limitation, Turner's results suggest that federal aid affects the distribution of institutional grant aid. This in turn suggests that institutions would behave similarly in deciding how to distribute campus-based aid.

Two important implications arise from the research investigating the Bennett Hypothesis. First, these studies show that institutions are not static actors; instead, institutions actively respond to outside factors by changing prices and their packaging of

institutional aid. Second, by documenting the differential responses across public, non-profit, and for-profit institutions, these studies also show that an institution's incentives and ability to actively engage in changing prices or aid packages varies significantly by the type of institution. This finding is a major consideration in my empirical strategy, detailed below.

IV. DATA

For this study, I will primarily use data from the National Postsecondary Student Aid Study (NPSAS). These data are collected and maintained by the National Center for Education Statistics, and are available to researchers with a restricted-use data license. For the past twenty-six years, NPSAS waves have been conducted approximately every four years. I use the most recent NPSAS wave corresponding to the academic year 2011-12 (NPSAS:12). NPSAS provides rich student-level data for a large, nationally representative sample of students (95,100 undergraduates) enrolled at postsecondary institutions during the 2011-12 academic year, i.e. between July 1st, 2011 and June 30th, 2012. In this paper, I limit my analysis sample to first- through fourth-year undergraduates enrolled full-time during the Fall 2011 term at four-year public or non-profit private institutions, resulting in a full sample size of over 23,000 students. I discuss my rationale for excluding two-year and for-profit institutions at the end of this section.

For each student observation, I observe basic demographic and academic background information, including race, gender, age, household income, parental education, and state of residence, as well as entrance exam scores (SAT or ACT). For students who file the Free Application for Federal Student Aid (FAFSA), I also observe

all the information gathered on the FAFSA used to determine a student's EFC (income, assets, family composition, etc.), as well as the date when the student filed the FAFSA. Most importantly, I observe all financial aid awarded to the student from all sources (i.e. federal state, institutional, or private), by aid program. That is, I separately observe Pell versus FSEOG awards; likewise, I separately observe Stafford versus Perkins loan borrowing. With the NPSAS, I observe which institution the student attends and basic information about this institution, including location, level (i.e. four-year, two-year, or less-than two-year); control (i.e. public, private non-profit, private for-profit), selectivity (i.e. very selective, moderately selective, minimally selective, and open admission).[95] NPSAS also provides student-level and institution-level sampling weights, which I use in all analyses.

Using institution identifiers provided in NPSAS, I merge additional institutional data from the Integrated Postsecondary Education Data System (IPEDS) including sticker price (gross tuition and fees), total undergraduate enrollment, number of Pell grant recipients enrolled, and number of Stafford loan borrowers enrolled. I also use data from Federal Student Aid's Title IV Program Volume Reports.[96] These reports contain institution-level data on the disbursements of federal aid, including number of recipients and total aid dollars disbursed.[97] For campus-based aid programs —Perkins Loans, FWS,

[95] These selectivity categories are provided by NPSAS:12, and were developed using the following criteria: whether the institution was open admission (i.e. no minimal requirements); the number of applicants; the number of students admitted; the 25th and 75th percentile of ACT and/or SAT scores, and whether or not test scores were required for admission.
[96] Data source website: https://studentaid.ed.gov/about/data-center/student/title-iv
[97] One complication to the NPSAS to Title IV Volume Report merge is that institutions in NPSAS are identified with the IPEDS UnitID, while institutions in the volume reports are identified with the OPEID. For smaller university systems, OPEID sometimes does not separate out individual institutions. For example, there is not a separate OPEID for Kent State University at Salem and Kent State University at Stark. See the Technical Appendix in Kelchen (2015) for more details. In all analysis containing

and FSEOG – these volume reports are available for each academic year. These reports provide key information for my research design, including identification of institutions that participate in each campus-based aid program, and total and per-student funding allocations. Combining this institution-level data with the student-level data from NPSAS will provide a clearest picture possible of the distribution of campus-based aid.

I exclude for-profit institutions and two-year institutions for several of reasons. First, I am much less likely to observe campus-based aid disbursements from the Title IV Volume Reports for these institutions. While I am able to match disbursement data for over 95 percent of four-year public or non-profit private institutions, the match rate is 88% for two-year public or non-profit private institutions and 32% for for-profit institutions. Second, participation in campus-based aid programs is substantially lower at for-profit and two-year institutions. While 19 percent of students at institutions in my sample receive some form of campus-based aid, only 5 percent of students at two-year institutions and 15 percent of students at for-profit institutions receive any form of campus-based aid. Third, for-profit and two-year institutions are inherently quite different from the more traditional four-year public and private non-profit institutions. The most striking difference between these types of institutions is the amount of institutional grant aid provided. While institutions in my sample distribute approximately $1,200 in institutional need- and merit-based grant aid per student, two-year schools distribute $132 per student and for-profit schools distribute $56. Due to these differences, it would not be appropriate to include two-year and for-profit institutions in

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institution-level disbursements per student, I do not include any institutions with a non-unique OPEID. This restriction excludes 34 institutions and 909 students from the analysis.

this analysis; however, I do suggest exploring campus-based aid distribution at two-year and for-profit institutions as an area for future research.

There are several advantages to using the NPSAS:12 data. First, it constitutes a large, nationally representative sample of students enrolled within the last five years, making the analysis relevant for current policy discussions. Second, compared to other available data sources, NPSAS provides the most detail on financial aid received by students. There are, however, a few limitations to the data. First, I only observe students once they are enrolled. These restrictions of the data may be problematic for my analysis for two reasons. If an offer (or lack thereof) of campus-based aid induces a prospective student to choose to enroll in college or not at all, this restriction would create a selection bias in the sample. However, I argue that this case is highly unlikely. As discussed above in Section I, campus-based aid represents a small fraction of financial aid available to students. Most campus-based aid recipients also receive Pell grants; all are eligible to borrow subsidized and unsubsidized Stafford loans; and many receive state grants. That is, prospective students have access to a variety of other financial aid sources other than campus-based aid in order to finance their education; therefore, the offer of campus-based aid is arguably highly unlikely to influence a student's decision of whether or not to enroll in college at all.

A more conceivable scenario would be that, for a student who is accepted for admission to institutions A and B but only receives an offer for campus-based aid from institution B, the differential offer of aid will influence the student's college choice. To estimate the degree to which this scenario is driving my results, I perform robustness

checks limiting the sample to students who sent their FAFSA to only one school (approximately 42 percent of first-year students in my sample).

The second limitation to using the NPSAS:12 is that I only observe aid awards (not offers) that were received by students. Presumably, there are likely a non-trivial percentage of students who would decline the offer of campus-based aid if offered. Since students who would accept an offer of campus-based aid are probably quite different than students who would not accept, I identify students who I assume would be likely to accept the offer of campus-based aid, and limit my student-level analysis to students who either did accept a campus-based aid offer, or who would have been likely to accept the offer. The first restriction I impose is that students must have filed the FAFSA, as this is a requirement for campus-based aid receipt. I assume that every student would accept an FSEOG award if offered, since the FSEOG is a grant that does not require any service and never has to be paid back.[98] In the case of FWS, I limit my sample to students who expressed an interest in work-study aid on the FAFSA. In the case of Perkins, I limit my sample to answered yes to the following NPSAS:12 student survey question: "Would you have borrowed more money for the 2011-12 school year if you could have?"

A separate limitation to the data is that while the sample is representative of college students nationally, the NPSAS sample of students who enroll at a given institution is not necessarily representative of the student population at that institution. Given the large number of undergraduate institutions in NPSAS:12 (n=1,460), the

[98] To the best of my knowledge, FSEOG awards are accepted by the student in the same manner that Pell grants are accepted. For example, the University of Virginia automatically accepts all grants on behalf of the student (http://sfs.virginia.edu/awardletter). For another example, the University of Kansas requires its students to accept all awards through their "Enroll & Pay" system (http://affordability.ku.edu/financialaid/apply/awards)

average number of observations per institution is relatively small (mean = 65 students per institution, standard deviation = 82). As such, it will not be possible to compare how two similar institutions, such as the University of Virginia and the University of North Carolina at Chapel Hill, distribute campus-based aid with reasonable precision. Instead, I compare campus-based aid distribution across institution type, defined as the intersection of institution control, and selectivity. Given the large sample of both students and institution in NPSAS, I am confident that I provide an accurate portrayal of how campus-based aid is distributed within these institution types.

V. ANALYSIS

The goal of my empirical analysis is to provide an understanding as to campus-based aid dollars are distributed to eligible undergraduate students. I begin by describing the characteristics of the institutions that choose to participate in campus-based aid programs. Among participating institutions, I describe the level of campus-based aid disbursements per student, and how these disbursements differ by institution type and characteristics. Then, using institution-level characteristics, I describe how institutions choose to distribute campus-based aid dollars among the eligible population; that is, do institutions offer campus-based aid to all eligible students, or focus the dollars on a small subset? Next, I perform a student-level analysis to estimate the predictors of campus-based aid receipt, which provides valuable insight on how institutions choose to which students to offer campus-based aid. Finally, I simulate hypothetical distributions of campus-based aid based on alternative distribution rules, and compare the current distribution of campus-based aid with simulated distributions.

A. Institutional Participation

As noted in Section II, institutions voluntarily participate in campus-based aid programs, and not all Title IV participating institutions (i.e. those at which Pell grants or Stafford loans may be used) participate in campus-based aid programs.[99] I observe institution-by-program-level participation using the Title IV Program Volume Report. If there is at least one student at an institution who receives an FSEOG (FWS, Perkins loan), then I code that institution as a participant in the FSEOG (FWS, Perkins loan) program Table 3.1 shows the estimated participation rates, overall and by institution type, for my sample of four-year public or private non-profit institutions. Panel A shows that virtually all institutions participate in the FSEOG program, with public institutions being slightly more likely to participate than private non-profit institutions, and less selective institutions being slightly less likely to participate than more selective institutions. Panel B shows that there is also an extremely high participation rate for FWS among these institutions. Overall, 98.7 percent of institutions participate in FWS. Again, private institutions and less selective institutions are slightly less likely to participate; still, the lowest estimated participation rate is 91.5 percent (public, open admission institutions). Compared with the FSEOG and FWS programs, there is relatively less participation in the Perkins Loans programs. For the full sample of public or non-profit private four-year institutions, the estimated participation rate is 86.9 percent. As Panel C of Table 3.1 shows, this lower participation rate is driven by low participation among the least selective institutions: less than half of open admission public institutions participate in the Perkins loans program and roughly one-quarter of open admission private institutions

[99] Institutional participation in other Title IV programs is not a sufficient condition for participation in campus-based aid programs. Institutions must submit a separate application to participate in campus-based aid programs, which may be approved or denied (Federal Student Aid, 2011). However, the exact requirements for approval are not readily available, nor is a list of approved or denied applicants since 1999-2000.

participate in the Perkins loans program. Still, the overall participation rate even for Perkins loans is quite high. When considering that institutions must contribute one-quarter of funds distributed through campus-based aid programs, the high participation rates in campus-based aid programs demonstrate that institutions have high demand for access to additional federal financial aid to offer their students.

To better understand the differences between institutions that choose to participate in the Perkins programs versus those that do not, I use regression analysis to estimate the predictors of institutional participation in the Perkins program. Specifically, I estimate the following regression equation using ordinary least squares:

$$Participate_i = \beta_0 + \beta_1 InstChar_i + \beta_2 InstTypeFE_i + \epsilon_i \quad (1)$$

where $Partcipiate_i$ is an indicator equal to one if institution i participates in the Perkins loans program; $InstChar_i$ is a vector containing the following institution-level variables: sticker price (i.e. the total tuition cost of a full-time student before any financial aid is applied; measured in thousands of dollars); admission rate; percent of undergraduates who receive a Pell grant; percent of undergraduates who borrow a Stafford loan; average institutional grant aid per undergraduate (measured in thousands of dollars); average state grant aid per undergraduate (measured in thousands of dollars); total undergraduate enrollment (measured in thousands of students); and indicators for residency: primarily non-residential (the omitted category), primarily residential, or highly residential.[100] $InstTypeFE_i$ is a vector of institution type dummy variables (i.e. institution type fixed effects). I define institution type as sector (public or private) by selectivity (very

[100] The source of these residency indicators are the Carnegie Classifications of 2010: Size and setting variable from IPEDS.

selective, moderately selective, minimally selective, or open admission), resulting in eight institution type categories. Table 3.2 shows the estimates of the vector β_1. The three estimates that are statistically and economically significantly are the coefficients of the variables sticker price, the percent of students who borrow Stafford loans, and the average institutional grant award. Specifically, as an institution's sticker price increases by $1000, the probability that the institution participates in the Perkins loan program increases by 0.9 percentage points (1 percent of the sample mean). Similarly, if the percent of students who borrow Stafford loans at an institution increases by ten points, the institutions' probability of participating in Perkins increases by 2.3 percentage points (2.6 percent). The explanation of the first two statistically significant results in Table 3.2 is straightforward: all else equal, students at institutions with higher sticker prices necessarily have higher financial need, and thus have higher demand for additional financial aid. Participation in Perkins loans can be considered a cost-effective means of providing greater access to financial aid. Similarly, institutions that enroll students who are more likely to borrow to finance their education have more incentive to participate in the Perkins loan program. One possible interpretation of these results is that availability of Perkins loans allows institutions to have a higher sticker price, consistent with the Bennett hypothesis discussed in Section III. However, I caution against accepting this conclusion based on the evidence provided in this paper, which is at best suggestive.

Also seen in Table 3.2 is that if an institution's average financial aid award increases by $1000, the probability the institution participates in the Perkins loan program increases by 1 percentage point (1.2 percent). *A priori*, it is unclear why institutions who provide more institutional grant aid would be more likely to participate

in the Perkins loan program. Perhaps institutions that offer larger amounts of institutional grant aid are more willing to provide additional financial aid programs to their students. Or, institutions that offer more institutional grant aid are those that practice more price discrimination, and therefore would benefit from using the Perkins loan program as an additional price discrimination tool. Again, this statement is conjecture and should not be interpreted as if it were based on rigorous evidence.

Of further interest in Table 3.2 is that whether an institution serves a larger percentage of lower-income students (i.e. Pell recipients) *does not* drive Perkins loan participation. In fact, the coefficient estimate shows that institutions with a higher proportion of Pell recipients are less likely to participate in Perkins loans, although this result is not statistically significant. This result could reflect a preference of institutions serving lower-income populations to minimize student loan debt. Regardless of the reason, this result shows that *ceteris paribus* institutions that serve more lower-income students are not more likely to offer Perkins loans to their students.

B. Institutional Disbursements Per Student

To provide context for my remaining results, I now describe the level of campus-based aid disbursements per student, and how these disbursements differ by institution type and characteristics. I use two institution-level measures of disbursements per student: disbursement per undergraduate, and disbursement per Pell recipient. I calculate these measures by dividing the total amount of FSEOG, FWS, or Perkins funds disbursed to students at an institution (observed in the Title IV Volume Report) by the total number of undergraduates or Pell recipients at an institution (observed in IPEDS). Table 3.3

shows the estimated average disbursements per student for all institutions, and by institution type.

Across all three campus-based aid programs, disbursements per undergraduate are larger for private institutions, and generally are increasing in selectivity. For example, while the average disbursement of FSEOG funds per undergraduate across all institutions is $89, public institutions typically disburse less than half that amount. Public open admission institutions disburse only $33 per undergraduate, despite the fact that this institution type enrolls one of the largest percentage of Pell grant recipients. This pattern is similar for FWS and Perkins distributions, with private institutions generally disbursing approximately three times as many campus-based aid dollars compared to public institutions. The differences across institution type are even starker when considering disbursements per Pell recipient. Disbursements per Pell recipient at very selective private institutions are roughly five times more than disbursements per Pell recipient at very selective public institutions, and more than an order of magnitude larger than disbursements per Pell recipient at public open admission institutions.

