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A Rescue or a Trap?—An Analysis of Parent PLUS Student Loans[*]

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Abstract

Parents taking out loans for their children's college educations may face an excessive debt burden that jeopardizes their own financial security. This paper examines the experience of Parent Loan for Undergraduate Students (PLUS) borrowers using administrative data from a large student loan guaranty agency. We find that PLUS borrowers are more likely to default if their children attend low-resource institutions, typically ones where lower-income enrollments predominate. Although parent PLUS generally outperforms student loans, PLUS performance is sensitive to program costs during difficult economic times. In contrast, student outcomes depend more on educational outcomes. Interviews with borrowers confirm that PLUS borrowers have more experience handling debt than their children, but there is a lack of communication on repayment obligations and expectations between generations. This study reveals the differing consequences of parent and student borrowing for higher education and the troublesome PLUS program design that poses challenges to certain borrowers.

Keywords: Student Loans, Parent PLUS, Default Risk, Minority Serving Institutions

JEL Codes: G51, J15, D04

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1 INTRODUCTION

For many young Americans, college is a gateway to higher earnings, stable employment, and better benefits. However, family savings and student aid alone cannot keep up with rising college expenses for many families. The Federal Parent Loan for Undergraduate Students (PLUS) program provides additional flexibility for parents to assist their children in paying for college. Yet, repayment of PLUS debt can become a long-term struggle for some borrowers.

Parent borrowing has increased over time despite the decline of educational loans in overall federal aid. About 24% of federal undergraduate loans originated in the 2019-20 academic year were parent PLUS, up more than 10 percentage points from a decade earlier.[1] As of the first quarter 2022, about 3.7 million parent borrowers—8.5% of the 43.4 million federal education loan borrowers, owed a total $104.8 billion in PLUS loan debt.[2] Unlike students, parents responsible for repaying the PLUS loan debt do not directly benefit from the returns on higher education, nor do they have full knowledge or control over the education experience.

Using unique borrower-level administrative data in the portfolio of a large student loan guaranty agency in Texas, we aim to answer two under-addressed research questions. How does student education experience and the type of institution attended affect the PLUS loan balance and performance affected by ? And how does parent borrowing experience differ from that of student borrowers? We unpack the increased default risk for borrowers with children attending low-resource institutions by showing that allowing liquidity-constrained parents to access easy credit may result in borrower distress. We also reveal that parent and student borrowers demonstrate contrasting repayment behaviors as related to education outcomes and program costs.

Studies of education loans mostly focus on student borrowers. Young adults holding student loan debt tend to save less, postpone household formation, home purchase, or business starts (Addo, 2014; Ambrose et al., 2015; Bleemer et al., 2021; Gicheva, 2016; Mezza et al., 2020; Munnell et al.,

[1]The share of federal loans in undergraduate student aid dropped from 40% in the 2009-10 to 28% in 2019-20, according to Figure SA-3 in Trends in College Pricing and Student Aids 2021 by The College Board. https://research.collegeboard.org/media/pdf/trends-college-pricing-student-aid-2021.pdf

[2]Parent PLUS accounted for 6.5% of the $1.61 trillion total outstanding federal student loan debt, which included loans taken out by graduated students. https://studentaid.ed.gov/sa/about/data-center/student/portfolio

2016). Parents' assistance helps reduce these potential debt impacts so that their credit-constrained children can attend higher-cost programs without becoming over burdened at the beginning of their adult lives. However, with more parents taking out PLUS loans, parental financial well-being becomes challenged. Parent borrowing and repayment experience remain understudied largely because of the historically small share of parent PLUS in the student loan market, the unalarming overall lower default rate that conceals borrower heterogeneity, and scant PLUS loan data availabilty. Only a small number of studies look at parent PLUS. Fishman (2014) examines the impact of PLUS credit standard changes particularly on loan disbursement and student enrollment at for-profit institutions and Historically Black Colleges and Universities (HBCUs). Fishman (2018) uses the 2011-2012 National Postsecondary Student Aid Study (NPSAS) to investigate the inequality among PLUS loan borrowers by income and, family resources, race, and ethnicity. Their study attributes the worsening indebtedness and repayment burden of black families to the wealth gap rooted in historical racial discrimination. Looney and Yannelis (2018) document the borrowing and repayment trends of federal Direct Loans and demonstrate that PLUS loan limit removal has facilitated the increase in large-balance loans and reduced repayment rates. Baum et al. (2019) proposes changes to the PLUS loan design that creates incentives for low-income families to take out loans that they cannot afford. Our access to the proprietary borrower loan performance, the enrollment and completion levels of borrowers' children, and additional institution data aid us in further understanding the complex nature of PLUS borrowing, shedding light on the implications of the program for at-risk borrowers.

We find that due to the PLUS program's low barrier to entry, financially stretched parents encounter debt payment challenges if they send their children to relatively low-resource institutions. Our analysis adds to the discussion of disparity in student loan borrowing experience across different socioeconomic groups (Houle, 2014; Addo et al., 2016; Scott-Clayton and Li, 2016; Scott-Clayton, 2018). We supplement individual borrower data with information about institutions attended by PLUS borrowers' children. The percent of students receiving Pell grants, the minority populations served, and the college entrance test scores of students of these institutions indicate borrowers' likely incomes, race and ethnicity, and students' college preparedness, respectively. The analysis of borrower and institution data explains the variation in loan performance by borrowers from different backgrounds.

We also compare repayment behavior of parent borrowers with undergraduate student borrowers during the Great Recession. Parent PLUS generally has outperformed student loans, consistent with previous studies. Parent borrowers typically have worked longer, earned more, and are more experienced at handling debt than newly graduated students. Without adding repayment risk, taking on debt to support credit-constrained children to pursue college education can lead to improvement in overall welfare of the two generations (Soares, 2015). However, the additional debt obligations can have detrimental consequences for older borrowers, especially during an economic downturn, when parent loan performance is sensitive to educational costs, while the performance of loans taken out by students depends more on their educational achievement. Students' earning prospects tend to improve with the investment if they succeed in college, but parents' don't.

To pay for additional debt, PLUS borrowers may sacrifice their own financial comfort by cutting other major expenses and investment. For example, individuals with installment debt tend to have lower retirement savings (Cavanagh and Sharpe, 2002). The administrative records do not contain information beyond loan performance and students' education experience. To gain insights on borrowers' other financial decisions and how the two generations interact during the PLUS borrowing and repayment process, we interviewed a group of parent borrowers and their children who also borrowed. Most PLUS borrowers reported handling the debt well, but some experienced a large impact when making other financial decisions. Parents and children expressed a lack of communication on academic expectations and the sharing of loan obligations. These interviews help present a more complete picture of the inter-generational relationship regarding college financing.

The return on investment from PLUS loans is determined by two factors: whether students successfully gain productive skills and obtain the degree through college and whether institutions taking the investment add value to students and parent borrowers. The rest of the paper is motivated to address these two related aspects. We provide the background of the PLUS program in the next section, exploring how parents decide on borrowing and repaying the debt. Then we describe the data sources that allow us to examine both student outcomes and institutional influence. In the fourth section, we present the empirical methods and the results. In the fifth section, we discuss the main findings in the supplementary surveys. Then, we conclude with policy implications.

2 PARENT PLUS PROGRAM

Most federal education loans are loans to students. Starting in the 1950s, the federal "Stafford Loan Program" is the largest undergraduate education loan program.[3] The 1980 Amendments to the Higher Education Act established the Federal PLUS loan program that allows parents to borrow for their children.

PLUS loans are different from Stafford loans and other education loans in a number of ways.

The underwriting rigor of PLUS loans falls between Stafford loans and private loans. While education loans from private lenders are risk-priced like other consumer loans, Stafford loans are made available with a flat interest rate to borrowers regardless of credit score (although owing federal tax or other debt may disqualify a borrower). Parents receive PLUS loans also with a flat interest rate regardless of ability to pay, as long as the borrowers do not have an adverse credit history.[4]

Parents can borrow much larger amounts than students. Since the 1992-1993 school year, parents have been allowed to borrow up to the difference between the total cost of attendance and other financial aid. For students, the annual and aggregate Stafford loan borrowing limits set by the Department of Education have not been adjusted since 2008 despite the rising college prices and increasing demand from mid- and lower-income families.[5] Grant aid has increased but overall student aid has not kept pace and left funding gaps to fill through paid student work, contributions from families, and PLUS loans. The average amount taken out by parents was $17,810 in the 2020-

[3] Stafford loans may be subsidized and unsubsidized for interest accrual in school or while loans are in deferment depending on the level of need determined through federal formulas that use data supplied by undergraduate students through the Free Application for Federal Student Aid (FAFSA).

