

# The Power of Active Disclosure: The Effect of Self-Certification on the Private Student Loan Market

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## **Abstract**

An active disclosure is a mandatory disclosure that requires the consumer to fill out individual-specific information related to product usage on a standardized form. Active disclosures may enhance comprehension more than static informational disclosures by requiring that consumers engage with form content, much like students engage with a problem sets, and since they do not require firms to individualize information, may be less costly to implement than alternatives that convey similar information. This paper considers the effectiveness of active disclosures empirically by evaluating the 2010 implementation of the US Department of Education's Private Education Loan Applicant Self-Certification Form (Self-Cert), which requires a potential private student loan (PSL) borrower to fill out a form describing his financial need, as defined by the Department of Education and the institution the student attends. The introduction of Self-Cert effectively created a disclosure that oriented borrowers towards federal sources of financial aid and imposed an individualized borrowing limit on PSL. Using a unique loan level data set of PSL originations combined with publicly available administrative data from the Department of Education, I evaluate the effects of Self-Cert using difference-in-difference and propensity score matching techniques. I find that the implementation of Self-Cert is effective at reducing PSL origination counts and dollar volumes substantially for students of all levels at non-profit and for-profit schools. For borrowers with comparable characteristics, PSL loan amounts decrease for undergraduate borrowers at not-for-profit schools, but increase at for-profit schools and do not change significantly for graduate students. These results are corroborated by analysis of the 2008 and 2012 waves of the Department of Education's

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\*The views expressed are those of the authors and do not necessarily represent those of the Director of the Consumer Financial Protection Bureau nor those of the staff.

National Postsecondary Student Aid Study. These findings are consistent with the theoretical model presented in the paper and provide supportive evidence that disclosures that rely on consumers to populate individual-specific information may be effective at affecting behavior.

## 1 Introduction

US student loan debt has received a lot of attention since the Financial Crisis: there is currently \$1.11 trillion in outstanding student loans, 11.0% of which is 90+ days delinquent. (Federal Reserve Bank of New York 2014) Concerns have been raised about student loan debt service displacing other expenditures such as home or car purchases or causing delays in personal commitments such as marriage or family formation, which could have potential adverse consequences for economic growth (Kingkade 2013, Lowrey 2013). Student loan borrowers with six-figure debt are often profiled, such as in a PBS Newshour Special Report titled “The Faces of Student Loan Debt” (PBS 2012), and various references have been made in the media about student loans being the next “subprime” crisis (Carney 2013, Leonard 2012, Vilani 2012).

Until recently, much of the literature on student loans, including Cameron and Taber (2004), Carneiro and Heckman (2002), and Keane and Wolpin (2001), focused on the extent to which individuals might be underinvesting in human capital due to credit constraints, and proposed interventions were typically targeted at the supply side in order to expand access to credit. The current student loan market in the US consists primarily of Federal student loans (FSL). Eligibility for FSL is based mainly on proof of enrollment and, at most, minimal threshold underwriting standards; government loans exist in order to overcome credit constraints due to lack of collateral and thin credit files. Individuals may also borrow in the private student loan (PSL) market, where loans are risk-priced. Recently, concerns have been raised about students borrowing too much, leading to repayment issues down the line. Ironically, the very characteristics that may limit access to credit for educational investment—inexperience in financial markets, a sparse credit history, youth, and the difficulty of pledging human capital or other collateral—may also lead to overborrowing. Overborrowing can either occur because individuals are overinvesting in education or because they are borrowing for consumption as well as investing in education. In this paper, I evaluate an intervention targeted at the latter type of overborrowing: the introduction of the Department of Education’s Private Education Loan Applicant Self-Certification Form (Self-Cert).

The Self-Cert was intended to deter potential PSL borrowers from taking out too much debt by limiting the total amount of debt and aid that an individual receives to the cost-of-attendance at his school. Prior to the implementation of the Self-Cert in February 2010, this restriction had been placed on FSL but did not extend to PSL. In addition to capping the amount a student can borrow, the Self-Cert also includes

disclosures about the availability of federal student aid and how to apply for it, requires the student to fill out information about his eligibility for aid and personal characteristics, and sign the form. I make use of a unique proprietary loan level PSL origination data set as well as publicly available Department of Education data to evaluate the program using difference-in-difference and propensity-score matching methods. The Self-Cert is an active disclosure: a document that requires a consumer to actively engage with the substantive information conveyed by filling out a worksheet-like portion of the form. A possible active section of an active disclosure may be an example of how the product is used. Evaluating the Self-Cert not only analyzes the effect of a demand side intervention on the PSL market, but it also empirically addresses how effectively active disclosures may perform in the field. Active disclosures may be an important policy alternative to static disclosures, since they may not impose the same burdens on industry as dynamic forms. I find that the Self-Cert is effective at decreasing originations and total dollars originated across post-secondary institutions at all levels of control. For borrowers with comparable characteristics, I also find that loan balances at origination decrease significantly for undergraduates at non-profit institutions, but the result does not hold for students at for-profit institutions. I also find that PSL pricing increases. These results are consistent with the theoretical model which takes into account the interaction between PSL and FSL markets that I develop in Section 3, and survive the bias correction for individuals switching from PSL to FSL introduced in Section 4.

## 2 Background

### 2.1 Student Loans in the United States

A unique feature of the US post-secondary education system is the fact that public subsidies for higher education fund public educational institutions and also fund student-specific grants and loans that may be applied towards attendance at private or public schools. Federal student aid is based on the concept of financial need, which is defined by the Office of Federal Student Aid at the Department of Education as “[t]he difference between the cost of attendance (COA) at a school and [one’s] Expected Family Contribution (EFC). While COA varies from school to school, [one’s] EFC does not change based on the school [one] attends.” (Federal Student Aid 2014) As an alternative to or in addition to federal grants and loans, students may also seek out funds from private sources, including PSL.

The interplay between the FSL and PSL systems is complex. A purely private student loan market may lead to credit rationing in the Stiglitz-Weiss (1986) sense: lenders have imperfect information about borrowers’ ability to repay, and lenders may use the interest rate as a screening mechanism. Mankiw (1986)

points out that in equilibrium, investments in education may not be socially efficient in a purely private market, and government intervention may be necessary. As he puts it on p. 466, “[t]o make a socially profitable loan, we only need to know that the expected return  $R$  exceeds the required return  $\rho$ . The probability of repayment  $P$  per se is irrelevant to a social planner. (Remember that the government program is not required to be revenue neutral.) Yet, to private lenders the expected return on a project  $R$  per se is irrelevant, and the repayment probability  $P$  is critically important.” Targeting government intervention in credit markets is difficult, however, since “by subsidizing particular groups, the borrowing can change the banks’ ordering of borrower groups by maximum return.” (Gale 1988) Government intervention can be costly; for example, in his simulations of the US credit markets from 1980-1987, Gale finds that 76% of welfare gains from federal subsidies to student loans are to inframarginal borrowers. (Gale 1991)

## 2.2 The Self-Cert and the Financial Aid Process

The Higher Education Opportunity Act was amended by Congress on August 14, 2008 to modify the Truth in Lending Act to require that potential PSL borrowers fill out the Self-Cert, shown in Figure 1, as part of the application process for PSL. This requirement took effect on February 14, 2010. The Self-Cert requires a student seeking PSLs to report the difference between the undiscounted cost of attendance at the student’s school minus his other financial aid. Borrowing beyond this amount results in a 1:1 claw-back of other financial aid, including a student’s PSL borrowing limit. School financial aid offices are legally required to provide students the information necessary to populate the Self-Cert, and students are strongly encouraged to apply for federal student aid through the Free Application for Federal Student Aid (FAFSA). The Department of Education is not permitted to impose any additional burden on PSL lenders, which limits the options for requiring that borrowing limit information be transmitted to the lenders. The Self-Cert was implemented on February 14, 2010. The Self-Cert may achieve two goals: first, it serves as a disclosure that informs potential PSL borrowers about how to apply for alternative forms of financial aid as well as one metric of a reasonable amount to borrow, and second, it serves to create a borrowing limit that is revealed to the PSL lender. Effectively, it encourages students to incur the cost of filling out the FAFSA and caps the amount that any individual can borrow.

