Choice Architecture versus Price: Comparing the Effects of Changes in the U.S. Student Loan Market

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December 14, 2015

Abstract

We show that changes in choice architecture have a large effect on student loan decisions while we do not find significant effects of sizeable interest rate changes. We evaluate the effect of two polices implemented in 2010 by the U.S. Department of Education: (1) the requirement that all applicants for private student loans fill out a Self-Certification Form, which includes various disclosures about federal aid, and (2) the prohibition of presenting a private student loan as a default option on a financial aid offer without disclosure of the relationship between the school and the creditor. Using difference-and-difference and matching techniques on a proprietary dataset of private student loan originations from the Consumer Financial Protection Bureau and survey and administrative data from the Department of Education, we show that these changes decreased private student loan originations by 33% at public four-year institutions, 18% at private not-for-profit four year institutions, and 55% at four year for-profit institutions. In contrast, we find no consumer response when analyzing 60 basis point decrease in the price of federal Parental PLUS loans at some schools, using same datasets and similar estimation techniques.

1   Introduction

The average amount that a U.S. student owns in student loans upon graduating with a bachelor's degree is $25,500 at four year public schools and $30,200 at four year private, not-for-profit schools (College Board 2015). A graduate degree often adds an additional tens of thousands of dollars of debt. This matters even more for students who drop out of college:

while the amount borrowed might be lower, the student's earning potential is nowhere near the same.

The issue of student debt in the U.S. is well-covered in the popular press (see, fore example, Kingkade 2013), with frequent assertions that the magnitude of the debt is preventing graduates reaching adult milestones like buying houses and starting families. Thus, students and/or their parents are likely aware of the importance of the decision to take a loan out.

Standard economics predicts that, given the magnitude of the decision and at least conditional on expectations of earning potential after graduating, students' decisions regarding their student loans should be close to rational and swayed by factors like interest rate changes rather than choice architecture, framing, or nudging. Instead, using administrative school-level data from the U.S. Department of Education and administrative loan-level data on private student loans collected by the U.S. Consumer Financial Protection Bureau, we find sizeable effects of choice architecture changes and no significant effects of price (interest rate) changes for a particular set of loans.

These results further emphasize the role that choice architecture changes can play in important consumer decisions, even relative to price changes. Our findings make policy implications fuzzier – getting the interest rates right will not make everything else fall into place automatically. On the other hand, our findings suggest that changes that are easier to make (default options and disclosures) might accomplish more, suggesting that careful experimentation with choice architecture in this and other markets might bring about significant improvements while not costing the government as much as interest rate changes.

Three major changes occurred in the U.S. student loan market in the first three quarters of 2010. First, starting from February 2010, any student taking out a private student loan was required to fill out a Self-Certification Form. The Self-Certification Form effectively increased the amount of information an applicant needs to complete a private student loan application, bringing the requirements for applying for private loans more in line with the requirements for applying for federal student loans and aid. The form, shown in Figure 1, is only a page long, but it requires contacting the school's financial aid office and also makes the existence of federal loans and the fact that they are substitutes for private loans readily apparent, including a phone number that a student can call to get more information regarding federal loans.

Second, a concurrent policy (also starting in February 2010) imposed restrictions on what could be presented as a default loan option on a financial aid notification letter. Prior to the policy change a school could list a specific private lender's student loan product as the default option to cover any gap between a student's cost of attendance and other financial aid. Eliminating this option effectively changed the default option to federal student loans.

Third, starting in July 2010, Parental PLUS Loans, which are taken out by undergraduate students' parents and are funded or guaranteed by the federal government, became 60 basis points cheaper at a subset of schools. Before the change, any school could choose from two options for such loans: either Direct Loans originated by the Department of Education or loans through the Federal Family Education Loan Program originated by private firms but guaranteed by the federal government (FFEL Loans). FFEL Loans were 60 basis points more expensive: the interest rate was 8.5% versus 7.9% for Direct Loans. In 2010 the Federal Family Education Loan Program was eliminated for loans taken out by students' parents. Instead, the schools that administered parent loans through this option were converted to the direct federal option, resulting in a 60 basis points price drop for these loans for these schools.

We find sizeable effects of the combination of the first (Self-Certification Form) and the second (change in default options for award notification) changes (choice architecture changes from now on). Private student loan originations dropped by 33% at four year public schools, 18% at four year not-for-profit private schools, and 55% at four year for-profit schools. In Figure 2, we plot private student loans originations over time at private not-for profit four year schools, the schools with the highest proportion of private student loans. We identify these changes using a difference-in-differences estimator: we assume that the counterfactual growth rates of federal student loans and private student loans would have been the same, and correct for possible substitution between the two groups.[1] We also control for many school-specific characteristics and for seasonality. Due to the simultaneity of the first and second change, and since the same type of loans were affected, we cannot identify whether the effects of either of the changes are significant by themselves.

We also analyze the intensive margin changes. We find that students decreased their private student loan borrowing by several hundred dollars both at public four-year institutions and two-year institutions. However, we find that students at for-profit institutions responded by borrowing more. Since we use propensity score matching, we believe that this response is driven by selection on unobservables. The students taking out a private student loan even despite all the changes in the market might be the students that require higher amounts conditional on observable characteristics.

We find precise zero effects of the third change (FFEL price change from now on, 60 basis points price drop for parent loans at some schools). Again, we use a difference-in-differences estimator, this time we use parent loans at the affected (FFEL) schools as a dependent variable and, parent loans at the unaffected schools as a control group. In Figure 8, we plot

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[1]Mechanically, the assumption is equivalent to total number of student loans originated not being affected, and any changes coming from substitutions from one type of a loan into another.

parent loans as a fraction of total loans over time for the affected (FFEL) schools and for the unaffected schools. While this effect might seem puzzling, we believe that it is almost expected. For a $30,000 borrowed, to be repaid over ten years, the difference in monthly payments attributable to 60 basis points change in interest rate is about nine dollars per month – an amount that is unlikely to strike many consumers as significant, especially in comparison to other decisions about college that consumers are making at the time.

Technically, there was a fourth change in July of 2010: the interest rate on Subsidized Stafford loans decreased by 110 basis points. Even apriori, we did not expect this change to affect the market due to eligibility constraints for Subsidized Stafford loans: anyone who is eligible should have already been taking out the maximum available given the advantageous terms. We analyze this change as well and, as expected, do not find a significant effect on the market.

The rest of the paper proceeds as follows: in Section 2 we discuss institutional details of the U.S. student loan market and how our findings fit into the literature. In Section 3 we discuss the data and in Section 4 we discuss the empirical methods that we use. In Section 5 we present the results, and we conclude in Section 6.

2 Background

2.1 Student Loans in the United States

Public funding for post-secondary education in the United States includes institution-level support for public schools and student-level financial aid. Non-merit student aid is based on current ability-to-pay. For dependent students, aid calculations account for family resources, including parental income and assets. Financial aid policy does not explicitly restrict the institutions that a student can apply to or attend, and cost-of-attendance can vary substantially between programs. For example, in the 2011-2012 academic year tuition and fees, excluding room and board, ranged from $182 to $45,290 for students in bachelor's degree programs at public or not-for-profit schools.[2] An institution's official cost of attendance for a student includes tuition and fees and can include allowances for books, supplies, transportation, room and board, dependent care, and other school-related expenses. Financial aid calculations are based on cost-of-attendance, which can be paid through cash, grants, or loans.

Student loans are uncollateralized loans for investment in human capital. Potential bor-

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[2]Authors' calculations from the Integrated Post Secondary Student Aid Study based on in-district, in-state, and out-of-state published values.

rowers often have thin or nonexistent credit histories, and their ability-to-repay depends on the educational investment for which they are borrowing. The educational investment literature, including Cameron and Taber (2004), Carneiro and Heckman (2002), and Keane and Wolpin (2001), has focused on underinvestment in human capital due to credit constraints. In a similar vein, public policy typically seeks to expand access to credit for students by targeting the supply side. The largest of these policies is the federal student loan program which originates loans to active students and their parents with eligibility criteria that mostly do not depend on borrowers' credit quality.[3] Federal loans include Subsidized and Unsubsidized Stafford loans which have universal borrowing limits, and Parental PLUS and Graduate PLUS loans that can cover costs up to cost-of-attendance. Stafford loans and Graduate PLUS loans are made in the name of the student, while Parental PLUS loans are taken out in a parent's name to cover his child's undergraduate expenses. The federal loan programs address Stiglitz and Weiss (1986) credit rationing due to screening that may occur in a purely private student loan market. As Mankiw (1986) points out, without government intervention investment in education may not be socially optimal.

The private student loan market in the United States includes all non-federal loans. Private student loans are generally originated by for-profit creditors and underwritten based on borrower and co-borrower characteristics and are risk priced. While both federal and private loans are bankruptcy non-dischargeable, due to the conditions of private student loan asset-backed securities and federal programs for distressed borrowers, federal loans tend to provide more modification options when borrowers cannot meet their obligations. From a borrower's point-of-view, one of the most salient differences may be the application process: applying for a private student loan is a standard consumer credit application whereas applying for federal student loans requires completion of the full federal financial aid application process. In Figure 4, we plot the relative volumes of the aforementioned loan types. As one can see, the market is dominated by Stafford loans; however, both the PLUS loans and the private student loans also play a significant role.

The process of applying for federal financial aid can be daunting. This may explain why borrowers do not, as economic theory predicts, exhaust their lowest cost of capital first (Avery and Turner 2012). To apply for federal grants and loans a student and his family must fill out the Free Application for Federal Student Aid (FAFSA) to determines the products for which he is eligible. Dynarski and Scott-Clayton (2006) show that the complexity of the FAFSA has a disproportionately detrimental effect on low-income families. This has clear implications for the extent to which federal student aid is redistributive. Through

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[3]PLUS loans require that borrowers do not have an adverse credit history, but have identical terms and prices for all eligible borrowers.

an experiment that streamlines FAFSA completion with income tax filing Bettinger et al. (2012) show that FAFSA completion assistance increases college attendance, persistence, and aid receipt.

2.2 Choice Architecture Changes in 2010

2.2.1 Self-Certification Form

The Self-Certification Form, shown in Figure 1, is a disclosure that clarifies the likely benefits of federal aid versus private loans and directs potential private student loan borrowers to resources for applying for federal financial aid. As of February 14, 2010 all applicants for private student loans are required to submit a Self-Certification Form to their lender before a private student loan can be originated. This form is a product of an August 14, 2008 act of Congress to amend the Higher Education Opportunity Act and modify the Truth in Lending Act to require the Self-Certification Form. The form must be populated by the borrower. Financial aid offices at post-secondary institutions are obligated to provide the relevant information to students or admitted students upon request.

The Self-Certification Form is a mandated disclosure and does not explicitly restrict borrowers or lenders in the private student loan market. Mandated disclosure is a popular policy alternative for exactly that reason: it provides information without imposing limits on market activity. In consumer finance, Lacko and Pappalardo (2010) find that US mortgage disclosures, as they existed in 2004-2005, were ineffective at increasing consumer understanding (see also Ben-Shahar and Schneider 2010), while Bertrand and Morse (2011) find that payday loan disclosures were effective in reducing borrowing behavior and made people think less narrowly about finance costs. Some of the potential improvements for disclosure offered by Lowenstein et al. (2014) are the provision of personalized information and vividness.

The Self-Certification Form, Figure 1, may provide both personalized information and vividness by requiring the potential borrower to populate information about his educational costs and resources available: Section 2 of the form requires the student to report his cost-of-attendance and estimated financial assistance and then subtract to obtain the maximum amount of private student loans he can borrow without his financial aid being clawed back one-for-one. Additionally, it draws attention to federal alternatives and how to apply for them in Section 1 of the form, the school attended and the period of enrollment covered in Section 3, and the applicant's identity through self-reported identifying information in Section 3 and a signature in Section 4. While Section 2 contains the warning "If you borrow more than the amount on line C, you risk reducing your eligibility for free or lower cost federal, state, or school financial aid," it does not prohibit borrowing more. In practice,

however, the suggested loan limit tends to be treated as binding, resulting in a market similar to the one described in Lochner and Monge-Naranjo (2011) where borrowers who want to consume more while in school through the use of private student loan are constrained.

Potential borrowers may be influenced by the Self-Certification Form because it applies techniques similar to those used in math pedagogy: Section 2 of the Self-Certification walks the consumer through the calculation of the maximum amount of private student loan funds he can borrow without affecting his other aid, which is consistent with results from experiments in the educational psychology literature that show that worked examples benefit inexperienced individuals (Kalyuga et al. 2001) as does strong procedural guidance (Chi et al. 1989, Eiriksdottir and Catrambone 2011). Relating the choice to a potential borrower's specific circumstances in Sections 2 through 4 may also make the analysis easier: Holling et al. (2008) and Koedinger and Nathan (2004) demonstrate that a familiar context increases students' ability to solve story problems. This exercise on the Self-Certification Form primes the applicant to think specifically about the relative costs of federal aid versus private student loans and may also simplify a consumer's analysis of the costs and benefits of various financial aid options since it effectively frames the private student loan borrowing decision as a univariate story problem with a guided example.

The story problem is the active part of this active disclosure: instead of just reading or skimming the form the consumer is forced to engage with the information on the form. This addresses motivated attention issues (Lowenstein et al. 2014) that may result in the consumer ignoring the message of the disclosure. Furthermore, since the consumer is populating the individual-specific information compliance and implementation costs may be lower for active disclosure than for pre-populated personalized disclosure–the firm only needs to provide a standard form.