To provide more context for differences in per student disbursements within institution type, I also estimate the following regression equation:

$$DisbursementPerStudent_i = \beta_0 + \beta_1 InstChar_i + \beta_2 InstTypeFE_i + \epsilon_i \quad (2)$$

where $InstChar_i$ and $InstTypeFE_i$ are defined as in Section V.A., and $DisbursementPerStudent_i$ is either FSEOG, FWS, or Perkins disbursements per

undergraduate or Pell recipient, as defined above.[101] Table 3.4 displays the resulting estimates from this regression analysis. Overall, an institution's sticker price is a consistent predictor of its campus-based aid disbursements per student. For example, a $1,000 increase in sticker price is associated with a $3.68 increase in FSEOG disbursements per undergraduate, and $25.08 increase in FSEOG disbursements per Pell recipient, *ceteris paribus*. These dollar amounts translate to a 4 percent increase in disbursements per undergraduate, and a 7 percent increase in disbursements per Pell recipient. Another strong and consistent predictor of disbursements per student is average state grant aid per student – a variable directly and negatively related to students' unmet financial need at an institution. For example, a $1,000 increase in the average state grant aid award is associated with an $10.95 decrease in FSEOG disbursements per undergraduate, and $51.87 decrease in FSEOG disbursements per Pell recipient, *ceteris paribus*. Compared to primarily non-residential institutions, highly residential institutions disburse substantially more campus-based aid dollars per undergraduate and Pell recipient. Finally, institutions with high admission rates and enroll a larger proportion of Stafford loan borrowers disburse significantly fewer dollars per Pell recipient.[102] In sum, the results in Tables 3.3 and 3.4 confirm Kelchen's findings that campus-based aid funds are disproportionately allocated to private, selective, high-cost institutions, and are consistent with the face that the federal allocation formulas are based mainly on historic allocation levels and financial need of students.

[101] Results are similar when using the natural log of disbursement per student as the dependent variable in Equation (2). I present the estimates using the linear specification of the dependent variable here for ease of interpretation.

[102] I also estimate Equation (2) by institution sector (i.e. public or private). Appendix Tables A3.1 and A3.2 show the results. Overall, I find that the relationship between sticker price and disbursement per student is quite similar between public and private institutions, but the coefficients on admission rate, percent who borrow Stafford loan, and average state grant aid per student is driven by private institutions.

C. Institution-Level Distribution Measures

In this section, I examine how institutions choose to distribute campus-based aid funds across their student bodies. Specifically, I aim to answer the following question: do institutions target campus-based aid dollars at a small sub-population of eligible students, or do institutions aim to distribute campus-based aid dollars widely across their populations of eligible students? To perform this analysis, I limit my sample to institutions participating in the relevant campus-based aid program. At these participating institutions, I then identify students eligible to receive campus-based aid. I classify a student as eligible if he has remaining financial need after federal and state grants are applied (excluding the FSEOG). Specifically, I classify a student as eligible if:

$$COA_i - EFC_i - FederalGrants_i - StateGrants_i > 0$$

I also limit my sample of eligible students to those likely to accept campus-based aid. As described in Section IV, this restriction limits my sample to: students who filed the FAFSA (for FSEOG analysis); students who filed the FAFSA and either received a Perkins loan *or* indicated they would borrow more if they could (for Perkins loan analysis); or students who filed the FAFSA and either received a FWS assignment *or* indicated they were interested in FWS on the FAFSA (for FWS analysis).

I estimate the number of eligible students enrolled in my full sample, and number of eligible students by institution type.[103] I use these estimated enrollment numbers to estimate the percent of eligible students who receive campus-based aid, both overall and

[103] Ideally, I would perform this analysis at the institution-level, and correlate the distribution measures with other institutional characteristics. However, there are two few observations per institution to estimate these measures with reasonable precision. The average number of student observations per institution in NPSAS:12 is 32, with a standard deviation of 28.

by institution type. The first row of columns (1) through (3) of Table 3.5 shows that a relatively small proportion of eligible students actually receive campus-based aid: 11.3 percent receive a FSEOG; 31.8 percent participate in FWS, and 27.8 percent borrow a Perkins loan. The percent of eligible students who receive campus-based aid varies substantially by institution type. These patterns are directly related to the availability of funds per student, as discussed in Section V.B. above. Overall, private institutions award campus-based aid to a larger proportion of their eligible students, compared to public institutions. This pattern is most striking for the FWS program. For example, selective private institutions award FWS to over one-half of eligible students, compared to less than one-quarter at selective public institutions. Another pattern of note is that selective institutions award campus-based aid to a larger proportion of eligible students compared to open admission institutions.

I perform the same analysis limiting my sample of eligible students to Pell recipients, with the goal of understanding how many eligible low-income students receive campus-based aid. Column (4) of Table 3.5 shows that 19.6 percent of Pell recipients with financial need receive a FSEOG. Compared to column (1), this estimate shows that eligible Pell recipients are 84 percent more likely to receive an FSEOG than the average eligible undergraduate. However, in comparing the estimates in column (2) and (5), eligible Pell recipients are no more likely to receive FWS than the average eligible undergraduate. Similarly, eligible Pell recipients are only 18 percent more likely to receive a Perkins loan than the average eligible undergraduate. These patterns indicate that while the FSEOG receipt is quite concentrated among Pell grant recipients, this is less true for Perkins loans and not at all the case for FWS.

The most important takeaway from this institution-level analysis is that a minority of low-income students both eligible for and likely to accept campus-based aid actually receive campus-based aid. This result stems from the relatively low levels of funding for campus-based aid programs, and begs the question as to how institutions choose which students receive offers of campus-based aid, and which students do not? To address this question, I next focus on student-level analysis to estimate the predictors of campus-based aid receipt.

D. Predictors of Campus-Based Aid Receipt

I first compare the simple means of student-level characteristics for campus-based aid recipients versus eligible non-recipients in Table 3.6. The first student characteristic I consider is whether the student filed the FAFSA on or before March 1st, a common institution priority deadline for institutional aid eligibility. While there is no deadline by which students must file the FAFSA in order to receive a federal Pell grant or Stafford loan, institutions may choose to limit their distribution of aid to students who meet their FAFSA deadline. This appears to be the case for FSEOG and Perkins. Nearly two-thirds of FSEOG and Perkins recipients file the FAFSA by March 1st, compared to 36.9 percent for the full sample of undergraduates. Similarly, FSEOG and Perkins recipients are 43 percent and 34 more likely to have filed the FAFSA by March 1st compared to eligible non-recipients, respectively. However, FWS recipients and eligible non-recipients file the FAFSA by March 1st at similar rates (53.7 percent versus 52.5 percent).

Comparing student demographic characteristics, Table 3.6 shows that FSEOG recipients are from significantly lower socio-economic backgrounds, compared to the full undergraduate population (column 1) and eligible non-recipients (column 3). FSEOG

recipients are more likely to be an under-represented minority (black, Hispanic, other race); more likely to be female; less likely to be classified as a dependent student; and come from substantially lower-income households. FSEOG recipients also have lower entrance exam scores, and are more likely to not have taken the SAT or ACT. FSEOG recipients receive significantly more need-based grant awards compared to FSEOG non-recipients; FSEOG recipients also borrow more Stafford loan dollars. In terms of these demographic characteristics, FSEOG recipients are very similar to Pell recipients. Appendix Table A3.3 displays the summary statistics for the sub-sample of Pell recipients (column 2). In contrast to Pell recipients, FSEOG recipients attend institutions with a higher cost of attendance (12 percent more than FSEOG non-recipients), and are more likely to attend private institutions. These patterns stem from the fact that private institutions receive larger campus-based aid allocations per student (as shown in Table 3.3) and distribute FSEOG awards to a larger proportion of eligible students (as shown in Table 3.5). Finally, FSEOG recipients are slightly more likely to be first-year students (12 percent) compared to eligible non-recipients.

The patterns in student characteristics for FWS and Perkins are quite different from those for FSEOG. FWS and Perkins recipients are *less likely* to be an underrepresented minority, and *more likely* to be a dependent student. While FWS and Perkins recipients are lower income than eligible non-recipients, these income differences are much smaller than those for FSEOG: while the average EFC of FSEOG recipients was $726, the average EFC of FWS and Perkins recipients was $7,257 and $3,940, respectively. FWS and Perkins recipients also have higher entrance exam test scores than their eligible non-recipient counterparts. Similar to FSEOG recipients, FWS and Perkins

recipients also receive substantially more financial aid from institutional, state need-based, and federal sources. Again, due to the fact that the more expensive private institutions receive larger campus-based aid allocations per student and distribute campus-based aid to a larger proportion of their students, FWS and Perkins recipients have on average significantly higher costs of attendance (40 percent and 28 percent than eligible non-recipients, respectively)

Several of the student characteristics are correlated with one another, and with institutional characteristics that determine campus-based aid availability at the institution. For example, campus-based aid recipients may receive more institutional grant aid because the institutions that offer more institutional grant aid are also the institutions that award campus-based aid to more students. To understand how these student and institutional characteristics predict campus-based aid receipt holding all else constant, I estimate the following regression equation using ordinary least squares:

$$ReceiveCBA_{it} = \beta_0 + \beta_1 StudentDemographics_{it} + \beta_2 StudentExamScore_{it} + \beta_3 StudentFinancialAid_{it} + \beta_4 StudentLevel_{it} + \beta_5 InstitutionFixedEffects_t + \epsilon_i \quad (3)$$

where $ReceiveCBA_{it}$ is an indicator equal to one if student i at institution t receives a campus-based aid award. I estimate this equation separately for the three campus-based aid programs, FSEOG, FWS, and Perkins. $StudentDemographics_{it}$ is a vector of student level demographic characteristics: race indicators, gender indicator, dependency status indicator, and EFC (measured in thousands of dollars). $StudentExamScore_{it}$ is a vector containing two variables: entrance exam percentile score (ranging from 1 to 100,

and taking a value of 0 if the student has no SAT or ACT score on record), and an indicator for if the student has no entrance exam score. $StudentFinancialAid_{it}$ contains the following variables describing the student's financial aid package: institutional need-based grant award, institution merit-based grant award, state grant award, and Stafford loans awards (all measured in thousands of dollars).[104] $StudentLevel_{it}$ is a vector of indicators for student level: sophomore, junior, and senior (freshman being the omitted category). $InstitutionFixedEffects_t$ is a vector of institution fixed effects, which controls for differences across institutions which may affect a student's likelihood of receiving campus-based aid, such as differences in institution-level disbursements per student, the proportion of eligible students at an institution, etc. In what follows, I discuss the results of this regression analysis using Equation (3), for both the full sample of eligible students likely to accept campus-based aid, and separately by institution sector.

1. Predictors of FSEOG receipt

I begin by analyzing the regression results for the FSEOG program, as shown in column (1) of Table 3.7. Overall, the coefficient estimates are consistent with institutions awarding FSEOG aid to students from the lowest socio-economic backgrounds. Dependent students are 2.9 percentage points (26 percent) less likely to receive an FSEOG compared to independent students. As a student's EFC increases by $1,000 (an increase in socio-economic status), his likelihood of receiving an FSEOG decreases by 0.27 percentage points (2.4 percent). Conditional on EFC, students who receive more institutional need-based aid or state based aid are also more likely to receive an FSEOG.

[104] I exclude Pell grant award from the vector of covariates, as Pell grant award is highly correlated with EFC.

This result may be driven by the fact that nearly all FSEOG recipients are also Pell recipients, and that institutions and states may have a preference for awarding aid to Pell recipients.[105] The strongest predictor of FSEOG receipt, however, is whether the student filed the FAFSA by March 1st. *Ceteris paribus*, students who file the FAFSA early are 5.8 percentage points (51 percent) more likely to receive a FSEOG, indicating that institutions are using their priority FAFSA filing deadlines to determine eligibility for FSEOG.

Table 3.8 shows the estimates of Equation (3) separately by institution sector, i.e. public institutions (column 1) versus private non-profit institutions (column 2). Considering that a smaller proportion of eligible students at public institutions receive an FSEOG award, filing the FAFSA by March 1st is a stronger predictor of FSEOG receipt at public institutions, where early filers are 66 percent more likely to receive an FSEOG award than later filers. Table 3.8 also shows that the decreased likelihood of FSEOG receipt for dependent students is concentrated within public institutions. The positive relationship between FSEOG receipt and institutional need-based grants is also stronger at public institutions, where a $1,000 increase in institutional need-based grants is coupled with an 11 percent increase in the likelihood of FSEOG receipt.

2. Predictors of FWS Receipt

The estimated predictors of FWS receipt (column 2 of Table 3.7) show that institutions make FWS award decisions markedly differently than for FSEOG. While lower-income students are slightly more likely to receive FWS – an increase in EFC of

[105] The results in Turner (2014) suggest that institutions do have a preference for Pell recipients, as shown by the increase in institutional grant aid awarded to students just below the EFC threshold for Pell eligibility versus students just above the EFC threshold.

$1,000 is associated with a decrease in probability of FWS receipt by 1.6 percent – dependency status and presence of entrance exam scores are much stronger predictors. Dependent students are 19 percent more likely to receive FWS aid compared to independent students; likewise, students with a valid entrance exam score are 21 percent more likely to receive FWS aid than those without. FWS recipients are also less likely to be freshmen. These predictors of FWS receipt may reflect institutions' preferences for the types of students that work in on-campus jobs.

The coefficients on the institutional financial aid variables tell perhaps the most interesting story of FWS receipt. Students who receive more institutional need-based grant dollars are more likely to receive FWS aid. These estimates are *conditional* on students' EFC, so these estimates are driven by variation in institutional need-based grants unrelated to students EFC. In addition, students who receive more institutional merit-based grant dollars are more likely to receive FWS aid. This result suggests that institutions are positively selecting students for participation in FWS. That is, inferring an institution's valuation of a student from the institutional aid awarded to that student, institutions are awarding FWS to the students who they value the most. The results in Table 3.8 suggest that this practice is concentrated within private institutions. This result could be driven by a combination of factors. Since the majority of FWS jobs are on-campus with the institution as the employer, institutions may only want their best students in these positions. Alternatively or in conjunction with this explanation, FWS positions may be highly valued by students and institutions are using offers of FWS as enrollment management.

3. Predictors of Perkins Receipt

Similar to FSEOG (yet unlike FWS), filing by March 1st is the strongest predictor of Perkins receipt. As shown in column (3) of Table 3.7, earlier FAFSA filers are 27 percent more likely to receive a Perkins loan. Interestingly, Asian students (a small minority representing 7.5 percent of undergraduate enrollment) are roughly half as likely to receive a Perkins loan as their white counterparts. While prior research shows that Asian students may be more debt averse than students of other races (e.g. Cunningham & Santiago, 2008), a difference in debt aversion by race is not likely to drive this result due to the sample restriction of students who would borrow more if able.

Similar to FSEOG and FWS, the coefficient estimate on EFC shows that lower-income students are more likely to receive a Perkins loans: as a student's EFC decreases by $1000, he is 1.3 percentage points more likely to receive a Perkins loan (5 percent). Across campus-based aid programs, this indicates that institutions are taking student income into account when awarding campus-based aid – an intuitive finding given program details, but nonetheless important to verify.

I also observe that higher achieving students are more likely to receive a Perkins loan. For example, a student with an entrance exam score at the 60th percentile is 0.6 percentage points (2 percent) more likely to receive a Perkins than a student at the 50th percentile. This relationship may be the result of institutions positively selecting students for Perkins loan receipt based on academic performance – as inferred about FWS above. Finally, Table 3.7 shows that freshmen are the *most* likely to receive Perkins loans compared with upper classroom. Perhaps as students persist after their first year in college, institutions are more willing to offer FWS or other grant aid as opposed to Perkins loans.

4. Additional specifications

I perform my student-level regression analyses using additional specifications and samples. First, I estimate Equation (3) with dollars of program-specific campus-based aid received by the student (converted to $1000s) as the dependent variable. The estimates displayed in Table 3.9 are of similar size and magnitude to those of Table 3.7. Interpreting the first estimate of Table 3.9, students who file the FAFSA by March 1st receive $51.50 more dollars in FSEOG aid compared to students who file after March 1st.

I also estimate Equation (2) restricting my sample to freshmen. Table 3.10 shows again that the coefficient estimates are of similar size and magnitude to those of Table 3.7. Finally, I estimate Equation (2) restricting my sample to freshmen who sent their FAFSA information to only one institution. As described in Section IV, this restriction will inform the degree to which students sorting into institutions based on campus-based aid offers drives my main results. Table 3.11 shows that for this subset of students, early FAFSA filing *does* predict FWS receipt (but not for Perkins loans). Otherwise, the size and magnitude of the estimates in Table 3.11 are similar to my main results in Table 3.7.

One remaining concern regarding the interpretation of this student-level analysis is whether students who do not receive campus-based aid actually have remaining financial need. If eligible non-recipients of campus-based aid have their full financial need met from other sources, then this would likely lessen any concerns regarding equitable distribution of campus-based aid. However, I do not find this potential scenario to be reality. I estimated the unmet need (equal to cost of attendance less EFC and all financial aid) for the lowest-income students (those with EFC equal to zero) who were eligible for, likely to accept, but did not receive campus-based aid. On average, these

students had a median unmet need of $5,408 (FSEOG); $5,220 (FWS); or $3,681 (Perkins). I also re-estimated Equation (2), but excluding all non-recipients with unmet need less than $1,000. Table 3.12 shows results quite similar to those of Table 3.7.

