
UNDERSTANDING THE EVOLUTION OF STUDENT LOAN BALANCES AND REPAYMENT BEHAVIOR: DO INSTITUTION TYPE AND DEGREE MATTER?

Meta Brown, Rajashri Chakrabarti, Wilbert van der Klaauw, and Basit Zafar

OVERVIEW

- To help inform the policy debate regarding student debt, the authors analyze the evolution of student loan balances and repayment behavior by institution type and degree program.
- They find that during the 2000-10 period, student loan balances at college exit increased and repayment behavior deteriorated for those pursuing undergraduate certificates and associate's and post-bachelor's degrees at private institutions relative to those pursuing such degrees at public institutions. Declines in repayment behavior at private institutions were sharpest for associate's degrees and undergraduate certificates.
- Further, the results suggest that the relative worsening in loan performance at private institutions stemmed primarily from student loans extended for study at for-profit institutions.

Student loans have come to play an increasingly prominent role in today's higher education market. In 2012, 71 percent of students graduating from four-year colleges took student loans to fund their education, representing 1.3 million students. That marked a sharp increase from 900,000 students, or 64 percent, in 2004.¹ Overall student loan balances surged from \$350 billion in 2004 to \$1.46 trillion in 2018.² During the last recession, student loan debt was the only form of debt that rose. It continued to climb in the recession's wake, soaring to \$1.26 trillion at the end of June 2016—a 170 percent increase from its 2006 level (Chakrabarti, Gorton, Jiang, and Van der Klaauw 2017; Chakrabarti, Haughwout, Lee, Scally, and van der Klaauw 2017). Student loans now constitute the largest form of nonmortgage household debt,

Meta Brown is an associate professor of economics at Stony Brook University. Rajashri Chakrabarti is a senior economist and Wilbert van der Klaauw a senior vice president at the Federal Reserve Bank of New York. Basit Zafar is an associate professor of economics at Arizona State University. Correspondence: rajashri.chakrabarti@ny.frb.org.

The views expressed in this article are those of the authors and do not necessarily reflect the position of the Federal Reserve Bank of New York or the Federal Reserve System. To view the authors' disclosure statements, visit https://www.newyorkfed.org/research/epr/2019/epr_2019_student-loan-balances_brown.

having surpassed both auto and credit card loans. Although student loans are not spread uniformly across the population, they affect a wide cross section of society: at the end of June 2016, student loan balances were held by 41 percent of the U.S. population aged seventeen to twenty-nine, 29 percent of those aged thirty to thirty-nine, and 8 percent of those above forty.³ Not surprisingly, many commentators have referred to the explosive rise of this debt as a “student loan bubble.”

Alongside the growth in education debt, student loan delinquency rates have been climbing. Student loan balances ninety or more days delinquent increased to 11 percent in the second quarter of 2016.⁴ Among students who left college in 2010 and 2011, 28 percent defaulted on their student loans within five years, compared with 19 percent of those who left school in 2005 and 2006 (Chakrabarti, Gorton, Jiang, and Van der Klaauw 2017; Chakrabarti, Haughwout, Lee, Scally, and van der Klaauw 2017). Student loan defaults have serious consequences, as they lead to sharp deteriorations in credit scores and may limit the ability of the borrower to purchase a home or take out other loans over time.⁵

While student loans promote human capital accumulation and help drive economic growth, the sheer magnitude of the market and the steep rise in delinquency rates constitute an important public policy issue, with implications for the nation’s economic and financial well-being. So it is surprising that few studies have examined the evolution of borrowing patterns over recent decades or attempted to break out the aggregate data on student loan performance by type of institution or degree pursued. Our study begins to fill that gap.