[4] Parents need to pass the PLUS loan credit check, details at `https://studentaid.gov/understand-aid/types/loans/plus`.

[5] The aggregate limits are $31,000 for dependent undergraduate students and $57,500 for independent student and dependent students whose parents cannot borrow PLUS loans. `https://studentaid.gov/understand-aid/types/loans/subsidized-unsubsidized`.

21 academic year, approaching three times of the average amount of total Stafford subsidized or unsubsidized loans, which was $6,470.[6]

Parent PLUS loans have higher interest and fees than Stafford loans or private loans with low-risk parents as cosigners.[7] With the relatively high interest, mature borrowers, and low defaults, parent PLUS has been the only education loan program generating profits to offset other federal student loan program costs. The Congressional Budget Office (CBO) estimated that the federal government will gain, on average, about 12 cents for each new Parent PLUS dollar lent in 2020, not including federal administrative costs associated with disbursing and servicing loans.[8]

Despite the higher interest, PLUS loans are appealing to some families than other loan options because of the repayment flexibility that federal loan programs offer. Parent PLUS borrowers can consolidate their loans and participate in the Income-Contingent Repayment Plan (ICR), although less generous than most other income-drive repayment (IDR) plans available to students, where participants only need to make monthly payment up to a proportion of their earnings.[9] Parent borrowers can also have their loans forgiven after ten years of on-time payments if they sign up for ICR and work in a job that qualifies them for the Public Service Loan Forgiveness (PSLF). Like the student borrowers, PLUS loan borrowers have their loan repayment automatically deferred with interest waived for over two years throughout the pandemic with zero payments counted as on-time payments toward future forgiveness in IDRs, while private loan borrowers have to negotiate with lenders individually for relief.

Parent PLUS program is intended for families who have already exhausted student borrowing options to access credit for expensive institutions. PLUS program shifts cost burden from students to parents and reduce repayment risk and program costs for the federal government. Like other student

[6]Trends in College Pricing and Student Aids 2021, The College Board. https://research.collegeboard.org/media/pdf/trends-college-pricing-student-aid-2021.pdf.

[7]PLUS loan interest rate is 7.54% as of July 1, 2022, and the loan fee at disbursement is 4.228% as of October 1, 2020, substantially higher than those of Stafford loans, which are 4.99% and 1.057%, respectively. Private loan rates differ by credit risk of borrowers.

[8]Based on Table 6 of the March 6, 2020 CBO estimates in Student Loan Programs. https://www.cbo.gov/data/baseline-projections-selected-programs#18

[9]https://studentaid.ed.gov/sa/repay-loans/understand/plans/income-driven. It is rare but possible for some parent borrowers to benefit more than student borrowers from enrolling in the IDRs because the income calculations exclude nontaxable income, such as Social Security benefits, child support, etc.

loans, parent PLUS loans are usually non-dischargeable in bankruptcy unless borrowers can prove undue hardship. Borrowers may have their wages, tax refund and social security garnished if they default on the loans.

3 DATA

Our main data on parent PLUS borrowers are provided by the Trellis Company, a nonprofit student loan guarantor that has helped administer the Federal Family Education Loan (FFEL) Program in Texas since 1979. In contrast to the Federal Direct Loans (DLs) issued from the federal government, the funds for FFEL loans are from private lenders, but the loans are insured by guaranty agencies and reinsured by the federal government. The Trellis data cover 62,449 parent PLUS recipients who entered repayment between October 2004 and September 2010, six fiscal years of Trellis. Starting the 2010-2011 academic year, all new federal loans are DLs; therefore, no new loans have entered Trellis' portfolio since July 2010. We only look at parent borrowers with children attending Texas institutions, because less than 10% of loans in Trellis' portfolio were in other states. During the fiscal years 2009 and 2010, the majority of Trellis' PLUS loans were transferred ("put") to the portfolio of Department of Education (ED) to allow more liquidity for the guaranteed loan program following the financial crisis. Borrowers entering repayment in 2009 or 2010 account for less than 5% of all PLUS recipients in the data and the loans remaining in the portfolio generally outperform those in other years.

The summary statistics are listed in Table 1. The average total amount at origination was $18,898. PLUS loans are usually not the only education loans taken out by these families. The children of 92% of these parent borrowers also took out loans guaranteed by Trellis and on average took out five Stafford loans totaling $18,673. Parents and students thus together accumulated substantial amount of debt to fund college expenses. About 10.5% of the parent PLUS borrowers took out loans for their own education as well with an average balance of $12,255. The average highest interest rate among multiple PLUS loans was 7.4%. Parent PLUS recipients were on average 49 years old when entering repayment, usually at around their prime earning age. Their oldest student being supported was about 20 years old, but the student can be as young as 15 and as old as 50, suggesting a slow repayment process for some. In 4.4% of the cases, both parents borrowed to support students.

The data track the repayment behavior of each borrower from the date of first entering repayment.[10] About 31.7% borrowers were delinquent at some point, 8.6% defaulted on the loan(s) and 6.5% did not manage to pay down any principal amounts, and the rest are making progress in repaying the debt.

The data also record the types of institution that borrower's children attended, their enrollment patterns and the highest grade the loan supported, which helps document students' education experience. Nearly two thirds of PLUS borrowers' children attended four-year public colleges, slightly more than a fifth went to four-year private colleges, and less than a tenth enrolled in two-year public or proprietary institutions. The rest (4.3%) enrolled in multiple types of schools.

The other data source for the study is the Integrated Postsecondary Education Data System (IPEDS) of the ED's National Center for Education Statistics. While the administrative data from Trellis do not contain information about borrowers' family financial resources and student college readiness, the data on a subset of four-year colleges from IPEDS provide more information. The American College Testing (ACT) scores at the 75 percentile of the admitted students measures the effectiveness of high school instruction effectiveness, student academic skills, college selectivity, and likelihood for future overall academic success.[11] The other variable from the IPEDS, the percent of students receiving Pell Grants, suggests how likely the students at the college have exceptional financial needs. We merge these IPEDS variables using the institution identifiers for students whose parents took out PLUS loans in the Trellis data.

[10] About 7.3% of parent borrowers were "purged" (not tracked) after being closed, usually due to being paid in full, for six years. Loans in deferment or forbearance remained in the data. Borrowers with larger balances are more likely to benefit from consolidating loans into a Direct Consolidation Loan to qualify for Income-Contingent Repayment Plan thus less likely to remain in Trellis' portfolio.

[11] ACT is one of college entrance exams used in college admission decisions, academic advising, course placement and identification of candidates for scholarships and loans.

4 EMPIRICAL ANALYSIS

4.1 How Much PLUS Loans to Borrow

The cost of attendance, family resources, and the willingness to borrow can all affect the amount borrowed by parents. The cost varies by the type of institution that students attend. Not surprisingly, the average balance that PLUS borrowers take out is highest for four-year private colleges, followed by four-year public colleges, with the lowest being those with children attending public two-year colleges (the left panel of Figure 1).

Although more debt entails more repayment responsibilities, the loan provides liquidity that allows students to pursue higher levels of education, attend selective programs, and access more opportunities. Parents on average borrow more if students enroll full time, have graduated, or reached a higher grade (Figure 2). PLUS loan balance is also higher if students attend institutions with higher ACT scores or lower share of students receiving Pell grants. As intended by program design, the average PLUS amount goes down as the share of students receiving Pell grants increases, helping higher income families to afford expensive programs. However, loan amount levels off around \$10,000 where the majority of students receive Pell grants, suggesting that families that have limited ability to repay still borrow substantial amounts of PLUS loans to support children to go to those colleges.[12] The PLUS program provides low barrier to entry because families' income, assets, and indebtedness are not considered at loan origination.

4.2 College experience and PLUS loans performance

Education loans are considered as an investment with future returns; therefore, a large debt alone does not necessarily imply repayment difficulties. Families make college choice and borrowing decisions based on student's academic potential, repayment capacity, and the expected value of education. Parents comfortable with debt and those with children academically ready may borrow

[12]The average Pell award for Texas recipients is \$4,082 in 2021 (Hanson, 2021). The majority of Pell recipients have family annual income less than \$20,000. The maximum Pell grant for the 2020-2021 academic year for families with zero income is \$6,495, only covering a quarter of the expenses for a four-year in-state public college or 15% for a four-year private college.

more to support children to attend selective but expensive programs. Students enrolling in these programs are more likely to graduate with a marketable degree. Loan repayment is less burdensome then if parents can manage the debt without the need to support the children later on. If student do not find suitable programs and the investment fails to bring good returns, parents may have to continue supporting the students and face challenges to repay the debt even with small loan size. Students' education outcome can thus have a big impact on loan performance.