The Self-Cert makes several pieces of information salient: (1) the applicant has federal alternatives and can apply through FAFSA; (2) PSL loans may reduce student aid eligibility; (3) the student’s eligibility for PSL (cost of attendance minus financial assistance); (4) the school attended and period of enrollment covered by the loan; and (5) the applicant’s identity through self-reported identifying information and a signature. As Ben-Shahar and Schneider state in their critique of mandatory disclosure, “[e]ven when people know they

need information, they may not want it enough to labor to acquire it.” (2010) Information about federal aid availability and its interaction with PSL are accessible to potential borrowers independently of the Self-Cert, but the Self-Cert primes the applicant to think specifically about the relative costs of federal aid versus PSL. The Self-Cert may also simplify a consumer’s analysis of the costs and benefits of various financial aid options since it effectively frames PSL borrowing as a story problem with a guided example. Describing alternatives as “cheaper” may reduce a multidimensional choice between PSL and FSL to a unidimensional choice based on total cost. Section 2 of the Self-Cert walks the consumer through the calculation of the maximum amount of PSL 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. Emphasizing individual-specific features of PSL may also encourage the student to pay more attention to particular aspects of the borrowing decision, including the fact that the loan likely only applies to a fraction of his time in school so he may need to borrow more in the future. The efficacy of mandatory disclosures depends on design and content elements and how they relate to the underlying product: for example, Lacko and Pappalardo (2010) find that US mortgage disclosures, as they existed in 2004-2005, were ineffective at increasing consumer understanding, whereas Bertrand and Morse (2011) find that payday loan disclosures were effective in reducing borrowing behavior and made people think less narrowly about finance costs.

The process of applying for federal student loans can be daunting. This may explain why borrowers may 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 FAFSA to determine 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, which has implications for the redistributiveness of the federal student aid regime. Through an experiment that streamlines FAFSA application with income tax filing, Bettinger et al. (2012) show that FAFSA assistance increased college attendance, persistence, and aid receipt. The Self-Cert explicitly states that lower cost funds may be available and that in order to qualify a borrower must fill out a FAFSA. To the extent that the Self-Cert encourages potential borrowers to value federal aid more and understand the federal student aid process, this may also lead to an increase in federal loan take-up and usage.

Prior to the introduction of Self-Cert, FSL were explicitly tied to a student’s educational investment, but a student’s need for PSL was not necessarily verified. This created a market similar to the model presented in

Lochner and Monge-Naranjo (2011) where borrowers who want to consume more while in school through the use of PSL can do so. The PSL borrowing limit imposed by Self-Cert effectively eliminated this possibility, potentially constraining individuals who would like to use loans to consume more while in school. One important characteristic of Self-Cert to note is that it does not require a direct transfer of information between an educational institution and a PSL lender, which may present an opportunity for borrower fraud.

### 3 Theory

Let  $w_0$  be the consumer's initial wealth in period 0 and let  $w_1$  be the consumer's expected earnings in period 1. Assume that he can borrow up to  $L^f$  in FSL at fixed rate  $r^f$ , and let  $l^f$  be the amount he borrows in FSL. Similarly, let  $l^p$  be the amount of private loans that he borrows and let  $r^p$  be the interest rate for PSL. Let  $a$  be the cost of applying for a federal loan (i.e. the cost of filling out the FAFSA). Let  $u(c)$  be his utility function in consumption  $c$ , and assume that  $u' > 0$  and  $u'' < 0$ . Let  $\beta$  be the consumer's discount rate. Then the consumer maximizes

$$\max_{l^f, l^p} u(c_0) + \beta u(c_1) \quad (1)$$

subject to

$$c_0 = w_0 + l^f + l^p - a \mathbf{1}[l^f > 0] \quad (2)$$

$$c_1 = w_1 - r^f l^f - r^p l^p \quad (3)$$

$$l^f \leq L^f \quad (4)$$

From first order conditions it follows that if  $l^f = 0$ ,

$$r^p = \frac{u'(w_0 + l^p)}{\beta u'(w_1 - r^p l^p)} \quad (5)$$

if  $l^p = 0$ ,

$$r^f = \frac{u'(w_0 + l^f - a)}{\beta u'(w_1 - r^f l^f)} \quad (6)$$

if  $l^f = L^f$ ,

$$r^p = \frac{u'(w_0 + L^f + l^p - a)}{\beta u'(w_1 - r^f L^f - r^p l^p)} \quad (7)$$

and if  $l^f < L^f$  and  $l^p > 0$ ,

$$r^p = r^f = \frac{u'(w_0 + l^f + l^p - a)}{\beta u'(w_1 - r^f l^f - r^p l^p)} \quad (8)$$

so the consumer chooses the condition in equations 5 through 8 that maximizes utility.

When the Self-Cert is introduced, there is an individual-specific maximum borrowing amount,  $L$ , such that  $l^f + l^p \leq L$  and individuals who apply for PSL must also fill out the FAFSA, so the application cost  $a$  is imposed on all loans, and the consumer's problem becomes

$$\max_{l^f, l^p} u(c_0) + \beta u(c_1) \quad (9)$$

subject to

$$c_0 = w_0 + l^f + l^p - a \quad (10)$$

$$c_1 = w_1 - r^f l^f - r^p l^p \quad (11)$$

$$l^f \leq L^f \quad (12)$$

$$l^f + l^p \leq L \quad (13)$$

It follows that if  $l^p = 0$ ,

$$r^f = \frac{u'(w_0 + l^f - a)}{\beta u'(w_1 - r^f l^f)} \quad (14)$$

if  $l^f = L^f$ ,

$$r^p = \frac{u'(w_0 + L^f + l^p - a)}{\beta u'(w_1 - r^f L^f - r^p l^p)} \quad (15)$$

and if  $l^f < L^f$  and  $l^p \geq 0$ ,

$$r^p = r^f = \frac{u'(w_0 + l^f + l^p - a)}{\beta u'(w_1 - r^f l^f - r^p l^p)} \quad (16)$$

so the consumer chooses the values of  $l^p$  and  $l^f$  that provide the highest utility between  $L = l^f$ ;  $l^f = L^f$  and  $l^p = L - L^f$ ;  $l^p = L$ , and the solutions to equations 14 through 16.