Using unique data based on a survey we administered as part of RAND’s American Life Panel in January 2011, we investigate whether there were differences over time in student loan balances both at college exit and currently, and we examine repayment behavior across institution types and degree programs—again looking especially for changing patterns over time. We distinguish three student loan vintages based on the year the students in the sample left or completed the degree program for which they took out a loan: pre-1980, 1980-99, and 2000-10. We also consider three “degree program buckets”: associate’s degrees and undergraduate certificates/diplomas (grouped together as “Associate’s Degrees” in this article); bachelor’s degrees (“Bachelor’s Degrees”); and master’s degrees, professional degrees, and Ph.D.’s (grouped together as “Post-Bachelor’s Degrees”).⁶ Our analysis finds evidence of economically and statistically large increases in student loan balances at college exit in the 2000-10 decade (compared with the previous vintage) in private institutions relative to public institutions for the Associate’s and Post-Bachelor’s Degree categories.⁷

We find that repayment behavior for loans for study in private institutions for Associate’s and Post-Bachelor’s Degrees showed steep deterioration in the 2000-10 decade relative to repayment behavior for loans for corresponding degrees in public institutions. The decline is largest by far in the Associate’s category, followed by Post-Bachelor’s, and these declines are highly statistically significant. The decline in loan repayment in the Associate’s Degree category is also statistically different from the decline in both the Bachelor’s and Post-Bachelor’s categories.

Importantly, while our data cannot distinguish between private for-profit and private not-for-profit institutions, associate’s degrees and undergraduate certificates have been overwhelmingly conferred in the private sector by for-profit institutions in the 2000-10 decade (Cellini and Goldin 2012; Chakrabarti and Grigsby 2013).⁸ Given that private for-profit institutions specialize in the degrees for which we find the largest declines in loan performance—and that this pattern is seen most dramatically in the past decade when for-profits posted a near-explosive surge in enrollment (Deming et al. 2012; Chakrabarti, Lovenheim, and Morris 2016)⁹—our results are consistent with a sharp deterioration in loan performance at private for-profit institutions.

1. OUR STUDY AND THE LITERATURE ON STUDENT LOANS

Our analysis is related to a small body of literature that examines student loan patterns. Avery and Turner (2012) document the increase in total student loans and assess the importance of student borrowing in human capital formation. Deming, Goldin, and Katz (2012) focus on private for-profit institutions and find evidence of higher unemployment rates, lower earnings, larger student loan debts, and higher default rates among for-profit graduates. Other studies, also related to ours, consider additional aspects of for-profit institutions. Cellini (2012) conducts a cost-benefit analysis of for-profit institutions, while Cellini and Goldin (2012) present evidence that eligible for-profit institutions raise tuition to capture federal student aid, a practice consistent with the so-called Bennett hypothesis.¹⁰ Cellini and Chaudhary (2012) and Cellini and Turner (2016) find support for a negative association between earnings and for-profit college attendance. Armona, Chakrabarti, and Lovenheim (2017) find evidence that for-profit college attendance leads to higher loan originations and default rates.

Although this literature provides a foundation for our analysis, our approach differs in important respects. Rather than limit our student loan analysis to for-profit institutions—the focus of many of the studies cited—we examine the whole spectrum of institutions and degrees. Moreover, the existing literature mostly looks at the period beginning in 2000, while our study compares loan outcomes in 2000-10 with those in previous vintages. We also depart from previous studies by investigating whether student loan balances and repayment behavior differ across institution and degree type—especially if the interaction between the two matters—and whether these patterns vary across student loan vintages.

In addition, our survey data have advantages over the data used in the existing literature. First, our survey questions elicited information about institution type, completion date, student loan balances, and repayment status for each degree program the respondent attended. We have loan-level data, which enables us to study behavior for each loan taken out by an individual student, separated by degree-institution combination. In contrast, student-level data in the literature make disaggregation of debt by different types of institutions and degrees difficult because students often enroll in multiple degree programs at multiple institutions. Thus, our data permit us to provide a perspective on loan behavior according to degree, institution, and loan vintage that previous studies cannot offer.

Second, the literature typically focuses on default rates, which only paint a partial picture. In addition to tracking student loans that default, one should track the much higher number of loans that become delinquent.¹¹ Our survey data let us capture both delinquency and default, providing a more complete view.

Note that the results of our study are largely descriptive. They should not be interpreted as showing a causal relationship between loan outcomes and the type of institution or degree program attended. Nonetheless, given the paucity of literature and the salience of student loans in today's policy arena, we believe our research takes an important step forward in promoting understanding of student loan behavior across institutions, degrees, and time.