2.2.2   Changes in Default Options Presented to Students

The regulation described above also, by-and-large, prohibited co-branding that implies that an educational institution endorses a particular loan product. The prohibition on co-branding without disclosure may affect what consumers perceived to be their choice set. Prior to the regulation, consumers may have perceived loans that were advertised as endorsed by their school as the default. The regulation effectively makes federal loans the default loan product. Default options have been shown to have substantial impacts on consumer decisionmaking, in contexts ranging from organ donation (Johnson and Goldstein 2003) and retirement savings (Choi et al 2003).

Both the Self-Certification Form and the prohibition on co-branding are examples of nudges. The rational and sophisticated borrower is unlikely to be affected by either of the

changes: this borrower is aware of the existence of federal loans, is aware of the limits on the loan amounts, and is unlikely to be moved by the default lender choice. However, an unsophisticated borrower might be susceptible to either of these changes, see Thaler and Sunstein (2008).

2.3   Change in PLUS Loan Pricing

As discussed in the introduction, prior to 2010 schools could provide PLUS loans in one of the two ways. A school could either provide PLUS loans directly from the Department of Education (Direct PLUS) or through private sector (FFEL PLUS, loans that were ultimately guaranteed by the federal government too), with the private sector option being 60 basis points more expensive. There were not many schools providing both options simultaneously, so we treat this as a binary decision for all purposes. We are not aware of systematic answers for why schools chose to offer the more expensive option. It might have been due to inertia: the pricing had been the same until Congress implemented the 60 basis point increase from July 2006. A popular internet resource for college education at the time mentioned that this might be related to convenience provided to the college administration.[4]

All schools transitioned to Direct PLUS loans in the third quarter of 2010, corresponding to the beginning of the 2010-2011 academic year. In Figure 3, we illustrate the timing of this program relative to the introduction of the Self-Certification Form: for the first two quarters of 2010 FFEL and Direct loans were still available, and the terms and conditions did not change, as can be seen in Table 1, which outlines the federal loan programs and their terms by academic year. From the consumer's point of view, the elimination of FFEL would have only affected students who attended schools which originated FFEL loans. The FFEL PLUS Loan interest rate was 8.5% through the 2009-2010 academic year, so individuals who would have previously considered FFEL PLUS loans experienced 60 basis point decrease in rates.

2.4   Change in Unsubsidized Stafford Pricing

Due to falling interest rates, Congress legislated a gradual decrease of interest rates for Subsidized Stafford Loans. As a part of this gradual decrease, the interest rates for subsidized Stafford loans decreased by 110 basis points for the 2010-2011 school year. As we show further in the paper, and as one can almost see from Figure 4, we believe that this change

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[4] "From a college perspective the customer service provided to the colleges is somewhat better from some (but not all) FFEL program lenders than the Direct Loan program. Using FFEL program lenders avoids the difficulties associated with post-disbursement changes and record reconciliation in the Direct Loan program, and there are better reporting capabilities available from FFEL program lenders." FinAid, http://www.finaid.org/loans/dl-vs-ffel.phtml, accessed on December 7th, 2015.

only affected the students who were going to take out Subsidized Stafford Loans one way or another: the terms are so favorable relative to other federal loans that it is unlikely that anyone eligible for Subsidized Stafford Loans perceived any other type loan as a viable substitute even before the interest rate decrease.

Technically, this change is another confirmation of our thesis that interest rate changes result in precise zero changes in demand. However, given the eligibility criteria for subsidized Stafford loans and their enormous price advantage, we did not expect a demand response apriori and we focus on analyzing the demand response to the 60 basis point change for the FFEL PLUS Loans described above.

3 Data

We draw on multiple datasets to estimate the effects of the policy changes described above on the student loan market. This results in three analysis datasets: first, a school-level quarterly dataset of loan originations by federal or private student loan type; second, a loan-level dataset of originated private student loans that includes borrower characteristics used for underwriting and terms and pricing; and third, a repeated cross-section of a representative sample of post-secondary students that includes information on their federal and private student loans.

3.1 Data Sources

One of our main sources of data is the Consumer Financial Protection Bureau's Private Student Loan Loan-Level Dataset. These data consist of anonymized loan-level records from all loans originated by the nine largest private student loan lenders in the United States in 2011. Each record includes borrower characteristics such as school and program attended, FICO scores of all borrowers and co-borrowers, and the interest rate, index, margin, size, and term of the loan. We also observe the quarter of origination: the data spans the first quarter of 2005 through the fourth quarter of 2011.

We also draw on administrative data from the Department of Education, including the quarterly Title IV Volume Reports of federal student loan originations, the Integrated Postsecondary Education Data System (IPEDS), which is an annual census of all federal funding eligible post-secondary institutions, and the Postsecondary Education Participants System (PEPS) public administrative data from the Department of Education's Office of Federal Student Aid.

The student-level data is from the restricted use files of the 2008 and 2012 waves of the

National Postsecondary Student Aid Study (NPSAS), which is produced by the Department of Education's National Center for Educational Statistics and combines survey and administrative data about a representative sample of post-secondary students.

3.2   Constructing the Analysis Datasets

We use the first dataset for analysis of the relative impacts of choice architecture and price changes. To construct this dataset, a quarterly school-level dataset of private and federal student loan originations, we combine the CFPB Private Student Loan Loan-Level Data with quarterly and annual Department of Education administrative data. Since the loan volume observations from the Title IV Volume reports are at the institution level, we collapse the Private Student Loan Loan-Level Dataset into school-by-quarter cells. We then append the data and merge on detailed school-level information from IPEDS and PEPS. Table 2 presents quarterly means of school characteristics by school control (public, private non-profit, and for-profit) and school level (four year or above, two year, less than two year) from 2008 through 2009 from the administrative loan data, weighted by total enrollments. At all three levels, public schools have larger average total enrollments and lower in-district tuition and fees than private or for-profit institutions. The price differences are quite large: average in-district tuition and fees four a four year degree are $5,535 at public schools, $18,741 at private non-profit schools, and $14,924 at for-profit institutions. Given this pattern in student costs, it is unsurprising that average loan amounts conditional on borrowing are also smaller at public institutions than at private or for-profit institutions for private student loans, PLUS loans, and Stafford Subsidized and Unsubsidized loans. PLUS loan take-up is substantially lower than Stafford loan take-up and comparable to private student loan take-up among four year students: for example, for undergraduates at four year not-for-profit institutions, in each quarter there are on average 379 subsidized Stafford loan originations, 386 unsubsidized Stafford loan originations,compared to 51 private student loan originations and 51 PLUS loan originations.

We use the second dataset for analysis of the intensive margin impacts of choice architecture changes and to show that the interest rates on private student loans did not change economically significantly in this time period. This dataset is simply the Private Student Loan Loan-Level Dataset augmented with IPEDS and PEPS for school-level detail. Underwriting is often based on school as well as borrower characteristics, so this additional detail is useful in considering pricing and loan characteristics.

We use the third dataset for analysis of the composition of a student's loan portfolio (federal loans only, federal and private loans, private loans only, or no loans) and for analysis

of heterogeneity of students' responses to the choice architecture changes based on demographics. This dataset is the pooled restricted use data from the 2008 and 2012 waves of NPSAS. NPSAS is a mandated National Center for Educational Statistics (NCES; a division of the Department of Education) data collection that draws from administrative federal, state, and school level administrative data as well as a student survey. NPSAS data about federal student aid is drawn from the Department of Education's administrative data systems, and data about private student loan is self-reported. While there are dollar amounts for self-reported private student loans, NPSAS does not include information on the interest rate or other terms of private student loans.

Figures 5 and 6 compare the composition of originations in the Loan Level Dataset to the student-level private student loan information in NPSAS in the 2007-2008 academic year. The shares of originations for four year undergraduates, two year undergraduates, and graduate students are similar in the two datasets for private and public schools: the majority of loans are to four year undergraduates, while graduate students make up 6% of weighted observations at public schools in the Loan Level Dataset and 7% in the student in NPSAS. The proportion of certificate students among private student loan borrowers in the NPSAS appears larger than the proportion in the Loan Level Dataset,which might be a result of multiple factors, including the fact that the Loan Level Dataset does not cover the universe of private student loan originations in 2007-2008. Table 3 presents the mean loan balances for students by level of study and school control type. For all level and control groups, the estimates are larger in Loan Level Dataset than in the NPSAS data. As an illustration, mean loan amounts for four year undergraduates at private non-profit schools are $12,611 in the Loan Level Dataset and $9408 in the NPSAS data. Table 4 reports the proportion of NPSAS respondents in each borrower category in the 2007-2008 and 2011-2012 academic years. In both years approximately 60% of students have no loans, but the proportion of students with federal student loans changes: in 2008 25% of students had exclusively federal student loans versus 37% in 2012.

4 Empirical Strategy

4.1 Choice Architecture Versus Price Effects: Quarterly School-Level Analysis

4.1.1 Choice Architecture

The terms of federal student loans remained, for the most part, the same over the sample period. Eligibility criteria and loan limits remained constant, and pricing remained constant

for Unsubsidized Stafford loans and Direct PLUS loans, as shown in Table 1. Thus, we are assuming that if the February 2010 introduction of the Self-Certification Form and the change in default options in award notification had not occurred, then the consumer decision would not change. If the composition of a students at a given school does not change then loan volumes and the ratio of private to federal student loans also should not change, both in terms of the number of loans originated and dollars originated. A convenient feature of the private-to-federal student loan ratio is that it can be compared across institutions of different sizes. If we assume that students are fully informed about their federal loan options and the interventions only provide incremental information about private student loans, then the demand for federal loans should not change, and we can perform a difference-in-difference analysis using federal loans as a control group for private student loans using the quarterly school-level dataset:

$$ln y_{it} = \beta_0 + \beta_{PSL} PSL_{it} + \beta_{post} post_{it} + \beta_{PSL \times post} PSL_{it} \times post_{it} + \psi X_{it} + \epsilon_{it} \qquad (1)$$

where y_{it} is a measure of either the number of loans or the total original balance of loans of a given school. PSL_{it} is an indicator for private student loans, $Post_{it}$ is an indicator for the first quarter of 2010 and later, and X_{it} is a vector of school-level characteristics. Assuming that federal student loans are not affected by the choice architecture policy changes, $\beta_{PSL \times post}$ identifies the effect of the change in choice architecture on private student loans. We also considered other measures, such as origination-to-enrollment ratios that would be comparable measures across schools of different size, but, as shown in Figure 7 the scale of the origination-to-enrollment ratio is very different for private and federal student loans but log originations for private and federal student loans have more common support. Therefore, the main specifications discussed in this paper are in logs, but we also perform this analysis in levels.

The assumption that students are aware of their federal loan options and are at most learning about private loans through the Self-Certification Form and the change in default options on award letters is foolhardy. Private student loan borrowers do have the option to switch to federal loans along both the extensive and intensive margins, which means that $\beta_{PSL \times post}$ likely overestimates the magnitude of the effect of the choice architecture interventions. To take potential switching of loan type into account, we construct a bias correction that bounds the program effect from below for the log specification. we assume that growth in private and federal student loans would be proportional if there were no policy change. Private student borrowers can respond to the change in choice architecture along the extensive margin in three ways:

1. Borrowers with both federal and private student loans can switch to federal loans only;

12

2. Borrowers with private loans only can switch to a mix of private and federal loans;

3. Borrowers with private student loans only can switch to federal student loans only.

For federal loan borrowers, all of these responses can happen in the opposite direction. Let γ be the net flow of borrowers who have a mix of federal and private loans to federal loans only as a proportion of private loans, δ be the net flow of borrowers who have private student loans only to federal loans only as a proportion of private loans, and let θ be the net flow of borrowers with private loans only to a mix of federal and private loans. Then

$$
\begin{aligned}
\beta_{PSL \times post} &= \left(\ln y_{post}^{private} - \ln y_{pre}^{private} \right) - \left(\ln y_{post}^{federal} - \ln y_{pre}^{federal} \right) \\
&= \ln \left(\frac{y_{post}^{private} / y_{pre}^{private}}{y_{post}^{federal} / y_{pre}^{federal}} \right) \\
&= \ln \left(\frac{1 - \gamma - \delta}{1 + \frac{y_{pre}^{private}}{y_{pre}^{federal}} (\delta + \theta)} \right) \\
&= \ln \left(\frac{1 - \gamma - \delta}{1 + \beta_{PSL} (\delta + \theta)} \right)
\end{aligned}
\tag{2}
$$

So if $\gamma \geq \theta$,

$$
\delta + \gamma \geq \frac{1 - e^{\beta_{PSL \times post}}}{1 + e^{\beta_{PSL \times post} + \beta_{PSL}}}
\tag{3}
$$

which bounds the proportion of private student loans that exit the market from below. If $\gamma < \theta$

$$
\delta + \theta > \frac{1 - e^{\beta_{PSL \times post}}}{1 + e^{\beta_{PSL \times post} + \beta_{PSL}}}
\tag{4}
$$

which bounds the increase in federal student loan take-up from above. In either case, the proportion of private student loan borrowers that are affected by the Self-Certification Form–$\gamma + \delta + \theta$–is bounded from below. This also applies when considering loan dollars.

Mechanically, this estimation strategy (including bias correction) is similar to using log total originations as a control for log private student loan originations. Both approaches assume proportional growth in private and federal student loans in the absence of the policy change.