5. Summary of Findings from Regression Analysis

Overall, institutions appear to be offering FSEOG to the lowest income students as intended. Institutions also appear to be awarding FWS and Perkins aid using quite different criteria compared to FSEOG. The results in Table 3.7 suggest that institutions are *not* "preferentially packaging" campus-based aid, i.e. concentrating self-help aid on less desirable students, as hypothesized by some researchers (see Section III).[106] Instead, institutions appear to be offering FWS and Perkins aid to more desirable students. In other words, institutions appear to be using offers of self-help campus-based aid as enrollment management. Since the goals of institutions and the federal government in providing financial aid are likely to differ, the way institutions are distributing campus-based aid may not be considered optimal to the federal government. For example, the federal government may find it sub-optimal to focus campus-based aid on students who are already receiving substantial aid packages from the institutions. For another example, the federal government may prefer for dependent and independent students to have equal access to FWS and Perkins loans. In the following section, I propose alternative

[106] One question is whether institutions use non-campus-based aid forms of self-help aid (i.e. loans or work-study from institutional or state sources). This is an interesting hypothesis, but I do not find evidence to support it. Only 2.4 percent of students likely to accept self-help aid receive non-CBA self-help aid from institutional or state sources. This small population of students (n=700 in my sample) appear to be even more positively selected than CBA self-help aid recipients, shown in Table A3.4. For example, non-CBA self-help recipients have an average SAT score of 1104, compared to 1063 and 1062 for FWS and Perkins recipients, respectively. This is of course driven in part by these students being more likely to attend very selective private institutions, but still suggests that institutions are not preferentially packaging non-CBA self-help aid, either.

distribution rules for campus-based aid that would remove the decision making from the institutions, and describe the simulated distribution of these alternative rules.

E. Simulated Alternate Disbursement Policies

For my final set of analyses, I estimate how campus-based aid dollars would be distributed among eligible freshmen under three alternative distribution rules. Each of these three rules involves splitting available campus-based aid dollars among all eligible students. This logic is more in line with the way that Pell grants and Stafford loans are awarded, in that all eligible applicants receive a Pell grant or Stafford loan. My alternative distributions differ from those of the Pell grant or Stafford loans in that I am assuming a finite amount of money to be distributed among all eligible applicants. In contrast, the maximum awards for Pell grants and Stafford loans are set before students apply for aid. I define students as being eligible for receiving campus-based aid in three ways:

1) Any student with unmet financial need, defined as cost of attendance less EFC, federal grants (excluding FSEOG), and state grants ("Financial Need alternative distribution")
2) Any Pell recipient with unmet financial need ("Pell Recipients alternative distribution")
3) Any student with an EFC of zero with unmet financial need ("Zero EFC alternative distribution")

I also include only eligible students likely to accept the relevant campus-based aid award. Once all students meeting the set out criteria are identified, I then calculate their new FSEOG award as a percentage of their Pell grant award, and their new Perkins awards as

a percentage of their subsidized Stafford loan award (more specifically, the amount that the student borrowed in subsidized Stafford loans). This percentage is determined by the total amount of campus-based aid dollars available to freshmen divided by the estimated total amount of Pell grants or subsidized Stafford loans received by the eligible population. For example, in calculating the new FSEOG award for the eligible population of Pell recipients with unmet financial need, I estimate that there are sufficient FSEOG funds to award each eligible freshman with an FSEOG amount equal to 4.7 percent of their Pell grant. Put simply, this alternative distribution would increase the Pell award for Pell recipients by the same percentage. Similarly, the alternative distributions of Perkins loans would increase the subsidized Stafford loan award for subsidized Stafford borrowers by the same percentage. In the case of FWS, I assign each recipient under new distributions to the same flat amount equal to the total amount of FWS dollars actually distributed in the population divided by the number of eligible students in the new distribution. To give an over-simplified example, if $10,000 of FWS dollars were actually distributed, and I identify 100 students as eligible to receive FWS under my alternative distribution rule, then each of the 100 students would receive $100 under the alterative distribution. Finally, if a student's new campus-based aid award is greater than their financial need, then I set their award equal to their unmet need. For example, if a student has unmet need of $1,000 but their new award is set at $1,500, I reduce the new award to $1,000.

Table 3.13 describes the current distribution of FSEOG, along with the Pell Recipients (#2) and Zero EFC (#3) alternative distributions. Because virtually all FSEOG recipients are also Pell recipients, I do not estimate a Financial Need alternate

distribution (alternate distribution #1) for FSEOG. Because the alternate distribution in column (2) serves a larger number of students than the current distribution, the FSEOG awards per student are necessarily lower than the current distribution. The median FSEOG award using this alternate distribution is $198, compared to $600 with the current distribution. The difference from the current distribution is largest at the top of the award distribution, with the 90th percentile of awards in the alternate distribution being $216, compared to $1,550 for the current distribution. This difference illustrates the clear tradeoff between, when holding the total amount of dollars disbursed constant, choosing to provide larger awards to fewer students versus providing smaller awards to more students. In the current distribution of FSEOG, only 11.3 percent of students with financial need receive an FSEOG award, and only 19.6 percent of eligible Pell recipients receive an FSEOG award. Using the Pell recipients alternative distribution, 57 percent of students with unmet need receive an FSEOG, and 100 percent of Pell recipients receive an FSEOG award.

When comparing the EFC distribution of recipients for the current FSEOG distribution and the Pell recipient alternative distribution, I observe that the current distribution serves a slightly lower-income population than the Pell recipient alternative distribution. Specifically, the 90th percentile EFC of recipients for the current distribution is $2,800 compared to the slightly higher $3,558 for the Pell Recipient alternative distribution. This result is not surprising, since virtually all FSEOG recipients are also Pell grant recipients. The Zero EFC alterative distribution does focus on a lower-income population than the current distribution, with 100 percent of eligible students with an EFC of zero receiving an FSEOG, and all recipients having an EFC of zero. While the

Zero EFC alternative distribution does serve more students with financial need compared to the current distribution (32 percent versus 11 percent), the Zero EFC alternative distribution serves fewer students with unmet need compared to the Pell Recipient alternative distribution. However, since the zero EFC alternative distribution focuses on a larger population than the current distribution – only 23 percent of students with Zero EFC currently receive an FSEOG –award sizes for the Zero EFC alternative distribution are necessarily smaller, with 90 percent of proposed recipients receiving $319 or less.

I repeat this same exercise to determine the alternate distributions of FWS for: all students with financial need likely to accept FWS; all Pell recipients with financial need likely to accept FWS; and all students with zero EFC likely to accept FWS. Table 3.14 describes the current distribution of FWS and these three alternative distributions. Under the Financial Need alternative distribution, all FWS recipients would receive the same flat amount of $688 – significantly lower than the median award of the current distribution of $2000. Again, the lower award amount under the alternative distribution is due to many more students receiving FWS under the alternative distribution. What is most interesting about the Financial Need alternative distribution is that the distribution of would-be recipients' EFCs is nearly the same, only slightly higher, than the current distribution. This result implies that current FWS distribution does not serve a lower-income population than the alternative distribution which awards FWS all eligible students. Column (3) of Table 3.14 shows that the Pell Recipient alternative distribution would result in FWS aid going to a significantly lower-income population. Since the Pell Recipient alternative distribution would increase the number of FWS recipients by 74 percent (55.4 percent of eligible students with financial need served versus 31.8 percent

currently), the award per student of $1241 is much lower than the current median. This alternative distribution may be unacceptable to participating institutions due to the low per student award. If an FWS student receive only $1241, then that could only "buy" the institution 171 hours of the student's time at the current federal minimum wage of $7.25. Across a forty week academic schedule, this translates to four hours of work per week. This arrangement would likely be problematic for two reasons. First, students who work as infrequently as one four hour shift per week would likely not be as efficient as students who work ten to twenty hours per week, since their human capital would be slower to develop. Second, if the typical FWS is too small ($1185 covered only 4.3 percent of the average student's cost of attendance in 2011-12), then students may not take their FWS responsibilities as seriously. As a result, more students may shirk their FWS responsibilities, a further loss of efficiency for the institutions employing them. These concerns carry less weight with the Zero EFC alternative distribution, with a per-student award of $2,250. While the Zero EFC alternative distribution is not likely a viable alternative to the current distribution – presumably, most policy makers would agree that FWS should not be restricted to the lowest income students – I instead examine these alternative distributions to highlight potential limitations of the current distributions of FWS.

Finally, I repeat this exercise with Perkins loans, whereby I distribute total dollars of Perkins loans disbursed to students whom I identity as eligible as a percentage of their Stafford loan award. Table 3.15 shows these results. When comparing the Financial Need alternative distribution to the current distribution, Table 3.15 shows that the current distribution serves a lower-income population compared to all eligible students. Still,

under the current distribution, only 32.7 percent of eligible Pell recipients, and 31.9 percent of eligible students with zero EFCs, receive a Perkins loan. The Pell Recipients alternative distribution would increase the subsidized loan award for Pell recipients by a median amount of $426; the Zero EFC alternative distribution would increase the subsidized loan award for students with zero EFCs by a median amount of $692. While these median awards are considerably smaller than that of the current distribution ($1800), the alternative distributions distribute Perkins loan dollars to significantly lower-income populations.

In sum, these alternative distributions are useful in considering how campus-based aid dollars are distributed among the population of eligible students, as well as highlighting the trade-off between awarding campus-based aid to a larger set of students versus larger per-student campus-based aid awards. I refrain from recommending any of these specific alternative distribution policies for a number of reasons. First, these alternative distribution policies rely on institutions to agree to supply 25 percent of campus-based aid awards for all awardees at their institution. In the case of the Pell Recipients and Zero EFC alternative distribution policies, this would require public and less selective institutions to contribute more funds toward campus-based aid than they currently do. Second, the Pell Recipient and Zero EFC alternative distribution policies inherently involve a transfer in financial aid from middle-income students to lower-income students, which may be politically unpopular. Finally, the alternative distributions would reduce campus-based aid awards per recipient. One hypothesis is that a larger financial aid award may be more than proportionally effective at improving student success, compared to smaller financial aid awards (i.e. a $2,000 grant may

improve likelihood of degree completion by more than double the improvement from a $1,000 grant). To my knowledge, there is no evidence to support (or refute) this hypothesis. Still, it raises an interesting point when considering alternative distributions to campus-based aid. A final caveat to my analysis is that the alternative distributions assume that the funding levels of campus-based aid programs remains the same. Given the small size of campus-based aid relative to other federal, state, and institutional aid sources, any proposed changes to campus-based aid may be coupled with changes in funding levels.

VI. CONCLUSION

Researchers and policy makers continue to critique the U.S. financial aid system for being overly burdensome and complex for students to navigate. However, compared with campus-based aid, the Pell grant and Stafford loans programs are relatively transparent: if a student completes the FAFSA, then the student is eligible for and can receive the same amount of financial aid from these programs at participating institutions. In the case of campus-based aid, the two-tier allocation scheme (i.e. funds are provided to institutions from the federal government, then institutions distribute funds to students) and very little *a priori* information or guidance from institutions lead to a general lack of knowledge of how campus-based aid is distributed. Given previous research on the Bennett hypothesis and preferential packaging, it is quite plausible that institutions make calculated decisions regarding how to allocate campus-based aid in order to best achieve their objectives and priorities.

In this study, I find that institutions with higher costs of attendance are more likely to participate in campus-based aid programs, disburse more campus-based aid

dollars per student, and are able to distribute campus-based aid awards more widely throughout their student bodies. This is helpful information when considering policy changes that would make Perkins loans work as a voucher, similar to Stafford loans. In this case, students who attend low-cost, less selective institutions would gain access to additional borrowing options they did not have before.

When considering how institutions decide to distribute campus-based aid dollars among their students, I find that institutions rely heavily on their priority aid deadlines. Specifically, students who file the FAFSA by March 1st are 51 and 27 percent more likely to receive FSEOG or Perkins aid, respectively. Given recent evidence looking at state aid application deadlines, reliance on these early deadlines may be creating a more regressive distribution of FSEOG and Perkins aid than if institutions did not use these priority deadlines (Bird, 2016). Why institutions use their priority deadlines for a binding constraint for awarding FSEOG and Perkins loans but not for FWS is puzzling. Perhaps because FWS recipients often become employees of the institution, institutions typically use a different set of criteria for selection of FWS recipients – this reasoning, however, is purely speculative.

While institutions do appear to award FSEOG aid to the lowest-income students, my results do not show the same pattern for FWS and Perkins aid. Instead, institutions appear to be supplementing the aid packages of students they value the most; this appears to be particularly true for FWS aid. This finding goes against previous literature charging institutions with awarding less-desirable self-help aid to students that the institutions value less.

A possible goal for reforming campus-based aid programs could be to make these programs more equitable. That is, policy makers may wish to see lower-income students have improved access to campus-based aid. A number of policy changes could achieve this goal. As Kelchen (2015) shows, the federal government could change the allocation formulas to rely less on historical disbursements and cost of attendance, and rely more on the income of students served at the institution. Alternatively (or in conjunction), the federal government could change the rules governing how institutions can distribute campus-based funds to their students. The fact that the FSEOG program has the most stringent rules governing distribution *and* FSEOG funds are most successfully targeted at low income students is probably not coincidence. Finally, similar to the alternative distributions I propose in this paper, the funds for FSEOG and Perkins could be combined with the Pell and Stafford loan programs. This option is similar to what President Obama has suggested for the fate of the Perkins program, although this option still would not address the distribution of FWS funds.

Even if policy makers decide to simplify or eliminate campus-based aid in the future, these potential actions would do little to simplify our current financial aid system as a whole. Campus-based aid is one of the many complexities found in the financial aid system, a system which involves students, many levels of governments, individual colleges and universities, and other private sources of aid. As discussed above, these actors have multifaceted and often competing incentives when deciding how much financial aid to provide, and to whom. In order to truly simplify financial aid, a more thorough overhaul of the system would be required. A recent example of such a plan is presidential candidate Bernie Sander's plan to make all public colleges tuition free and

debt free. The political and financial viability of such a dramatic shift, however, is debatable.

Table 3.1: Proportion of institutions participating in campus-based aid programs

Panel A: FSEOG (overall = 99.2%)

	Public	Private
Very Selective	100.0%	98.5%
Moderately Selective	99.9%	98.9%
Minimally Selective	100.0%	99.8%
Open Admission	97.1%	97.2%

Panel B: FWS (overall = 98.7%)

	Public	Private
Very Selective	100.0%	98.5%
Moderately Selective	99.6%	98.9%
Minimally Selective	100.0%	95.6%
Open Admission	97.1%	91.5%

Panel C: Perkins (overall = 86.9%)

	Public	Private
Very Selective	96.2%	96.1%
Moderately Selective	93.7%	91.1%
Minimally Selective	82.6%	83.9%
Open Admission	42.6%	25.8%

Data: 2011-12 National Postsecondary Student Aid Study (NPSAS:12). Sample includes public or private non-profit four-year institutions (n=720). Institutional participation is determined by Title IV Program Volume Reports available from Federal Student Aid (https://studentaid.ed.gov/sa/about/data-center/student/title-iv). Selectivity categories provided in NPSAS:12. Institution sample weights used in all analyses. All sample sizes rounded to the nearest ten in compliance with IES reporting standards.

Table 3.2: Determinants of institutional Perkins loans participation

Sticker Price ($1000s)	0.0085***
	(0.0030)
Admission Rate	0.0075
	(0.0725)
% Receive Pell Grant	-0.1498
	(0.1173)
% Borrow Stafford Loan	0.2323**
	(0.0919)
Average institutional grant aid ($1,000s)	0.0101**
	(0.0042)
Average state grant aid ($1,000s)	0.002
	(0.0117)
Undergraduate enrollment (1,000s)	0.0031
	(0.0019)
Primarily Residential	-0.0223
	(0.0309)
Highly Residential	-0.016
	(0.0376)
Constant	0.5599***
	(0.1020)
R-squared	0.317
N	720

Data: 2011-12 National Postsecondary Student Aid Study (NPSAS:12). Sample includes public or private non-profit four-year institutions. Dependent variable is an indicator equal to one if the institution participates in the Perkins loan program. Institutional participation is determined by Title IV Program Volume Reports available from Federal Student Aid (https://studentaid.ed.gov /sa/about/data-center/student/title-iv). Institution sample weights used in all analyses. All sample sizes rounded to the nearest ten in compliance with IES reporting standards.