2. DATA

Our data come from a survey of 756 individuals conducted over the internet through the RAND American Life Panel (ALP) in January 2011.¹² Our analysis focuses on the 204 survey respondents who had ever taken out a student loan for themselves. Basic summary statistics on this subset of respondents are presented in Table 1. Males constitute 41.7 percent of the sample. Whites make up 84.3 percent of the sample, while blacks and Hispanics constitute 8.8 percent and 5.4 percent of the sample, respectively. The 204 respondents had an average family income of \$70,270 and a median family income of \$67,500. Approximately 37 percent of the respondents had a Post-Bachelor's Degree (master's, professional, or Ph.D.) and 39 percent had a Bachelor's Degree.¹³

In our sample, 71.1 percent of respondents originated loans for only one degree, 22.1 percent took out loans for two degrees, and 6.9 percent had loans for three or more degrees. We have a total of 279 loan observations on the 204 respondents. Respondents had an average student loan balance of \$24,923 when they left the degree program (balance at exit) and an average current balance of \$7,586 when they were interviewed as part of the survey. All monetary amounts in this study are adjusted to 2011 dollars, the survey year. In our sample, 24 percent of the loans were taken out for associate's degrees or undergraduate certificates or diplomas (Associate's Degrees), 51 percent for Bachelor's Degrees, and 25 percent for master's, professional, or doctoral degrees (Post-Bachelor's Degrees). We put all student loans in our sample into the three vintages identified earlier—pre-1980, 1980-99, and 2000-10—based on the year the borrower left the degree program for which he or she had taken out the loan.

As expected, our sample of student loan borrowers is not representative of the U.S. population. Our respondents were relatively advantaged: they had higher-than-average educational attainment and higher-than-average income. They were also more likely to be white. As previously noted, our data set is unusually rich from a number of other perspectives. Instead of working with student-level data, we have student-loan-level data, which allows us to study balance and repayment behavior by degree and institution type. Student-level data usually cannot differentiate among loans taken by an individual for the pursuit of different degrees at different institution types. In addition, while the literature typically studies student loan default, our data allow us to study delinquency in addition to default. Our survey questions elicit the repayment history of each student loan, so that we can identify whether the loan was in good standing (current, deferred, under forbearance, forgiven, or fully paid off) or not (delinquent or in default).¹⁴ We refer to the good-standing variable as “good repayment” in this article. Mentions of “repayment behavior” in this article refer to analysis using the good-standing variable as a dependent variable.

For each student loan,¹⁵ we have data on what degree it was originated for, whether or when the degree program was completed, type of institution (public in-state, private in-state, public out-of-state, private out-of-state), number of years of study toward the degree (“years of study”), number of years for which the loan was taken out for that degree (“years of loan”), type of student loan (private, federal, state, or combination of federal and state, referred to as “combination”), student loan balance at exit, and current student loan balance. Using these data, we examine whether student loan behavior varied according to degree type, institution type, and loan vintage. We note that there may be measurement errors in some of our variables—a drawback common with survey data. For example, it is possible that some individuals do not remember their exact loan volumes at exit, their current balances, or the date when they originated loans corresponding to a specific degree.

TABLE 1

Descriptive Statistics for the Sample

Total number of respondents	756
Number of respondents who took out any student loan	204
Demographic breakdown of borrowers (percent)	
Male	41.7
Black	8.8
Hispanic	5.4
Asian	1.5
Average age (years)	45.3
	[44]
	(12.6)
Average family annual income (dollars)	70,270
	[67,500]
	(31,806)
Breakdown by highest degree earned (percent)	
High school diploma	11.8
Associate's Degree	12.3
Bachelor's Degree	39.2
Post-Bachelor's Degree	36.8
Breakdown of loan reciprocity by number of degrees (percent)	
Took out loan for one degree	71.1
Took out loans for two degrees	22.1
Took out loans for three or more degrees	6.9
Average balance at exit (dollars)	24,923
	[18,100]
	(27,888)
Average current balance (dollars)	7,586
	[0]
	(16,190)
Percentage of loans in good standing ^a	75

(CONTINUED ON NEXT PAGE)

3. EMPIRICAL ANALYSIS

3.1 Examining Student Loan Characteristics and Type of Institution Attended: Does Degree Type Matter?

In this section, using our sample of individuals who took out student loans for themselves (“student loan borrowers”), we investigate how degree type correlated with student loan characteristics and institution type. The results are presented in Table 2. Panel A shows that, for all degree types, the majority of loans taken out were for degree programs at public institutions.