4.1.2 FFEL Price Changes

As we discussed in the background section, the FFEL program was abolished in July of 2010, which resulted in an effective 60 bps decrease in the price of PLUS loans for students who

would have otherwise been at institutions that only offered FFEL PLUS loans. Since out "post" period spans the first quarter of 2010 though the fourth quater of 2011, this could potentially be a confounding factor in our estimates of the effects of the change in choice architecture. To address this, we take two approaches: first, incorporating interaction terms relating to the timing of the FFEL price change into equation 1, and second, considering the utilization of PLUS Loans at schools that made FFEL Loans in from 2008Q1 through 2010Q2 versus schools that only made Direct Loans.

To implement the first approach we add an additional dummy variable for appearing in 2010Q3 or later, $PostFFEL$, and interact it with the private student loan dummy in 1, which becomes

$$
\begin{aligned}
\ln y_{it} = \beta_0 &+ \beta_{PSL}PSL_{it} + \beta_{post}post_{it} + \beta_{postFFEL}postFFEL_{it} \\
&+ \beta_{PSL \times post}PSL_{it} \times post_{it} + \beta_{PSL \times PostFFEL}PSL_{it} \times PostFFEL_{it} + \psi X_{it} + \epsilon_{it}
\end{aligned}
\tag{5}
$$

The coefficient of interest is $\beta_{PSL \times post}$ as in equation 1, and we can perform the same bias correction to obtain the program effect net of switching between private and federal loans. Another potential concern is that because only students at schools that were part of the FFEL program were affected by the FFEL price change, they might also be the ones driving the main effect. To address this we add a dummy for being at an institution that was part of the FFEL program (FFEL Institutions), $FFELInstitution$ in or after the 2007-2008 academic year and interact it with the timing of the policy changes and a dummy for private student loans. Again, the coefficient of interest is $\beta_{PSL \times post}$ as in equation 1, and we can perform the same bias correction to obtain the program effect net of switching between private and federal loan.

$$
\begin{aligned}
\ln y_{it} = \beta_0 &+ \beta_{PSL}PSL_{it} + \beta_{post}post_{it} + \beta_{postFFEL}postFFEL_{it} \\
&+ \beta_{FFELInstitution}FFELInstitution_{it} + \beta_{PSL \times post}PSL_{it} \times post_{it} \\
&+ \beta_{PSL \times PostFFEL}PSL_{it} \times PostFFEL_{it} \\
&+ \beta_{PSL \times FFELInstitution}PSL_{it} \times FFELInstitution_{it} \\
&+ \beta_{post \times FFELInstitution}post_{it} \times FFELInstitution_{it} \\
&+ \beta_{postFFEL \times FFELInstitution}postFFEL_{it} \times FFELInstitution_{it} \\
&+ \beta_{PSL \times postFFEL \times FFELInstitution}PSL_{it} \times PostFFEL_{it} \times FFELInstitution_{it} \\
&+ \psi X_{it} + \epsilon_{it}
\end{aligned}
\tag{6}
$$

The second way that we consider the effect of the FFEL price change is through a comparison of PLUS loan utilization at FFEL institutions and non-FFEL instutions before

and after the program. Let y_{it} represent the origination or dollar volume of PLUS loans at a given school in a given quarter. Then we are interested the estimate of $\beta_{FFELInstitution \times Post}$ in the equation below.

$$
\begin{aligned}
\ln y_{it} = \beta_0 &+ \beta_{FFELInstitution} FFELInstitution_i + \beta_{postFFEL} postFFEL_t \\
&+ \beta_{postFFEL \times FFELInstitution} postFFEL_{it} \times FFELInstitution_i + \psi X_{it} + \epsilon_{it}
\end{aligned}
\tag{7}
$$

4.1.3 Subsidized Stafford Loan Price Change

As can be seen in Table 1, the interest rate on Subsidized Stafford Loans decreased from 6.8% to 3.4% over the sample period, including a 110 basis point decrease in July 2010. In contrast to Unsubsidized Stafford loans and PLUS loans, Subsidized Stafford loans require that borrowers demonstrate financial need, so they are not available to all students who are eligible for other federal loans. Consequently, the extent to which Subsidized Stafford Loan use can adjust is limited. To get a sense of the size of the potential effect, we compare the change in Subsidized Stafford loans ($SubsStafford$) to the change in the total volume of student loans by estimating

$$
\begin{aligned}
\ln y_{it} = \beta_0 &+ \beta_{SubsStafford} SubsStafford_{it} + \beta_{post} post_{it} \\
&+ \beta_{SubsStafford \times post} SubsStafford_{it} \times post_{it} + \psi X_{it} + \epsilon_{it}
\end{aligned}
\tag{8}
$$

A positive coefficient on $\beta_{SubsStafford \times post}$ is consistent with Subsidized Stafford Loan usage increasing faster than overall student loan usage.

4.2 Analyzing the Effects of Choice Architecture Changes on Intensive Margin and Loan Terms

As for most other consumer credit products, underwriting and pricing in the private student loan market is performed using automated underwriting models. In the Private Student Loan Loan-Level Dataset we observe all of the factors that the lender observes at origination, so we know what loan terms a student loan borrower would face under a different pricing regime as long as there's someone with identical characteristics who took out a loan under that regime. This feature makes strong ignorability[5] a reasonable assumption when comparing pricing regimes, so the effect of the Self-Certification Form on pricing and loan size can be estimated using propensity score matching (Rosenbaum and Rubin 1983).

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[5]Strong ignorability is the assumption that all variables related to the outcome and treatment assigment are included in the control variables. In this case, this is means that we have all of the variables used in underwriting and pricing.

4.3 Student-Level Loan Portfolio Choice and Heterogeneity Analysis

To corroborate these results we also analyze differences in borrowing behavior between the 2008 and 2012 waves of NPSAS. We pool the data from both waves and focus on the coefficient on an indicator for appearing in the 2012 NPSAS as a measure of the effect of the choice architecture policy changes. The additional benefit of this data comes from the rich demographic and financial aid variables, including our ability to observe private and federal student loan borrowing within an individual. To compare borrowing before and after the policy changes, we perform multinomial logit and logit analysis of the mix of private and federal student loans that students borrow as well as OLS, seemingly unrelated regressions (SUR), tobit, and tobit SUR analysis of federal and private student loan amounts, focusing on the coefficient for an indicator variable for appearing after the implementation of the policies (i.e. in the 2012 wave). We also consider potential heterogeneous effects between groups by fully interacting student characteristics with an indicator for appearing after the implementation of the policies.

5 Results

The discussion above predicts that the implementation of the choice architecture changes will lead to an increase in federal student loans relative to private student loans as well as a decrease in the size of private student loans. Figure 2 presents average private student loan originations at four year or more private, non-for-profit institutions by previous FFEL institution status. Net of the strong seasonal pattern corresponding to an increase in lending activity at the beginning of each academic year, we see that private student loan originations decrease from about 150,000 at private not-for-profit institutions in the third quarter of 2008 to approximately 100,000 in the third quarter of 2010 and 2011, after the policy changes have been implemented.

5.1 Choice Architecture Versus Price Effects: Quarterly School-Level Analysis

5.1.1 Choice Architecture

To control for potential changes in the distribution of students across schools, we estimate equation 1 separately by sector and present the results for four year or above institutions in Table 5 and the results for two year institutions in Table 6. The main results presented in

this paper–such as the 33% decrease in private student loan take-up at public four year or higher institutions, the 18% decrease at private not-for profit four year or higher institutions, and the 55% decrease at for-profit four year or higher institutions–are reported in the last row of these tables. The estimates presented are generated from models that include school fixed-effects, quarter fixed-effects and a linear time trend, as well as controls for tuition and fees, cohort default rates, and log total enrollment. The models are weighted by enrollment, so the estimates presented can be thought of as the average effect at the student level. Panel A for each table presents the base specification of equation 1, Panel B presents estimates that also account for the price change for PLUS loans by accounting for the timing of the elimination of FFEL, as in equation 5, and Panel C presents the results that allows for differences between FFEL and non-FFEL institutions as outlined in equation 6. For each model, the raw estimate in the first row presents the percentage change assuming that no borrowers replace private loans with federal loans, $e^{\beta_{PSL \times post}} - 1$, and the bias-corrected estimate in the last row of estimates for each model is the lower bound of the program effect as a proportion of private student loans described in equations 3 and 4; standard errors are calculated using the delta method.

Table 5 shows that originations decrease for public, private not-for-profit, and for-profit four year or above schools and that the results are robust to the additional interactions for potential effects related to the elimination of FFEL. For example, the estimate in column 1 of Panel A corresponds to a 43% decrease in the incidence of private student loan borrowing at four-year public schools, with program effect estimates of 38.3% and 33.1% in Panel B and Panel C. This is similar to the 17.8% decrease in private student loan originations at private not-for-profit institutions and the 54.9% decrease at for-profit schools. The effects on dollars originated in columns 2, 4, and 6, are more mixed. While estimates of the effects for for-profit schools in column 6 are consistently large and negative–the estimates correspond to dollars originated at a given school being reduced by about one half–once the interaction for the elimination of the FFEL program are taken into account, the bias corrected program effect estimates on dollars originated change from negative in Panel A to a positive 18.6% for public school students and a positive 16.0% for private not-for profit school students. The results for originations in Table 6 are similar for two year public schools: the estimated program effect is a 64.3% in private student loan originations. Private student loan dollars originated also decrease by 37.6%. The effects for two year for-profit schools are negative in Panel A and B, but are not robust to the introduction of the interactions with whether students at the school took out FFEL loans prior to the end of the program. In Panel C, the bias-corrected estimate of the program effect is not statistically significant in column 5, and the dollars originated more than double in column 6.

5.1.2 FFEL Price Change

Panel C of Table 5 and Table 6 implement the first strategy we described to deal with potential price effects. For the most part, the bias-corrected main effects, in the last row of estimates, survive the addition of controls for the timing of the end of FFEL and whether or not an institution is a FFEL institution.

The results of our implementation of the second strategy, which compares originations at Parental PLUS loans at FFEL institutions and non-FFEL institutions before and after the end of the FFEL program as described in equation 6, are presented in Table 7, and find no significant effect of the price change on PLUS loan take-up. If potential Parental PLUS borrowers at FFEL institutions were sensitive to the 60 bps price decrease they experienced, then we would expect that PLUS borrowing would increase disproportionately at FFEL institutions. However, as shown in Panel A, the coefficient on the interaction between being in a FFEL Institution after FFEL was abolished is positive and not significant for log originations and log dollars for four year or higher institutions at public, private, and for-profit institutions. Similarly, in Panel B, the effects for two year for-profits are positive and not significant in columns 5 and 6, and the effects are also not significant, albeit with negative point estimates, for public two year institutions.

5.1.3 Subsidized Stafford Loan Price Change

One possible channel through which federal student loan could increase is through changes in levels of financial need. If potential borrowers have more demonstrated financial need then they are more likely to be eligible to qualify for Subsidized Stafford loans, which have the same or lower interest rates and that do not accrue interest while the borrower is in school. Interest is capitalized on Unsubsidized Stafford loans and PLUS loans, so even with the same interest rate the choice is clear. Since the process of becoming eligible for federal aid is identical for the eligible and non-eligible and loan eligibility is typically disclosed on financial aid offer letters, we are not concerned about students being aware of Unsubsidized Stafford Loans but not Subsidized Stafford loans. Consequently, an increase in financial need of enrolled students would appear in a disproportionate increase in Subsidized Stafford loan borrowing relative to other loans.

We evaluate this using the framework from equation 8 and present the results in Table 8. We find that there are statistically significant decreases in Subsidized Stafford loan originations relative to total originations after the policy changes were implemented for almost all groups. The one exception is the approximately 1.3% increase in Subsidized Stafford Loan originations at four-year not-for-profit private schools, which is accompanied by an

approximately 1.1% decrease in Subsidized Stafford loan dollars originated.

5.2 Analyzing the Effects of Choice Architecture Changes on Intensive Margin and Loan Terms

Table 9 presents the propensity score matching results that match loans that are made after the policy change to loans made to borrowers with similar characteristics before the change. The results presented use an Epachnikov kernel, but the nearest-neighbor results are consistent. Original loan balances decline for both public and private non-profit four year schools, although the treatment effect is much larger for private schools: a decline of $762 versus a decline of $216. Similarly, original balances decline for two-year public schools. This pattern does not hold for two and four year students at for-profit schools: they both experience an increase in original loan balance once We control for borrower characteristics. Unlike for undergraduates, loan sizes among graduate students at non-profit schools are not significantly affected by the Self-Certification Form. The discrepancy between these results and the results from the difference-in-difference estimates may be driven by selection on unobservables. While the application files of the borrowers compared at for-profit schools may be similar before and after the policy changes, the borrowers that remain in the private market might be different. For example, students who have parents that are less willing to contribute towards the cost of education may need to borrow more and be less able to move from the private to the federal loan market.

These changes in loan takeup and loan size were not accompanied by an economically significant increase in price. As shown in the propensity-score matched comparison of the original interest rate of private student loans before and after the policy changes in the bottom half of Table 9, we actually observe statistically significant but economically small decreases in original rates for undergraduates and graduate students at four year or higher public or private not-for-profit schools. For all other groups the price effects were either negative or not statistically significant at a 95% confidence level. This implies that the effects observed are not attributable to a change in private student loan pricing, and are therefore due to the change in choice architecture.

5.3 Student-Level Loan Portfolio Choice and Heterogeneity Analysis

To corroborate our findings in the previous section, we compare post-secondary student borrowing patterns before and after the policy changes. While we do not have the detailed

chronology that we have in the quarterly data, this analysis makes it possible to look a students private and federal student loan choices jointly and to make use of more detailed borrower characteristics that are not in the administrative data for legal reasons.