The PSL lender maximizes profits under the assumption that individuals with a given set of characteristics default with probability  $\theta$  and the recovery rate on a defaulted loan is  $\gamma < 1$ . Let  $R$  be the risk-free interest rate and assume that the firm is risk neutral. The firm's problem is

$$\max_{r^p} \theta \gamma r^p l^p + (1 - \theta) r^p l^p - \frac{1}{1 + R} l^p \quad (17)$$

so

$$r^p = \frac{(\theta \gamma + (1 - \theta)) l^p - \frac{1}{1 + R} \frac{dl^p}{dr^p}}{\frac{dl^p}{dr^p} (\theta \gamma + (1 - \theta))} \quad (18)$$

from the consumer's problem, one can show that  $\frac{dl^p}{dr^p} < 0$ . Note that  $\frac{dl^p}{dr^p}$  does not depend on  $\theta$  since the consumer does not change his expectation of default, so

$$\frac{dr^p}{d\theta} = \frac{\gamma l^p - l^p}{\frac{dl^p}{dr^p} (\theta\gamma + (1 - \theta))} - \frac{(\gamma - 1)}{\left[\frac{dl^p}{dr^p} (\theta\gamma + (1 - \theta))\right]^2} > 0 \quad (19)$$

The creditor's assumption about the effect of Self-Cert on default rates is ambiguous: on the one hand, Self-Cert should prevent overborrowing, and decrease the probability of default, but on the other hand, it reduces the number of PSL only borrowers, and since the government has the senior claim on the borrower's assets and is more able to recover payment on loans given default, repayment risk on PSL may increase since many will be de facto subordinated to FSL.

Figure 2 presents one possible way in which the introduction of Self-Cert could affect the market for PSL. Prior to the introduction of the Self-Cert, the consumer compares his utility from taking out PSL only in the interest-rate/loan amount combinations described by equation 5 and illustrated by  $D_0^{private}$ , or from taking out a combination of PSL and FSL as described by equation 7 and shown in  $D_0^{both}$ . When Self-Cert is introduced the cost of application for PSL increases to the cost of applying for FSL, so if  $r^p \geq r^f$  the consumer will prefer to max out his FSL first, so  $D^{private}$  is no longer relevant. His demand for PSL above the FSL maximum remains the same, so  $D_1^{both}$  overlaps with  $D_0^{both}$ . Since the Self-Cert also limits total borrowing to a student's EFC,  $L$ ,  $D_1^{both}$  ends at  $l^p = L - L^f$ .

Figure 2 illustrates the case in which the PSL lender believes that the Self-Cert will increase the default rate for PSL, so the supply curve shifts from  $S_0$  to  $S_1$ . Prior to the introduction of Self-Cert, the borrower chooses the value of  $E_0^{private}$  or  $E_0^{both}$  that gives him a higher level of utility. After Self-Cert is introduced, his new equilibrium loan amount is  $E_1^{both}$ .

## 4 Empirical Strategy

Let  $y$  denote the outcome of interest, and assume that absent any policy change, the changes in  $y$  are proportional for PSL and FSL. Then, absent any policy change, the ratio of school-level  $y^{PSL}$  to  $y^{FSL}$  should remain constant. If FSL are not affected by the policy change, we can estimate the effect of the introduction of Self-Cert on FSL using standard difference-in-difference techniques on the natural log of the outcome variable. Let  $PSL_i$  be an indicator for private student loans, let  $Post_i$  be an indicator for after the introduction of the self-certification form, let  $X_i$  be a vector of school-level characteristics, and let  $\epsilon_i$  be an error term. Conditional on the assumption that absent any policy change the outcome variable would be proportional for FSL and PSL,  $e^{\beta_{PSL \times Post}} - 1$  captures the percentage change in private student loan originations attributable



to the introduction of Self-Cert.

$$\ln(y_i) = \beta_0 + \beta_{PSL}PSL_i + \beta_{post}Post_i + \beta_{PSL \times post}PSL_i \times Post_i + \gamma X_i + \epsilon_i \quad (20)$$

In Section 3 I predict that potential PSL borrowers may have decided to switch from using PSL to using FSL. Let  $-\delta$  denote the true proportion of potential PSL borrowers who switch from exclusively using PSL to exclusively using FSL. Then if we estimate equation 20,

$$\beta_{PSL \times post} = \ln \left( \frac{1 + \delta}{1 - \frac{y^{PSL}}{y^{FSL}} \delta} \right) \quad (21)$$

Note that  $\ln \left( \frac{y^{PSL}}{y^{FSL}} \right) = \beta_{PSL}$ , so rearranging equation 21 implies that

$$\delta = \frac{e^{\beta_{PSL \times Post}} - 1}{1 + e^{\beta_{PSL \times post} + \beta_{PSL}}} \quad (22)$$

If some borrowers that would otherwise be in both the FSL and the PSL markets exit the PSL market and stay in the FSL market, then the change in PSL will be greater than  $\delta$ . Let  $\theta$  denote the proportion of all PSL borrowers who switch from having PSL and FSL to FSL only. Then

$$\beta_{PSL \times post} = \ln \left( \frac{1 + \delta + \theta}{1 - \frac{y^{PSL}}{y^{FSL}} \delta} \right) \leq \ln \left( \frac{1 + \delta}{1 - \frac{y^{PSL}}{y^{FSL}} \delta} \right) \quad (23)$$

so from equations 21 and 23,

$$\delta \geq \frac{e^{\beta_{PSL \times Post}} - 1}{1 + e^{\beta_{PSL \times post} + \beta_{PSL}}} \quad (24)$$

and  $\frac{e^{\beta_{PSL \times Post}} - 1}{1 + e^{\beta_{PSL \times post} + \beta_{PSL}}}$  is an lower bound for  $\delta$ , and therefore also a lower bound for the change in PSL borrowing attributable to Self-Cert. This is the estimate reported as the ‘‘bias-corrected estimate’’ in the results.

The extent to which this substitution occurs can be estimated from data on individuals that includes usage of PSL and FSL. Preliminary analysis includes a multinomial logit estimate with the following four borrower categories as outcomes: no loans, FSL only, FSL and PSL, and PSL only and the program effect estimates  $\beta_{post,j}$  in each of the linear predictor equations in equation 25

$$f(y_k, j) = \beta_{0,k} + \beta_{post,k}Post_i + \gamma_k X_i + \epsilon_{k,i}; k = 1, 2, 3, 4 \quad (25)$$

where  $y_k$  is a binary variable for being in each of the mutual-exclusive borrower categories. A similar analysis

can be done for loan amounts, using OLS, seemingly-unrelated regression (SUR), and SUR tobit techniques. I also propensity score match students in the 2012 NPSAS to students in the 2008 NPSAS and then compare their mix of loan types borrowed and average loan amounts.