TABLE 1 (CONTINUED)

Among degrees for which loans were taken out:	
Number of observations	279
Breakdown by degree type (percent)	
Associate's Degree	24.0
Bachelor's Degree	51.3
Post-Bachelor's Degree	24.7
Breakdown by completion date of degree (percent)	
Pre-1980 vintage ^b	19.8
1980-99 vintage	44.0
2000-10 vintage	36.3

Source: Authors' calculations, based on data from the American Life Panel (ALP), January 2011.

Notes: For continuous variables, the mean is reported in the first row, the median in square brackets, and the standard deviation in parentheses. Associate's Degree encompasses associates's degrees and undergraduate certificates and diplomas. Post-Bachelor's Degree pools master's, professional, and Ph.D. degrees. All dollar amounts are adjusted to 2011 dollars.

^aGood standing indicates that, since taking out the loan, the respondent either did not default on the loan or had no payments past due.

^bVintages are defined as the period during which the respondent left the degree program for which the loan was taken out.

However, the proportion of loans taken out for study in private institutions increased with higher degrees. These patterns are expected because more students go to public institutions than to private institutions at various degree levels and because the proportion of students going to private institutions is higher for higher degrees. In addition, as might be expected, a higher proportion of loans were taken out for study in in-state public institutions, while the proportion of loans for study in out-of-state institutions, especially out-of-state private, showed statistically significant increases with higher degrees.

In our sample, years of study for various degrees match the expected number of years for those degrees (Panel B). Interestingly, years of loan (Panel C) for Associate's Degrees were economically and statistically higher than the corresponding number for years of study, possibly because Associate's Degree students were likely to be attending college part-time. Years of loan for other degrees correlate well with the number of years of study for those degrees.

Panel D shows that, for all degree programs, loans taken out were more likely to be public (federal or state) loans. This finding is not surprising because federal loans come with more generous terms and conditions than private loans. They have strong repayment protections,¹⁶ are federally subsidized and guaranteed, generally do not require a co-signer, and offer identical terms regardless of the student's credit history, other measures of ability to pay, or institution attended. Of note here is that, for higher degrees, the composition of loans seems to shift slightly toward private loans, or a combination of public and private loans, but these differences are not statistically significant.

As noted earlier, loan balances at exit are considerably higher for the more advanced degrees, both statistically and economically.¹⁷ Correspondingly, current loan balances are also higher for the more advanced degrees.

TABLE 2

Investigating Student Loan Characteristics and Institution Type by Type of Degree

	All Degrees (1)	Associate's Degrees (2)	Bachelor's Degrees (3)	Post-Bachelor's Degrees (4)	F-test ^a
Number of observations	279	67	143	69	
Panel A					
Breakdown by institution type (percent)					
Public institution	64.83	78.46	61.97**	55.93**	0.0458
Private institution	35.16	21.53	38.02**	44.06***	0.0458
In-state public	56.77	70.76	56.33**	44.06***	0.0215
In-state private	19.78	16.92	24.64	13.55	0.1324
Out-of-state public	8.06	7.692	5.633	11.86	0.0996
Out-of-state private	15.38	4.615	13.38*	30.50***	0.0005
Panel B					
Years of study	3.16 [3] (1.40)	2.21 [2] (1.02)	3.87*** [4***] (1.18)	2.22 [2] (1.09)	0.0000
Panel C					
Years of loan	3.46 [3] (2.43)	3.71 [2] (2.77)	3.71 [4] (2.37)	2.39*** [2] (1.98)	0.0104
Panel D					
Breakdown by loan type (percent)					
Federal/state-only	70.22	73.01	70.92	66.10	0.8513
Private-only	9.93	12.69	6.382	13.55	0.1796
Combination	19.85	14.28	22.69	20.33	0.5004
Panel E					
Loan balance at exit (thousands of dollars)	25.58 [17.94] (30.63)	13.81 [12.10] (10.60)	25.89*** [20.79***] (32.06)	34.91*** [23.29***] (36.04)	0.0002
Current loan balance (thousands of dollars)	8.821 [0] (17.28)	4.28 [0] (7.27)	6.59 [0] (11.65)	17.47** [.90] (28.57)	0.0000

(CONTINUED ON NEXT PAGE)

TABLE 2 (CONTINUED)

	All Degrees (1)	Associate's Degrees (2)	Bachelor's Degrees (3)	Post- Bachelor's Degrees (4)	F-test ^a
Panel F					
Percentage of loans in good standing					
All loans	74.55	62.68	75.52	81.66**	0.0207
Federal/state-only loans	75.39	65.21	75.00	84.61**	0.0974
Private-only loans	85.18	75.00	88.88	87.50	0.7986
Combination	66.66	33.33	71.87**	75.00*	0.1271

Source: Authors' calculations, based on data from the American Life Panel (ALP), January 2011.