5.3.1 Loan Portfolio Choice

Individual level analysis using the NPSAS data, which controls for student race, age, and cost-of-attendance net of grants, is presented in Tables 10 and 11. Table 10 explores the allocation of a student's loan portfolio. Table 11 considers the effect of the policy changes on loan dollars under various assumptions of the error structure between amount of federal and private student loans borrowed.

First, we consider the effects on loan portfolio allocation. Panel A of Table 10 presents relative risk ratios from estimating multinomial logit with linear predictor equations and Panel B reports log-odd estimates from an analogous logit for having a private student loan, regardless of whether the borrower has federal student loans or not. The probability that a student has federal student loans only increases by 24% on average, and these effects are relatively large for undergraduates: bachelor's degree students' probability of having federal student loans only increases by roughly 50% after introduction of the choice architecture policy changes, and the probability that associate degree students have federal student loans only increases by 30.1%. These effects are not statistically significant for master's degree or doctoral (both professional and academic) degree students. However we do see that the relative risk of students using federal student loan and private student loan jointly falls significantly across all program levels, and in column 3 that the proportion of master's degree students with private student loan only is approximately 60% lower than prior to Self-Cert. The log-odds estimates for having a private student loan are similar to the bias-corrected estimates from the Private Student Loan Loan Level Dataset and Title IV Volume Report analysis: the log odds of having a private student loan decreases by approximately 68% for all students.

Second, we consider dollars borrowed. The dollars originated per student are presented in Table 11: Panel A presents results from separate OLS regressions for private student loan, federal student loan, and total loans borrowed, while Panel B presents regression coefficients from for private student loan and federal student loan loans for SUR models, which allows for the errors in the private student loan and federal student loan equations to be correlated within individual. The total borrowing estimate in Panel B is a linear combination of these two estimates. The OLS estimate of the effect of the Self-Certification Form on total borrowing is a decrease in borrowing of $483 per student, and is insignificant for bachelor's degree students. While the SUR estimates are consistent with the OLS estimates

20

in that private student loan borrowing decreases for most groups and federal student loan borrowing increases, estimates of the extent to which federal student loan borrowing offsets private student loan borrowing differs. For example, in column 2, the OLS estimate for total borrowing suggest that the choice architecture interventions do not significantly affect the total amount a bachelor's degree student borrows, whereas the SUR estimate suggests that borrowing increases significantly by $2010 per student after the implementation. Panel C presents the results for a SUR tobit [6], which show similar patterns of decreases in private student loan amounts and increases in federal student loan. The average private student loan decreased by $7312 after the implementation of the policies, and the average federal student loan loan amount increased by $630. Since tobit coefficients combine the effects of changes in take-up rates as well as changes along the intensive margin, even if individuals were switching between private student loan and federal student loan this would not be represented by equal and opposite coefficients for private student loans and federal student loans. Panel D presents the analogous tobit estimates for total loans. While across all students average total borrowing decreases by $730, as shown in column 1, the extent to which borrowing decreases varies by degree program. Average borrowing increases by approximately $352 for four year undergraduates in column 2 in contrast to a $323 decrease for associate degree students in column 3, a $969 decrease for master students in column 4, and a statistically insignificant decrease of $194 for doctoral students in column 5.

To compare individuals who are on the common support of the 2008 and 2012 NPSAS, we propensity score match the 2012 respondents to the 2008 respondents based on race, age categories, dependency status, parental education, region, a polynomial in adjusted gross income, and student budget net of grants. The results presented consider the 2012 group the treated group, and matching is performed based on one nearest neighbor. Any comparisons of the two populations are weighted by the survey weight of the 2012 population. As shown in Panel A of Table 12, we find that the 2012 population's distribution of types of loans taken up, in the "2012 Actual" row, appear to include a lower proportion of private student loans than the counterfactual in the "2008 Matched" row. Take-up of private student loan only is decreased by approximately two-thirds from 3.99% to 1.32% for the matched sample. Also, the proportion of individuals who do not take up any loans increases from 42.41% to 56.93%. Panel B breaks the change in distribution of loan type take-up for four year undergraduates, and demonstrates qualitatively similar patterns for public, private non-profit, and for-profit students.

Table 13 focuses on loan amounts and the mix of federal student loan and private student loans held by four year undergraduates, split by loan program. Each estimate presented is

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[6]SUR tobit was implemented using the cmp package in Stata.

based on a comparison of the 2012 and matched 2008 respondents using the same propensity score match as in Table 9, and each estimate is a regression of the outcome variable of being treated and a constant. Column 2 shows that average private student loan amount for four year undergraduate students at public, private non-profit, and for-profit schools decrease by \$719, \$1972, and \$2826 respectively. Unlike the results in Table 11, these decreases are not offset by significant increases in federal student loan borrowing, so total borrowing decreases by \$778, \$1636, and \$3088 as shown in column 3. Columns 4 to 10 show changes in the take-up rates of different loan types. While Subsidized Stafford loans, Perkins, and state loans decline significantly for all three groups, there is a 9.4 percentage point increase in Unsubsidized Stafford loans for students at public schools and a 26.78 increase in Unsubsidized Stafford Loans for students at private non-profit schools in column 5. Since the sizes of Unsubsidized Stafford loans do not depend on income, some of this effect may be driven by students from higher income families. Similar to the results shown in Table the effects on private student loan take-up in column 10 are sizable: the 9.91 percentage point decrease in private student loan for public schools and the 17.95 percentage point decrease for private non-profit schools both correspond to a 61% decrease in take-up, and the 38.78% percentage point decrease in private student loan at for-profit schools corresponds to a 79% decrease.

5.3.2 Heterogeneity Analysis

To understand potential heterogeneous treatment effects, we also interact demographic characteristics with the *post* variable in Table 14, which considers the propensity for a student to have a private student loan, and in Table 15 which presents coefficients from a multinomial logit for the mix of loans a students have. These estimates are analogous to the estimates in Panel B and Panel A of Table 4, respectively. Similarly, 16 presents estimates from a SUR tobit model, analogous to the models presented in Panel C of Table 11.

We observe some differences in the effects of the policies on portfolio allocation by demographics. Column 1 of Table 14 shows that blacks reduces their private student loan borrowing rates by 24 percent more than comparable whites and Hispanics reduce their private student loan borrowing rates by 16 percent more than comparable whites. Private loan borrowing rates also decrease by approximately 24 percent for students age 24 to 29 relative to those 23 and under. The main effect is still sizable: the coefficient on *post* still corresponds to a decrease of 53 percent. Black undergraduates reduce their private student loan borrowing by 30 percent more than comparable whites in column 2, but none of the other race categories is significantly different from whites. For master degree students in column 4 we actually see that the relative rate of PSL borrowing among Asian students actually

increases by 360 percent relative to their white peers. Table 15 tells a similar story: overall blacks and Hispanics are less likely to become federal only borrowers or federal and private student loan borrowers. As in 4, we see a shift from private loans to federal loans.

We also observe group differences in the effects of the policies on amount borrowed. In Table 16 we see that the average private student loan borrowed by a black student is reduced by $2357 more than a private student loan for a comparable white, and after the Self-Certification Form is implemented relationship between total cost of attendance and federal or private loan borrowing becomes less positive. Among associates degree students in column 2, older students–those 24 to 29 years old or over 30 years old–increase their federal borrowing by approximately $2000 less than their 23 year old and under counterparts.

6   Conclusion

In this paper we show that choice architecture, the way that a decision is framed, has an important role in the student loan decision: the introduction of the Self-Certification Form and the restriction on co-branded loans significantly reduced private student loan borrowing. In contrast, sizeable changes in interest rates did not appear to significantly affect student choice. Student loans are often an entry point into the consumer credit market and student's largest financial decision to date. Given the lifecycle timing of the decision, this process may be formative, so impactful policy at this juncture is may be particularly important.

While this paper demonstrates that choice architecture plays a large role in student loan decisions, we cannot identify the extent to which the Self-Certification Form or the change in the default loan option contributed to the combined effect of the policies. Understanding how different choice architecture options affect financial aid decisionmaking is relevant to both education and consumer finance policy, and could be a fruitful area of future research.

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Table 1: Federal Student Loans

	Undergraduate Subsidized Stafford	Graduate Subsidized Stafford	Unsubsidized Stafford	Parental PLUS	Graduate PLUS
Eligibility	· Undergraduate or graduate student enrolled at least half-time · Demonstrated financial need · Meet federal student aid requirements	· Undergraduate or graduate student enrolled at least half-time · Demonstrated financial need · Meet federal student aid requirements	· Undergraduate or graduate student enrolled at least half-time · No need requirement · Meet federal student aid requirements	· Parent of dependent undergraduate enrolled at least half-time · No adverse credit history · Student meets federal student aid requirements	· Enrolled half time in a graduate or professional program · No adverse credit history · Meet federal student aid requirements
Interest Capitalized While in School	No	No	Yes	Yes	Yes
Borrower	Student	Student	Student	Parent	Student
Interest Capitalized While in School	No	No	Yes	Yes	Yes
Loan Limits ($)					
1st Year Undergraduate	3,500		6,000		
2nd Year Undergraduate	4,500		6,000		
3rd Year Undergraduate	5,500		7,000		
4th Year undergraduate	5,500		7,000		
Total Undergraduate	23,000		32,500		
Graduate (1 Year)		12,000	12,000		
Lifetime Total		65,500	73,000		
Interest Rates					
2007-2008 Academic Yr	6.80	6.80	6.80	7.90 Direct, 8.50 FFEL	7.90 Direct, 8.50 FFEL
2008-2009 Academic Yr	6.00	6.80	6.80	7.90 Direct, 8.50 FFEL	7.90 Direct, 8.50 FFEL
2009-2010 Academic Yr	5.60	6.80	6.80	7.90 Direct, 8.50 FFEL	7.90 Direct, 8.50 FFEL
2010-2011 Academic Yr	4.50	6.80	6.80	7.90	7.90
2011-2012 Academic Yr	3.40	6.80	6.80	7.90	7.90

Source: Department of Education (studentaid.ed.gov) ,finaid.org, fas.org.

Table 2: Educational Institution Level Means Prior to the Self-Certification Form

Four Year Undergraduates

	Public	Private	For-Profit
Number of Institutions	1520.25	3809.8125	574.125
Total Enrollment	13,528	2,656	2,405
In District Tuition and Fees	5,522	18,741	14,924
Private Student Loan Originations	125	51	36
Average Private Student Loan Original Balance	8,804	11,996	11,424
PLUS Loan Originations	169	53	78
Average PLUS Original Balance	6,684	9,519	5,527
Subsidized Stafford Originations	1,319	379	1,644
Subsidized Stafford Original Balance	3,648	4,422	4,001
Unsubsidized Stafford Originations	1,333	386	1,769
Subsidized Stafford Original Balance	4,152	5,179	4,864

Two Year Undergraduate

	Public	Private	For-Profit
Number of Institutions	1,941	343	574
Total Enrollment	8,095	326	2,919
In District Tuition and Fees	2,485	10,869	16,277
Private Student Loan Originations	13	4	7
Average Private Student Loan Original Balance	9,260	10,029	11,113
PLUS Loan Originations	172	34	748
Average PLUS Original Balance	3,977	5,880	7,643
Subsidized Stafford Originations	401	67	1,840
Subsidized Stafford Original Balance	2,623	3,031	3,766
Unsubsidized Stafford Originations	219	44	1,551
Subsidized Stafford Original Balance	2,811	3,552	5,030

Graduate Students

	Public	Private	For-Profit
Number of Institutions	1,952	4,441	615
Total Enrollment	13,746	2,706	2,919
In District Tuition and Fees	5,842	21,085	16,251
Private Student Loan Originations	20	15	11
Average Private Student Loan Original Balance	9,171	12,809	12,279
PLUS Loan Originations	154	95	247
Average PLUS Original Balance	6,801	8,653	8,578

Private Student Loan Loan Level Dataset, IPEDS, and Title IV Volume
Reports restricted to 2008Q1 through 2009Q4.
Means across all quarters.
Means reported at the institution level, weighted by total enrollment.
A borrower may have multiple Stafford loans if he has a Subsidized and
an Unsubsidized Stafford Loan.

Table 3: Mean Loan Balance by School Control and Level, Private Student Loan Loan Level Data and NPSAS08

		Private Student Loan Loan Level Dataset		NPSAS08	
		Mean	SD	Mean	SD
		(1)	(2)	(3)	(4)
Public	Four Year Undergraduates	8963.723	15.55412	6247.72	83.89082
	Two Year Undergraduates	8988.028	30.94746	3723.169	73.57182
	Graduate Students	10024.49	62.34981	6470.048	471.7986
	Less Than Two Year	7297.67	281.6626	4296.881	239.7316
Private, Non-Profit					
	Four Year Undergraduates	12611.84	31.11802	9408.449	190.2495
	Two Year Undergraduates	10921.96	268.2806	6875.261	488.2568
	Graduate Students	16338.67	80.5036	9248.696	327.8379
	Less Than Two Year	10812.32	771.2229	5939.102	642.9253
For-Profit					
	Four Year Undergraduates	11186.54	76.87082	6320.914	203.215
	Two Year Undergraduates	10562.8	141.3288	8687.333	891.7526
	Two Year Undergraduates	11450.47	112.1771	6016.095	218.3916
	Less than Two Year	8490.614	82.73527	4863.133	88.9957

Loan amounts reported in nominal dollars. Private Student Loan Loan Level Data-set estimates at the loan level and NPSAS08 estimates at the individual level. NPSAS08 observations weighted using WTA000.