In order to consider how the introduction of Self-Cert affected the features of student loans, I also propensity score match PSL that were originated post Self-Cert with PSL that were originated pre-Self-Cert. Let  $S$  be an indicator for being observed post-self-Certification. If we assume there is little loan officer discretion in the terms of PSL, which is likely since underwriting of PSL was predominantly based on automated underwriting models which took into account the borrower characteristics observed in my data, strong ignorability is a reasonable assumption, and propensity score matching identifies the program effect (Rosenbaum and Rubin 1983). Formally, the strong ignorability assumption can be written as

$$y_i^{pre} \perp X = x, \forall x \tag{26}$$

so the treatment effect of Self-Cert can be estimated with the analogue of

$$\tau = E [y_i^{post} | p(x), S = 1] - E [y_i^{pre} | p(x), S = 0]$$

where  $p(x)$  is the propensity score, which I estimate in practice using a probit.

## 5 Data

This project combines data from multiple sources: the private student loan data for this project comes from the Consumer Financial Protection Bureau’s (CFPB) PSL Loan Level Data-set, which includes loan-level information from all PSL originated by the nine largest PSL lenders operating in the US in 2011 from 2005 through 2011; FSL information is obtained from the Department of Education’s Title IV Volume Reports, and information about educational institutions is obtained from the Department of Education’s Integrated Post-Secondary Education Data System (IPEDS) and Post-secondary Education Participants System (PEPS).

The CFPB’s PSL Loan Level Data-set was collected for the purposes of writing a report to Congress that was required under §1077 of the Dodd-Frank Act. The data includes detailed information about each loan: the amount borrowed, term, interest rate, margin, the index the loan is indexed to, distribution channel, school attended, and the FICO score of the primary and all affiliated borrowers. In order to preserve confidentiality, geography is reported at the state level, time is reported at the quarter level, and

the originator is not identified. Furthermore, due to Equal Credit Opportunity Act limitations, I do not have information about the race or gender of the borrowers.

Since the PSL Loan Level Data-set includes a school name or identifier, I merge it to Department of Education administrative data. Since the PSL data set classifies schools by OPEID, I first merge the data to PEPS, which is the Office of Federal Student Aid's publicly reported program-level information about federal student loan performance, summarized as a 2 or 3 year cohort default rate. I also created a crosswalk between OPEID and IPEDS ID, and matched the data to IPEDS, which is an annual census of schools that keeps track of items such as tuition and fees, enrollments, and school finance.

Data about FSL are available quarterly at the institution level in the Title IV Volume Reports. Loan counts and total dollars disbursed are available at the school level for subsidized Stafford loans, which are need-based loans originated in the student loans that do not accrue interest while the student is enrolled; unsubsidized Stafford loans, which are originated in the student's name; Parental PLUS loans which are originated in the parents name up to the difference between the cost of attendance and other aid; and Grad PLUS loans, which are originated in a graduate student's name up to EFC. Stafford loans have limits determined by year in school, independent status, and financial need, while PLUS loans are available up to EFC and are only made to individuals who do not have an adverse credit history, as defined by the Department of Education. Since the PSL Loan Level Data-set is at the loan level by quarter, for the difference-in-difference estimates of origination counts and school-level dollar volumes I collapse the PSL Loan Level Data-set into school-by-quarter cells and append it to the Title IV volume reports, and weight by enrollments. Difference-in-difference estimates of the effect of the program on average original balances are estimated using the PSL Loan Level Data appended to school-level estimates of average loan size, weighted by number of originations.

Table 1 presents quarterly means of school characteristics by school control (public, private non-profit, and for-profit) and school level from 2008 through 2009, 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 for 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 PSL loan amounts of students who borrow are also smaller at public institutions than at private or for-profit institutions for PSLs, PLUS loans, and Stafford subsidized and unsubsidized loans. PLUS loan take-up is substantially lower than Stafford loan or PSL take-up at two year and four year students: for example, in each quarter there are on average 1,840 subsidized Stafford loan originations, 1,551 unsubsidized Stafford loan originations, and 1,549 PSL originations at for-profit two year schools, compared to 748 PLUS loan originations.

In addition to the administrative data from student loans, I also make use of the pooled 2008 and 2012 waves of the National Postsecondary Student Aid Study (NPSAS), which 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 FSA is drawn from the Department of Education’s administrative data systems, and data about PSL is self-reported. While there are dollar amounts for the self-reported PSL, NPSAS does not include information on the interest rate or other terms of PSL. Figures 5 and 6 compare the composition of originations in the Loan Level Data-set 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: for example, 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 Data-set and 7% in the student in NPSAS. The proportion of certificate students among PSL borrowers in the NPSAS appears larger than those in the Loan Level Data-set, which might be a result of multiple factors, including the fact that the Loan Level Data-set does not cover the universe of PSL originations in 2007-2008. Table 2 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 Data-set than in the NPSAS data. As an illustration, mean loan amounts are for four year undergraduates at private non-profit schools are \$12,611 in the Loan Level Data-set and \$9408 in the NPSAS data. Table 3 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 exclusively had PSL versus 37% in 2012.

## 6 Results

The model in Section 3 predicts that the implementation of Self-Cert will lead to an increase in FSL relative to PSL as well as a decrease in PSL loan amount. Figure 3 presents origination counts, normalized by 2008Q1 origination counts<sup>1</sup>, for PSL, Stafford subsidized and unsubsidized, Parental PLUS and Grad PLUS loans for four year undergraduates at public institutions. PSL originations track federal loans throughout 2008 and 2009, but after the first quarter of 2010, PLUS loan originations increase dramatically relative to PSL. A similar pattern can be observed in total dollars originated in figure 4. This pattern appears to be driven primarily by the number of originations; the path of normalized average loan sizes for PSL broadly

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<sup>1</sup>The normalization for each loan product involved calculating the mean loan amount across schools in a given category in 2008Q1, and then dividing mean estimates for the successive quarters by the 2008Q1 means. This was done to keep the different loan products on similar scales.

track the patterns for FSL. Note that there is a strong seasonal pattern which corresponds to an increase in lending activity at the beginning of each academic year.

To control for potential changes in the distribution of students across schools, I estimate equation 20 separately by school control and level. The estimates presented are generated from models that include school fixed-effects as well as controls for tuition and fees, cohort default rates, and log total enrollment. Table 4 presents the results for four year schools by control, and for each school type presents estimates using Parental PLUS loans and Stafford loans as control groups. For each model, the raw estimate 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 is the lower bound for  $\delta$  described in Equation 24; standard errors are calculated using the delta method. Across all school types, the number of PSL originations per school drops substantially. As can be seen from columns 1, 3, and 5, the effects of Self-Cert is larger on average at private schools than public schools: a 97% decline at both private non-profits and for-profits versus an 85% decline at public schools. Similarly, when Parental PLUS loans are used as a control group, the proportion total dollars of PSL originated drops by more than 50% for all 3 types of school, but this pattern reverses for private non-profit schools when Stafford loans are used as a control group. Average original balances for PSL increase when PLUS loans are used as a control group but change by less than 5 percent when Stafford loans are used as a control group. This difference in estimates when Stafford loans are used as a control group may be due to the fact that Stafford loans have a loan limit that is often below a student’s expected family contribution, so Stafford loan usage cannot adjust as fully as PLUS loan usage for a given student.