Table 3.3: Campus-based aid disbursements per student, by institution type

	Disbursement per UG			Disbursement per Pell recipient		
	FSEOG (1)	FWS (2)	Perkins (3)	FSEOG (4)	FWS (5)	Perkins (6)
All Institutions	$89	$135	$138	$335	$522	$597
Public						
Very Selective	$44	$70	$91	$181	$283	$391
Moderately Selective	$54	$79	$87	$157	$248	$309
Minimally Selective	$45	$49	$44	$109	$121	$121
Open Admission	$33	$39	$39	$80	$93	$86
Private						
Very Selective	$170	$274	$307	$945	$1,476	$1,784
Moderately Selective	$119	$189	$144	$380	$619	$493
Minimally Selective	$120	$179	$175	$433	$632	$670
Open Admission	$101	$96	$103	$218	$213	$265

Data: 2011-12 National Postsecondary Student Aid Study (NPSAS:12). Sample includes public or private non-profit four-year institutions. Institutional disbursement per student is determined by Title IV Program Volume Reports available from Federal Student Aid (https://studentaid.ed.gov /sa/about/data-center/student/title-iv) and enrollment counts from IPEDS. Selectivity categories provided in NPSAS:12. Institution sample weights used in all analyses. Institution sample weights used in all analyses. All sample sizes rounded to the nearest ten in compliance with IES reporting standards.

Table 3.4: Determinants of campus based aid disbursements per student

	Disbursement per UG			Disbursement per Pell recipient		
	FSEOG	FWS	Perkins	FSEOG	FWS	Perkins
	(1)	(2)	(3)	(4)	(5)	(6)
Sticker Price ($1000s)	3.68***	4.74***	5.82***	25.08***	38.70***	41.53***
	(0.83)	(1.45)	(2.08)	(4.99)	(5.62)	(12.34)
Admission Rate	-36.85*	20.65	-112.77*	-381.45***	-320.16*	-1243.58***
	(21.86)	(32.96)	(65.62)	(121.29)	(165.83)	(388.91)
% Receive Pell Grant	163.87***	240.10***	93.52	-31.4	13.88	-125.06
	(27.52)	(50.65)	(64.50)	(91.40)	(134.41)	(327.16)
% Borrow Stafford Loan	-23.37	-105.12**	-137.86*	-461.54***	-755.82***	-1562.53***
	(21.65)	(51.32)	(79.50)	(117.31)	(148.13)	(465.64)
Average institutional grant aid ($1,000s)	1.73	1.79	2.45	1.06	-5.62	2.02
	(1.30)	(1.70)	(2.76)	(7.41)	(8.12)	(19.46)
Average state grant aid ($1,000s)	-10.36***	-9.54***	-21.70***	-51.87***	-69.31***	-132.82***
	(2.11)	(3.53)	(5.56)	(8.51)	(12.42)	(26.56)
Undergraduate enrollment (1,000s)	-0.35	-0.55	0.32	-1.92*	-2.3	-0.69
	(0.24)	(0.35)	(0.84)	(1.08)	(1.45)	(3.77)
Primarily Residential	10.95**	17.47**	25.18*	33.91	47.61*	142.52**
	(5.26)	(8.86)	(13.27)	(21.42)	(27.73)	(59.62)
Highly Residential	29.57***	72.14***	59.84***	152.02***	302.01***	329.19***
	(8.31)	(15.73)	(18.34)	(33.22)	(46.92)	(87.16)
Constant	-4.01	-13.48	119.38	436.88***	496.37***	1528.23***
	(23.11)	(42.69)	(77.11)	(132.10)	(175.07)	(462.98)
R-squared	0.456	0.42	0.34	0.604	0.657	0.501
N	690	690	590	690	690	590

Data: 2011-12 National Postsecondary Student Aid Study (NPSAS:12). Sample includes public or private non-profit four-year institutions. Institutional disbursements per student are determined by Title IV Program Volume Reports available from Federal Student Aid (https://studentaid.ed.gov /sa/about/data-center/student/title-iv) and enrollment counts from IPEDS. Selectivity categories provided in NPSAS:12. Institution sample weights used in all analyses. All other institution-level variables are sourced from IPEDS. All sample sizes rounded to the nearest ten in compliance with IES reporting standards.

Table 3.5: Distribution of campus based aid funds among institutions' students

	% of eligible undergraduates who receive CBA			% of eligible Pell recipients who receive CBA		
	FSEOG (1)	FWS (2)	Perkins (3)	FSEOG (4)	FWS (5)	Perkins (6)
All Institutions	11.3%	31.8%	27.8%	19.6%	31.7%	32.7%
Public	9.3%	18.5%	20.0%	14.9%	19.6%	25.2%
Very Selective	10.8%	22.5%	27.7%	20.1%	27.0%	37.2%
Mod. Selective	8.9%	17.5%	18.1%	14.6%	18.0%	23.3%
Minimally Selective	9.1%	23.5%	16.6%	12.8%	23.2%	16.4%
Open Admission	8.4%	11.5%	17.0%	11.2%	12.6%	20.8%
Private	15.5%	52.7%	41.0%	31.6%	56.2%	47.0%
Very Selective	13.9%	56.9%	51.1%	35.7%	64.0%	60.9%
Mod. Selective	14.7%	52.6%	33.5%	28.5%	55.5%	39.1%
Minimally Selective	23.3%	50.2%	46.8%	41.0%	55.4%	50.7%
Open Admission	13.1%	22.0%	29.2%	20.7%	20.8%	40.3%

Data: 2011-12 National Postsecondary Student Aid Study (NPSAS:12). Sample includes public or private non-profit four-year institutions that participate in the relevant campus-based aid program. Denominator is equal to the number of students at campus-based aid participating institutions who filed the FAFSA (FSEOG); students who filed the FAFSA and either received a Perkins loan or indicated they would borrow more if they could (Perkins), or students who filed the FAFSA and either received an FWS assignment or indicated they were interested in FWS on the FAFSA (FWS). Institutional participation is determined by Title IV Program Volume Reports available from Federal Student Aid (https://studentaid.ed.gov/sa/about/data-center/student/title-iv). Selectivity categories provided in NPSAS:12. Institution sample weights used in all analyses. All sample sizes rounded to the nearest ten in compliance with IES reporting standards.

Table 3.6: Student characteristics, by campus based aid receipt

		FSEOG		FWS		Perkins	
	All Students	Recipients	Non-recipients	Recipients	Non-recipients	Recipients	Non-recipients
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Filed FAFSA by March 1st	36.9%	63.4%	44.3%	53.7%	52.5%	63.0%	46.9%
White	63.4%	51.9%	63.3%	60.7%	59.1%	61.8%	58.8%
Black	12.1%	19.6%	13.6%	13.3%	15.9%	12.3%	16.7%
Hispanic	12.7%	14.8%	13.2%	13.0%	14.4%	13.0%	13.6%
Asian	7.5%	8.6%	5.4%	8.5%	5.8%	6.0%	6.0%
Other race	4.3%	5.2%	4.6%	4.6%	4.8%	6.9%	4.9%
Female	54.9%	56.3%	56.2%	57.3%	55.5%	52.9%	57.1%
Dependent	79.5%	73.7%	79.4%	88.9%	83.6%	82.8%	73.9%
EFC	$12,325	$726	$12,471	$7,257	$12,247	$3,940	$6,186
Household income	$76,042	$23,760	$75,494	$60,187	$73,797	$43,457	$54,168
ACT score	22.7	21.4	22.5	23	22.3	23	21.8
SAT score	1049	1002	1041	1063	1034	1062	1015
No entrance exam score	10.6%	13.1%	10.4%	4.0%	7.8%	8.3%	12.8%
Institutional need grants	$1,838	$4,364	$1,877	$5,752	$1,631	$5,682	$2,078
Institutional merit grants	$1,825	$2,128	$1,913	$3,684	$1,727	$3,018	$1,680
State need-based grants	$682	$1,804	$722	$1,131	$832	$1,351	$824
State merit-based grants	$204	$141	$232	$138	$232	$90	$141
Pell Award	$1,720	$4,544	$1,849	$2,427	$2,014	$3,108	$2,311
Stafford Loans	$3,888	$5,441	$4,836	$5,076	$4,792	$6,507	$6,952
Total Cost of Attendance	$27,906	$30,729	$27,455	$37,334	$26,676	$36,003	$28,160
Unmet need (before CBA)	$6,560	$8,026	$4,884	$7,691	$4,499	$7,663	$4,956
Unmet need (after all aid)	$6,176	$6,144	$4,571	$5,518	$4,359	$4,962	$4,601

Freshman	24.3%	28.6%	25.5%	24.8%	30.3%	30.4%	23.2%
Sophomore	22.7%	21.8%	23.0%	25.1%	22.6%	23.3%	21.6%
Junior	22.1%	21.6%	21.9%	20.2%	21.8%	19.7%	23.8%
Senior	30.8%	28.0%	29.6%	29.9%	25.3%	26.7%	31.5%
Public							
Very Selective	17.0%	14.5%	15.8%	9.8%	16.2%	13.6%	13.7%
Moderately Selective	37.9%	28.8%	38.8%	19.3%	42.6%	26.2%	45.5%
Minimally Selective	6.1%	5.0%	6.6%	4.1%	6.6%	3.1%	5.9%
Open Admission	8.2%	6.5%	8.6%	2.6%	8.4%	2.5%	4.6%
Private							
Very Selective	11.0%	12.4%	9.4%	23.2%	8.0%	21.3%	7.6%
Moderately Selective	13.9%	20.7%	15.1%	31.5%	13.0%	22.6%	17.5%
Minimally Selective	4.1%	9.7%	3.8%	8.6%	3.8%	9.9%	4.6%
Open Admission	1.7%	2.3%	1.9%	0.9%	1.3%	0.8%	0.6%
Primarily non-residential	38.1%	29.9%	37.8%	17.1%	38.6%	17.8%	3749.0%
Primarily residential	35.8%	37.0%	36.3%	31.3%	38.5%	38.0%	40.1%
Highly residential	23.2%	31.7%	22.8%	51.0%	20.2%	43.7%	21.8%
N	23720	2160	17200	3460	8440	1510	3270

Data: 2011-12 National Postsecondary Student Aid Study (NPSAS:12). Sample includes public or private non-profit four-year institutions that participate in the relevant campus-based aid program. "Non-recipients" includes students at campus-based aid participating institutions who filed the FAFSA (FSEOG); students who filed the FAFSA and they would borrow more if they could (Perkins), or students who filed the FAFSA and indicated they were interested in FWS on the FAFSA (FWS). Selectivity categories provided in NPSAS:12. Student level sample weights used in all analyses. All other institution-level variables sourced from IPEDS. All sample sizes rounded to the nearest ten in compliance with IES reporting standards.

Table 3.7: Determinants of campus based aid receipt

	FSEOG (1)	FWS (2)	Perkins (3)
Filed FAFSA by March 1st	0.0575***	0.0127	0.0762***
	(0.0054)	(0.0101)	(0.0153)
Black	0.0289***	0.0244	-0.0082
	(0.0092)	(0.0151)	(0.0240)
Hispanic	0.0213**	0.0039	0.0114
	(0.0086)	(0.0148)	(0.0239)
Asian	0.0259*	0.0407*	-0.1074***
	(0.0136)	(0.0230)	(0.0332)
Other race	0.0082	0	0.0015
	(0.0117)	(0.0210)	(0.0310)
Female	-0.0034	0.0223**	-0.011
	(0.0050)	(0.0090)	(0.0141)
Depend	-0.0287***	0.0608***	0.036
	(0.0085)	(0.0161)	(0.0237)
EFC ($1,000s)	-0.0027***	-0.0051***	-0.0126***
	(0.0001)	(0.0003)	(0.0011)
Entrance exam percentile score	-0.0005***	-0.0003	0.0006**
	(0.0001)	(0.0002)	(0.0003)
No entrance exam score	-0.0158	-0.0658***	-0.0179
	(0.0116)	(0.0232)	(0.0295)
Institutional need-based grants ($1,000s)	0.0056***	0.0083***	0.0028
	(0.0008)	(0.0013)	(0.0020)
Institutional merit-based grants ($1,000s)	0	0.0042***	0.0002
	(0.0007)	(0.0014)	(0.0025)
State grants ($1,000s)	0.0154***	0.0038*	0.0134***
	(0.0015)	(0.0022)	(0.0040)
Stafford Loans ($1,000s)	0.0015**	0.0006	0.0082***
	(0.0007)	(0.0015)	(0.0030)
Sophomore	-0.0084	0.0492***	-0.0483**
	(0.0068)	(0.0116)	(0.0192)
Junior	-0.0146**	0.0283**	-0.1133***
	(0.0071)	(0.0129)	(0.0203)
Senior	-0.0101	0.0775***	-0.0765***
	(0.0069)	(0.0128)	(0.0207)
Constant	0.1143***	0.2090***	0.2482***
	(0.0117)	(0.0225)	(0.0401)
R-squared	0.232	0.394	0.443
N	18560	11420	4550

Data: 2011-12 National Postsecondary Student Aid Study (NPSAS:12). Each column represents estimates from a separate regression model, with the dependent variable being an indicator for whether a student received the form of campus-based aid specified. All regressions include institution fixed effects. Sample includes students public or private non-profit four-year institutions that participate in the relevant campus-based aid program. Sample includes students who either received the relevant campus-based aid, or non-recipients who: filed the FAFSA (FSEOG); students who filed the FAFSA and they would borrow more if they could (Perkins), or students who filed the FAFSA and indicated they were interested in FWS on the FAFSA (FWS). Student sample weights used in all analyses. All sample sizes rounded to the nearest ten in compliance with IES reporting standards.

Table 3.8: Determinants of campus based aid receipt, by institution sector

	FSEOG		FWS		Perkins	
	Public	Private	Public	Private	Public	Private
	(1)	(2)	(3)	(4)	(5)	(6)
Filed FAFSA by March 1st	0.0613***	0.0445***	0.0105	0.0236	0.0847***	0.0441
	(0.0060)	(0.0112)	(0.0109)	(0.0204)	(0.0172)	(0.0308)
Black	0.0221**	0.0540**	0.0290*	0.0418	0.0247	-0.0854*
	(0.0096)	(0.0214)	(0.0161)	(0.0337)	(0.0271)	(0.0471)
Hispanic	0.0133	0.0428**	-0.0004	0.0154	0.007	0.0141
	(0.0091)	(0.0194)	(0.0157)	(0.0304)	(0.0276)	(0.0425)
Asian	0.0341**	0.0103	0.0476*	0.0199	-0.0712*	-0.1732***
	(0.0152)	(0.0275)	(0.0244)	(0.0446)	(0.0371)	(0.0623)
Other race	0.016	-0.0077	0.0022	-0.0007	0.0244	-0.0357
	(0.0132)	(0.0239)	(0.0224)	(0.0419)	(0.0348)	(0.0612)
Female	0.0017	-0.0134	0.0174*	0.0351*	-0.0008	-0.0381
	(0.0054)	(0.0108)	(0.0097)	(0.0186)	(0.0157)	(0.0286)
Depend	-0.0413***	0.0136	0.0571***	0.0636	0.0296	0.0739
	(0.0090)	(0.0217)	(0.0161)	(0.0415)	(0.0259)	(0.0581)
EFC ($1,000s)	-0.0022***	-0.0034***	-0.0031***	-0.0077***	-0.0137***	-0.0117***
	(0.0001)	(0.0003)	(0.0003)	(0.0005)	(0.0013)	(0.0018)
Entrance exam percentile score	-0.0003***	-0.0008***	-0.0003	-0.0002	0.0007**	0.0007
	(0.0001)	(0.0002)	(0.0002)	(0.0004)	(0.0003)	(0.0006)
No entrance exam score	-0.002	-0.0577**	-0.0108	-0.2294***	0.0153	-0.1276*
	(0.0126)	(0.0268)	(0.0237)	(0.0608)	(0.0318)	(0.0725)
Institutional need-based grants ($1,000s)	0.0099***	0.0040***	0.0104***	0.0061***	0.0029	0.0016
	(0.0020)	(0.0009)	(0.0031)	(0.0015)	(0.0054)	(0.0023)

Institutional merit-based grants ($1,000s)	-0.0005	-0.0003	-0.0024	0.0051***	0.0006	-0.0019
	(0.0012)	(0.0009)	(0.0021)	(0.0018)	(0.0037)	(0.0032)
State grants ($1,000s)	0.0141***	0.0185***	0.0047**	0.0017	0.0125***	0.0140*
	(0.0017)	(0.0034)	(0.0023)	(0.0048)	(0.0046)	(0.0076)
Stafford Loans ($1,000s)	0.0014*	0.0015	-0.0048***	0.0097***	0.0045	0.0193***
	(0.0008)	(0.0017)	(0.0016)	(0.0033)	(0.0033)	(0.0067)
Sophomore	0.0024	-0.0329**	0.0486***	0.0432**	-0.0552**	-0.0505
	(0.0074)	(0.0143)	(0.0128)	(0.0218)	(0.0234)	(0.0331)
Junior	-0.0055	-0.0361**	0.0549***	-0.0154	-0.0762***	-0.2042***
	(0.0076)	(0.0155)	(0.0135)	(0.0263)	(0.0222)	(0.0434)
Senior	-0.0041	-0.0258*	0.1073***	0.0372	-0.0469**	-0.1567***
	(0.0074)	(0.0148)	(0.0140)	(0.0255)	(0.0232)	(0.0423)
Constant	0.0871***	0.1723***	0.0975***	0.3905***	0.1703***	0.3676***
	(0.0123)	(0.0287)	(0.0231)	(0.0529)	(0.0432)	(0.0878)
R-squared	0.18	0.291	0.223	0.398	0.335	0.518
N	11690	6880	6550	4870	2580	1970

Data: 2011-12 National Postsecondary Student Aid Study (NPSAS:12). Each column represents estimates from a separate regression model, with the dependent variable being an indicator for whether a student received the form of campus-based aid specified. All regressions include institution fixed effects. Sample includes students public or private non-profit four-year institutions that participate in the relevant campus-based aid program. Sample includes students who either received the relevant campus-based aid, or non-recipients who: filed the FAFSA (FSEOG); students who filed the FAFSA and they would borrow more if they could (Perkins), or students who filed the FAFSA and indicated they were interested in FWS on the FAFSA (FWS). Student sample weights used in all analyses. All sample sizes rounded to the nearest ten in compliance with IES reporting standards.