Table 4: Loan Type Proportions, NPSAS 2008 and NPSAS 2012

| | 2008 | | | | 2012 | | | | |
	No Loans	Federal Only	Private Only	Both	No Loans	Federal Only	Private Only	Both	N
All Students	0.6089	0.2544	0.0357	0.101	0.5774	0.3654	0.0149	0.0423	238760
Bachelor's Degree	0.4653	0.3473	0.0405	0.1469	0.4141	0.4983	0.0176	0.0699	89500
Associate's Degree	0.7307	0.1686	0.0297	0.0711	0.703	0.2661	0.0092	0.0217	57990
Master's Degree	0.5604	0.3272	0.0373	0.0751	0.5401	0.4186	0.0138	0.0275	13000
Doctoral Degree	0.7103	0.2295	0.0169	0.0432	0.6694	0.3003	0.0143	0.0159	9940

$*p<0.1$, $**p<0.05$, $***p<0.01$; standard errors in parentheses.
Source: NPSAS 2008 and NPSAS 2012.
All models include a control for student budget minus all other grants (NETCST3) as well as dummies for race (RACE) and age category (AGECAT: <24, 24-29, 30+).
An individual is considered to have Private Student Loan if PRIVLOAN>0 and is considered to have federal student loan if TFEDLN2>0 or TFEDLN>0.
Student level is from the BENLADEG variable harmonized between surveys: professional and other doctoral programs are combined in the NPSAS2012 for consistency with NPSAS2008.
Observations weighted by WTA000, number of observations rounded to the nearest 10.

Table 5: Difference-in-Difference Estimates, Four Year or Above Institutions, Federal Student Loan Control Group, Weighted by Total Enrollment

	Public		Private Not-For-Profit		For Profit	
	(1)	(2)	(3)	(4)	(5)	(6)
	Log Originations	Log Dollars Originated	Log Originations	Log Dollars Originated	Log Originations	Log Dollars Originated
	Panel A: Basic DD Model					
Post × PSL	-0.572***	-0.140***	-0.374***	-0.183***	-0.808***	-0.600***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.001)	(0.001)
Bias-Corrected Estimate of Post × PSL	-0.432***	-0.130***	-0.309***	-0.167***	-0.554***	-0.451***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
N	4.97E+08	4.96E+08	2.26E+08	2.25E+08	3.01E+07	3.01E+07
R^2	0.844	0.963	0.832	0.933	0.858	0.944
	Panel B: Estimates With FFEL Implementation Separated					
Post × PSL	-0.488***	0.147***	-0.255***	0.026***	-1.120***	-0.709***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.001)	(0.001)
Post FFEL × PSL	-0.112***	-0.453***	-0.186***	-0.321***	0.517***	0.128***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.002)	(0.001)
Bias Corrected Estimate of Post × PSL	-0.383***	0.158***	-0.223***	0.027***	-0.673***	-0.508***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.001)
N	4.97E+08	4.96E+08	2.26E+08	2.25E+08	3.01E+07	3.01E+07
R^2	0.844	0.964	0.832	0.933	0.858	0.944
	Panel C: Interactions With FFEL Institution Status Prior to 2010					
Post × PSL	-0.409***	0.171***	-0.203***	0.150***	-0.812***	-0.681***
	(0.001)	(0.001)	(0.002)	(0.002)	(0.017)	(0.013)
Post FFEL × PSL	-0.115***	-0.461***	-0.140***	-0.487***	1.104***	0.967***
	(0.001)	(0.001)	(0.003)	(0.002)	(0.021)	(0.016)
Post × PSL × FFEL Institution	-0.082***	-0.025***	-0.053***	-0.125***	-0.308***	-0.024
	(0.001)	(0.001)	(0.002)	(0.002)	(0.017)	(0.013)
Post FFEL × PSL × FFEL Institution	0.003*	0.009***	-0.053***	0.170***	-0.590***	-0.851***
	(0.001)	(0.001)	(0.002)	(0.002)	(0.021)	(0.016)
Bias Corrected Estimate of Post × PSL	-0.331***	0.186***	-0.178***	0.160***	-0.549***	-0.491***
	(0.001)	(0.001)	(0.002)	(0.002)	(0.008)	(0.007)
N	4.97E+08	4.96E+08	2.25E+08	2.25E+08	3.01E+07	3.00E+07
R^2	0.844	0.964	0.832	0.935	0.859	0.945

*p<0.1,**p<0.05, ***p<0.01; standard errors in parentheses.
All models include controls for tuition and fees, cohort default rate, log total enrollment, historically black or Hispanic serving institution status, a time trend, and fixed effects for quarter and institution.
Weighted by total enrollment; number of observations reflects using total enrollment as a frequency weight.
Control group is all federal student loans.

Table 6: Difference-in-Difference Estimates,Two Year Institutions, Federal Student Loan Control Group, Weighted by Total Enrollment

	Public		Private Not-For-Profit	
	(1)	(2)	(3	(4)
	Log Originations	Log Dollars Originated	Log Originations	Log Dollars Originated
Panel A: Basic DD Model				
Post × PSL	-0.841***	-0.646***	-0.409***	-0.315***
	(0.000)	(0.000)	(0.003)	(0.002)
Bias-Corrected Estimate of Post × PSL	-0.566***	-0.475***	-0.335***	-0.269***
	(0.000)	(0.000)	(0.002)	(0.002)
N	0.846	0.885	3,008,924	2,994,627
R^2	1.906e+08	1.897e+08	0.865	0.910
Panel B: Estimates With FFEL Implementation Separated				
Post × PSL	-0.952***	-0.465***	-0.859***	-0.814***
	(0.000)	(0.000)	(0.004)	(0.003)
Post FFEL × PSL	0.231***	-0.305***	0.730***	0.780***
	(0.001)	(0.001)	(0.004)	(0.004)
Bias Corrected Estimate of Post × PSL	-0.611**	-0.370***	-0.575***	-0.556***
	(0.000)	(0.000)	(0.002)	(0.001)
N	1.906e+08	1.897e+08	3,008,924	2,994,627
R^2	0.847	0.885	0.866	0.912
Panel C: Interactions With FFEL Institution Status Prior to 2010				
Post × PSL	-1.037***	-0.473***	0.091	0.759***
	(0.002)	(0.002)	(0.052)	(0.044)
Post FFEL × PSL	0.590***	0.061***	-0.479***	-0.487***
	(0.003)	(0.003)	(0.054)	(0.046)
Post × PSL × FFEL Institution	0.078***	0.002	-0.945***	-1.574***
	(0.002)	(0.002)	(0.052)	(0.044)
Post FFEL × PSL × FFEL Institution	-0.364***	-0.369***	1.218***	1.269***
	(0.003)	(0.003)	(0.054)	(0.046)
Bias Corrected Estimate of Post × PSL	-0.643***	-0.376***	-0.094	1.112***
	(0.001)	(0.001)	(0.057)	(0.092)
N	1.887e+08	1.878e+08	3,008,924	2,994,627
R^2	0.847	0.885	0.866	0.912

*p<0.1,**p<0.05, ***p<0.01; standard errors in parentheses.
All models include controls for tuition and fees, cohort default rate, log total enrollment, historically black or Hispanic serving institution status, a time trend, and fixed effects for quarter and institution.
Weighted by total enrollment; number of observations reflects using total enrollment as a frequency weight.
Control group is all federal student loans.

Table 7: Difference-in-Difference of Parental PLUS Loans at Schools that Were Part of the FFEL Program vs. Non-FFEL Program Schools

	Public		Private		For-Profit	
	(1)	(2)	(3)	(4)	(5)	(6)
	Log Origina-tions	Log Dollars	Log Origina-tions	Log Dollars	Log Origina-tions	Log Dollars
Panel A: Four Year or Higher Institutions						
Post FFEL	0.151	0.255**	0.150*	0.089	-0.569	-0.649
	(0.079)	(0.078)	(0.061)	(0.064)	(0.474)	(0.586)
FFEL Institution	-0.082	-0.100	0.385	0.465*	0.287	0.488
	(0.202)	(0.244)	(0.207)	(0.193)	(0.424)	(0.478)
Post FFEL	0.049	0.020	0.038	0.090	0.502	0.372
x FFEL Institution	(0.060)	(0.060)	(0.061)	(0.065)	(0.499)	(0.615)
N	1.010×10^8	1.010×10^8	47,229,753	47,229,753	6,554,737	6,554,737
R^2	0.345	0.345	0.269	0.328	0.334	0.360
Panel B: Two Year Institutions						
Post FFEL	0.055	0.061			-0.164	-0.233
	(0.143)	(0.171)			(0.188)	(0.229)
FFEL Institution	-0.881*	-0.835*			-0.085	0.093
	(0.356)	(0.374)			(0.210)	(0.278)
Post FFEL	-0.095	-0.111			0.279	0.190
x FFEL Institution	(0.143)	(0.170)			(0.207)	(0.249)
N	47,620,577	47,620,577			1,411,226	1,411,226
R^2	0.090	0.057			0.415	0.386

*p<0.1,**p<0.05, ***p<0.01; standard errors in parentheses.
All models include controls for tuition and fees, cohort default rate, log total enrollment, historically black or Hispanic serving institution status, a time trend, and fixed effects for quarter.
Weighted by total enrollment; number of observations reflects using total enrollment as a frequency weight.
Control group is all student loans.
Source: Title IV Volume Reports, IPEDS, PEPS.

Table 8: Difference-in-Difference of Subsidized Stafford vs. All Loans

	Public		Private		For-Profit	
	(1)	(2)	(3)	(4)	(5)	(6)
	Log Origina-tions	Log Dollars	Log Origina-tions	Log Dollars	Log Origina-tions	Log Dollars
Panel A: Four Year or Higher Institutions						
Post FFEL	0.282***	-0.094***	0.118***	-0.085***	0.472***	-0.180***
	(0.001)	(0.000)	(0.001)	(0.000)	(0.003)	(0.001)
Subsidized Staffords	1.437***	-2.330***	1.121***	-2.451***	1.853***	-2.363***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.002)	(0.001)
Post FFEL	-0.017***	0.010***	0.013***	-0.011***	-0.596***	-0.092***
x Subsidized Staffords	(0.001)	(0.000)	(0.001)	(0.000)	(0.002)	(0.001)
N	1.986×10^8	2.009×10^8	91,928,309	93,508,023	12,409,632	12,726,969
R^2	0.384	0.887	0.466	0.873	0.423	0.856
Panel B: Two Year Institutions						
Post FFEL	0.123***	-0.280***			0.454***	-0.454***
	(0.001)	(0.000)			(0.004)	(0.002)
Subsidized Staffords	1.176***	-2.059***			0.841***	-2.274***
	(0.000)	(0.000)			(0.002)	(0.001)
Post FFEL	-0.147***	0.000			-0.491***	-0.037***
x Subsidized Staffords	(0.001)	(0.000)			(0.004)	(0.002)
N	1.454×10^{08}	1.536×10^8			2,749,007	2,950,005
R^2	0.406	0.766			0.417	0.800

*p<0.1,**p<0.05, ***p<0.01; standard errors in parentheses.
All models include controls for tuition and fees, cohort default rate, log total enrollment, historically black or Hispanic serving institution status, a time trend, and fixed effects for quarter and institution.
Weighted by total enrollment; number of observations reflects using total enrollment as a frequency weight.
Control group is all student loans.
Source: CFPB Private Student Loan Loan Level Dataset, Title IV Volume Reports, IPEDS, PEPS.

Table 9: Effect of the Self-Certification Form, Propensity Score Matching Results

	Public	Private, Non-Profit	For-Profit
	(1)	(2)	(3)
Original Balance			
Four Year	-216.3716***	-762.1033***	545.0620***
	(41.6269)	(63.7422)	(188.8903)
Untreated	252,082	153,644	31,581
Treated	89.926	68,490	5,533
Two Year	-912.9443***		854.7623**
	(132.4641)		(375.1506)
Untreated	38,526		4,988
Treated	5,064		841
Graduate Students	514.7403	207.0175	-2693.50**
	(989.8706)	(1874.6772)	(1262.3172)
Untreated	7,851	12,516	325
Treated	13,989	13,808	114
Original Interest Rate			
Four Year	-0.0017***	-0.0020***	0.0014*
	(0.0002)	(0.0002)	(0.0007)
Two Year	0.0009		-0.0029*
	(0.0006)		(0.0017)
Graduate Students	-0.0078***	-0.0050**	0.0004
	(0.0019)	(0.0023)	(0.0046)

*$p<0.1$, **$p<0.05$, ***$p<0.01$, standard errors in parentheses.
Private Student Loan Loan Level Data, 2008-2011.
Propensity score matching on having a co-borrower, year in school, school type, FICO score intervals, distribution channel, tuition and fees, quarter of origination, and enrollment status
Weighted by Epachnikov kernel; sample sizes are the same for both outcomes.

Table 10: Loan Types Borrowed, NPSAS 2008 and 2012

	(1) All Students	(2) Bachelor's Degree	(3) Associate's Degree	(4) Master's Degree	(5) Doctoral Degree Program
Panel A: Multinomial Logit of Borrower Type					
Federal Only	1.2411***	1.4984***	1.3062***	1.0472	1.0789
	(0.0193)	(0.0368)	(0.0406)	(0.0708)	(0.0869)
Both	0.3349***	0.4355***	0.2455***	0.2663***	0.2907**
	(0.0098)	(0.0177)	(0.0176)	(0.0451)	(0.1095)
Private Only	0.4038***	0.4728***	0.2921***	0.4096***	0.8711
	(0.0235)	(0.0428)	(0.0363)	(0.0925)	(0.3619)
N	220670	83650	54130	11520	7730
Pseudo-R^2	0.0956	0.0389	0.1418	0.1470	0.1118
Panel B: Logit Estimates of Probability of Having a Private Student Loan					
Private Loan	0.3202***	0.3590***	0.2383***	0.2930***	0.4072**
	(0.0087)	(0.0131)	(0.0154)	(0.0416)	(0.1342)
N	220670	83650	54130	11520	7730
Pseudo-R^2	0.0714	0.0480	0.1295	0.0744	0.0556

* p >0.1, **p<0.05, ***p<0.01.