Table 5 repeats the exercise in Table 4 with attention focused on public and for-profit two year schools. Private not-for-profit two year schools are omitted because of small sample size; there are only 192 private not-for profit schools in the 2008-2009 academic year. As can be seen from Table 5, when Parental PLUS loans are used as a control group for PSL, loans decline for both public and for-profit 2 year institutions, although the decline is larger for public schools—97% versus 90%. For both groups average original balances of originated loans increase and total dollars originated decline by 94% and 87% respectively. These results when Stafford loans are used as a control group for loans at public two-year schools in column 2 are consistent with the results where parental PLUS loans are used as controls in column 1, but this is not the case at for-profit two year schools in columns 3 and 4.

Table 7 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 Epanechnikov kernel, but the nearest-neighbor results are consistent. Original loan balances decline for both public and non-profit private 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 I control for borrower characteristics. Unlike undergraduates, loan sizes among graduate students at non-profit schools are not significantly affected by Self-Cert. The discrepancy between these results and the results from the difference-in-difference estimates suggest that the Self-Cert may have changed the composition of borrowers at a given school, since some borrowers may have chosen to not take up PSL due to the Self-Cert. Consistent with the prediction in equation 19, the introduction of Self-Cert is also associated with an increase in the price of loans for all school types, ranging from 93 basis points for graduate students at public schools to 209 basis points for graduate students at for-profit schools.

Preliminary individual level analysis using the NPSAS data, which controls for student race, age, and cost-of-attendance net of grants, is presented in Tables 8 and 9. Panel A of Table 8 presents relative risk ratios from estimating the multinomial logit with linear predictor equations described in equation 25 and Panel B reports log-odd estimates from an analogous logit for having a PSL, regardless of whether the borrower has FSL or not. The probability that a student has FSL only increases by 24% on average, and these effects are relatively large for undergraduates: bachelor's degree students probability of having FSL only increases by roughly 50% after Self-Cert, and the probability that associate degree students have FSL 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 FSL and PSL jointly falls significantly across all academic levels, and in column 3 that the proportion of master's degree students with PSL only is approximately 60% lower than prior to Self-Cert. The log-odds estimates for having a PSL are similar to the bias-corrected estimates from the PSL Loan Level Dataset and Title IV Volume Report analysis: the log odds of having a PSL decreases by approximately 68% for all students. The dollars originated per student are presented in Table 9: Panel A presents results from separate OLS regressions for PSL, FSL, and total loans borrowed, while Panel B presents regression coefficients from for PSL and FSL loans for SUR models, which allows for the errors in the PSL and FSL 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 Self-Cert 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 in that PSL borrowing decreases for most groups and FSL borrowing increases, estimates of the extent to which FSL borrowing offsets PSL borrowing differs. For example, in column 2, the OLS estimate of total borrowing suggests that Self-Cert does 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 Self-Cert. Future work includes being more precise about how to jointly estimate intensive

and extensive margin decisions for PSL and FSL using these data. Panel C presents the results for a SUR tobit<sup>2</sup>, which show similar patterns of decreases in PSL amounts and increases in FSL. The average PSL decreased by \$7312 after the implementation of Self-Cert, and the average FSL loan amount increased by \$630. Since tobit coefficients combine the effects of changes in takeup rates as well as changes along the intensive margin, even if individuals were switching between PSL and FSL this would not be represented by equal and opposite coefficients for PSLs and FSLs.

To compare individuals who are on the common support of the 2008 and 2012 NPSAS, I 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 10, I 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 PSL than the counterfactual in the "2008 Matched" row. Takeup of PSL 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 423.41% to 56.93%. Panel B breaks the change in distribution of loan type takeup for 4 year undergraduates, and demonstrates qualitatively similar patterns for public, private non-profit, and for-profit students.

Table 11 focuses on loan amounts and the mix of FSL and PSL loans held by 4 year undergraduates, split by loan program. Each estimate presented is based on a comparison of the 2012 and matched 2008 respondents using the same propensity score match as in Table 10, and each estimate is a regression of the outcome variable of being treated and a constant. Column 2 shows that average PSL loan amount for 4 year undergraduate students at public, private non-profit, and for-profit schools decrease by \$719, \$1972, and \$2826 respectively. Unlike the results in Table 9, these decreases are not offset by significant increases in FSL borrowing, so total borrowing decreases by \$778, \$1636, and \$3088 as shown in column 3. Columns 4 to 10 show changes in the takeup 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 size 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 4, the effects on PSL takeup in column 10 are sizeable: the 9.91 percentage point decrease in PSL for public schools and the 17.95 percentage point decrease for private non-profit schools both correspond to a 61% decrease in takeup, and the 38.78% percentage point decrease in PSL at for-profit

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<sup>2</sup>SUR tobit was implemented using the `cmp` package in Stata.

schools corresponds to a 79% decrease.

## 7 Conclusions

The empirical results of this project demonstrate that the Self-Cert was effective at reducing PSL borrowing rates. The effects can be quite large: conservatively, PSL originations declined by 27% among undergraduates at four year institutions and the average four year undergraduate PSL borrower would have borrowed \$216 more before the intervention. The combination of these effects is associated with an overall 18% decline in dollars originated in the market segment, while pricing increased by 125 basis points on average. While the effects along the extensive margin do not hold for for-profit schools, originations decrease for all types of schools. Furthermore, I find that the mix of loans that students use after Self-Cert changes: students are approximately 24% more likely to have FSL only, and the takeup rate of PSL decreases by approximately 68%. These decline in PSL dollars borrowed may have been partially offset by increases in FSL dollars originated. While these effects may seem large, they are consistent with the relatively large effects found in financial aid interventions in other studies, such as Bettinger et al. (2012) and Castleman and Page (2014).

The effects observed in this paper suggest that demand side disclosure interventions may be effective at affecting consumer behavior, and that self-populated disclosures may be a viable alternative to smart disclosures that are populated with consumer-specific information by firms. While it is not possible to disentangle the effects due to the loan limit imposed on those who fill out the Self-Cert truthfully and the effect of the disclosure function of the Self-Cert, this suggests that the effectiveness of self-populated disclosures may be a future area of research for both academic and policy research. Since the implementation costs of a self-populated form may be more similar to the implementation costs of a static form than a dynamic form, they may be a potential policy alternative to more costly interventions. Furthermore, to the extent that the act of filling out the disclosure requires the consumer to engage with the informational content of the form, it may also result in an increase in the effectiveness of the form in improving consumer understanding.

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Table 1: 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
PSL Originations	1,094	331	1,418
Average PSL Original Balance	5,161	6,357	6,299
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
PSL Originations	289	54	1,549
Average PSL Original Balance	3,537	4,119	5,737
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
PSL Originations	105	74	214
Average PSL Original Balance	7,657	9,876	9,456
PLUS Loan Originations	154	95	247
Average PLUS Original Balance	6,801	8,653	8,578

PSL Loan Level Data, 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 2: Mean Loan Balance by School Control and Level, PSL Loan Level Data and NPSAS08

		PSL Loan Level Dataset		NPSAS08	
		Mean	Standard	Mean	Standard
		(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. PSL Loan Level Dataset estimates at the loan level and NPSAS08 estimates at the individual level. NPSAS08 observations weighted using WTA000.