Table 3.9: Determinants of student-level campus based aid award ($1,000s)

	FSEOG (1)	FWS (2)	Perkins (3)
Filed FAFSA by March 1st	0.0515***	0.0303	0.1585***
	(0.0060)	(0.0279)	(0.0351)
Black	0.0393***	0.0648	0.0281
	(0.0105)	(0.0426)	(0.0541)
Hispanic	0.0444***	-0.0103	0.0284
	(0.0122)	(0.0405)	(0.0529)
Asian	0.0281	0.0502	-0.1723**
	(0.0189)	(0.0658)	(0.0691)
Other race	0.0044	-0.0479	0.0091
	(0.0134)	(0.0512)	(0.0726)
Female	0.0012	0.004	-0.0392
	(0.0058)	(0.0258)	(0.0310)
Depend	-0.0138	0.1688***	0.0733
	(0.0084)	(0.0482)	(0.0511)
EFC ($1,000s)	-0.0023***	-0.0097***	-0.0198***
	(0.0002)	(0.0007)	(0.0024)
Entrance exam percentile score	-0.0003**	-0.0006	0.0003
	(0.0001)	(0.0006)	(0.0007)
No entrance exam score	-0.013	-0.1762***	-0.1218*
	(0.0111)	(0.0678)	(0.0654)
Institutional need-based grants ($1,000s)	0.0102***	0.0179***	0.0092*
	(0.0016)	(0.0031)	(0.0053)
Institutional merit-based grants ($1,000s)	0.0016	0.0070*	0.003
	(0.0012)	(0.0036)	(0.0062)
State grants ($1,000s)	0.0092***	0.0161***	0.0291***
	(0.0019)	(0.0056)	(0.0091)
Stafford Loans ($1,000s)	0.0019**	0.0058	0.0305***
	(0.0009)	(0.0044)	(0.0073)
Sophomore	-0.0224***	0.1094***	-0.0949**
	(0.0079)	(0.0299)	(0.0409)
Junior	-0.0199**	0.1153***	-0.2167***
	(0.0086)	(0.0351)	(0.0442)
Senior	-0.0265***	0.2125***	-0.1172**
	(0.0080)	(0.0369)	(0.0476)
Constant	0.0707***	0.3536***	0.3394***
	(0.0125)	(0.0684)	(0.0885)
R-squared	0.188	0.31	0.431
N	18560	11420	4550

Data: 2011-12 National Postsecondary Student Aid Study (NPSAS:12). Each column represents estimates from a separate regression model, with the dependent variable being the dollar amount a student received of the relevant campus-based aid program. All regressions include institution fixed effects. Sample includes students public or private non-profit four-year institutions that participate in the relevant campus-based aid program. Sample includes students who either received the relevant campus-based aid, or non-recipients who: filed the FAFSA (FSEOG); students who filed the FAFSA and they would borrow more if they could (Perkins), or students who filed the FAFSA and indicated they were interested in FWS on the FAFSA (FWS). Student sample weights used in all analyses. All sample sizes rounded to the nearest ten in compliance with IES reporting standards.

Table 3.10: Determinants of campus based aid receipt (freshmen only)

	FSEOG (1)	FWS (2)	Perkins (3)
Filed FAFSA by March 1st	0.0447***	0.0027	0.0738***
	(0.0078)	(0.0123)	(0.0257)
Black	0.0272**	-0.0082	0.0451
	(0.0127)	(0.0174)	(0.0357)
Hispanic	0.0370***	-0.01	0.0362
	(0.0119)	(0.0176)	(0.0371)
Asian	0.014	0.0028	-0.0747
	(0.0191)	(0.0290)	(0.0573)
Other race	0.0311*	-0.0465*	0.1103**
	(0.0175)	(0.0270)	(0.0489)
Female	0.0104	0.0302***	0.0304
	(0.0075)	(0.0106)	(0.0225)
Depend	-0.0107	0.0146	0.0493
	(0.0146)	(0.0271)	(0.0508)
EFC ($1,000s)	-0.0028***	-0.0040***	-0.0133***
	(0.0002)	(0.0003)	(0.0016)
Entrance exam percentile score	-0.0002	-0.0003	0.0001
	(0.0002)	(0.0002)	(0.0005)
No entrance exam score	0.0113	-0.0265	-0.0557
	(0.0230)	(0.0380)	(0.0777)
Institutional need-based grants ($1,000s)	0.0054***	0.0117***	0.0040*
	(0.0010)	(0.0016)	(0.0023)
Institutional merit-based grants ($1,000s)	0.0013	0.0066***	0.0023
	(0.0010)	(0.0016)	(0.0026)
State grants ($1,000s)	0.0196***	0.0056*	0.0140**
	(0.0024)	(0.0030)	(0.0060)
Stafford Loans ($1,000s)	0.0025*	0.0054**	0.0127**
	(0.0014)	(0.0022)	(0.0060)
Constant	0.0752***	0.2072***	0.1836**
	(0.0187)	(0.0341)	(0.0754)
R-squared	0.298	0.506	0.621
N	8620	5790	2080

Data: 2011-12 National Postsecondary Student Aid Study (NPSAS:12). Each column represents estimates from a separate regression model, with the dependent variable being an indicator for whether a student received the form of campus-based aid specified. All regressions include institution fixed effects. Sample includes students public or private non-profit four-year institutions that participate in the relevant campus-based aid program. Sample includes students who either received the relevant campus-based aid, or non-recipients who: filed the FAFSA (FSEOG); students who filed the FAFSA and they would borrow more if they could (Perkins), or students who filed the FAFSA and indicated they were interested in FWS on the FAFSA (FWS). Student sample weights used in all analyses. All sample sizes rounded to the nearest ten in compliance with IES reporting standards.

Table 3.11: Determinants of campus based aid receipt, students who send FAFSA to one school only (freshmen only)

	FSEOG (1)	FWS (2)	Perkins (3)
Filed FAFSA by March 1st	0.0473***	0.0519***	-0.0056
	(0.0113)	(0.0177)	(0.0475)
Black	0.0299	-0.0302	0.1265*
	(0.0191)	(0.0290)	(0.0757)
Hispanic	0.0186	-0.0189	-0.0212
	(0.0163)	(0.0292)	(0.0765)
Asian	0.0322	0.0566	-0.0621
	(0.0291)	(0.0553)	(0.1730)
Other race	0.022	-0.1088***	0.1544
	(0.0283)	(0.0379)	(0.1354)
Female	0.0136	0.0209	0.0664
	(0.0111)	(0.0171)	(0.0486)
Depend	-0.0167	0.0455	0.0442
	(0.0195)	(0.0290)	(0.0860)
EFC ($1,000s)	-0.0022***	-0.0032***	-0.0120***
	(0.0003)	(0.0005)	(0.0036)
Entrance exam percentile score	-0.0001	-0.0002	0.0001
	(0.0002)	(0.0004)	(0.0011)
No entrance exam score	0.0328	-0.0112	0.0101
	(0.0289)	(0.0477)	(0.0956)
Institutional need-based grants ($1,000s)	0.0009	0.0122***	0.0159**
	(0.0018)	(0.0035)	(0.0071)
Institutional merit-based grants ($1,000s)	0.0004	0.0067**	0.0063
	(0.0015)	(0.0028)	(0.0051)
State grants ($1,000s)	0.0202***	0.0076	0.0151
	(0.0039)	(0.0051)	(0.0146)
Stafford Loans ($1,000s)	0.0027	0.0087***	0.0125
	(0.0021)	(0.0033)	(0.0117)
Constant	0.0672**	0.0926**	0.1075
	(0.0266)	(0.0397)	(0.1291)
R-squared	0.404	0.616	0.723
N	3810	2320	810

Data: 2011-12 National Postsecondary Student Aid Study (NPSAS:12). Each column represents estimates from a separate regression model, with the dependent variable being an indicator for whether a student received the form of campus-based aid specified. All regressions include institution fixed effects. Sample includes students public or private non-profit four-year institutions that participate in the relevant campus-based aid program. Sample includes students who either received the relevant campus-based aid, or non-recipients who: filed the FAFSA (FSEOG); students who filed the FAFSA and they would borrow more if they could (Perkins), or students who filed the FAFSA and indicated they were interested in FWS on the FAFSA (FWS). Student sample weights used in all analyses. All sample sizes rounded to the nearest ten in compliance with IES reporting standards.

Table 3.12: Determinants of campus based aid receipt (excluding non-CBA recipients with less than $1000 in unmet need)

	FSEOG (1)	FWS (2)	Perkins (3)
Filed FAFSA by March 1st	0.0903***	0.0125	0.0661***
	(0.0089)	(0.0134)	(0.0230)
Black	0.0513***	0.0458**	-0.0147
	(0.0159)	(0.0216)	(0.0336)
Hispanic	0.0327**	0.0139	-0.0292
	(0.0159)	(0.0210)	(0.0329)
Asian	0.0863***	0.0528*	-0.1058**
	(0.0235)	(0.0284)	(0.0467)
Other race	0.025	0.0208	-0.0403
	(0.0198)	(0.0265)	(0.0413)
Female	0.0115	0.0270**	-0.0158
	(0.0083)	(0.0119)	(0.0198)
Depend	-0.1545***	0.0178	0.02
	(0.0192)	(0.0264)	(0.0379)
EFC ($1,000s)	-0.0058***	-0.0101***	-0.0245***
	(0.0002)	(0.0004)	(0.0014)
Entrance exam percentile score	-0.0007***	-0.0003	0.0007*
	(0.0002)	(0.0003)	(0.0004)
No entrance exam score	-0.0337	-0.058	-0.0124
	(0.0246)	(0.0415)	(0.0482)
Institutional need-based grants ($1,000s)	0.0012	0.0013	-0.0047*
	(0.0011)	(0.0014)	(0.0025)
Institutional merit-based grants ($1,000s)	-0.0056***	-0.0040**	-0.0112***
	(0.0010)	(0.0016)	(0.0027)
State grants ($1,000s)	0.0173***	-0.0034	-0.0003
	(0.0025)	(0.0032)	(0.0051)
Stafford Loans ($1,000s)	-0.0102***	-0.0143***	0.0005
	(0.0015)	(0.0022)	(0.0050)
Sophomore	-0.0012	0.0604***	-0.04
	(0.0114)	(0.0153)	(0.0253)
Junior	-0.0047	0.0690***	-0.1131***
	(0.0120)	(0.0178)	(0.0289)
Senior	-0.0131	0.0846***	-0.0995***
	(0.0113)	(0.0164)	(0.0294)
Constant	0.4478***	0.6237***	0.6912***
	(0.0264)	(0.0366)	(0.0673)
R-squared	0.403	0.484	0.605
N	9690	7020	2670

Data: 2011-12 National Postsecondary Student Aid Study (NPSAS:12). Each column represents estimates from a separate regression model, with the dependent variable being an indicator for whether a student received the form of campus-based aid specified. All regressions include institution fixed effects. Sample includes students public or private non-profit four-year institutions that participate in the relevant campus-based aid program. Sample includes students who either received the relevant campus-based aid, or non-recipients who: filed the FAFSA (FSEOG); students who filed the FAFSA and they would borrow more if they could (Perkins), or students who filed the FAFSA and indicated they were interested in FWS on the FAFSA (FWS). Student sample weights used in all analyses. All sample sizes rounded to the nearest ten in compliance with IES reporting standards.

Table 3.13: Alternate distribution of FSEOG

	Current distribution	Alternative Distributions	
		Pell Recipients	Students with EFC=0
	(1)	(2)	(3)
Award size			
10th Percentile	$200	$62	$160
50th Percentile	$600	$198	$319
90th Percentile	$1,550	$216	$319
Distribution of recipients' EFC			
10th Percentile	$0	$0	$0
50th Percentile	$0	$0	$0
90th Percentile	$2,800	$3,558	$0
% students with unmet need who receive aid	11.3%	57.2%	32.3%
% Pell recipients who receive aid	19.6%	100.0%	56.6%
% of students with zero EFC who receive aid	23.2%	100.0%	100.0%

Data: 2011-12 National Postsecondary Student Aid Study (NPSAS:12). Results from sample of students at four-year public or private non-profit institutions enrolled full-time in Fall 2011. Sample includes students who either received an FSEOG award or filed the FAFSA for the 2011-12 award year. See text for more details on this analysis.

Table 3.14: Alternate Distribution of FWS

		Alternative distributions		
	Current distribution	Students with unmet need	Pell Recipients	Students with EFC=0
	(1)	(2)	(3)	(4)
Award size				
10th Percentile	$722	$688	$1,241	$2,250
50th Percentile	$2,000	$688	$1,241	$2,250
90th Percentile	$3,500	$688	$1,241	$2,250
Distribution of recipients' EFC				
10th Percentile	$0	$0	$0	$0
50th Percentile	$2,900	$3,143	$0	$0
90th Percentile	$22,010	$21,560	$3,658	$0
% students with unmet need receive aid	31.8%	100.0%	55.4%	20.6%
% Pell recipients receive aid	31.7%	100.0%	100.0%	55.1%
% of students with zero EFC receive aid	30.5%	100.0%	100.0%	100.0%

Data: 2011-12 National Postsecondary Student Aid Study (NPSAS:12). Results from sample of students at four-year public or private non-profit institutions enrolled full-time in Fall 2011. Sample includes students who either received an FWS award or indicated their interest in FWS on the FAFSA for the 2011-12 award year. See text for more details on this analysis.

Table 3.15: Alternate Distribution of Perkins loans

		Alternative distributions		
	Current distribution	Students with unmet need	Pell Recipients	Students with EFC=0
	(1)	(2)	(3)	(4)
Award size				
10th Percentile	$800	$126	$215	$351
50th Percentile	$1,800	$225	$426	$692
90th Percentile	$3,500	$337	$555	$1,053
Distribution of recipients' EFC				
10th Percentile	$0	$0	$0	$0
50th Percentile	$1,162	$2,457	$0	$0
90th Percentile	$12,142	$15,792	$3,796	$0
% students with unmet need receive aid	27.8%	100.0%	61.2%	33.5%
% Pell recipients receive aid	32.7%	100.0%	100.0%	54.8%
% of students with zero EFC receive aid	31.9%	100.0%	100.0%	100.0%

Data: 2011-12 National Postsecondary Student Aid Study (NPSAS:12). Results from sample of students at four-year public or private non-profit institutions enrolled full-time in Fall 2011. Sample includes students who either received a Perkins award or indicated their interest borrowing more in student loans. See text for more details on this analysis.

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APPENDICES

APPENDIX 1.1

In this Appendix, I propose and test two alternate hypotheses to explain the progressive effect of earlier state deadlines on the distribution of state merit-based grants.