Standard errors in parentheses.

Reported coefficients are relative risk ratios for multinomial logit specifications and odds ratios for logit specifications.

Source: NPSAS 2008 and NPSAS 2012.

All models include a control for student budget minus all other grants (NETCST3) as well as dummies for race (RACE) and age category (AGECAT: <24, 24-29, 30+).

An individual is considered to have Private Student Loan if PRIVLOAN>0 and is considered to have federal student loan if TFEDLN2>0 or TFEDLN>0.

Student level is from the BENLADEG variable harmonized between surveys: professional and other doctoral programs are combined in the NPSAS2012 for consistency with NPSAS2008.

Sample restricted to citizens and permanent residents.

Observations weighted by WTA000.

Table 11: Loan Dollar Amounts, NPSAS 2008 and NPSAS 2012

	(1) All Students	(2) Bachelor's De- gree	(3) Associate's De- gree	(4) Master's De- gree	(5) Doctoral De- gree Program
			Panel A: OLS		
Private Borrowing	-708.6707***	-1074.0233***	-457.5411***	-644.8104***	-441.8291*
	(18.0365)	(37.3848)	(22.0038)	(93.1439)	(205.5248)
R^2	0.0624	0.0575	0.1084	0.0468	0.0299
Federal Borrowing	226.1247***	1170.7098***	166.1368***	85.9254	464.6233
	(34.3953)	(57.7169)	(27.9230)	(218.5049)	(398.2263)
R^2	0.3112	0.1015	0.2510	0.3734	0.2817
Total Borrowing	-482.5460***	96.6865	-291.4043***	-558.8850*	22.7942
	(38.2896)	(68.1997)	(36.1042)	(225.7795)	(492.5282)
N	220670	83650	54130	11520	7730
R^2	0.3338	0.1170	0.2902	0.3891	0.2893
		Panel B: Seemingly Unrelated Regressions			
Private Borrowing	-271.7249***	-523.1358***	-181.5443***	-131.0874*	-59.6358
	(14.2576)	(29.0797)	(16.1927)	(65.4182)	(111.5858)
Federal Borrowing	2203.0608***	2532.9067***	1082.7240***	4149.0870***	4991.7478***
	(39.5525)	(57.8198)	(31.8461)	(228.7493)	(403.7254)
Total Borrowing	1931.3359***	2009.7709***	901.1797***	4017.9996***	4932.1121***
	(43.4101)	(66.5963)	(38.4655)	(244.6327)	(446.5169)
N	233170	88090	57480	12000	8030
R^2 Private Equation	0.0546	0.0863	0.0339	0.0388	0.0376
R^2 Federal Equation	0.2006	0.3551	0.1684	0.3226	0.2647
		Panel C: Tobit Seemingly Unrelated Regressions			
Private Borrowing	-7311.6545***	-7475.1761***	-6381.5450***	-8838.9036***	-7436.4397**
	(173.2331)	(265.6375)	(293.0889)	(916.2879)	(2628.5834)
Federal Borrowing	630.1909***	1837.1325***	766.7024***	165.8077	559.3164
	(82.7461)	(103.4876)	(99.7207)	(450.3780)	(973.9502)
N	220670	83650	54130	11520	7730
p	0.0000	0.0000	0.0000	0.0000	0.0000
			Panel D: Tobit		
Total Borrowing	-730.2962***	352.3648**	-323.9641**	-968.5211*	-194.4172
	(85.8943)	(115.7922)	(112.1167)	(446.0305)	(1087.3534)
N	220670	83650	54130	11520	7730
Pseudo-R^2	0.0309	0.0075	0.0346	0.0353	0.0298

* p<0.1, **p<0.05, ***p<0.01.
Standard errors in parentheses.
Source: NPSAS 2008 and NPSAS 2012.
All models include a control for student budget minus all other grants (NETCST3) as well as dummies for race (RACE) and age category (AGECAT: <24, 24-29, 30+).
Outcome variables are PRIVLOAN, TFEDLN2/TFEDLN, and the sum of Private Student Loans and TFEDLN2/TFEDLN.
Student level is from the BENLADEG variable harmonized between surveys: professional and other doctoral programs are combined in the NPSAS2012 for consistency with NPSAS2008.
Sample restricted to citizens and permanent residents.
Observations weighted by WTA000 and number of observations rounded to the nearest 10.

Table 12: Propensity Score Matching Loan Status for Private Student Loan Borrowers

	No Loans	Federal Only	Private Only	Both	Untreated	Treated	Pseudo-R^2
	Estimated 2012 Loan Take-up Status						
Panel A: All Students							
2012 Actual	56.93%	37.22%	1.32%	4.53%	109010	68010	0.2148
2008 Matched	42.41%	34.19%	3.99%	19.40%			
Panel B: Four Year Undergraduates							
Public							
2012 Actual	50.23%	43.37%	1.76%	4.64%	34460	15470	0.1907
2008 Matched	42.69%	41.00%	3.61%	12.70%			
Private Non-Profit							
2012 Actual	37.19%	51.56%	1.18%	10.08%	18560	7030	0.1957
2008 Matched	32.42%	38.38%	3.90%	25.30%			
For Profit							
2012 Actual	25.37%	64.39%	1.48%	8.76%	6250	14852	0.1213
2008 Matched	12.42%	38.56%	6.19%	42.83%			

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

Standard errors in parentheses.

Source: NPSAS 2008 and NPSAS 2012.

Propensity score matching with 1 neighbor based on race, age categories, dependency status, parental education, institution region, a poliynomial in adjusted gross income, and student budget minus all other grants (NETCST3).

An individual is considered to have Private Student Loans if PRIVLOAN>0 and is considered to have federal student loans if TFEDLN2>0 or TFEDLN>0.

Pseudo-R^2 refers to the pseudo-r2 of the corresponding propensity score probit.

Obervations are weighted using the treated observation weights (WTA000) and all observation counts rounded to the nearest 10.

Table 13: Propensity Score Matching Estimates of Effect of Self-Cert

| | Loan Dollars | | | Has Loan Type | | | | | | |
	Federal	Private	Total Loans	Subsidized Stafford	Unsubs Stafford	Parental Plus	Perkins	Institutional Loans	State Loans	Private Student Loans
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Public										
Treatment Effect	-58.9691	-719.3097***	-778.2789***	-0.0293***	0.0939***	-0.0018	-0.0280***	-0.0048***	-0.0082***	-0.0991***
	(67.3168)	(32.5243)	(75.3867)	(0.0065)	(0.0062)	(0.0031)	(0.0026)	(0.0011)	(0.0010)	(0.0041)
Constant	4008.4489***	1077.7477***	5086.1966***	0.4368***	0.2991***	0.0725***	0.0561***	0.0084***	0.0104***	0.1632***
	(48.8642)	(28.2686)	(57.4283)	(0.0047)	(0.0043)	(0.0024)	(0.0022)	(0.0010)	(0.0010)	(0.0035)
R^2	0.0000	0.0196	0.0040	0.0009	0.0097	0.0000	0.0049	0.0009	0.0027	0.0244
N Treated	15470	15470	15470	15470	15470	15470	15470	15470	15470	15470
N Untreated	34460	34460	34460	34460	34460	34460	34460	34460	34460	34460
Private Non-Profit										
Treatment Effect	-262.3855	-2825.7237***	-3088.1092***	-0.0645***	0.0200	-0.0347***	-0.0446***	-0.0030	-0.0036**	-0.3878***
	(150.1968)	(101.8995)	(173.5582)	(0.0115)	(0.0126)	(0.0052)	(0.0049)	(0.0022)	(0.0011)	(0.0108)
Constant	6161.8261***	3450.4765***	9612.3026***	0.7753***	0.6668***	0.0680***	0.0757***	0.0087***	0.0038***	0.4902***
	(110.6058)	(94.0350)	(138.2058)	(0.0079)	(0.0088)	(0.0047)	(0.0044)	(0.0020)	(0.0011)	(0.0092)
R^2	0.0006	0.1106	0.0503	0.0054	0.0005	0.0063	0.0099	0.0003	0.0016	0.1804
N Treated	6250	6250	6250	6250	6250	6250	6250	6250	6250	6250
N Untreated	14850	14850	14850	14850	14850	14850	14850	14850	14850	14850
For-Profit										
Treatment Effect	-262.3855	-2825.7237***	-3088.1092***	-0.0645***	0.0200	-0.0347***	-0.0446***	-0.0030	-0.0036**	-0.3878***
	(150.1968)	(101.8995)	(173.5582)	(0.0115)	(0.0126)	(0.0052)	(0.0049)	(0.0022)	(0.0011)	(0.0108)
Constant	6161.8261***	3450.4765***	9612.3026***	0.7753***	0.6668***	0.0680***	0.0757***	0.0087***	0.0038***	0.4902***
	(110.6058)	(94.0350)	(138.2058)	(0.0079)	(0.0088)	(0.0047)	(0.0044)	(0.0020)	(0.0011)	(0.0092)
R^2	0.0006	0.1106	0.0503	0.0054	0.0005	0.0063	0.0099	0.0003	0.0016	0.1804
N Treated	6250	6250	6250	6250	6250	6250	6250	6250	6250	6250
N Untreated	14850	14850	14850	14850	14850	14850	14850	14850	14850	14850

*p<0.1, **p<0.05, ***p<0.01.
Standard errors in parentheses.
Source: NPSAS 2008 and NPSAS 2012.
Propensity score matching with 1 neighbor based on race, age categories, dependency status, parental education, institution region, a polynomial in adjusted gross income, and student budget minus all other grants (NETCST3).
An individual is considered to have Private Student Loan if PRIVLOAN>0 and is considered to have federal student loans if TFEDLN2>0 or TFEDLN>0.
Observations are weighted using the treated observation weights (WTA000) and all observation counts rounded to the nearest 10.

Table 14: Private Student Loan Takeup, Interactions with Demographics, NPSAS 2008 and 2012

	(1) All Students	(2) Bachelor's Degree	(3) Associate's Degree	(4) Master's Degree	(5) Professional and Other Doctoral Degrees
Post	0.4684***	0.5973***	0.2503***	0.4931	0.3791
	(0.0234)	(0.0449)	(0.0340)	(0.2105)	(0.2092)
Post × Black	0.7616***	0.7000***	1.0723	0.7344	0.6390
	(0.0541)	(0.0682)	(0.1673)	(0.2825)	(0.4400)
Post × Hispanic	0.8411*	0.9652	0.8202	0.5873	0.6899
	(0.0633)	(0.1018)	(0.1445)	(0.2268)	(0.4255)
Post × Asian	1.2236	0.9774	1.1071	3.5971*	2.4152
	(0.1649)	(0.1688)	(0.3624)	(1.9094)	(1.2410)
Post × American Indian	0.8995	0.9880	0.8427	2.6646	
	(0.2853)	(0.4501)	(0.4861)	(3.5633)	
Post × Native	0.7661	0.5125	1.8123	0.4547	
Hawaiian or Pacific Islander	(0.2527)	(0.2675)	(1.1172)	(0.7039)	
Post × More than	1.2822	1.0181	2.2468	2.4785	
One Race	(0.3094)	(0.3645)	(1.2022)	(2.1619)	
Post × Age 24-29	0.7618***	0.8549	0.9470	0.6688	0.9000
	(0.0519)	(0.0888)	(0.1376)	(0.2850)	(0.4102)
Post × Age 30+	0.9116	0.8404	1.0773	0.9259	1.0052
	(0.0614)	(0.0881)	(0.1540)	(0.4082)	(0.5160)
Post × Total Cost	1.0000***	1.0000***	1.0000***	1.0000*	1.0000
of Attendance	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)
N	208790	85070	51450	10740	3510
R^2	0.0728	0.0559	0.1090	0.0722	0.0648

*p<0.1,**p<0.05, ***p<0.01; standard errors in parentheses.

Source: NPSAS 2008 and NPSAS 2012.

All models include a control for total cost of attendance (CTOTLCOA), dummies for race, and age category (AGECAT,¡24,24-29,30+) and interactions of these controls with appearing in the 2012 sample.

Outcome variables is a binary variable for a positive value of PRIVLOAN.

Student level is from the BENLADEG variable harmonized between surveys: professional and other doctoral programs are combined in the NPSAS2012 sample for consistency with NPSAS2008.

Sample restricted to citizens and permanent residents.

Observations weighted by WTA000 and number of observations rounded to the nearest 10.