Table 3: Loan Type Proportions, NPSAS 2008 and NPSAS 2012

	2008				2012				N
	No Loans	FSL Only	PSL Only	FSL and PSL	No Loans	FSL Only	PSL Only	FSL and PSL	
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

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 PSL if PRIVLOAN>0 and is considered to have FSL 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 4: The Effect of the Self-Certification Form on Four Year Undergraduates

	Public		Private Non-Profit		For-Profit	
	PLUS Loan Control Group (1)	Stafford Loan Control Group (2)	PLUS Loan Control Group (3)	Stafford Loan Control Group (4)	PLUS Loan Control Group (5)	Stafford Loan Control Group (6)
Originations						
Raw Estimate	-0.902*** (0.000)	-0.276*** (0.000)	-0.988*** (0.000)	-0.724*** (0.000)	-0.976*** (0.000)	-0.534*** (0.001)
Bias Corrected Estimate	-0.846*** (0.000)	-0.271*** (0.000)	-0.966*** (0.000)	-0.721*** (0.000)	-0.972*** (0.000)	-0.533*** (0.001)
R2	0.632	0.845	0.592	0.848	0.750	0.876
Total Dollars Originated						
Raw Estimate	-0.818*** (0.000)	-0.189*** (0.000)	-0.551*** (0.000)	0.204*** (0.001)	-0.965*** (0.000)	-0.529*** (0.001)
Bias Corrected Estimate	-0.714*** (0.000)	-0.180*** (0.000)	-0.442*** (0.000)	0.192*** (0.001)	-0.957*** (0.000)	-0.528*** (0.001)
R2	0.556	0.758	0.491	0.709	0.698	0.825
Average Original Balance						
Raw Estimate	1.233*** (0.003)	-0.007*** (0.001)	2.106*** (0.005)	-0.046*** (0.001)	1.378*** (0.007)	0.140*** (0.002)
Bias Corrected Estimate	0.441*** (0.001)	-0.003*** (0.000)	0.616*** (0.001)	-0.016*** (0.000)	0.447*** (0.002)	0.039*** (0.001)
R2	0.622	0.484	0.722	0.665	0.723	0.737

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

PSL Loan Level Data, IPEDS, and Quarterly Department of Education Title IV Volume Reports, 2009 through 2011.

Institution level fixed effects. Originations and total dollars originated weighted by undergraduate enrollment.

All models include controls for tuition and fees, cohort default rate, and log enrollment.

Reported estimates correspond to linear regressions of log originations, log total dollars originated, and log average original balance. Estimated presented represent percentage changes.

Table 5: Effects of Self-Certification Form on Two Year Undergraduates

	Public		For-Profit	
	PLUS Loan Control Group (1)	Stafford Loan Control Group (2)	PLUS Loan Control Group (3)	Stafford Loan Control Group (4)
Originations				
Raw Estimate	-0.988*** (0.000)	-0.724*** (0.000)	-0.911*** (0.000)	0.201*** (0.005)
Bias Corrected Estimate	-0.966*** (0.000)	-0.721*** (0.000)	-0.901*** (0.000)	0.200*** (0.005)
R2	0.592	0.848	0.736	0.846
Total Dollars Originated				
Raw Estimate	-0.984*** (0.000)	-0.742*** (0.000)	-0.886*** (0.001)	0.076*** (0.005)
Bias Corrected Estimate	-0.939*** (0.000)	-0.733*** (0.000)	-0.867*** (0.001)	0.075*** (0.005)
R2	0.492	0.750	0.682	0.775
Average Original Balance				
Raw Estimate	0.311*** (0.006)	-0.089*** (0.003)	0.845*** (0.017)	0.018** (0.006)
Bias Corrected Estimate	0.113*** (0.002)	-0.029*** (0.001)	0.282*** (0.004)	0.005** (0.002)
R2	0.446	0.400	0.798	0.602

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

PSL Loan Level Data, IPEDS, and Quarterly Department of Education Title IV Volume Reports, 2009 through 2011.

All models include institution fixed-effects. Originations and total dollars originated weighted by undergraduate enrollment.

All models include controls for tuition and fees, cohort default rate, and log enrollment.

Reported estimates correspond to linear regressions of log originations, log total dollars originated, and log average original balance. Estimated presented represent percentage changes.

Table 6: Effects of Self-Certification Form on Graduate Students

	Public (1)	Private Non-Profit (2)	For-Profit (3)
Originations			
Raw Estimate	-0.890*** (0.000)	-0.787*** (0.000)	-0.989*** (0.000)
Bias Corrected Estimate	-0.852*** (0.000)	-0.761*** (0.000)	0.987*** (0.000)
R2	0.652	0.715	0.736
Total Dollars Originated			
Raw Estimate	-0.876*** (0.013)	-0.774*** (0.000)	-0.989*** (0.000)
Bias Corrected Estimate	-0.827*** (0.013)	-0.741*** (0.000)	-0.986*** (0.000)
R2	0.370	0.657	0.711
Average Original Balance			
Raw Estimate	-0.288*** (0.003)	0.120*** (0.004)	0.004 (0.023)
Bias Corrected Estimate	-0.165*** (0.002)	-0.060*** (0.002)	0.002 (0.012)
R2	0.352	0.495	0.584

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

PSL Loan Level Data, IPEDS, and Quarterly Department of Education Title IV Volume Reports, 2009 through 2011.

Control group is federal Graduate PLUS loans.

Institution level fixed effects. Originations and total dollars originated weighted by undergraduate enrollment.

All models include controls for tuition and fees, cohort default rate, and log enrollment.

Reported estimates correspond to linear regressions of log originations, log total dollars originated, and log average original balance. Estimated presented represent percentage changes.



Table 7: Effect of Self-Cert, Propensity Score Matching Results

	Public (1)	Private, Non-Profit (2)	For-Profit (3)
Original Balance			
Four Year	-216.3716*** ( 41.6269)	-762.1033*** ( 63.7422)	545.0620*** ( 188.8903)
Untreated	252,082	153,644	31,581
Treated	89,926	68,490	5,533
Two Year	-912.9443*** ( 132.4641)		854.7623** ( 375.1506)
Untreated	38,526		4,988
Treated	5,064		841
Graduate Students	514.7403 ( 989.8706)	207.0175 (1874.6772)	-2693.50** (1262.3172)
Untreated	7,851	12,516	325
Treated	13,989	13,808	114
Margin			
Four Year	0.0125*** ( 0.0002)	0.0126*** ( 0.0002)	0.0194*** ( 0.0007)
Two Year	0.0135*** ( 0.0006)		0.0101*** ( 0.0016)
Graduate Students	0.0093*** ( 0.0029)	0.0115*** ( 0.0036)	0.0209*** ( 0.0060)

PSL 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 8: Loan Types Borrowed, NPSAS 2008 and 2012