To further examine how the amount borrowed, institution types, and student experience explain the repayment behavior of PLUS borrowers, we estimate a linear probability model of PLUS default.

$$Default_{ij} = \beta_0 + \beta_1 Loan_i + \beta_2 School_j + \beta_3 Student_i + \epsilon_{ij}.$$

The outcome is whether the borrower defaults on any PLUS loan within the seven-year period after entering repayment. i indexes the parent borrower and the associated student; j denotes the institution that the student attends. $Loan_i$ denotes PLUS loan characteristics such as the total loan amount taken out by parent borrower i, interest rate, and other variables related to the borrower or the loans. $School_j$ denotes the type, minority population served, selectivity of the institution j attended by the borrower i's child. If the student attends multiple types of schools, we consider the institution type to be "multi-type". $Student_i$ denotes variables measuring the educational experience of borrower i's child, which include the highest grade the loan is supporting, enrollment pattern, and whether the student has graduated or withdrawn from the college. ϵ_{ij} is the idiosyncratic error term.

The results are presented in Table 2. Column 1 shows that parent borrowers' seven-year default probability does not increase with PLUS loan size; on the contrary, a $2,000 (or 10.6%) increase from average PLUS loan balance is associated with a small but statistically significant decrease in default by 0.12 percentage points. Loan performance is strongly related to borrower's child's college type and education experience. Borrowers with children attending proprietary colleges have the worst loan performance, a 16.1 percentage-point higher chance of default, relative to those with children going to a public four-year college. Borrowers with children attending public two-year colleges have about 1.2 percentage-point lower chance of default comparing with those going to four-year public colleges, likely due to the lower debt burden and the better job prospects at public than proprietary two-year colleges. Parents with children attending private nonprofit four-year colleges also tend to default more by about 1.1 percentage point than those going to public four-year schools. Parent borrowers with children who have graduated or reached higher grade levels are less likely to default on the loans, all else equal. If the students have withdrawn from college, parent borrowers tend to struggle—likely they still owe the debt without the students getting the credential and reaping the benefits of education. For parent borrowers, students enrolling in school on a part-time basis seems to help with repayment, perhaps because students work while attending school and help around the family to alleviate parent's financial burden. The regression also controls for repayment entry year dummies, number of PLUS loans taken out, interest rate, ages of borrowers and children, as well as loans taken out by students and parents for their own education.[13] Controlling for school fixed effects (Column 3), the coefficient estimates are similar to those in Column 1, except that institutional variables are no longer identifiable.

4.3 Repayment Challenges at Low-Resource Colleges

The parent PLUS loan program, initially designed to expand credit access for families of any income level to support children's education at expensive programs, becomes the go-to resource for lower-income or lower-credit score parents sending children to attend low-resource colleges. Parents with higher credit scores and stable incomes may instead borrow a private loan with a lower interest to fill the gap in college financing. While private lenders tend to target students attending top-quality schools with higher earning potential or savvy consumers with good-credit cosigners, the non-need-based parent PLUS loan program is more appealing to low-income borrowers and those who are unable to obtain affordable loans from private lenders.

Minority-serving institutions (MSIs) tend to be lower-resourced schools with limited institutional grant funds to support their disproportionately economically disadvantaged students.[14] The

[13]Unreported in Table 2, chance of PLUS default is higher if the borrowers enter repayment during the Great Recession years. Borrowers also tend to default if they take out multiple loans, support a student at an older age, and if students also borrow a large amount for themselves, other things equal.

[14]The ED defines MSIs as either designated by the law such as Historically Black Colleges and Universities (HB-

gap in student aid is often filled through PLUS borrowing at these institutions. There has been an ongoing debate regarding the connection between MSI financing and PLUS borrowing, especially after the 2011 steep enrollment decline at Historically Black Colleges and Universities (HBCUs) resulted from a tightening of PLUS credit standard.[15]

In the Trellis data, about 24.5% of the borrowers' children attend MSIs, which include Hispanic Serving Institutions (HSIs) Historically Black Colleges and Universities (HBCU) or predominantly black colleges. Parents sending children to MSIs tend to borrow less (the right panel of Figure 1). As shown in Column 1 of Table 2, parent PLUS borrowers whose children attend MSIs are 3.4 percentage-point more likely to default on their loans than those whose children attend non-MSIs seven years into repayment, other things equal. In Column 2, we add the interaction terms of MSI with loan size, institution type and enrollment pattern to see if the impact of these factors differ between MSIs and non-MSIs.[16] As the results show, higher borrowing amount is associated with even lower repayment risk for parents sending children to MSIs. While parent borrowers with children attending public two-year non-MSIs have a higher chance of default than those with children going to public four-year non-MSIs, it reduces the risk of default for those sending children to MSIs. For those supporting children to attend four-year private MSIs, the default risk increases further than those attending a non-MSI. Graduation also a larger positive effect on loan performance of PLUS borrowers with children attending MSIs. Supporting children attaining higher grades or having withdrawn from college does not affect the chance of PLUS default differently for parents sending children to MSIs or non-MSIs. In addition, attending school part-time helps only parents

CUs), Tribal Colleges and Universities (TCUs), or based on the percentage of undergraduate minority student enrollment such as Hispanic-serving institution. `https://nces.ed.gov/pubs2008/2008156.pdf`

[15]In October 2011, ED discovered that unlike the FFEL program, the accounts in collection or charged offs in the previous five years were not considered as "adverse credit history in the credit check for Direct PLUS loans." ED corrected the mistake but the tightening of credit check rules led to the denial of PLUS loan to a large number of applicants, leaving some parents with no option to pay for children's college education and the budget deficiency at schools mainly serving low-income and minority students (Fishman, 2018). A year after the correction, PLUS denial rate went up by 10 percentage points. For some HBCUs and predominantly black colleges, the denial rate went as high as 75% (Nelson, 2012). ED later loosened the standard by changing the minimum total debts with adverse conditions from zero to be over $2,085 (inflation adjusted based on 2015 dollar) to allow more otherwise disqualified parents to borrow PLUS again. The change to PLUS credit check does not affect the Trellis loans because Trellis originated loans prior to the ED correction and used the FFEL standard.

[16]MSIs are not proprietary therefore the interaction terms of the two types have no observations and the variable drops out of the specification.

with children attending MSIs but not those attending non-MSIs.[17] The signs of coefficient estimates on the interaction terms with school fixed effects remain the same, but the sizes of the estimates are smaller (Column 4 of Table 2).

4.4 Proxies for Missing Variables

We do not observe borrowers' income, net worth, and other characteristics such as student academic skills and college preparedness that possibly explain families' initial decisions on school choice and amounts to borrow. These missing variables may also contribute to various educational and labor market outcomes that affect parent borrowers' repayment capacity. For example, informed families are more likely to find out programs that match students' academic interest and parents' ability to repay. We cannot attribute the differences in repayment behavior simply to institutional differences and education attainment. The relationships found from the above regressions thus do not necessarily have causal interpretations.

To address this limitation, we add two institution-level variables from IPEDS for four-year colleges as proxies for unobserved student college readiness and family income. The ACT score at 75 percentile signifies student's academic skills or college preparedness; the percent students receiving Pell grants indicates the likelihood of the borrower's family to have exceptional financial need.[18] Including these variables helps control for student and family characteristics that are critical for college and borrowing decisions. The average share of students receiving a Pell grant is 36.4% at MSIs and 27.7% at non-MSIs. The average ACT score at 75 percentile is 22.7 at MSIs and 25.4 at non-MSIs.

With the same specification in Column 1 of Table 2, we run the regression for four-year colleges with data available on the two added control variables. The coefficients in Column 1 of Table 3 are consistent with regression estimates with data including two-year colleges in Table 2. Parent bor-

[17] If we replace the MSI dummy by the indicator for HBCU and colleges with predominantly black students (only 3% of the sample), most coefficient estimates have similar signs and a larger magnitude. For PLUS borrowers sending children to HBCUs or predominantly black colleges (Table A1).