Table 15: Loan Type Mix, Interactions with Demographics, NPSAS 2008 and 2012

	(1) All Students	(2) Bachelor's Degree	(3) Associate's Degree	(4) Master's Degree	(5) Professional and Other Doctoral Degrees
Federal Only					
Post	2.3142***	3.8307***	1.9537***	3.2965***	2.4103**
	(0.0800)	(0.2108)	(0.1396)	(0.7039)	(0.8014)
Post × Black	0.8728**	0.8900	0.8117*	0.7820	0.7441
	(0.0398)	(0.0740)	(0.0696)	(0.1723)	(0.3241)
Post × Hispanic	1.0139	1.1647*	0.9305	0.8133	1.1804
	(0.0469)	(0.0867)	(0.0930)	(0.1798)	(0.5539)
Post × Asian	0.7275***	0.7683*	1.0428	0.5711*	0.5627*
	(0.0569)	(0.0792)	(0.2308)	(0.1624)	(0.1635)
Post × American Indian	1.2227	1.1920	1.3051	1.9539	
	(0.2251)	(0.3448)	(0.4748)	(1.7067)	
Post × Native	1.3017	1.3141	1.1478	6.4500	
Hawaiian or Pacific Islander	(0.2996)	(0.4876)	(0.5171)	(7.1900)	
Post × More than	1.2724	1.0635	1.0411	3.0633	4.9234
One Race	(0.2482)	(0.2951)	(0.4771)	(3.0405)	(5.9727)
Post × Age 24-29	0.8834**	0.8610*	1.0182	0.9092	0.6984
	(0.0366)	(0.0622)	(0.0847)	(0.1885)	(0.2009)
Post × Age 30+	1.2795***	0.9731	1.8097***	1.0444	0.5588
	(0.0509)	(0.0722)	(0.1391)	(0.2169)	(0.1771)
Post × Total Cost	0.9999***	0.9999***	0.9999***	0.9999***	1.0000***
of Attendance	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)
Private Only					
Post	0.3216***	0.6432*	0.2274***	0.0654***	0.5462
	(0.0460)	(0.1289)	(0.0822)	(0.0533)	(0.3637)
Post × Black	0.8364	0.5200*	1.4288	1.2169	0.1421
	(0.1394)	(0.1455)	(0.4782)	(0.7929)	(0.1943)
Post × Hispanic	0.7310	1.0327	0.7042	0.3787	1.13e+08***
	(0.1251)	(0.2589)	(0.2570)	(0.2674)	(1.33e+08)
Post × Asian	0.8620	0.5905	0.0748**	1.1935	2.3360
	(0.2005)	(0.1971)	(0.0728)	(0.6533)	(2.1571)
Post × American Indian	0.6566	0.9715	0.0000***	7.1449*	0.0000
	(0.4416)	(0.8345)	(0.0000)	(5.6947)	
Post × Native	0.8066	0.5623	2.9792	1.1807e+09***	
Hawaiian or Pacific Islander	(0.4907)	(0.6165)	(2.7880)	(1.5838e+09)	

Post × More than	1.7144	2.4257	7.0567	0.8828	
One Race	(0.8525)	(1.6042)	(8.8331)	(1.3482)	
Post × Age 24-29	1.0899	1.1996	1.3744	2.6573	0.2340
	(0.1603)	(0.2681)	(0.4367)	(1.5428)	(0.2311)
Post × Age 30+	1.2644	1.6665*	1.1562	3.1451	0.4783
	(0.1897)	(0.3908)	(0.3856)	(2.0425)	(0.4184)
Post × Total Cost	1.0000	1.0000**	1.0000	1.0000	1.0000
of Attendance	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)
Both Federal and Private					
Post	0.7454***	1.4177***	0.3459***	1.1345	0.5462
	(0.0432)	(0.1250)	(0.0527)	(0.5486)	(0.3637)
Post × Black	0.7192***	0.7304**	0.8678	0.5766	0.6888
	(0.0580)	(0.0877)	(0.1543)	(0.2595)	(0.5287)
Post × Hispanic	0.8886	1.0652	0.8202	0.6329	0.6530
	(0.0758)	(0.1307)	(0.1712)	(0.2867)	(0.5156)
Post × Asian	0.9925	0.9630	1.1918	2.5442	1.4615
	(0.1529)	(0.1909)	(0.4513)	(1.5351)	(0.8780)
Post × American Indian	1.1595	1.2642	1.1782	4.0174	0.0000
	(0.4286)	(0.6893)	(0.7555)	(5.7189)	(.)
Post × Native	0.9237	0.6076	1.5175	0.0000***	0.0000
Hawaiian or Pacific Islander	(0.3547)	(0.3662)	(1.2015)	(0.0000)	(.)
Post × More than	1.4054	0.9729	1.5896	3.7282	3.3080e+09
One Race	(0.4033)	(0.4058)	(0.9344)	(3.6679)	(.)
Post × Age 24-29	0.6498***	0.7496*	0.8288	0.6349	0.6880
	(0.0503)	(0.0911)	(0.1362)	(0.3063)	(0.3874)
Post × Age 30+	0.9692	0.7228**	1.4387*	1.0083	0.5474
	(0.0741)	(0.0880)	(0.2308)	(0.5091)	(0.3435)
Post × Total Cost	0.9999***	0.9999***	0.9999***	0.9999***	1.0000***
of Attendance	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)
N	213,340	86,310	51,840	11,550	3610
R^2	0.1289	0.0908	0.1663	0.1454	0.1121

*p<0.1,**p<0.05, ***p<0.01; standard errors in parentheses.

Source: NPSAS 2008 and NPSAS 2012.

All models include a control for total cost of attendance (CTOTLCOA), dummies for race, and age category (AGECAT,<24,24-29,30+) and interactions of these controls with appearing in the 2012 sample.

Outcome variables is a binary variable for a positive value of PRIVLOAN, a positive value of TFEDLN2/TFEDLN, or both.

Student level is from the BENLADEG variable harmonized between surveys: professional and other doctoral programs are combined in the NPSAS2012 sample for consistency with NPSAS2008.

Sample restricted to citizens and permanent residents.

Observations weighted by WTA000 and number of observations rounded to the nearest 10.

Table 16: Seemingly Unrelated Tobit Models of Dollars Borrowed, Demographic Interactions, NPSAS 2008 and 2012

	(1) Bachelor's Degree	(2) Associate's Degree	(3) Master's Degree	(4) Professional and Other Doctoral Degrees
Federal Student Loan Dollars				
Post	4760.1032***	3243.0099***	5627.4874***	-3830.8610
	(306.3077)	(269.7653)	(1030.9153)	(2756.7088)
Post × Black	-140.7767	-672.6469**	-2401.2524	1367.5345
	(261.1489)	(260.2474)	(1314.3141)	(3615.5846)
Post × Hispanic	433.4318	-1168.1410***	1.3813	2786.3737
	(293.5370)	(331.7987)	(1770.1963)	(3681.6276)
Post × Asian	-843.9404	-242.0711	-3239.8030	-5911.8593*
	(485.4134)	(681.1287)	(2337.4955)	(2789.9093)
Post × American Indian	660.0855	-129.0995	-4694.5993	11250.8524***
	(980.4123)	(1046.6503)	(4404.1678)	(2061.7607)
Post × Native Hawaiian or Pacific Islander	422.9741	-62.5004	2184.8843	-20820.4434*
	(1543.1913)	(1335.1536)	(6895.3100)	(9828.1349)
Post × More than One Race	540.0229	26.5398	3473.2905	14804.1465
	(936.5215)	(1288.8488)	(6759.1477)	(9924.4656)
Post × Age 24-29	132.3986	-2339.6961***	679.9747	1992.9953
	(259.7181)	(237.0698)	(1522.0148)	(2760.9613)
Post × Age 30+	-591.1517	-2136.8936***	-1531.2359	1361.4790
	(326.8545)	(290.7246)	(1045.0870)	(2410.6345)
Post × Total Cost of Attendance	-0.1677***	-0.1227***	0.1258**	-0.5256***
	(0.0092)	(0.0127)	(0.0473)	(0.0608)
Private Student Loan Dollars				
Post	-4423.0366***	-5765.6774***	-5177.8858**	-10919.0320*
	(735.8957)	(733.6799)	(1633.2682)	(4651.4118)
Post × Black	-2357.2496***	189.8014	-2421.9412	-4773.3279
	(644.1860)	(726.7877)	(2658.3697)	(6111.3696)
Post × Hispanic	-468.8006	-625.3665	-4564.0495	-4023.0072
	(714.3376)	(795.4020)	(2716.5377)	(5554.5740)
Post × Asian	-809.5222	-117.7993	9884.2176*	8328.5484
	(1074.3101)	(1382.4529)	(4893.1796)	(4822.7918)
Post × American Indian	984.1834	-808.9616	4756.2035	
	(2861.8699)	(2285.1399)	(9265.2224)	
Post × Native Hawaiian or Pacific Islander	-5749.3495	2423.2367	-2646.6642	
	(2987.1852)	(2780.1696)	(10023.5712)	
Post × More than One Race	652.2932	4362.7864	6381.9421	97367.9119***
	(2309.9712)	(2515.7021)	(6256.0676)	(8055.6593)
Post × Age 24-29	185.2427	-941.5230	-297.8364	379.6738
	(669.3649)	(649.9442)	(3024.3783)	(4537.9092)
Post × Age 30+	41.2111	-784.9513	-2736.8318	6.1773
	(886.9132)	(761.2749)	(2082.7598)	(3651.6177)
Post × Total Cost of Attendance	-0.1572***	-0.1284***	-0.1615**	-0.1186
	(0.0180)	(0.0316)	(0.0576)	(0.0679)
N	85,070	51,450	10,740	3,510
ll	-1.2923e+08	-5.4316e+07	-2.4972e+07	-6791823.3981
p	0.0000	0.0000	0.0000	0.0000

*p<0.1,**p<0.05, ***p<0.01; standard errors in parentheses.
Source: NPSAS 2008 and NPSAS 2012.
All SUR models include a control for total cost of attendance (CTOTLCOA), dummies for race, and age category (AGECAT,¡24,24-29,30+) and interactions of these controls with appearing in the 2012 sample.
Outcome variables are PRIVLOAN and TFEDLN2/TFEDLN.
Student level is from the BENLADEG variable harmonized between surveys: professional and other doctoral programs are combined in the NPSAS2012 sample for consistency with NPSAS2008.
Sample restricted to citizens and permanent residents.
Observations weighted by WTA000 and number of observations rounded to the nearest 10.

Figure 1: Self Certification Form

Private Education Loan
Applicant Self-Certification

Important: Pursuant to Section 155 of the Higher Education Act of 1965, as amended, (HEA) and to satisfy the requirements of Section 128(e)(3) of the Truth in Lending Act, a lender must obtain a self-certification signed by the applicant before disbursing a private education loan. The school is required on request to provide this form or the required information only for students admitted or enrolled at the school. Throughout this Applicant Self-Certification, "you" and "your" refer to the applicant who is applying for the loan. The applicant and the student may be the same person.

Instructions: Before signing, carefully read the entire form, including the definitions and other information on the following page. Submit the signed form to your lender.

SECTION 1: NOTICES TO APPLICANT

- Free or lower-cost Title IV federal, state, or school student financial aid may be available in place of, or in addition to, a private education loan. To apply for Title IV federal grants, loans and work-study, submit a Free Application for Federal Student Aid (FAFSA) available at www.fafsa.ed.gov, or by calling 1-800-4-FED-AID, or from the school's financial aid office.
- A private education loan may reduce eligibility for free or lower-cost federal, state, or school student financial aid.
- You are <u>strongly</u> encouraged to pursue the availability of free or lower-cost financial aid with the school's financial aid office.
- The financial information required to complete this form can be obtained from the school's financial aid office. If the lender has provided this information, you should contact your school's financial aid office to verify this information and to discuss your financing options.

SECTION 2: COST OF ATTENDANCE AND ESTIMATED FINANCIAL ASSISTANCE

If information is not already entered below, obtain the needed information from the school's financial aid office and enter it on the appropriate line. Sign and date where indicated.

A. Student's cost of attendance for the period of enrollment covered by the loan $_____

B. Estimated financial assistance for the period of enrollment covered by the loan $_____

C. Difference between amounts A and B $_____

   WARNING: If you borrow more than the amount on line C, you risk reducing your eligibility for free or lower-cost federal, state, or school financial aid.

SECTION 3: APPLICANT INFORMATION

Enter or correct the information below.

Full Name and Address of School _____

Applicant Name (last, first, MI) _____ Date of Birth (mm/dd/yyyy) ____/____/_____

Permanent Street Address _____

City, State, Zip Code _____ _____

Area Code / Telephone Number   Home (   ) _____   Other (   ) _____

E-mail Address_____

Period of Enrollment Covered by the Loan (mm/dd/yyyy)   From ____ / ____ / _____ to ____ / ____ / _____

If the student is <u>not</u> the applicant, provide the student's name and date of birth.

Student Name (last, first, MI) _____ Student Date of Birth (mm/dd/yyyy) ____/____/_____

SECTION 4: APPLICANT SIGNATURE

I certify that I have read and understood the notices in Section 1 and, that to the best of my knowledge, the information provided on this form is true and correct.