A. Crowd out by need-based grants

It is possible that when state deadlines occur later, need-based grants crowd out merit-based grant dollars. Consider the case where a student qualifies for both a need-based and merit-based grant. A state may choose to have the need-based grant is applied to a student's aid package first; if the student has remaining unmet financial need, the merit-based grant is then applied second.[107] Therefore, if a student receives enough need-based grant aid from state, federal, and private sources to cover his unmet need, then he would not receive a state merit-based grant. I test this hypothesis empirically by estimating the effect of state deadlines on the amount of state grant aid received (need only, merit only, and total) received, separately for different levels of academic achievement. I divide the analytic sample into three categories: (1) students in the top quartile of the distribution of entrance exam scores; (2) students in the middle half of the distribution of entrance exam scores; and (3) students in the bottom quartile of the distribution of entrance exam scores *or* students with no valid entrance exam score. I

[107] I have not found anecdotal evidence to support this hypothesis, as information regarding how states package multiple awards is not readily available. The one exception I found is West Virginia, which applies its merit-based scholarship (the PROMISE Scholarship) *first* to students' aid packages, and then its need-based grant. Source: https://www.cfwv.com/Financial_Aid_Planning/Scholarships/Promise/Award_Information.aspx

refer to these categories as the highest-achieving, mid-achieving, and lower-achieving students, respectively.

If later deadlines cause a crowding out of state merit-based grants for lower-income students, then I should observe this reallocation of aid for the higher-achieving students. However, my results in Table A1.5 do not support this hypothesis. Table A1.5 shows that earlier deadlines increase both state need- and merit-based grant awards to Pell eligible students, both in absolute terms and relative to Pell ineligible students. An interesting pattern that does emerge from Table A1.5 is that in addition to earlier deadlines affecting the distribution of grant aid by income, earlier deadlines may also cause a redistribution of grant aid by academic achievement. I address this issue in the main body of the text in Section VI.

B. State deadlines and college choice

A second potential explanation for the progressive effect of earlier deadlines on state merit-grants is that earlier deadlines are causing a differential shift in students' choice of college. As I mention in Section II, state need- or merit-based grants cannot be used at all institutions. Many state merit-based grants are limited to use at four-year, in-state, public institutions. Earlier deadlines may cause students to be more likely to attend an institution that accepts merit-based if earlier deadlines cause merit grants to represent a larger proportion of students' potential aid packages. I test this hypothesis by estimating a probit regression model with the dependent variable $CollegeSector_{ist}$, which is an indicator for the six separate college sectors in the sample (public four-year; public two-year; private four-year; private two-year; proprietary four-year; proprietary two-year). If the hypothesis that college choice causes progressive distributional effect of deadlines on

state merit-based grants, then students should be relatively more likely to attend public four-year institutions. However, as the marginal effects estimates in Table A1.6 show, this is not the case. In fact, earlier deadlines cause Pell eligible students to be 1.4 percentage points relatively less likely to attend a public four-year institution, and instead 1.2 percentage points relatively more likely to attend a public two-year institution. Broken out by academic achievement, Table A1.7 shows that these results are concentrated within the mid- and lower-achieving student samples. The results in Tables A1.6 and A1.7 are inconsistent with the hypothesis that college choice is driving the progressive distributional effect of deadlines on state merit-based grants.

APPENDIX TABLES AND FIGURES

Table A1.1: Relationship between state deadlines and grant funding (lagged deadline)

	Total Aid (natural log $)	Need aid (natural log $)	Merit aid (natural log $)	% Need aid	Need aid $ per FTE UG	Merit aid $ per FTE UG
	(1)	(2)	(3)	(4)	(5)	(6)
State Deadline	0.165*	0.021	0.199	-0.044	-2.01	51.688
(+1=30 days earlier)	(0.092)	(0.060)	(0.220)	(0.037)	(17.894)	(52.468)
R-squared	0.959	0.962	0.871	0.781	0.817	0.856
N	243	243	243	243	243	243

Data: NASSGAP Annual Surveys, 2002 through 2012. Notes: each column displays estimates from a separate regression model. All regression models include year fixed effects, state fixed effects, and the following state by year level controls: average in-state tuition at public four-year colleges and universities (natural log); state unemployment rate; state poverty rate. All relevant variables are in 2011$.

Table A1.2: Relationship between state deadlines and grant funding (lead deadline)

	Total Aid (natural log $)	Need aid (natural log $)	Merit aid (natural log $)	% Need aid	Need aid $ per FTE UG	Merit aid $ per FTE UG
	(1)	(2)	(3)	(4)	(5)	(6)
State Deadline	0.074	0.179***	0.192	0.002	26.537	3.515
(+1=30 days earlier)	(0.096)	(0.067)	(0.233)	(0.046)	(17.286)	(71.026)
R-squared	0.951	0.954	0.865	0.731	0.821	0.847
N	269	269	269	269	269	269

Data: NASSGAP Annual Surveys, 2002 through 2012. Notes: each column displays estimates from a separate regression model. All regression models include year fixed effects, state fixed effects, and the following state by year level controls: average in-state tuition at public four-year colleges and universities (natural log); state unemployment rate; state poverty rate. All relevant variables are in 2011$.

Table A1.3: The effect of state deadlines on grant awards of recipients

	State need-based grant ($) (1)	State merit-based grant ($) (2)
State Deadline	300.80***	249.53***
	(72.13)	(84.58)
Pell * Deadline	-96.56**	114.57***
	(41.91)	(36.55)
R-squared	0.311	0.455
N	16860	5190

Data: NPSAS waves 1999-00, 2003-04, 2007-08, and 2011-12. Notes: each column displays estimates from a separate regression model. All regression models include student gender, dependency status, and entrance exam score, year fixed effects, state fixed effects, and the following state by year level controls: average in-state tuition at public four-year colleges and universities (natural log); state unemployment rate; state poverty rate; total funding for state grant programs (natural log). All relevant variables are in 2011$. See text for more information on these control variables. Sample sizes rounded to the nearest ten in compliance with IES reporting standards. Sample includes students who are first- through fourth-year undergraduate students who received a state grant, enrolled at a four-year or two-year institution in Fall 1999, 2003, 2007, or 2011, and are residents of a state with a FAFSA deadline on or before July 1st.

Table A1.4: The effect of state deadlines on Pr(Receive Need Grant), not limiting sample

	Include spring enrollees (1)	Include less-than two-year institutions (2)
State Deadline	0.0154***	0.0154***
	(0.0031)	(0.0031)
Pell * Deadline	-0.0138***	-0.0135***
	(0.0016)	(0.0016)
R-squared	0.1890	0.1862
N	148,520	160,150

Data: NPSAS waves 1999-00, 2003-04, 2007-08, and 2011-12. Notes: each column displays estimates from a separate regression model. All regression models include student gender, dependency status, and entrance exam score, year fixed effects, state fixed effects, and the following state by year level controls: average in-state tuition at public four-year colleges and universities (natural log); state unemployment rate; state poverty rate; total funding for state grant programs (natural log). All relevant variables are in 2011$. See text for more information on these control variables. Sample sizes rounded to the nearest ten in compliance with IES reporting standards. Sample includes students who are first- through fourth-year undergraduate students enrolled at a four-year or two-year institution in Fall 1999, 2003, 2007, or 2011 (except as otherwise stated in column header), and are residents of a state with a FAFSA deadline on or before July 1st.

Table A1.5: Distributional effect of deadlines on probability of grant receipt, by academic achievement

	State Need Grant $			State Merit Grant $			Total State Grant $		
	Highest-Achieving	Mid-Achieving	Lower-Achieving	Highest-Achieving	Mid-Achieving	Lower-Achieving	Highest-Achieving	Mid-Achieving	Lower-Achieving
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
State Deadline	161.71***	141.37***	41.79***	55.91	-30.99	-15.48**	216.44***	113.30***	32.48**
	(47.27)	(24.21)	(12.94)	(55.50)	(23.70)	(6.58)	(71.39)	(34.36)	(14.94)
Pell * Deadline	238.14***	81.74***	-60.06***	124.59***	60.52***	22.31***	378.25***	136.87***	-32.73***
	(35.85)	(21.12)	(8.33)	(24.46)	(12.57)	(3.87)	(44.79)	(25.26)	(9.67)
R-squared	0.136	0.132	0.077	0.3	0.265	0.066	0.17	0.137	0.08
N	14,270	29,030	67,710	14,270	29,030	67,710	14,270	29,030	67,710

Data: NPSAS waves 1999-00, 2003-04, 2007-08, and 2011-12. Notes: each column displays estimates from a separate regression model. All regression models include student gender, dependency status, and entrance exam score, year fixed effects, state fixed effects, and the following state by year level controls: average in-state tuition at public four-year colleges and universities (natural log); state unemployment rate; state poverty rate; total funding for state grant programs (natural log). All relevant variables are in 2011$. See text for more information on these control variables. Sample sizes rounded to the nearest ten in compliance with IES reporting standards. Sample includes students who are first- through fourth-year undergraduate students enrolled at a four-year or two-year institution in Fall 1999, 2003, 2007, or 2011, and are residents of a state with a FAFSA deadline on or before July 1st.

Table A1.6: Effect of state deadlines on college choice

	Public, four-year	Public, two-year	Non-profit, four-year	Non-profit, two-year	For-profit, four-year	For-profit, two-year
	(1)	(2)	(3)	(4)	(5)	(6)
State Deadline	0.0101	0.0243**	-0.0009	-0.0030***	0.0063	-0.023***
	(0.0076)	(0.0104)	(0.0055)	(0.0009)	(0.0073)	(0.0038)
Pell * Deadline	-0.0142***	0.0115**	-0.0008	0.0012***	-0.0043	0.0052***
	(0.0036)	(0.0047)	(0.0027)	(0.0005)	(0.0028)	(0.0021)
R-squared	0.2589	0.2281	0.1467	0.1489	0.1854	0.1979
N	40230	40230	40230	39360	40210	40210

Data: NPSAS waves 1999-00, 2003-04, 2007-08, and 2011-12. Notes: each column displays estimates from a separate regression model. All regression models include student gender, dependency status, and entrance exam score, year fixed effects, state fixed effects, and the following state by year level controls: average in-state tuition at public four-year colleges and universities (natural log); state unemployment rate; state poverty rate; total funding for state grant programs (natural log). All relevant variables are in 2011$. See text for more information on these control variables. Sample sizes rounded to the nearest ten in compliance with IES reporting standards. Sample includes students who are first- through fourth-year undergraduate students enrolled at a four-year or two-year institution in Fall 1999, 2003, 2007, or 2011, and are residents of a state with a FAFSA deadline on or before July 1st.

Table A1.7: Effect of state deadlines on college choice, by academic achievement

Panel A: Highest-achieving students

	Public, four-year	Public, two-year	Non-profit, four-year	Non-profit, two-year	For-profit, four-year	For-profit, two-year
	(1)	(2)	(3)	(4)	(5)	(6)
Pell * Deadline	-0.0026	0.0070	-0.0148	-0.0021	-0.0113*	-0.0096*
	(0.0163)	(0.0117)	(0.0168)	(0.0158)	(0.0061)	(0.0056)
R-squared	0.1328	0.3044	0.1335	0.1902	0.2408	0.2659
N	3960	3760	3960	1820	1850	2820

Panel B: Mid-achieving students

	Public, four-year	Public, two-year	Non-profit, four-year	Non-profit, two-year	For-profit, four-year	For-profit, two-year
	(1)	(2)	(3)	(4)	(5)	(6)
Pell * Deadline	-0.0216**	0.0186**	-0.0036	0.0009	-0.0010	0.0019
	(0.0095)	(0.0085)	(0.0072)	(0.0009)	(0.0020)	(0.0045)
R-squared	0.1134	0.1858	0.0839	0.2526	0.2762	0.1329
N	10100	10090	10100	7520	9820	5290

Panel A: Lower-achieving students

	Public, four-year	Public, two-year	Non-profit, four-year	Non-profit, two-year	For-profit, four-year	For-profit, two-year
	(1)	(2)	(3)	(4)	(5)	(6)
Pell * Deadline	-0.0092***	0.0082	0.0022	0.0016***	-0.0052	0.0065
	(0.0038)	(0.0057)	(0.0026)	(0.0006)	(0.0038)	(0.0029)
R-squared	0.2233	0.1370	0.1052	0.1487	0.1586	0.1820
N	26170	26170	26170	25580	26150	26150

Data: NPSAS waves 1999-00, 2003-04, 2007-08, and 2011-12. Notes: each column displays estimates from a separate regression model. All regression models include student gender, dependency status, and entrance exam score, year fixed effects, state fixed effects, and the following state by year level controls: average in-state tuition at public four-year colleges and universities (natural log); state unemployment rate; state poverty rate; total funding for state grant programs (natural log). All relevant variables are in 2011$. See text for more information on these control variables. Sample sizes rounded to the nearest ten in compliance with IES reporting standards. Sample includes students who are first- through fourth-year undergraduate students enrolled at a four-year or two-year institution in Fall 1999, 2003, 2007, or 2011, and are residents of a state with a FAFSA deadline on or before July 1st.

Figure A1.1: Distribution of states' FAFSA filing deadlines, 2015-16 award year

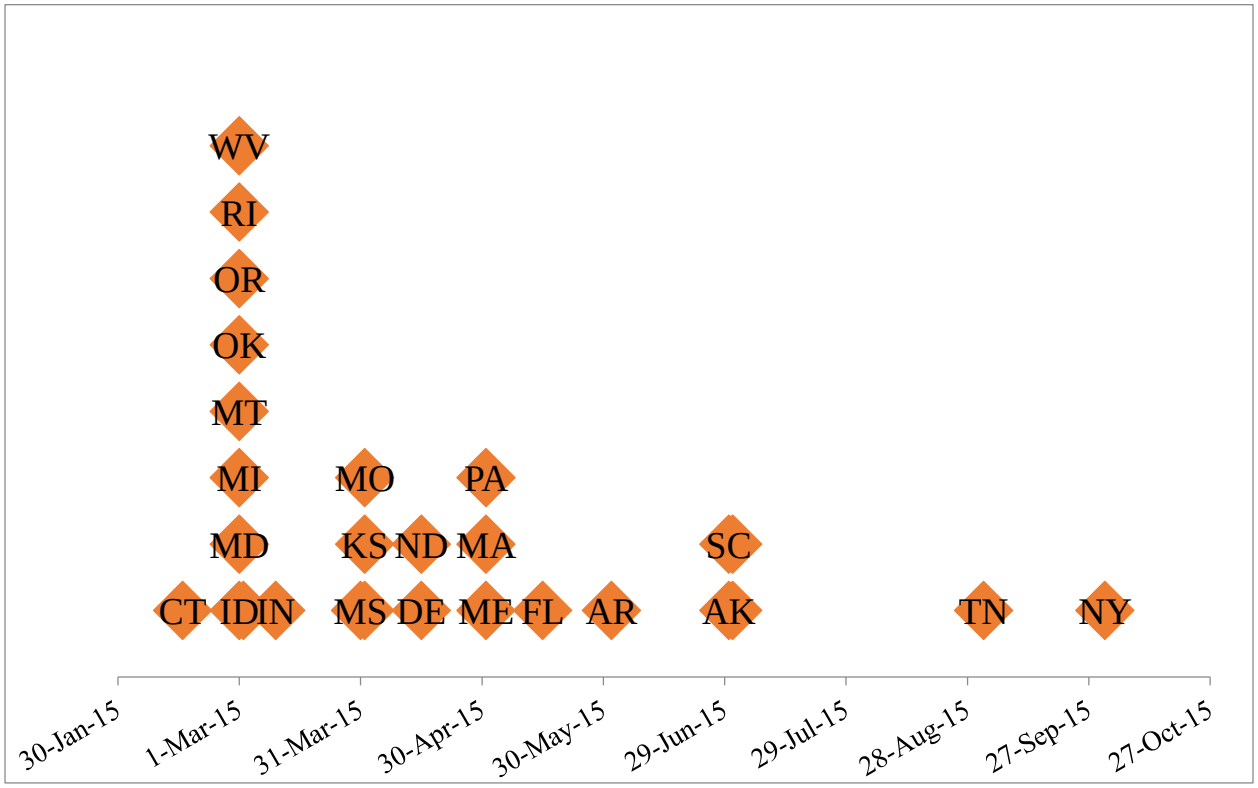


Table A2.1: FAFSA refiling rates, by institution level

	Pell recipients		Pell with 3.0+ GPA	
	All	Re-enrolled	All	Re-enrolled
	(1)	(2)	(3)	(4)
Four-year	93.3%	96.0%	95.6%	96.8%
Two-year	81.9%	88.8%	85.7%	90.9%
Less-than two-year	53.6%	66.3%	54.3%	67.6%

Notes: all entries in these tables are based on the authors' calculations from the Beginning Postsecondary Students Longitudinal Study (BPS:04/09). All samples sizes are rounded to the nearest ten to comply with the Institute of Education Sciences' reporting standards.