	(1)	(2)	(3)	(4)	(5)
	All Students	Bachelor's Degree	Associate's Degree	Master's Degree	Doctoral Degree Program
Panel A: Multinomial Logit of Borrower Type					
FSL Only	1.2411*** (0.0193)	1.4984*** (0.0368)	1.3062*** (0.0406)	1.0472 (0.0708)	1.0789 (0.0869)
FSL and PSL	0.3349*** (0.0098)	0.4355*** (0.0177)	0.2455*** (0.0176)	0.2663*** (0.0451)	0.2907** (0.1095)
PSL Only	0.4038*** (0.0235)	0.4728*** (0.0428)	0.2921*** (0.0363)	0.4096*** (0.0925)	0.8711 (0.3619)
N	220670	83650	54130	11520	7730
Pseudo-r <sup>2</sup>	0.0956	0.0389	0.1418	0.1470	0.1118
Panel B: Logit Estimates of Probability of Having a PSL					
Has PSL	0.3202*** (0.0087)	0.3590*** (0.0131)	0.2383*** (0.0154)	0.2930*** (0.0416)	0.4072** (0.1342)
N	220670	83650	54130	11520	7730
Pseudo-R <sup>2</sup>	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 PSL if PRIVLOAN>0 and is considered to have FSL 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 9: Loan Dollar Amounts, NPSAS 2008 and NPSAS 2012

	(1)	(2)	(3)	(4)	(5)
	All Students	Bachelor's De- gree	Associate's Degree	Master's De- gree	Doctoral De- gree Program
Panel A: OLS					
PSL Borrowing	-708.6707*** (18.0365)	-1074.0233*** (37.3848)	-457.5411*** (22.0038)	-644.8104*** (93.1439)	-441.8291* (205.5248)
R2	0.0624	0.0575	0.1084	0.0468	0.0299
FSL Borrowing	226.1247*** (34.3953)	1170.7098*** (57.7169)	166.1368*** (27.9230)	85.9254 (218.5049)	464.6233 (398.2263)
R2	0.3112	0.1015	0.2510	0.3734	0.2817
Total Borrowing	-482.5460*** (38.2896)	96.6865 (68.1997)	-291.4043*** (36.1042)	-558.8850* (225.7795)	22.7942 (492.5282)
N	220670	83650	54130	11520	7730
R2	0.3338	0.1170	0.2902	0.3891	0.2893
Panel B: Seemingly Unrelated Regressions					
PSL Borrowing	-271.7249*** (14.2576)	-523.1358*** (29.0797)	-181.5443*** (16.1927)	-131.0874* (65.4182)	-59.6358 (111.5858)
FSL Borrowing	2203.0608*** (39.5525)	2532.9067*** (57.8198)	1082.7240*** (31.8461)	4149.0870*** (228.7493)	4991.7478*** (403.7254)
Total Borrowing	1931.3359*** (43.4101)	2009.7709*** (66.5963)	901.1797*** (38.4655)	4017.9996*** (244.6327)	4932.1121*** (446.5169)
N	233170	88090	57480	12000	8030
R2 PSL Equation	0.0546	0.0863	0.0339	0.0388	0.0376
R2 FSL Equation	0.2006	0.3551	0.1684	0.3226	0.2647
Panel C: Tobit Seemingly Unrelated Regressions					
PSL Borrowing	-7311.6545*** (173.2331)	-7475.1761*** (265.6375)	-6381.5450*** (293.0889)	-8838.9036*** (916.2879)	-7436.4397** (2628.5834)
FSL Borrowing	630.1909*** (82.7461)	1837.1325*** (103.4876)	766.7024*** (99.7207)	165.8077 (450.3780)	559.3164 (973.9502)
N	220670	83650	54130	11520	7730
p	0.0000	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 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 PSL 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 10: Propensity Score Matching Loan Status for PSL Borrowers

	Estimated 2012 Loan Takeup Status				Untreated	Treated	Pseudo-R2
	No Loans	FSL Only	PSL Only	FSL and PSL			
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%	14850	6250	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 polynomial in adjusted gross income, and student budget minus all other grants (NETCST3).

An individual is considered to have PSL if  $PRIVLOAN > 0$  and is considered to have FSL if  $TFEDLN2 > 0$  or  $TFEDLN > 0$ .

Pseudo-R2 refers to the pseudo-R2 of the corresponding propensity score probit.

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

Table 11: Propensity Score Matching Estimates of Effect of Self-Cert

	Loan Dollars			Has Loan Type						
	FSL	PSL	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)
<b>Public</b>										
Treatment Effect	-58.9691 (67.3168)	-719.3097*** (32.5243)	-778.2789*** (75.3867)	-0.0293*** (0.0065)	0.0939*** (0.0062)	-0.0018 (0.0031)	-0.0280*** (0.0026)	-0.0048*** (0.0011)	-0.0082*** (0.0010)	-0.0991*** (0.0041)
Constant	4008.4489*** (48.8642)	1077.7477*** (28.2686)	5086.1966*** (57.4283)	0.4368*** (0.0047)	0.2991*** (0.0043)	0.0725*** (0.0024)	0.0561*** (0.0022)	0.0084*** (0.0010)	0.0104*** (0.0010)	0.1632*** (0.0035)
R2	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
<b>Private Non-Profit</b>										
Treatment Effect	336.7458 (186.5436)	-1972.9285*** (123.7718)	-1636.1827*** (225.4049)	0.0062 (0.0129)	0.2678*** (0.0124)	-0.0086 (0.0082)	-0.0599*** (0.0083)	0.0069** (0.0026)	-0.0073*** (0.0019)	-0.1795*** (0.0102)
Constant	5868.7432*** (134.7194)	2885.8205*** (111.8658)	8754.5637*** (175.9284)	0.5284*** (0.0097)	0.2760*** (0.0085)	0.1330*** (0.0065)	0.1398*** (0.0068)	0.0084*** (0.0016)	0.0111*** (0.0010)	0.2920*** (0.0087)
R2	0.0005	0.0379	0.0080	0.0000	0.0741	0.0002	0.0092	0.0010	0.0018	0.0499
N Treated	7030	7030	7030	7030	7030	7030	7030	7030	7030	7030
N Untreated	18560	18560	18560	18560	18560	18560	18560	18560	18560	18560
<b>For-Profit</b>										
Treatment Effect	-262.3855 (150.1968)	-2825.7237*** (101.8995)	-3088.1092*** (173.5582)	-0.0645*** (0.0115)	0.0200 (0.0126)	-0.0347*** (0.0052)	-0.0446*** (0.0049)	-0.0030 (0.0022)	-0.0036** (0.0011)	-0.3878*** (0.0108)
Constant	6161.8261*** (110.6058)	3450.4765*** (94.0350)	9612.3026*** (138.2058)	0.7753*** (0.0079)	0.6668*** (0.0088)	0.0680*** (0.0047)	0.0757*** (0.0044)	0.0087*** (0.0020)	0.0038*** (0.0011)	0.4902*** (0.0092)
R2	0.0006	0.1106	0.0503	0.0054	0.0005	0.0063	0.0099	0.0003	0.0016	0.1804
R2	0.0006	0.0503	0.1106	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 PSL if PRIVLOAN>0 and is considered to have FSL if TFEDLN2>0 or TFEDLN>0.