Signature of Applicant _____ **Date** (mm/dd/yyyy) _____

2/12/2010

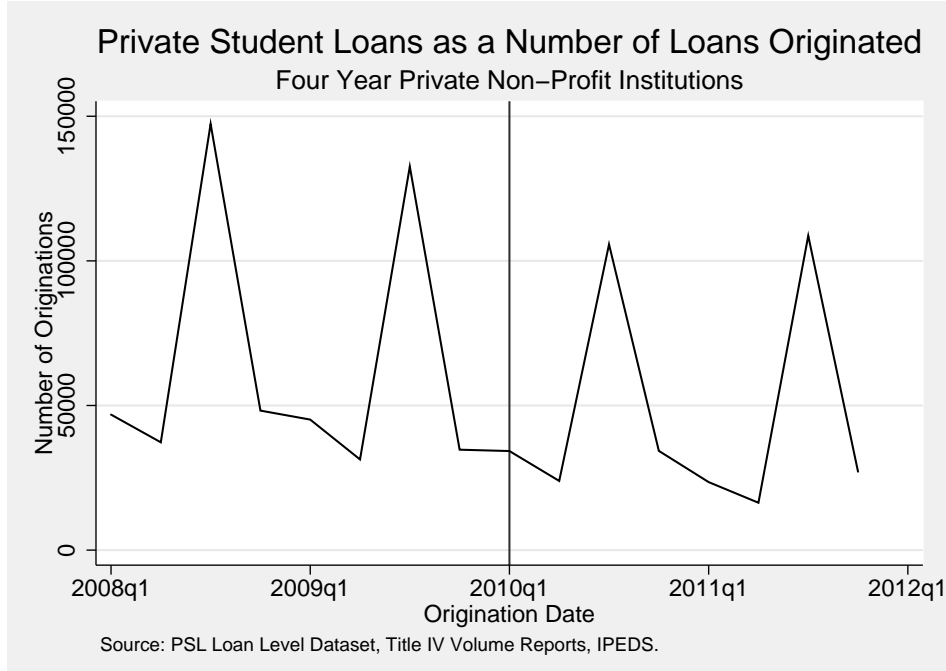Figure 2: Private Student Loan Originations at Four Year Not-For-Profit Institutions

Figure 3: Timeline of Policy Changes
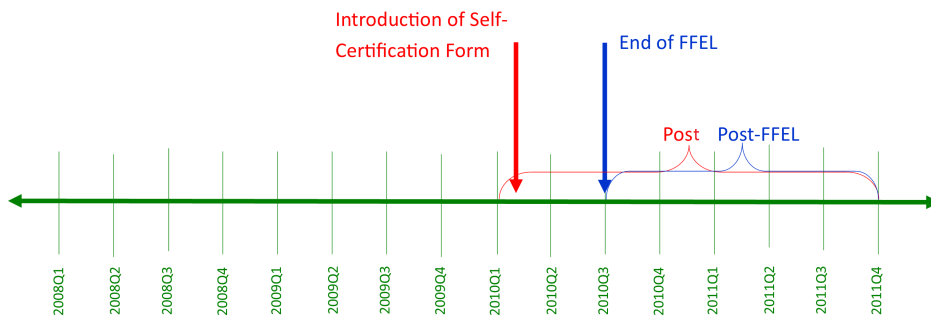
Figure 4: Number of Loans Originated

Source: PSL Loan Level Dataset, Title IV Volume Reports, IPEDS.
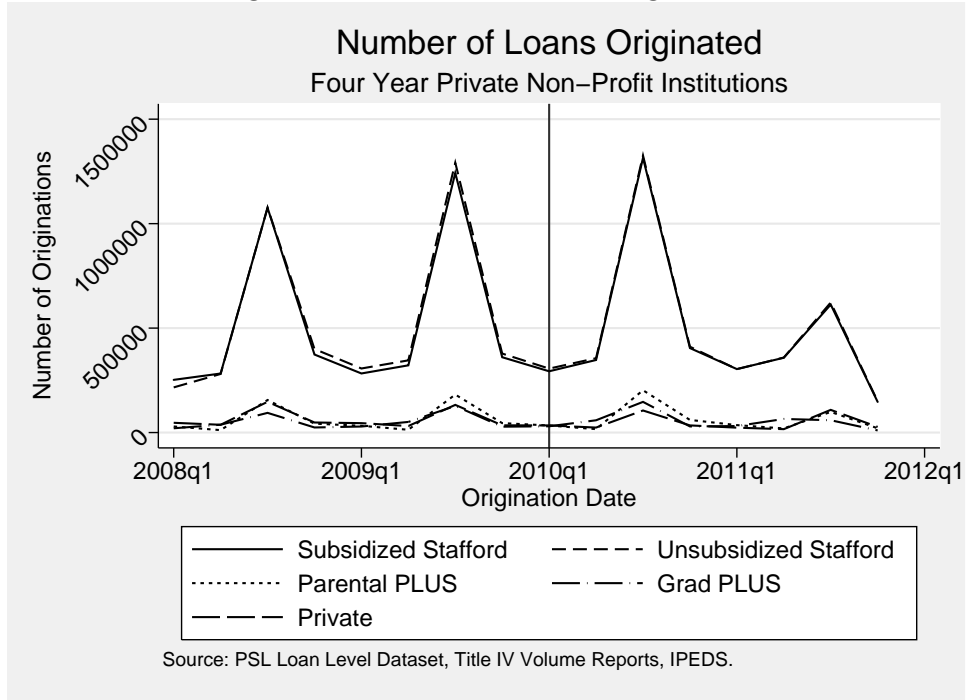
Figure 5: Composition of Private Student Loans, 2007-2008 Academic Year
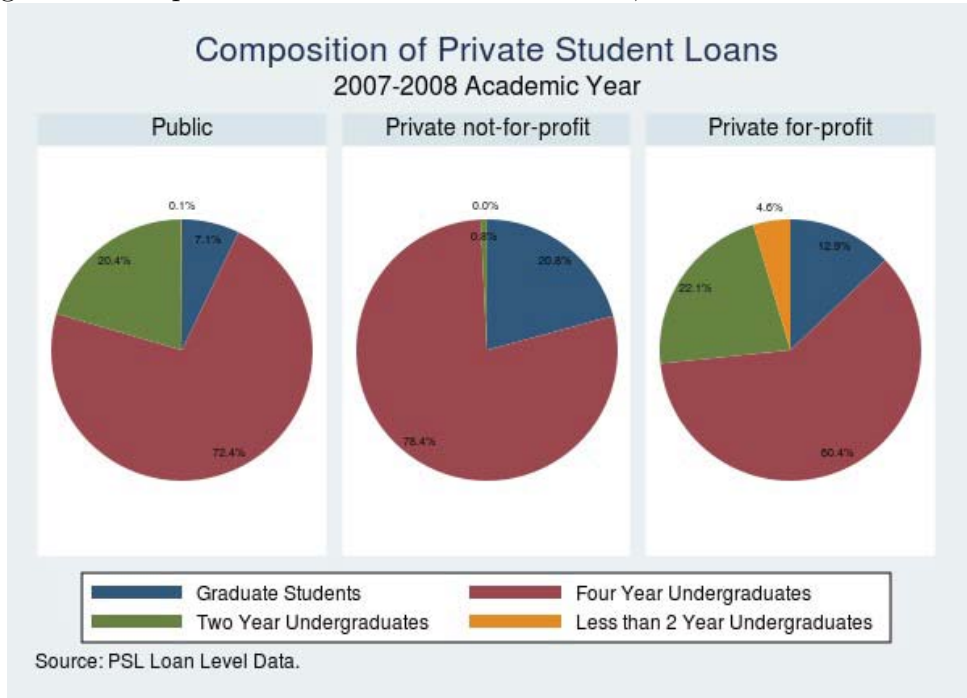

Source: PSL Loan Level Data.

Figure 6: Composition of Private Student Loan Borrowers, 2007-2008 Academic Year
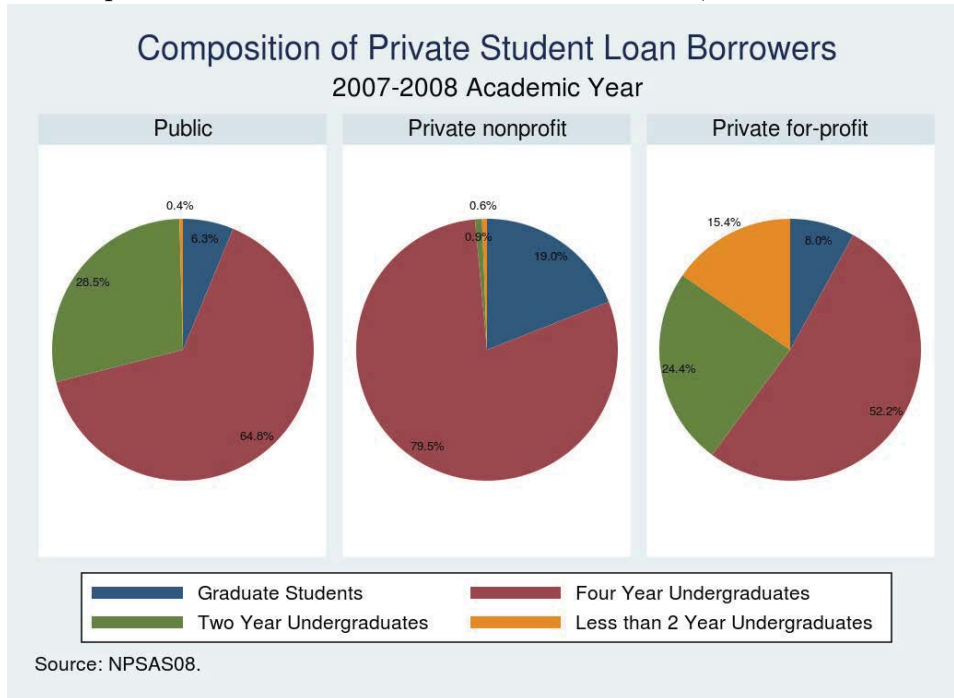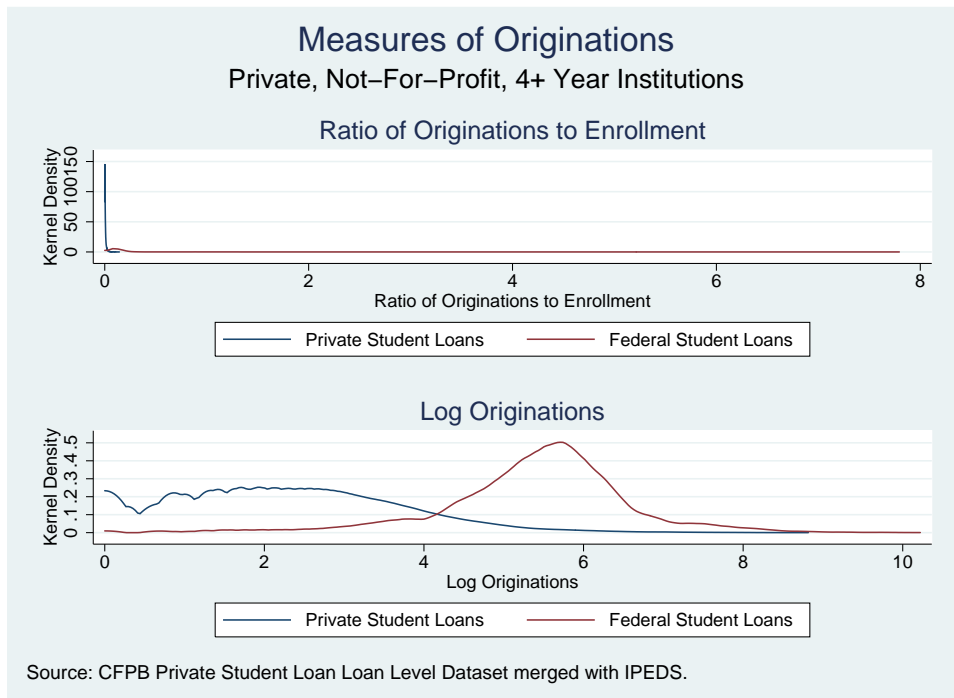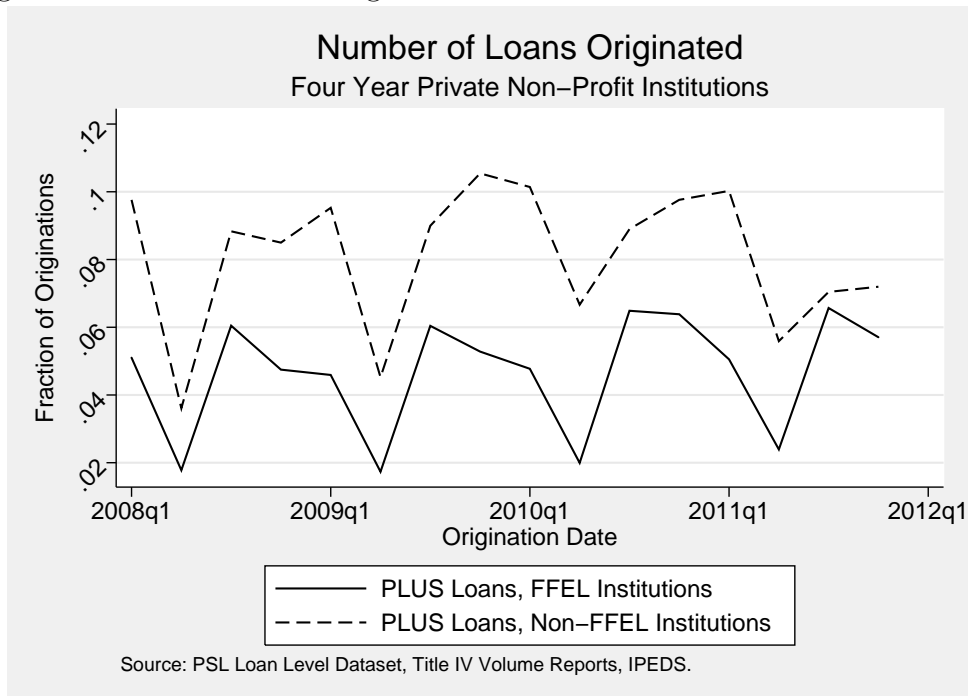

Figure 7: Measure of Originations

Figure 8: Parental PLUS Originations at FFEL and Non-FFEL Institutions

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