[18] IPEDS data also contain ACT 25 percentile scores, SAT percentiles, acceptance rate, and other financial need measures, but they have more missing data or smaller variations across institutions. Results using alternative measures are generally consistent with the presented results.

rowers with children attending MSIs are about 4 percentage-point more likely to default, other things equal. However, controlling for institution's percent of students receiving a Pell Grant (Column 2), the coefficient on MSI is no longer significantly different from zero. That is, holding constant the share of students with exceptional financial need, parent borrowers sending children to an MSI no longer presents a significantly higher default risk than those sending children to a non-MSI. The higher default risk for MSIs is therefore largely associated with the likelihood of students from families with extremely low income. If taking out of loans on top of such financial distress, families are much less likely to afford additional debt. Controlling for the institution's ACT score, which is negatively associated with default risk, the coefficient on MSI remains insignificantly different from zero (Column 3). Adding the interactions of MSI with the two institution-level variables, we find that the difference in PLUS loan default between MSIs and non-MSIs is largely driven by the difference in family financial needs (Column 4 of Table 3).[19]

4.5 Other Repayment Outcomes

There are other loan performance measures for PLUS borrowers (Table 1). Besides the seven-year defaults, Trellis provides additional information on whether the PLUS borrowers end up defaulting on any loan ten years into repayment. The ten-year default rate was at 10.2%, higher than the seven-year rate, 8.6%. In addition, most borrowers paid down a portion of the debt, some borrowers consolidated the loans, but some others had no reductions in principal balance at all seven years after entering repayment. The linear probability regression results on the other outcomes are presented in Table 4. Estimates for ten-year default probability are similar to those for seven-year defaults. Not surprisingly, higher PLUS balance is associated with higher probability of loans not paid down or being consolidated, leading to lower repayment rate, consistent with Looney and Yannelis (2018). Since parents with children attending proprietary institutions are much more likely to have defaulted on the loan, they are less likely to remain in repayment or have consolidated the loans.

Parent borrowers whose children attend MSIs are less likely to have paid down the debt, more

[19]The gap in probability of PLUS loan default between HBCUs or historical Black colleges and other colleges also can be explained away by the differences in the two institution-level indicators (Column 3 and 4 of Table A1).

likely to have consolidated the loans than those whose children attended non-MSIs, even after controlling for the likelihood of financial distress and student college preparedness. Only the ten-year default risk remains not statistically different from those with children attending non-MSIs after controlling for those variables. Results on educational experience for school fixed-effect regressions are robust and presented in Table A2.

4.6 Parents versus Student Borrowers

College education typically leads to a host of financial and other lifetime gains for students (Carnevale et al., 2016) but not necessarily for parent borrowers. Nevertheless, parents still borrow PLUS loans and become responsible for the repayment. Perhaps they internalize part of the benefits from children's education by counting the improvement of their children's wellbeing as their own (Soares, 2015). There could be pecuniary gains for parents as well. Parents' net lifetime income may increase as a result of incurring PLUS debt. If children complete college, their subsequent higher income can offset the need for other future support from parents and contribute to caring for parents at an older age. Silverstein et al. (2002) studies the behavior of adult children providing support to their older parents and found that economic and social exchange as well as altruism all motivate intergenerational reciprocity. However, student and parent borrowers do not share the same economic prospect and the transfer back from students to parents may not take place even if students successfully complete college and land well-paying jobs. Parents' loan performance can be affected by different factors than those for student borrowers.

The Trellis Company guarantees not only PLUS loans but also loans taken out by students. We combine a subset of 24,243 parent PLUS borrowers and 284,487 Stafford loan borrowers who overlapped for fiscal years 2007, 2008 and 2009. We remove those with loans supporting the fifth year or above because we cannot differentiate between undergraduate and graduate students among those. Table 5 compares the two types of borrowers in terms of their loan characteristics, education experience, institution types and loan performance. During the three years, PLUS borrowers tend to hold fewer but larger loans. On average, their highest interest rate paid is 2.4 percentage point higher than student borrowers when entering repayment. Children of PLUS borrowers mostly attend four-year public or private institutions instead of two-year or proprietary institutions. A lower share of parents borrow to support children's final years in college, while students tend to borrow less at lower grades. Undergraduates supported by PLUS are more likely to graduate, less likely to enroll in school on part-time basis, and less likely to withdraw from college than undergraduates borrowing for themselves.[20] Seven years into repayment, parent PLUS borrowers paid down an average $6,289, or 53.4% of their initial balance, while students only paid down 20% at the end of five years into repayment.[21] PLUS borrowers who entered repayment in 2007, 2008 and 2009 have lower balance on average and worse performance than the full sample covering fiscal years 2005-2010, because PLUS borrowers in the sub-sample started repayment during the Great Recession. Still, PLUS loans have better repayment outcomes than Stafford loans because parents tend to be more financially stable and experienced with debt.

We run the linear probability model of default with the combined data and present the results in Table 6.[22] All else equal, parent PLUS borrowers are 21 percentage-point less likely to default comparing with student borrowers (Column 1).[23] Column 2 of Table 6 suggests that the difference can be largely explained by enrollment pattern and type of institution that borrowers' children attend. Student borrowers are more likely to default if they hold a larger amount of debt, attend a two-year public institution, enroll in school on a part-time basis, or have withdrawn from college. A longer program, higher attainment, and being more engaged in school as a full-time student reduce default risk for student borrowers. The results including school fixed-effects instead of controlling

[20]The combined data do not allow us to link students and parent borrowers if they are from the same family; therefore, PLUS borrowers' children likely borrow for themselves too.

[21]Amounts paid down and delinquency measures in the Trellis data are based on performance seven years into repayment for PLUS loans and five years into repayment for Stafford loans; they are therefore not strictly comparable between the two types of borrowers. For defaults and consolidations, we calculate the days between payment entry and the events to make the performance of the two types of loans comparable.

[22]We also run the regressions controlling for the IPEDS variables and the results are robust. However, the IPEDS data are only available for a subset of four-year colleges, we just present the results with fewer control variables.

[23]To capture the dynamics of loan payments, we also estimate a Cox proportional hazard model on the duration of repayment before borrowers default on their loans. The proportional hazards assumption test failed but the results with Strata by PLUS have similar estimates for other variables. The coefficient of Cox model estimates have similar signs to those in the linear probability model. Using the estimates and the summary statistics for the regressors, Figure A1 plots the survival rate of parent PLUS entering repayment in 2007 as compared with loans taken out by students attending public four-year institutions full time with average number of loans, interest rate, and grade supported. At any given time, parent borrowers tend to default less than student borrowers.

for school types also suggest parent borrowers are affected differently student borrowers (Column 3 and 4 in 6. Supporting children to attend a longer program or private college, or to enroll in school full time adds to parents' repayment burdens and perhaps does not bring immediate financial gains. In particular, the comparisons are based on data during the Great Recession. Graduation becomes associated with higher defaults for parents, unlike what we find with the full sample that includes periods before and after the recession (Table 2).[24] During the economic downturn, even graduates from college may not find rewarding jobs nor help alleviate the burden by parents. In the long term, the costs for parents making inter-generational transfer through PLUS borrowing could be offset by reduction in other forms of financial support stemming from having children with higher levels of education, and presumably, higher earnings and lower unemployment.

5 BORROWER INTERVIEWS

PLUS loans involve both parents and students. Borrower experience and loan performance can also be affected by relationship between the generations and their understanding of debt obligations. Parents may have incomplete knowledge about colleges and loan programs, or become inconsistent on supporting children as circumstances change. To learn about how PLUS debt have impacted other financial behavior, we conducted phone interviews of selected parent PLUS borrowers and their children who also took out Stafford loans.[25] Borrowers were asked questions related to student loan knowledge and decisions made prior to and during college, an assessment of expectations compared to reality regarding costs and the impact of loan repayment, and the impact the loans had on areas like savings and major purchases. The telephone calls were recorded and transcribed. A detailed report of the interviews are in Fletcher et al. (2020).

Among both parents and children, most expected the parents to repay the PLUS loans without the contribution from the children. Only a small number of borrowers expected children to pay part

[24] The Texas Workforce Commission wage records shared by Trellis with us show that parent PLUS loan borrowers have a slower wage growth than students. Parent borrowers are less likely to be unemployed but once unemployed, stay out of job longer and receive unemployment insurance (UI) for a longer period of time (Table A3).

[25] Detailed sampling method is in Appendix A1 and the questionnaires used for the online and follow-up phone surveys are available upon request.

of or the full amount either immediately or after a particular event, such as graduating from college, getting settled in a job, or paying off their own student loan debt. The children who had attended MSIs less commonly said that they would contribute to repayment compared to the children who had attended non-MSIs. All the children were more likely than parents to mention lack of discussion around the issue of repayment, indicating that sometimes parents felt that there was an understanding but there really was not.

Given the repayment expectations, it is not surprising that most children reported that they did not feel an impact when the parent PLUS entered repayment. Of children who reported feeling an impact, those who attended MSIs tended to be contributing to or fully making payments while those who attended non-MSIs talked about parents having less money to spend on things like college care packages and family vacations. Parents whose children attended a non-MSI more commonly said that entering repayment had a bigger impact compared to parents whose children attended an MSI.