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

Figure 1: Self Certification Form

	<h2 style="margin: 0;">Private Education Loan Applicant Self-Certification</h2>	OMB No. 1845-0101 Form Approved Exp. Date 02-28-2013
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**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](http://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 strongly 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 not 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) \_\_\_\_\_

Figure 2: Effects of the Self-Certification Form on Supply and Demand for PSL

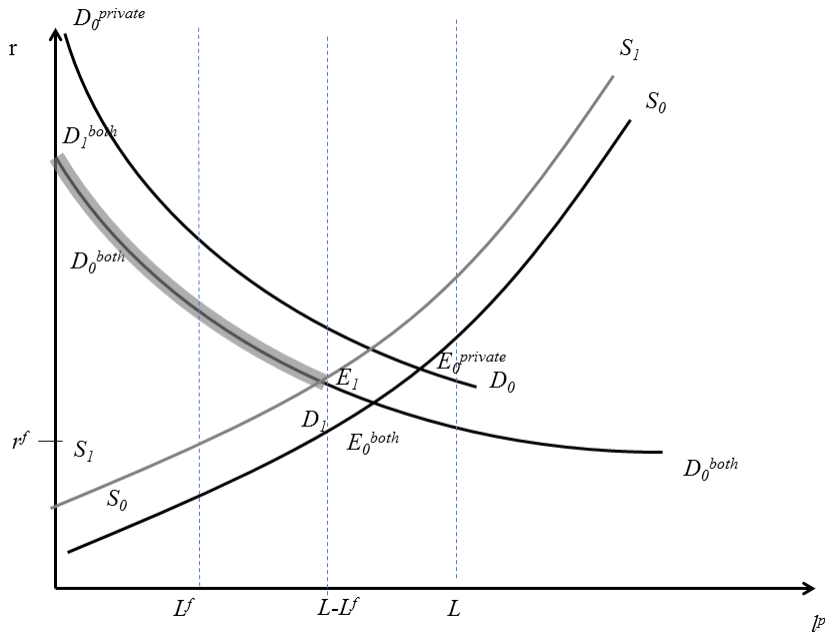


Figure 3: Originations, Four Year Undergraduates at Public Institutions

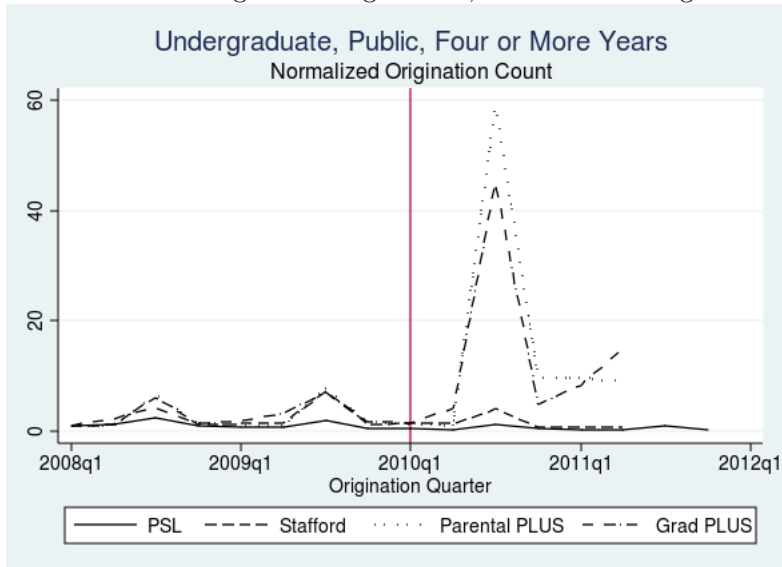


Figure 4: Mean Total Dollars Borrowed, Four Year Undergraduates at Public Institutions

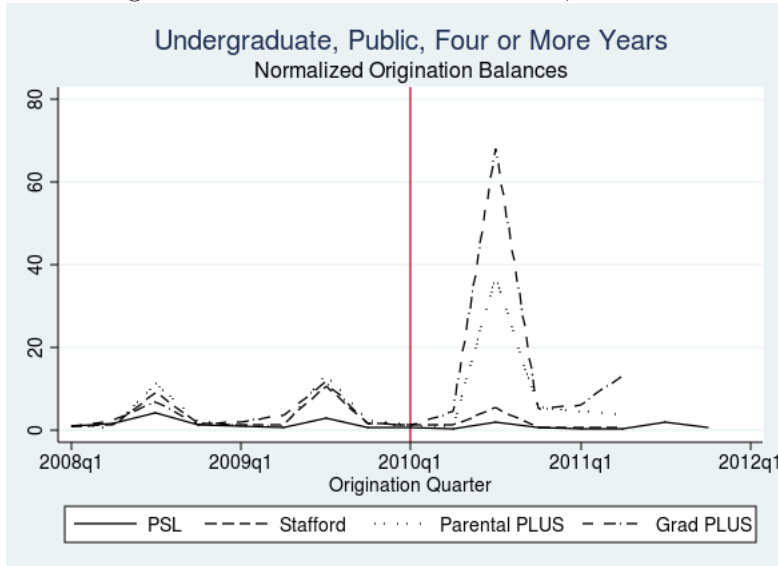


Figure 5: Composition of Private Student Loans, 2007-2008 Academic Year

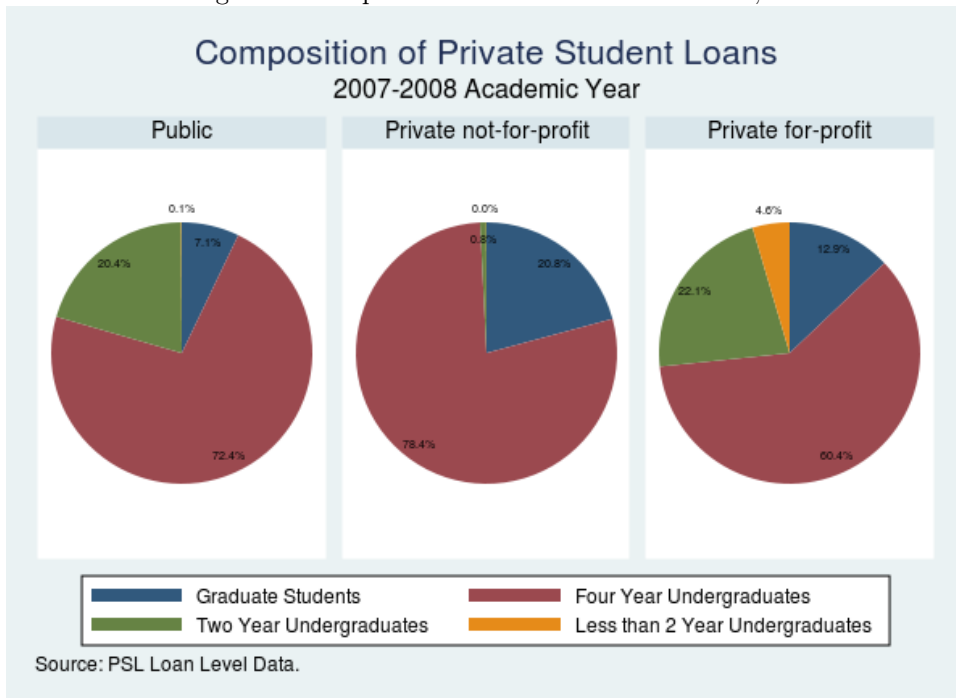




Figure 6: Composition of Private Student Loan Borrowers, 2007-2008 Academic Year