Table A2.2: Differences in student characteristics by refiling behavior, students with 3.0+ GPA

	All Pell Recipients		Re-enrolled	
	Refilers	Non-refilers	Refilers	Non-refilers
	(1)	(2)	(3)	(4)
First year GPA	3.49	3.54	3.49	3.52
Pell award amount	$2,528	$2,590	$2,552	$2,656
Pell award as % of COA	0.23	0.22	0.23	0.21
Other grants	$2,321	$627	$2,435	$839
Other grants as % of COA	0.13	0.04	0.13	0.06
Other need-based grants	$1,663	$350	$1,745	$423
Other need-based grant as % of COA	0.09	0.03	0.10	0.03
Merit-based grants	$658	$277	$689	$416
Merit-based grants as % of COA	0.04	0.02	0.04	0.03
Student Loans	$2,476	$2,900	$2,580	$3,279
Student loans as % of COA	0.16	0.20	0.17	0.22
Full-time	0.81	0.78	0.82	0.82
Female	0.68	0.81	0.67	0.8
Underrepresented Minority	0.44	0.56	0.43	0.55
Dependent	0.61	0.4	0.62	0.44
SAT score	960	843	965	851
First Generation College Student	0.63	0.74	0.62	0.73
Total income	$23,454	$19,324	$23,819	$20,867
Cost of Attendance	$13,600	$13,383	$13,845	$13,834
Lives on campus	0.21	0.05	0.23	0.08
Lives with parents	0.35	0.35	0.35	0.32
Lives on own	0.43	0.60	0.43	0.60
Has dependent child(ren)	0.28	0.45	0.28	0.41
Spouse with income	0.08	0.12	0.08	0.09
Any outside job	0.59	0.56	0.59	0.51
Hours worked at outside job	27.2	30.4	27.3	27.7
Any work study	0.15	0.07	0.16	0.08
Hours of work study	12.6	16.2	12.6	16.8
Four-year institution	0.43	0.11	0.46	0.14
Two-year institution	0.47	0.43	0.45	0.43
Less-than two-year institution	0.10	0.46	0.09	0.43
Public institution	0.60	0.41	0.59	0.39
Private, not-for-profit institution	0.16	0.06	0.17	0.08
Private, for-profit institution	0.24	0.53	0.24	0.54
Admission Rate	0.86	0.92	0.86	0.89
Enrolled in 2004-05	0.92	0.53	1.00	1.00

Enrolled in 2005-06	0.70	0.27	0.74	0.38
Enrolled in 2006-07	0.59	0.27	0.61	0.24
GPA as of June 2006	3.27	3.37	3.27	3.38
Received Certificate by June 2009	0.04	0.04	0.03	0.03
Received AA by June 2009	0.06	0.02	0.06	0.02
Received BA by June 2009	0.32	0.06	0.34	0.11
On time BA graduation	0.14	0.03	0.15	0.05
Missing SAT score	0.42	0.69	0.41	0.64
Missing first generation indicator	0.20	0.28	0.20	0.29
Missing total income	0.003	0.005	0.003	0
Missing cost of attendance	0.05	0.03	0.05	0.04
N	2440	380	2290	210

Notes: all entries in these tables are based on the authors' calculations from the Beginning Postsecondary Students Longitudinal Study (BPS:04/09). All samples sizes are rounded to the nearest ten to comply with the Institute of Education Sciences' reporting standards.

Table A2.3: Differences in student characteristics, by institution level

	Four-year (1)	Two-year (2)	Less-than Two-year (3)
First year GPA	2.80	2.87	3.18
Pell award amount	$2,732	$2,326	$2,976
Pell award as % of COA	0.19	0.29	0.20
Other grants	$3,870	$742	$279
Other grants as % of COA	0.19	0.07	0.02
Other need-based grants	$2,840	$596	$188
Other need-based grant as % of COA	0.14	0.06	0.01
Merit-based grants	$1,030	$145	$91
Merit-based grants as % of COA	0.05	0.01	0.01
Student Loans	$3,438	$1,453	$3,368
Student loans as % of COA	0.21	0.11	0.21
Full-time	0.89	0.71	0.92
Female	0.60	0.66	0.75
Underrepresented Minority	0.45	0.49	0.72
Dependent	0.81	0.54	0.41
SAT score	970	831	830
First Generation College Student	0.55	0.68	0.81
Total income	$26,098	$21,044	$16,848
Cost of Attendance	$17,050	$9,344	$15,735
Lives on campus	0.46	0.04	0.00
Lives with parents	0.28	0.46	0.42
Lives on own	0.26	0.50	0.58
Has dependent child(ren)	0.12	0.34	0.46
Spouse with income	0.04	0.09	0.10
Any outside job	0.53	0.69	0.50
Hours worked at outside job	23.6	28.6	29.3
Any work study	0.26	0.07	0.03
Hours of work study	12.1	14.0	21.7
Public institution	0.55	0.80	0.09
Private, not-for-profit institution	0.31	0.04	0.04
Private, for-profit institution	0.15	0.16	0.87
Admission Rate	0.75	0.97	0.91
Enrolled in 2004-05	0.91	0.81	0.68
Enrolled in 2005-06	0.82	0.55	0.23
Enrolled in 2006-07	0.71	0.45	0.21

GPA as of June 2006	3.08	3.10	3.32
Received certificate by June 2009	0.02	0.05	0.07
Received AA by June 2009	0.03	0.08	0.02
Received BA by June 2009	0.45	0.08	0.01
On-time BA graduation	0.19	0.02	0.01
Missing SAT score	0.20	0.54	0.80
Missing first generation indicator	0.19	0.22	0.28
Missing total income	0.002	0.003	0.001
Missing cost of attendance	0.06	0.06	0.02
N	2280	2160	620

Notes: all entries in these tables are based on the authors' calculations from the Beginning Postsecondary Students Longitudinal Study (BPS:04/09). All samples sizes are rounded to the nearest ten to comply with the Institute of Education Sciences' reporting standards.

TABLE A24: Institution Characteristics, by Level

	Four-year (1)	Two-year (2)	Less-than two-year (3)
Open admission policy?	17.8%	73.8%	72.4%
Accredited by recognized agency?	72.4%	79.0%	87.0%
Calendar System			
Semester	74.4%	55.2%	7.5%
Quarter	13.3%	19.8%	4.4%
Trimester	2.7%	2.6%	1.3%
Four-one-four plan	5.1%	13.0%	0.1%
Other academic year	3.0%	1.0%	4.0%
Differs by program	0.6%	8.4%	23.1%
Continuous	1.1%	13.0%	59.7%
Top 10 Certificate/Degree programs			
1	Business, Management, and Marketing	Health Professions	Health Professions
2	Social Sciences	Liberal Arts and Sciences	Personal and Culinary Services
3	Education	Business, Management, and Marketing	Business, Management, and Marketing
4	Health Professions	Computer and Information Sciences	Computer and Information Sciences
5	Visual and Performing Arts	Mechanic and Repair Technologies	Mechanic and Repair Technologies
6	Psychology	Engineering Technologies	Engineering Technologies
7	Computer and Information Sciences	Protective Services	Transportation and Materials Moving
8	Communication and Journalism	Personal and Culinary Services	Construction Trades
9	Liberal Arts and Sciences	Family and Consumer Sciences	Precision Production
10	Engineering	Visual and Performing Arts	Visual and Performing Arts

Source: Integrated Postsecondary Education Data System.

Table A3.1: Determinants of campus based aid disbursements per undergraduate, by institution sector

	FSEOG		FWS		Perkins	
	Public	Private	Public	Private	Public	Private
	(1)	(2)	(3)	(4)	(5)	(6)
Sticker Price ($1000s)	5.35***	3.66***	7.43***	4.66**	4.48	3.77
	(1.48)	(1.06)	(1.83)	(1.90)	(2.86)	(2.77)
Admission Rate	9.59	-66.92**	0.52	38.08	32.23	-174.39*
	(17.51)	(32.45)	(25.21)	(51.05)	(36.08)	(95.34)
% Receive Pell Grant	111.91***	271.83***	135.90***	399.16***	-74.62**	405.36***
	(26.34)	(58.67)	(39.39)	(112.63)	(34.58)	(138.69)
% Borrow Stafford Loan	-7.08	-52.62	-34.35	-205.70*	24.26	-289.08**
	(24.31)	(41.41)	(31.34)	(107.53)	(33.83)	(140.26)
Average institutional grant aid ($1,000s)	3.19	2.73*	4.47*	2.72	8.22**	6.33*
	(2.24)	(1.60)	(2.48)	(2.24)	(3.93)	(3.40)
Average state grant aid ($1,000s)	-5.99***	-17.53***	-7.57***	-12.4	-6.16*	-41.98***
	(1.97)	(5.18)	(2.61)	(8.33)	(3.23)	(13.27)
Undergraduate enrollment (1,000s)	-0.41*	-1.09	-0.55**	-1.31	-0.45	5.99
	(0.24)	(1.51)	(0.27)	(2.43)	(0.48)	(5.58)
Primarily Residential	12.56**	-13.15	15.16**	-5.28	8.59	5.31
	(5.67)	(13.64)	(6.79)	(22.66)	(8.95)	(37.77)
Highly Residential	23.90**	12.55	32.18**	69.49***	9.95	66.81**
	(11.26)	(12.86)	(12.91)	(25.89)	(17.15)	(33.77)
Constant	-36.11**	4.09	-24.52	-2.73	21.05	140.57
	(17.46)	(41.99)	(24.97)	(84.62)	(37.46)	(130.83)
R-squared	0.305	0.267	0.309	0.211	0.253	0.289
N	310	380	310	380	250	330

Data: 2011-12 National Postsecondary Student Aid Study (NPSAS:12). Sample includes public or private non-profit four-year institutions. Institutional disbursements per student are determined by Title IV Program Volume Reports available from Federal Student Aid (https://studentaid.ed.gov /sa/about/data-center/student/title-iv) and enrollment counts from IPEDS. Selectivity categories provided in NPSAS:12. Institution sample weights used in all analyses. All other institution-level variables are sourced from IPEDS. All sample sizes rounded to the nearest ten in compliance with IES reporting standards.

Table A3.2: Determinants of campus based aid disbursements per Pell recipient, by institution sector

	FSEOG		FWS		Perkins	
	Public	Private	Public	Private	Public	Private
	(1)	(2)	(3)	(4)	(5)	(6)
Sticker Price ($1000s)	18.46***	20.59***	25.35***	33.17***	21.48**	21.96
	(4.78)	(6.42)	(6.68)	(6.98)	(9.89)	(17.88)
Admission Rate	10.83	-562.93***	-51.58	-380.79	0.92	-1784.07***
	(57.14)	(177.44)	(103.88)	(240.60)	(164.28)	(539.11)
% Receive Pell Grant	-88.66	81.95	-123.43	134.19	-598.32***	863.73
	(57.57)	(184.47)	(85.76)	(257.08)	(123.15)	(623.25)
% Borrow Stafford Loan	-43.63	-804.68***	-122.72**	-1270.03***	-52.86	-2671.26***
	(50.63)	(218.44)	(61.16)	(274.18)	(111.76)	(790.29)
Average institutional grant aid ($1,000s)	16.93*	4.2	22.27**	-3.09	36.60**	23.53
	(10.09)	(9.20)	(10.34)	(9.96)	(15.88)	(25.84)
Average state grant aid ($1,000s)	-18.17***	-86.28***	-27.92***	-104.86***	-32.80**	-246.18***
	(5.94)	(19.47)	(8.07)	(27.69)	(13.49)	(60.34)
Undergraduate enrollment (1,000s)	-0.99	-6.83	-1.37	-4.33	-1.1	21.35
	(0.75)	(8.66)	(0.84)	(11.33)	(1.70)	(26.27)
Primarily Residential	31.84**	-22.86	42.01**	-7.58	58.30*	51.65
	(14.88)	(58.40)	(19.18)	(76.13)	(31.69)	(140.74)
Highly Residential	89.77*	105.79*	124.32**	291.47***	32.77	338.91**
	(49.93)	(54.57)	(48.08)	(81.22)	(59.23)	(136.23)
Constant	39.59	799.18***	136.54	888.30***	272.10*	2371.82***
	(54.02)	(233.16)	(98.80)	(316.58)	(159.91)	(751.64)
R-squared	0.387	0.537	0.411	0.572	0.411	0.496
N	310	380	310	380	250	330

Data: 2011-12 National Postsecondary Student Aid Study (NPSAS:12). Sample includes public or private non-profit four-year institutions. Institutional disbursements per student are determined by Title IV Program Volume Reports available from Federal Student Aid (https://studentaid.ed.gov /sa/about/data-center/student/title-iv) and enrollment counts from IPEDS. Selectivity categories provided in NPSAS:12. Institution sample weights used in all analyses. All other institution-level variables are sourced from IPEDS. All sample sizes rounded to the nearest ten in compliance with IES reporting standards.

Table A3.3: Student characteristics, by Pell grant and Stafford loan receipt

	All Students	Pell Recipients	Stafford loan recipients (subsidized)
	(1)	(2)	(3)
Filed FAFSA by March 1st	36.9%	47.2%	47.9%
White	63.4%	49.2%	59.6%
Black	12.1%	20.2%	17.3%
Hispanic	12.7%	18.4%	12.9%
Asian	7.5%	6.9%	5.5%
Other race	4.3%	5.0%	4.7%
Female	54.9%	57.9%	57.1%
Dependent	79.5%	66.4%	75.4%
EFC	$12,325	$943	$5,816
Household income	$76,042	$25,372	$52,195
ACT score	22.7	21.2	22
SAT score	1049	991	1020
No entrance exam score	10.6%	16.6%	12.5%
Institutional need-based grants	$1,838	$2,231	$2,330
Institutional merit-based grants	$1,825	$1,469	$1,853
State need-based grants	$682	$1,384	$960
State merit-based grants	$204	$173	$157
Pell Award	$1,720	$4,174	$2,510
Stafford Loans	$3,888	$5,164	$6,656
Total Cost of Attendance	$27,906	$25,436	$28,692
Freshman	24.3%	26.0%	24.7%
Sophomore	22.7%	22.0%	21.9%
Junior	22.1%	21.8%	23.2%
Senior	30.8%	30.2%	30.1%
Public			
Very Selective	17.0%	13.9%	13.4%
Moderately Selective	37.9%	38.5%	38.3%
Minimally Selective	6.1%	7.6%	6.3%
Open Admission	8.2%	11.8%	7.0%
Private			
Very Selective	11.0%	7.1%	9.6%
Moderately Selective	13.9%	14.2%	17.9%
Minimally Selective	4.1%	4.6%	5.3%
Open Admission	1.7%	2.3%	2.2%
Primarily non-residential	38.1%	43.8%	35.6%
Primarily residential	35.8%	33.2%	37.2%
Highly residential	23.2%	18.6%	25.1%
N	23720	9600	12220

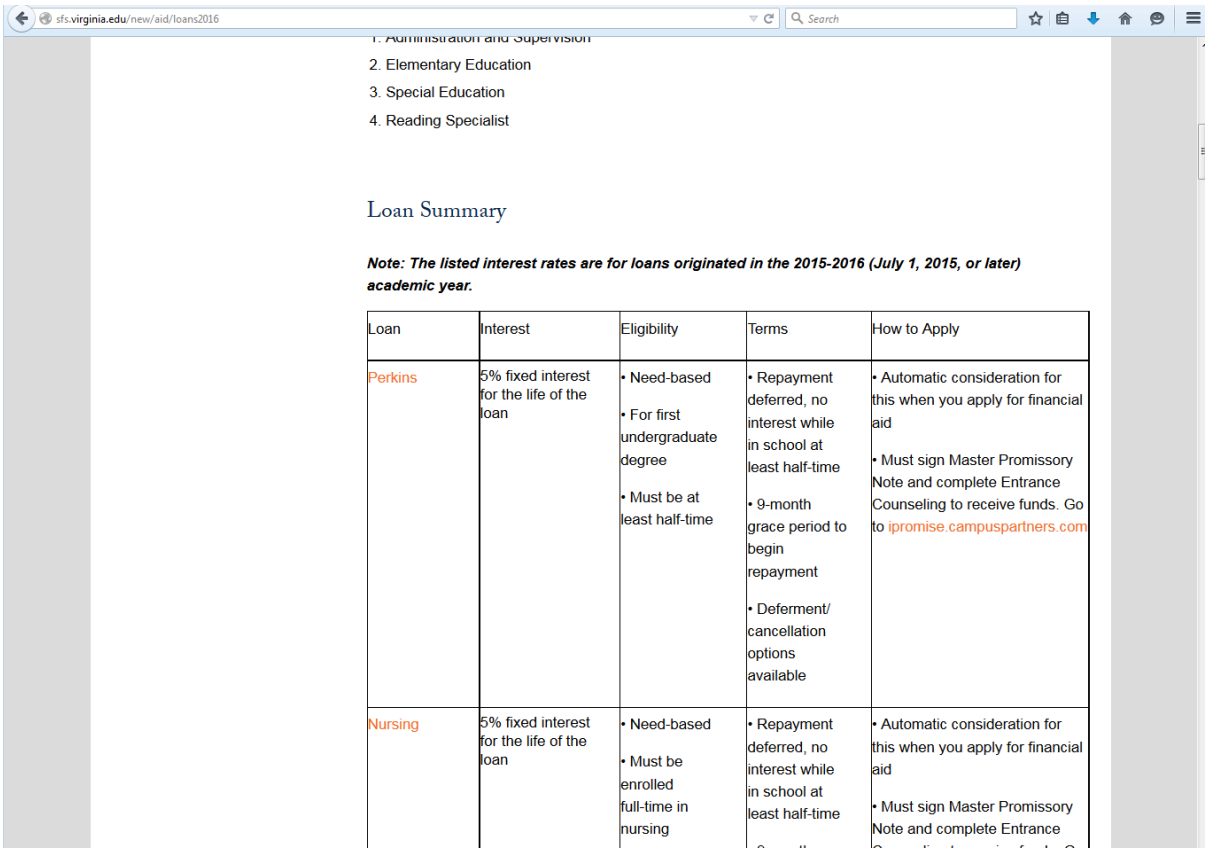
Data: 2011-12 National Postsecondary Student Aid Study (NPSAS:12). Sample includes public or private non-profit four-year institutions that participate in the relevant campus-based aid program. Selectivity categories provided in NPSAS:12. Institution level sample weights used in all analyses. All other institution-level variables sourced from IPEDS. All sample sizes rounded to the nearest ten in compliance with IES reporting standards.