The children generally reported feeling a higher impact on their finances due to their own student loan repayment compared with parents with the PLUS loans, particularly with regards to major purchases and other goals. Parents most said that the PLUS loans had a low or no impact on their major purchases or other goals. Parents generally felt that the PLUS loans either had no impact on their ability to save or had a high impact, with fewer responses between those two extremes. The children were more likely to say that the impacts of their loans were not what they had expected, compared to the parents who may have been more experienced with consumer debt. Parents most said that the impacts were as expected. Other common responses of parents included comments about borrowing more than anticipated and that it had taken longer to repay than expected.

Overall, most parents reported being supportive of their children and most children reported feeling supported by their parents throughout college. Parents whose children attended MSIs more commonly, compared to parents whose children attended non-MSIs, described some waning support over time. Some parents were dismayed about how long it took their children to get through college or disappointed when they children withdrew from schools without a degree. Some believed their children did not take higher education seriously enough. Children who did not feel as supported talked about their parents' reluctance to borrow, feeling like they were supported only if they followed a parent-approved educational plan. When parent finances became precarious, especially if they were related to a slower pace towards degree attainment, students reported a transition of financial responsibilities that they may not have expected nor been prepared for. The decision to pay for college through parent loans may not always come with thoughtful discussions with their children about explicit academic expectations and implied reciprocal on-going financial obligations.

6 CONCLUSION

Access to PLUS loans provides parents an option to fund their children's education when they see borrowing as beneficial. Whether the benefits are realized depends on not only students' educational experience and earning prospects but also how the outcomes affect parent borrowers' financial situation. In this study, we examine the factors that contribute to the borrowing and performance of parent PLUS loans. We find that parent borrowers' repayment behavior largely depends on their children's college experience and not the amount borrowed. Borrowing PLUS loans on top of financial distress leads to more financial strain and, thus, poorer performance particularly for borrowers whose children attend low-resource colleges. Because of the lack of scrutiny of parents' repayment ability, those who have no access to other financial resources take out PLUS loans and become more likely to struggle to repay. The phenomenon grew more acute with tightened underwriting following the Great Recession. The three-year cohort default rates (CDR) of PLUS loans increased from 1.8% in fiscal year 2006 to 5.1% in fiscal year 2010, more than doubling across institution types during the period.[26] Parent PLUS performance is not used to calculate an institution's CDR that determines its eligibility for future federal loan funds. Fishman (2014) shows that some universities sending parent PLUS loan offers in financial aid award packages may steer low-income parents into PLUS borrowing and away from Stafford loans. The easily accessible parent loans could have added excessive

[26] A cohort default rate (CDR), the standard measure of federal education loan performance, is the percentage of borrowers who enter repayment during a particular federal fiscal year (FY), October 1 to September 30, and default or meet other specified conditions prior to the end of the third fiscal year. The PLUS Loan three-year CDR are published at `https://www2.ed.gov/policy/highered/reg/hearulemaking/2012/programintegrity.html` and available only for fiscal years 2006 to 2010.

burden to families with low income or wealth.

Repayment mechanisms differ between parent and student borrowers. Although parent PLUS outperforms loans taken out by students overall, parents who borrow to support their children's education face different repayment challenges during an economic downturn. Unlike student borrowers, parents may have higher default risk with students staying in school longer and are sensitive to the costs associated with students' enrolment pattern and higher education attainment. When students take on Stafford loans, it allows them to potentially gain from higher education later on in life; parent PLUS borrowers do not share the same earnings boost prospect. The returns to investment through PLUS borrowing do not necessarily transfer to parents in the short term. Only a small share of parent PLUS borrowers become seriously delinquent or default on their debt. Yet, they can encounter hardship that jeopardizes their retirement security if debt collection reduces their government benefits. In 2015, 18% of 50- to 64-year-old student loan borrowers in default held parent PLUS loans at the time of initial withholding of social security benefits, or "offset."[27] Among student loan borrowers in default and 65 and older, 33% held Parent PLUS loans. For some of the older borrowers, the Social Security benefits received after the offset fell below the federal poverty guidelines.[28] Although parent borrowers may consider children's well-being part of their own, prioritizing children's higher education by PLUS loan borrowing beyond their payment capacity can put parents into financial peril.

The distress can be exacerbated if decisions are made without complete information or effective coordination between generations. Our interviews with parent and student borrowers suggest that PLUS borrowers may not have fully expected the repayment obligations nor had sufficient communications with their children regarding the financial responsibility and academic expectations despite the parents' greater experience handling debt. Borrowing to pay for a child's education represents a significant moment in the relationship between a parent and child. The investment and associated risks reflect a deep commitment to the child, given that the parent's own earning power would

[27] Government Accountability Office, Social Security Offsets, Improvements to Program Design Could Better Assist Older Student Loan Borrowers with Obtaining Permitted Relief. GAO-17-45, 2016. `https://www.gao.gov/assets/gao-17-45.pdf`

[28] ED collects repayment from older borrowers (age 50 and older) who default on federal student loans by withholding a portion of their Social Security benefits, also called an "offset."

be unaffected by the child's education. The collegiate pathway to adulthood, when parental borrowing is involved, seems to come with parental sacrifice and an improvised transfer of financial responsibility.

Our analysis of the parent-child differences in borrowing motives and consequences provide evidence and support for reforms to the parent PLUS program. Adverse consequences could be avoided or mitigated if loan counseling were mandatory for parent borrowers as it is for student loan borrowers and more assistance was provided to families on choosing value-added colleges and programs that can help students succeed. For financially distressed families, PLUS loans may not be a viable resource when students attend low-resources schools. Other changes are proposed to reduce the need and access for parents to borrow for their children (Baum et al., 2019; Fishman, 2014), such as increasing grant aid to students in need, increasing the loan limit for low-income students while restricting the amount their parents can borrow, tightening PLUS underwriting standards, and holding institutions accountable.

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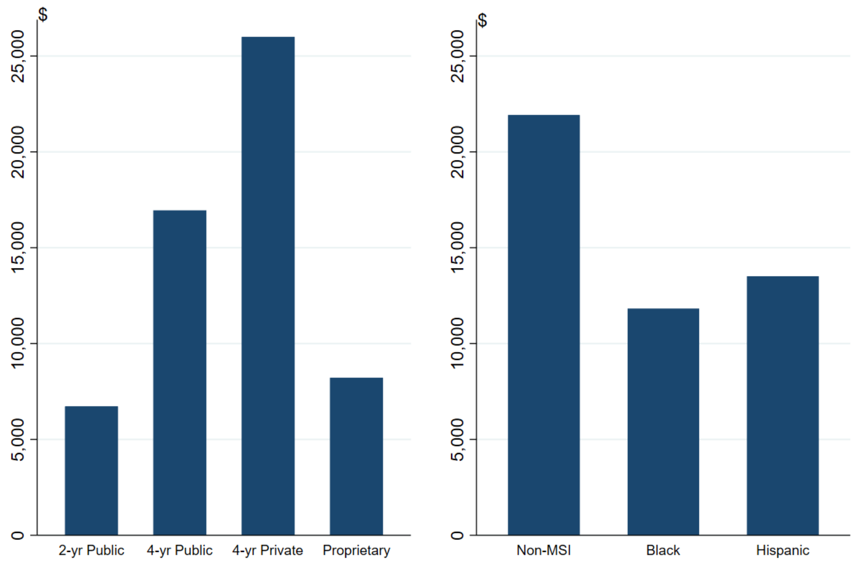
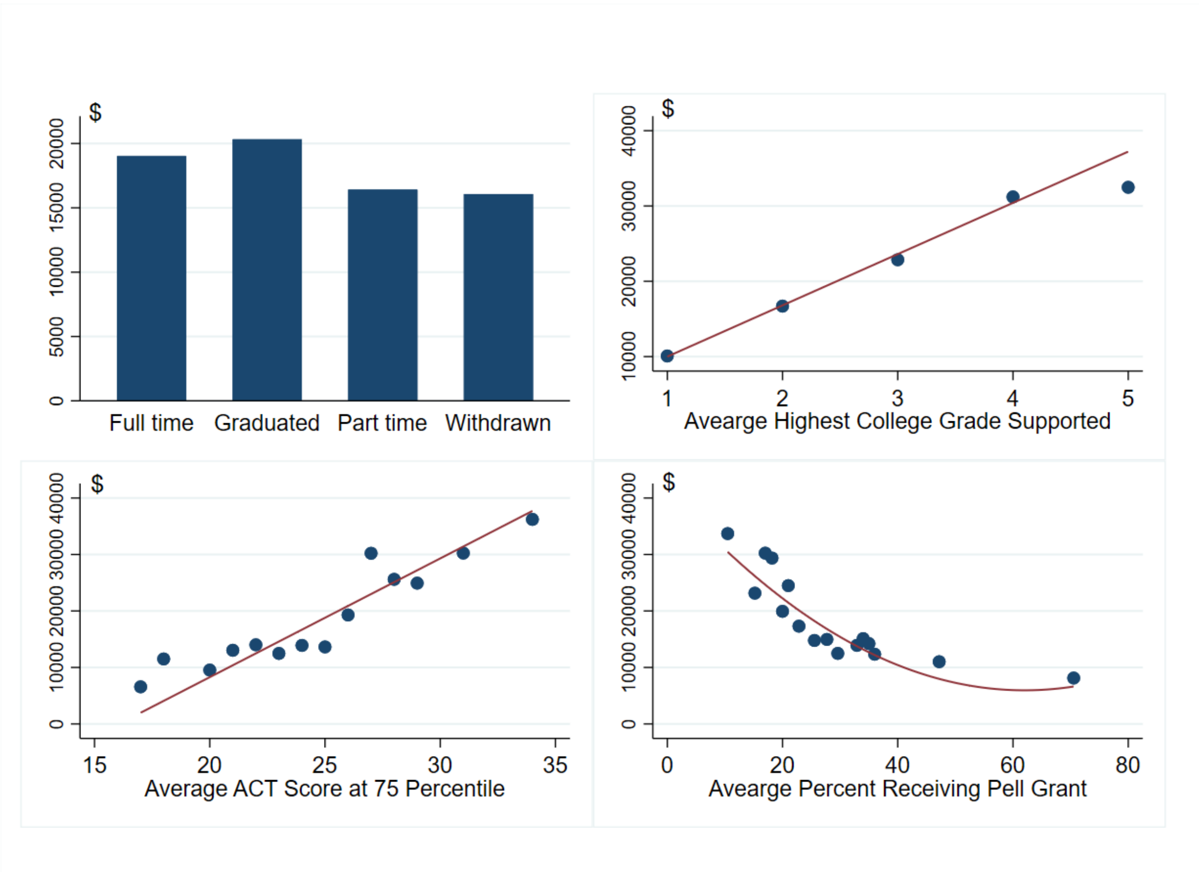
Figure 1: Average PLUS Loan Balance by Institution Type



Note: Data from Trellis on PLUS borrowers entering payment 2005-2010 with children attending Texas colleges

Figure 2: Average PLUS Loan Balance by College Experience



Note: Data from Trellis on PLUS borrowers entering payment 2005-2010 with children attending Texas colleges

Table 1: Summary Statistics of Parent PLUS Loans

VARIABLES	Mean	Variables	Mean
PLUS loan characteristics:		**PLUS loan performance:**	
Number of PLUS loans	1.9	Default in 7 years of payment	8.6%
Highest interest rate	7.40	Default in 10 years of payment	10.2%
PLUS loan amount borrowed	$ 18,898	Delinquency	31.7%
Borrower repayment age	48.6	Deferment	14.4%
Number of students supporting	1.1	Forbearance	33.9%
Parents borrow for own education	10.5%	PLUS loan amount paid down ($)	$ 9,698
		Paid down	48.4%
Student experience:			
Children's Stafford loan amount ($)	$ 18,673	**Institution characteristics:**	
1st year the highest grade funded	38.2%	ACT 75 percentile	25.8
2nd year the highest grade funded	19.4%	Percent receiving Pell grant	26.5%
3rd year the highest grade funded	17.4%	2-year public	3.8%
4th year the highest grade funded	23.7%	4-year public	63.8%
5th year the highest grade funded	1.5%	4-year private nonprofit	22.2%
Graduated	54.3%	Proprietary	5.9%
Withdrawn	29.7%	Minority serving institution (MSI)	24.5%
Enroll full time	8.7%	Predominantly Black or HBCU	3.3%
Enroll part time	6.5%	Hispanic Serving	21.3%

Notes: Shown in nominal dollars. Data from Trellis on PLUS borrowers entering payment 2005-2010 with children attending Texas colleges. Enrollment patterns, MSI category, ACT percentiles and percent receiving Pell grants are missing for some borrowers. The statistics are based on nonmissing data.

Table 2: Probability of Parent PLUS Loan Default

VARIABLES	(1)	(2)	(3)	(4)
Log(amount)	-0.0115***	-0.00759**	-0.0127***	-0.00604**
	(0.00304)	(0.00297)	(0.00166)	(0.00233)
Proprietary	0.161***	0.152***		
	(0.0371)	(0.0400)		
Public 2 year	-0.0123**	0.0289***		
	(0.00523)	(0.00738)		
Private 4 year	0.0112***	0.00922***		
	(0.00383)	(0.00293)		
Graduate	-0.0220***	-0.0156***	-0.0208***	-0.0147***
	(0.00345)	(0.00335)	(0.00353)	(0.00333)
Highest grade	-0.0153***	-0.0141***	-0.0118***	-0.0117***
	(0.00190)	(0.00142)	(0.00121)	(0.00139)
Withdrawn	0.0194***	0.0155***	0.0199***	0.0137***
	(0.00297)	(0.00464)	(0.00406)	(0.00501)
Part time	-0.0135***	-0.00601	-0.0147***	-0.00802*
	(0.00286)	(0.00395)	(0.00279)	(0.00431)
MSI	0.0344***	0.205***		
	(0.00492)	(0.0448)		
MSI × Log(amount)		-0.0154***		-0.0146***
		(0.00311)		(0.00206)
MSI × Public 2 year		-0.0873***		
		(0.0152)		
MSI × Private 4 year		0.0122*		
		(0.00697)		
MSI × Graduated		-0.0285***		-0.0191***
		(0.00706)		(0.00539)
MSI × Highest grade		-0.00755		-0.00323
		(0.00541)		(0.00521)
MSI × Withdrawn		0.0104		0.0114
		(0.00717)		(0.00731)
MSI × Part time		-0.0260**		-0.0202*
		(0.0101)		(0.0102)
Constant	0.209***	0.157***	0.255***	0.218***
	(0.0350)	(0.0350)	(0.0211)	(0.0236)
School Fixed Effects			Yes	Yes
Observations	53,484	53,484	62,404	53,478
R-squared	0.033	0.036	0.062	0.053

Note: Robust standard errors clustered at two-digit zip code level. Controlling for repayment entry year dummies, number of loans, interest rate, ages of borrowers and children, amounts borrowed by student and parent for their own education. *** p<0.01, ** p<0.05, * p<0.1

Table 3: Probability of PLUS Default at Four-Year Colleges: Controlling for Income and College Readiness Proxies

VARIABLES	(1)	(2)	(3)	(4)
log(amount)	-0.0109***	-0.00501**	-0.00583***	-0.00653***
	(0.00294)	(0.00251)	(0.00216)	(0.00205)
Private 4 year	0.0116***	0.0192***	0.0173***	0.0166***
	(0.00373)	(0.00404)	(0.00334)	(0.00315)
Graduated	-0.0204***	-0.0180***	-0.0170***	-0.0168***
	(0.00379)	(0.00395)	(0.00427)	(0.00426)
Highest grade	-0.00169***	-0.00138***	-0.00121***	-0.00123***
	(0.000211)	(0.000173)	(0.000191)	(0.000195)
Withdrawn	0.0210***	0.0183***	0.0164***	0.0165***
	(0.00443)	(0.00480)	(0.00505)	(0.00501)
Part time	-0.00810***	-0.00774***	-0.00732**	-0.00709**
	(0.00303)	(0.00270)	(0.00285)	(0.00281)
MSI	0.0402***	0.00582	0.00517	-0.0918
	(0.00564)	(0.00520)	(0.00457)	(0.150)
%Pell		0.00252***	0.000946***	0.000106
		(0.000360)	(0.000359)	(0.000274)
ACT75			-0.00323***	-0.00429***
			(0.000736)	(0.000834)
MSI $\times$%Pell				0.00261***
				(0.000979)
MSI $\times$ ACT75				0.000685
				(0.00521)
Constant	0.183***	0.0780**	0.215***	0.264***
	(0.0349)	(0.0324)	(0.0475)	(0.0460)
Observations	48,556	48,392	46,487	46,487
R-squared	0.032	0.038	0.028	0.029