Table A3.4: Characteristics of recipients of other self-help aid (institutional or state loans, institutional or state work-study)

Filed FAFSA by March 1st	51.4%
White	63.1%
Black	9.7%
Hispanic	12.7%
Asian	9.7%
Other race	4.8%
Female	54.2%
Dependent	91.0%
EFC	$14,246
Household income	$85,096
ACT score	24.1
SAT score	1104
No entrance exam score	5.4%
Institutional need-based grants	$7,117
Institutional merit-based grants	$2,921
State need-based grants	$1,240
State merit-based grants	$127
Pell Award	$1,470
Stafford Loans	$4,355
Total Cost of Attendance	$37,587
Freshman	22.1%
Sophomore	22.5%
Junior	24.9%
Senior	30.5%
Public	
Very Selective	8.0%
Moderately Selective	21.3%
Minimally Selective	4.4%
Open Admission	1.0%
Private	
Very Selective	29.1%
Moderately Selective	30.4%
Minimally Selective	5.1%
Open Admission	0.8%
Primarily non-residential	14.2%
Primarily residential	31.7%
Highly residential	53.4%
N	700

Data: 2011-12 National Postsecondary Student Aid Study (NPSAS:12). Sample includes public or private non-profit four-year institutions that participate in the relevant campus-based aid program. Selectivity categories provided in NPSAS:12. Institution level sample weights used in all analyses. All other institution-level variables sourced from IPEDS. All sample sizes rounded to the nearest ten in compliance with IES reporting standards.

Figure A3.1: University of Virginia's financial aid webpage with Perkins loan information



sfs.virginia.edu/new/aid/loans2016

1. Administration and Supervision
2. Elementary Education
3. Special Education
4. Reading Specialist

Loan Summary

Note: The listed interest rates are for loans originated in the 2015-2016 (July 1, 2015, or later) academic year.

Loan	Interest	Eligibility	Terms	How to Apply
Perkins	5% fixed interest for the life of the loan	• Need-based • For first undergraduate degree • Must be at least half-time	• Repayment deferred, no interest while in school at least half-time • 9-month grace period to begin repayment • Deferment/ cancellation options available	• Automatic consideration for this when you apply for financial aid • Must sign Master Promissory Note and complete Entrance Counseling to receive funds. Go to ipromise.campuspartners.com
Nursing	5% fixed interest for the life of the loan	• Need-based • Must be enrolled full-time in nursing	• Repayment deferred, no interest while in school at least half-time	• Automatic consideration for this when you apply for financial aid • Must sign Master Promissory Note and complete Entrance

Figure A3.2: Harvard's financial aid webpage with Perkins loan information

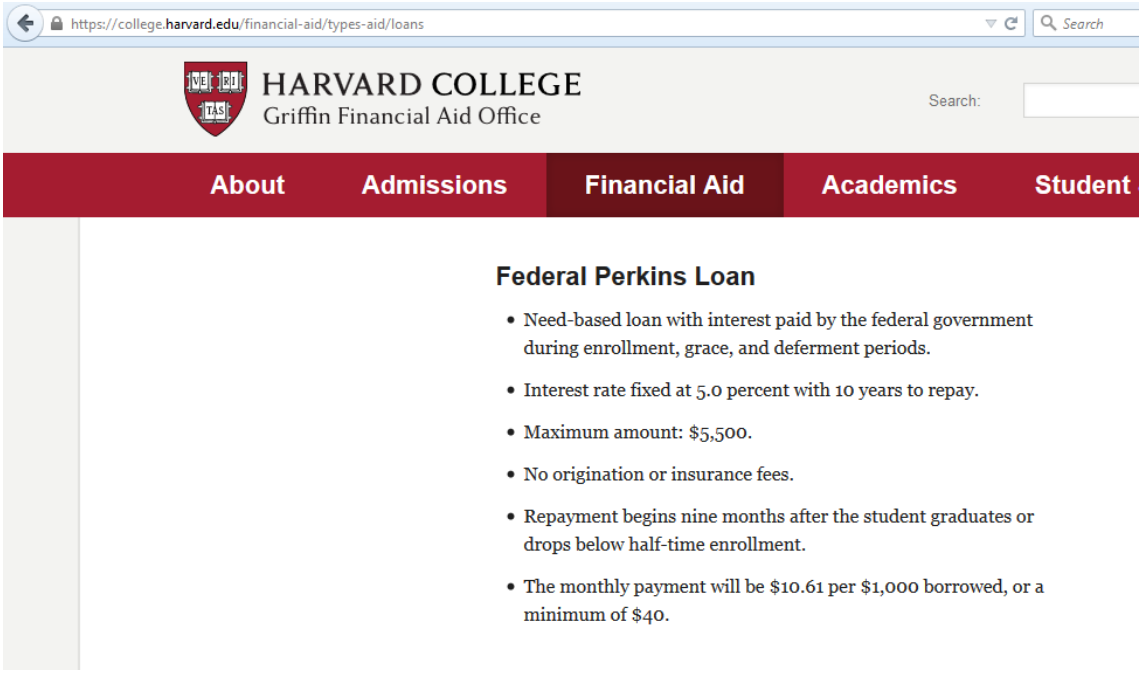


Figure A3.3: University of Kansas's financial aid webpage with Perkins loan information

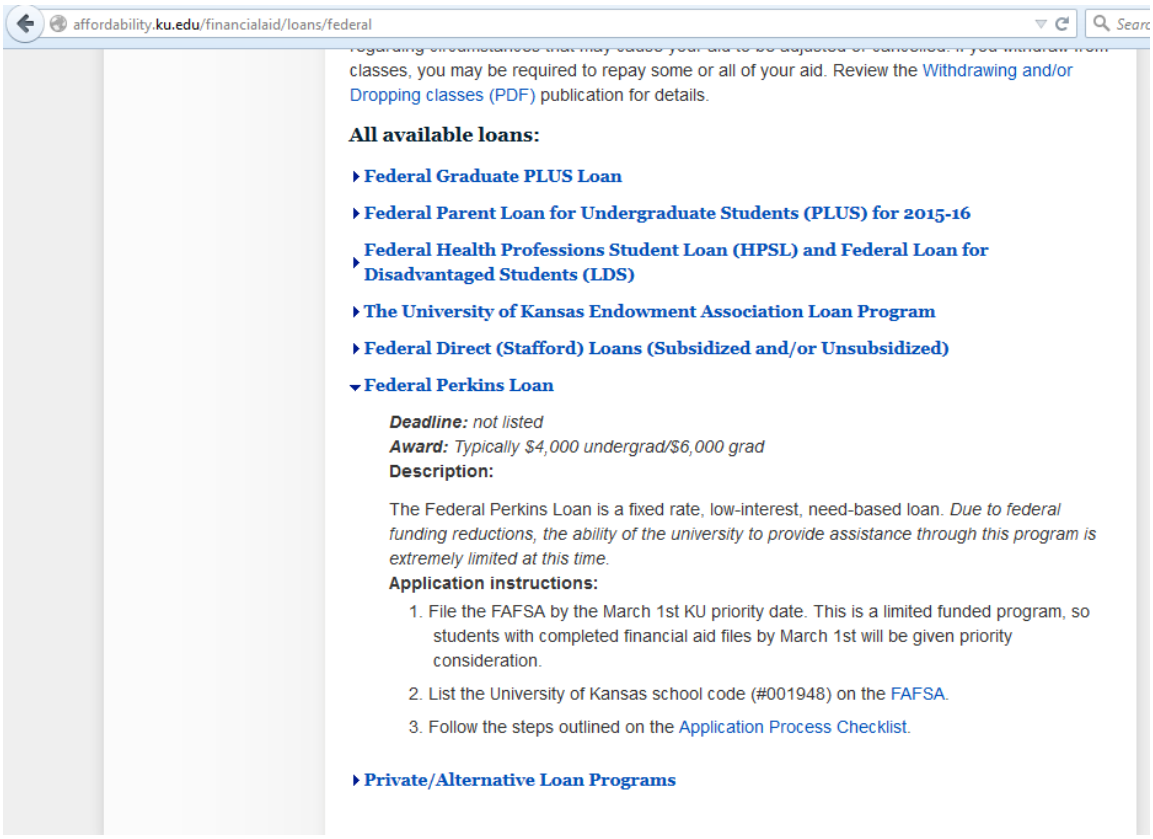


Figure A3.4: Temple University's FSEOG information webpage

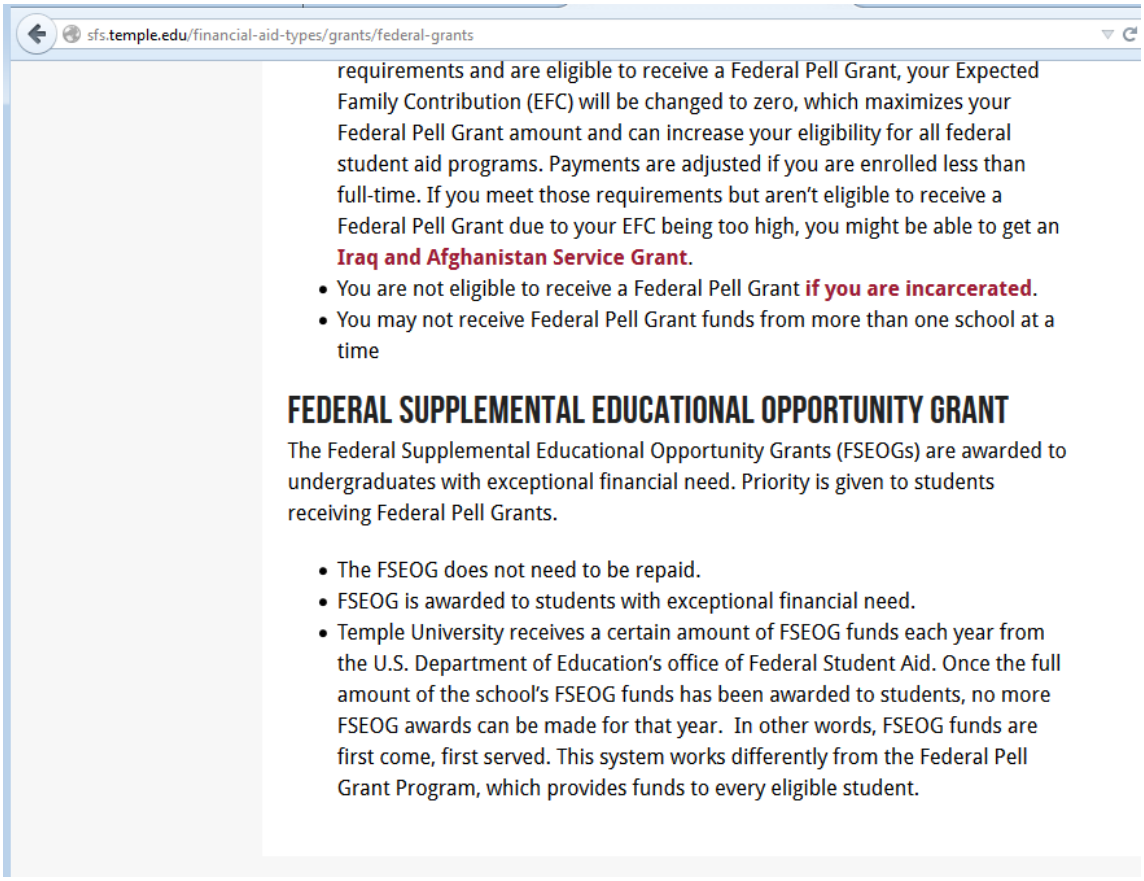


Figure A3.5: Southern Methodist University's FSEOG information webpage

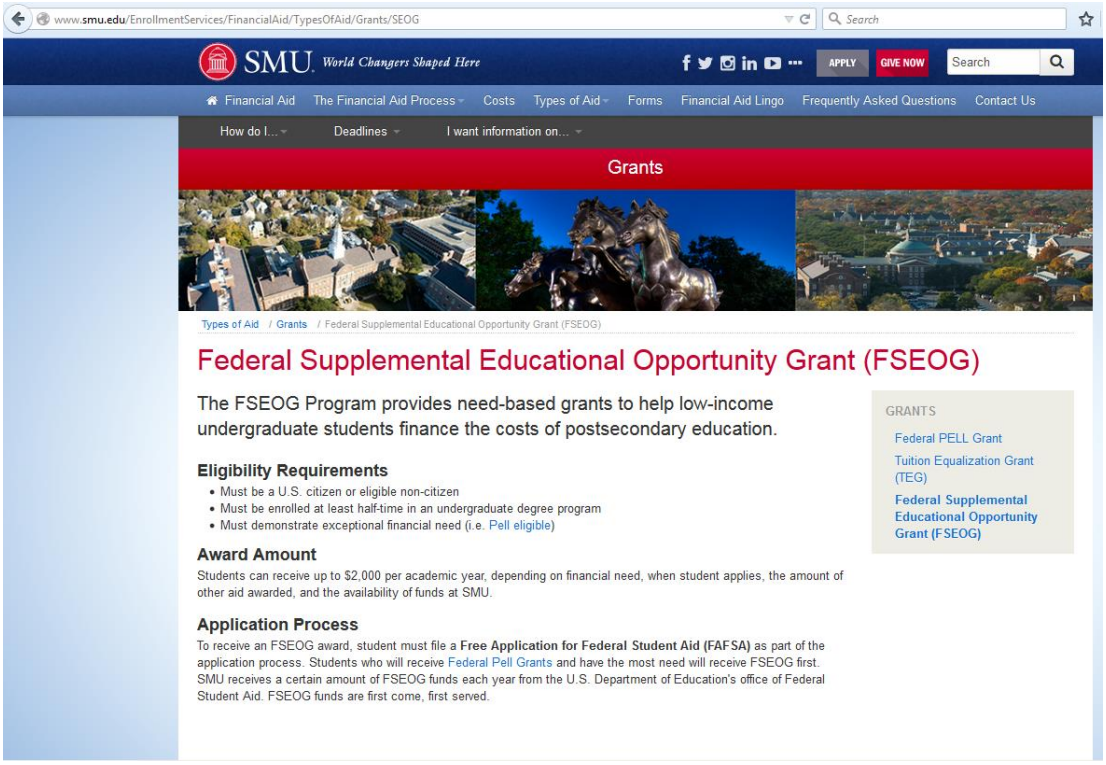


Figure A3.6: University of Maryland University College's FSEOG information webpage

Figure A3.7: Augusta University's FSEOG information webpage