Note: Data are for four-year colleges only. Robust standard errors clustered at two-digit zip code level. Controlling for repayment entry year dummies, number of loans, interest rate, ages of borrowers and children, amounts borrowed by student and parent for their own education. MSI refers to Minority-serving institution. *** p<0.01, ** p<0.05, * p<0.1

Table 4: PLUS Performance: Other Outcomes

VARIABLES	Default in 10 Years		No Pay Down		Consolidate	
	(1)	(2)	(3)	(4)	(5)	(6)
Log(amount)	-0.00941***	-0.00337	0.0276***	0.0295***	0.0484***	0.0468***
	(0.00316)	(0.00219)	(0.00147)	(0.00181)	(0.00166)	(0.00162)
Proprietary	0.163***		-0.0341***		-0.0219**	
	(0.0315)		(0.00742)		(0.00965)	
Public 2 year	-0.0125*		-0.00331		0.0138***	
	(0.00637)		(0.00640)		(0.00482)	
Private 4 year	0.0113***	0.0188***	0.00390**	0.0102***	0.00272	0.00500*
	(0.00405)	(0.00341)	(0.00169)	(0.00267)	(0.00300)	(0.00300)
Graduated	-0.0244***	-0.0186***	-0.0138***	-0.0115***	0.0186***	0.0176***
	(0.00427)	(0.00425)	(0.00303)	(0.00397)	(0.00232)	(0.00217)
Highest grade	-0.0187***	-0.0141***	-0.0153***	-0.0126***	-0.0110***	-0.0126***
	(0.00180)	(0.00146)	(0.00200)	(0.00180)	(0.00271)	(0.00316)
Withdrawn	0.0213***	0.0177***	-0.00267	-0.00362	0.0188***	0.0179***
	(0.00323)	(0.00471)	(0.00366)	(0.00458)	(0.00529)	(0.00586)
Part time	-0.0140***	-0.00687**	0.00429	0.00344	0.0212***	0.0179**
	(0.00313)	(0.00294)	(0.00308)	(0.00419)	(0.00683)	(0.00721)
MSI	0.0418***	0.00667	0.0304***	0.00968***	0.00998***	0.00737*
	(0.00463)	(0.00506)	(0.00211)	(0.00315)	(0.00274)	(0.00381)
%Pell		0.000842**		0.000167		-9.75e-05
		(0.000412)		(0.000246)		(0.000328)
ACT75		-0.00469***		-0.00388***		-0.000742
		(0.000776)		(0.000346)		(0.00105)
Constant	0.211***	0.256***	-0.289***	-0.202***	-0.537***	-0.537***
	(0.0330)	(0.0441)	(0.0161)	(0.0244)	(0.0399)	(0.0573)
Observations	53,484	48,422	53,484	48,422	53,484	48,422
R-squared	0.034	0.028	0.028	0.028	0.029	0.028

Note: Data for column (2), (4) and (6) are for four-year colleges only. Robust standard errors clustered at two-digit zip code level. Controlling for repayment entry year dummies, number of loans, interest rate, ages of borrowers and children, amounts borrowed by student and parent for their own education. *** $p<0.01$, ** $p<0.05$, * $p<0.1$

Table 5: Mean Statistics: PLUS Vs Stafford

VARIABLES	PLUS	Stafford
PLUS loan characteristics:		
Number of loans	1.4	3.1
Highest interest rate	8.5%	6.1%
Loan amount borrowed	$13,134	$9,373
Borrower repayment age	48.5	26.3
Student experience:		
1st year the highest grade funded	52%	42%
2nd year the highest grade funded	22%	19.2%
3rd year the highest grade funded	14.5%	12.5%
4th year the highest grade funded	11.4%	26.3%
Graduated	48.2%	32.3%
Withdrawn	27.6%	50.6%
Part time	5.6%	9.8%
Institution characteristics:		
ACT 75 percentile	25.5	24.4
Acceptance rate	70.9%	74.1%
Percent Pell	27.7%	33.7%
2-year public	4.4%	24.9%
4-year public	67.2%	46.1%
4-year private nonprofit	20.9%	10.7%
Proprietary	5.7%	13.3%
PLUS loan performance:		
Default in 7 years of payment	10.2%	31.5%
Delinquency	33.8%	64.9%
Deferment	17.9%	49%
Forbearance	34.7%	44.6%
Loan amount paid down	$6,289	$1,141
Paid down	53.4%	20%

Notes: Shown in nominal dollars. Excluding loans supporting grades above four. Borrowers entered repayment in fiscal years 2007, 2008 and 2009. Data include 24,243 parent borrowers and 284,248 Stafford borrowers from Trellis. Unlike that the PLUS performance is based the reports seven years into repayment, those of students are based on the data five years into repayment except for defaults and consolidation, which are calculated based on event dates.

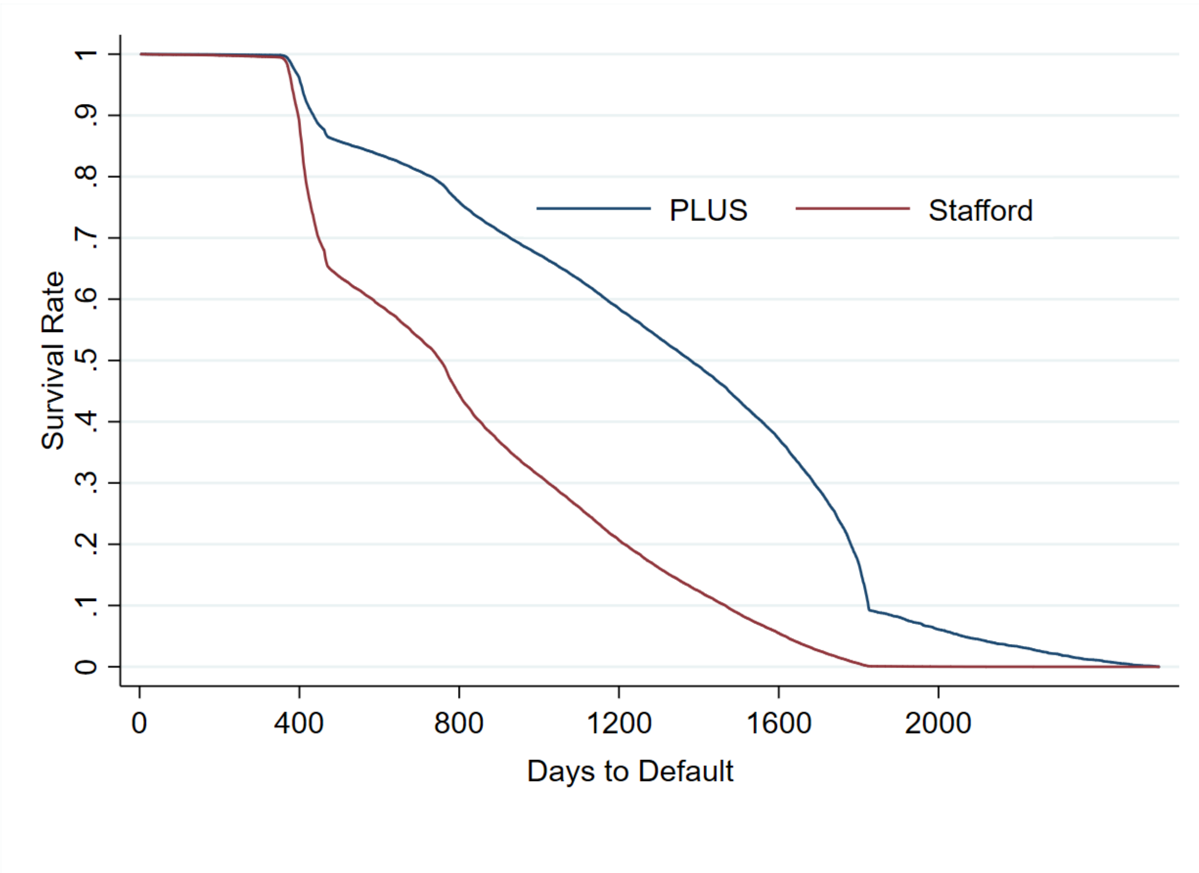
Table 6: Probability of Default: PLUS vs Stafford

VARIABLES	(1)	(2)	(3)	(4)
Log(amount)	0.00544***	0.0142***	0.00868***	0.0152***
	(0.00144)	(0.00163)	(0.00149)	(0.00163)
Proprietary	0.212***	0.206***		
	(0.00319)	(0.00325)		
Public 2 year	0.0386***	0.0323***		
	(0.00255)	(0.00264)		
Private 4 year	-0.0104***	-0.0137***		
	(0.00230)	(0.00254)		
Graduated	-0.0283***	-0.0305***	-0.0307***	-0.0331***
	(0.00289)	(0.00331)	(0.00317)	(0.00348)
High grade	-0.0725***	-0.0800***	-0.0636***	-0.0704***
	(0.000927)	(0.00103)	(0.000972)	(0.00104)
Withdrawn	0.140***	0.144***	0.131***	0.136***
	(0.00287)	(0.00321)	(0.00298)	(0.00323)
Part time	0.0441***	0.0475***	0.0437***	0.0478***
	(0.00365)	(0.00398)	(0.00374)	(0.00396)
PLUS	-0.211***	0.0265	-0.179***	-0.0887***
	(0.00477)	(0.0267)	(0.00507)	(0.0342)
PLUS × Log(amount)		-0.0394***		-0.0216***
		(0.00291)		(0.00373)
PLUS× Public 2 year		-0.0249**		
		(0.0109)		
PLUS × Private 4 year		0.0291***		
		(0.00538)		
PLUS × Graduated		0.0168***		0.0190**
		(0.00603)		(0.00816)
PLUS × Highest grade		0.0724***		0.0678***
		(0.00203)		(0.00279)
PLUS × Withdrawn		-0.0960***		-0.0996***
		(0.00696)		(0.00873)
PLUS × Part time		-0.0480***		-0.0560***
		(0.00985)		(0.0136)
School Fixed Effects			Yes	Yes
Constant	0.212***	0.158***	0.191***	0.150***
	(0.0116)	(0.0128)	(0.0123)	(0.0132)
Observations	308,730	308,730	308,692	308,692
R-squared	0.132	0.135	0.153	0.156

Note: Borrowers entered repayment in fiscal years 2007, 2008 and 2009. Data include 24,243 parent borrowers and 284,248 Stafford borrowers from Trellis. Robust standard errors clustered at two-digit zip code level for (1) and (2). Controlling for number of PLUS loans, highest interest rate, repayment age, and repayment entry year effects. *** p<0.01, ** p<0.05, * p<0.1.

Appendices

Figure A1: Survival Rate of PLUS Vs Stafford Borrowers



Note: Calculations are based on coefficient estimates of a Cox proportional hazard model of default

A1 Trellis Borrower Survey Sampling

In October 2017, Trellis emailed a short survey to parent PLUS borrowers and student borrowers whose parents had borrowed parent PLUS for them. The survey asked for demographic information and assessed interest in participating in an in-depth telephone interview.

Borrowers whose loans are paid in full for more than six years and those with invalid email addresses were removed. The removed borrowers accounted for approximately 33 percent of parent PLUS borrowers and 41 percent of student borrowers. Then the survey was sent to 41,663 parent PLUS borrowers and 39,532 student borrowers whose parents took out PLUS loans for them. There was a 21 percent bounce rate for parent borrowers and a 14 percent bounce rate for student borrowers. The survey was successfully sent to 31,902 parent borrowers and 33,459 student borrowers. An additional 1 percent of parent borrowers and 1 percent of student borrowers unsubscribed after receiving the survey invitation.

The response rate was 2.33 percent for parent borrowers (742 completed the survey) and 2.46 percent for student borrowers (823 completed). Borrowers that responded to the survey were not necessarily representative of the full sample. The primary purpose of the survey was to secure volunteers for the in-depth telephone interview. Twenty-eight percent of the parent borrower respondents volunteered (209 parent volunteers) and 57 percent of the student borrower respondents volunteered (470 student volunteers).

Trellis review the survey respondents who volunteered to be interviewed and selected 49 parent borrowers and 36 student borrowers, spanning across the identified repayment groups. The interviewees had a variety of characteristics (such as gender, income category, age at time of repayment, school type, graduated status). This selection of borrowers was not meant to be representative of all borrowers or even of the full study sample, but was selected to ideally hear from people with different experiences.

Trained interviewers conducted one interview per participant that lasted a median of 34 minutes for parent borrowers and 37 minutes for student borrowers.

Table A1: PLUS Defaults at HBCUs and Black Colleges

VARIABLES	(1)	(2)	(3)	(4)	(5)
Log(amount)	-0.0125***	-0.0107***	-0.00646***	-0.00642***	-0.00825***
	(0.00243)	(0.00242)	(0.00209)	(0.00209)	(0.00226)
Proprietary	0.176***	0.177***			
	(0.0466)	(0.0469)			
Public 2 year	0.00122	0.00572			
	(0.00636)	(0.00631)			
Private 4 year	0.00931***	0.00822**	0.0158***	0.0143***	
	(0.00340)	(0.00324)	(0.00292)	(0.00283)	
Graduated	-0.0205***	-0.0189***	-0.0167***	-0.0167***	-0.0161***
	(0.00331)	(0.00341)	(0.00421)	(0.00421)	(0.00358)
Highest grade	-0.0150***	-0.0145***	-0.0124***	-0.0123***	-0.0120***
	(0.00154)	(0.00149)	(0.00199)	(0.00198)	(0.00172)
Withdrawn	0.0190***	0.0178***	0.0167***	0.0165***	0.0177***
	(0.00291)	(0.00293)	(0.00494)	(0.00488)	(0.00328)
Part time	-0.0120***	-0.00921***	-0.00677**	-0.00667**	-0.00990***
	(0.00275)	(0.00254)	(0.00274)	(0.00273)	(0.00286)
Black	0.147***	0.652***	0.0950***	-2.346**	
	(0.00779)	(0.101)	(0.0146)	(1.164)	
Black × Log(amount)		-0.0501***			-0.0473***
		(0.00896)			(0.0107)
Black × Public 2 year		-0.236***			
		(0.0445)			
Black × Private 4 year		0.0109			
		(0.0147)			
Black × Graduated		-0.0763***			-0.0728***
		(0.0161)			(0.0140)
Black × Highest grade		-0.0190			-0.0123
		(0.0115)			(0.0117)
Black× Withdrawn		0.0162			0.0172
		(0.0269)			(0.0282)
Black × Part_time		-0.0668**			-0.0614**
		(0.0308)			(0.0290)
%Pell			0.000144	-7.96e-05	
			(0.000318)	(0.000321)	
ACT75			-0.00458***	-0.00510***	
			(0.000859)	(0.000866)	
Black ×%Pell				0.0101***	
				(0.00256)	
Black× ACT75				0.103*	
				(0.0591)	
Constant	0.209***	0.190***	0.271***	0.291***	0.220***
	(0.0320)	(0.0334)	(0.0510)	(0.0510)	(0.0268)
School Fixed Effects					Yes
Observations	53,484	53,484	46,487	46,487	53,478
R-squared	0.040	0.042	0.029	0.029	0.053

Note: Robust standard errors clustered at two-digit zip code level. Controlling for repayment entry year dummies, number of loans, interest rate, ages of borrowers and children, amounts borrowed by student and parent for their own education.*** p<0.01, ** p<0.05, * p<0.1.

Table A2: Other PLUS Loan Performance Outcomes with School Fixed Effects

VARIABLES	(1) Default in 10 Years	(2) No Pay Down	(3) Consolidate
Log(amount)	-0.0106***	0.0287***	0.0455***
	(0.00203)	(0.00121)	(0.00164)
Graduated	-0.0237***	-0.0118***	0.0188***
	(0.00382)	(0.00256)	(0.00199)
Highest grade	-0.0141***	-0.0118***	-0.00811***
	(0.000972)	(0.00160)	(0.00254)
Withdrawn	0.0208***	-0.00395	0.0167***
	(0.00456)	(0.00315)	(0.00379)
Part time	-0.0170***	0.00516	0.0209***
	(0.00295)	(0.00398)	(0.00696)
Constant	0.264***	-0.248***	-0.472***
	(0.0244)	(0.0171)	(0.0394)
Observations	62,404	62,404	62,404
R-squared	0.063	0.039	0.040

Note: Robust standard errors clustered at two-digit zip code level. Controlling for repayment entry year dummies, number of loans, interest rate, ages of borrowers and children, amounts borrowed by student and parent for their own education.*** p<0.01, ** p<0.05, * p<0.1.

Table A3: Borrower Labor Market Outcome

	Parent borrowers 2007	Parent borrowers 2010	Student borrowers 2007	Student borrowers 2010
Mean wage ($)	18,421	20,995	8,536	10,088
Wage growth (%)	32	16	200	175
Share on UI (%)	20	16	34	24
Mean weeks on UI	25	19	20	16
UI received ($)	7,569	6,070	4,966	3,935

Note: Texas Workforce Commissions and Trellis Random sample of 2,847 parent borrowers and 2,328 student borrowers entering payment FY 2007 and FY 2010. UI stands for unemployment insurance.