Notes: For continuous variables, the mean is reported in the first row, the median in square brackets, and the standard deviation in parentheses. The table reports a pairwise Wilcoxon test for equality of proportion/mean against Associate's Degree. The median test (for equality of median against Associate's Degree) is also reported. Associate's Degree encompasses associate's degrees and undergraduate certificates and diplomas. Post-Bachelor's Degree pools master's, professional, and Ph.D. degrees. All dollar amounts are adjusted to 2011 dollars.

^a The p-value of the F-test is reported for equality of means across columns (degree types), excluding column 1.

*Significant at the 10 percent level.

**Significant at the 5 percent level.

***Significant at the 1 percent level.

The first row of Panel F pools all student loan types, showing that loans associated with more advanced degrees were more likely to be in good standing than loans associated with the Associate's Degree. The difference is also statistically significant for the Post-Bachelor's Degree. This pattern is repeated for all public, private, and combination loans.

3.2 Examining Student Loan Characteristics and Type of Institution Attended: Does Loan Vintage Matter?

We next investigate whether student characteristics and outcomes and types of institution attended varied by student loan vintage (Table 3). While there seems to have been a move among student loan borrowers toward in-state public institutions in the 1980-99 period relative to the pre-1980 era, the pattern reversed in the past decade with shifts toward private institutions, especially in-state private (Panel A). This picture is consistent with the rapid growth of for-profit institutions in the past decade (Deming, Goldin, and Katz 2012; Chakrabarti, Lovenheim, and Morris 2016).¹⁸ Interestingly, average and median years of study fell in the past decade, a statistically significant difference from the two earlier vintages (Panel B).¹⁹ These declines may also indicate a rise in the share of for-profit enrollment in the 2000-10 period because such institutions are more likely to offer two-year associate's degrees.

TABLE 3

Investigating Student Loan Characteristics and Institution Type by Student Loan Vintage

	All Vintages	Pre-1980	1980-99	2000-10	F-test ^a
	(1)	(2)	(3)	(4)	
Number of observations	279	54	120	99	
Panel A					
Breakdown by institution type (percent)					
Public institution	64.83	60.37	67.22	64.28	0.6819
Private institution	35.16	39.62	32.77	35.71	0.6819
In-state public	56.77	45.28	63.02**	55.10	0.0887
In-state private	19.78	28.30	15.96*	19.38	0.1714
Out-of-state public	8.06	15.09	4.20**	9.18	0.0489
Out-of-state private	15.38	11.32	16.80	16.32	0.6373
Panel B					
Years of study	3.16	3.17	3.45	2.85*	0.0082
	[3]	[3.5]	[4*]	[3*]	
	(1.40)	(1.17)	(1.32)	(1.54)	
Panel C					
Years of loan	3.46	3.62	3.77	3.04	0.1036
	[3]	[2]	[4*]	[3]	
	(2.43)	(3.02)	(2.35)	(2.19)	

(CONTINUED ON NEXT PAGE)

In the last two loan vintages, especially the 2000-10 vintage, there seems to have been an increase in supplementation of public loans with combination loans (Panel D, last row). Balance at exit also shows a large increase in the last two vintages, and the upturn is economically and statistically significant for the last vintage (Panel E) relative to the pre-1980 vintage. The percentage of loans in good standing fell in the last two vintages, though the differences are not statistically significant (Panel F).

3.3 Investigating Student Loan Performance by Degree and Vintage: Does Interaction between Degree and Vintage Matter?

In this section, we study student loan characteristics and outcomes by degree type and vintage, and investigate whether the performance of loans for various degrees differed within and across vintages. Specifically, were the larger balances and the worsening repayment behavior in the later vintages, described in the previous section, driven by student loans for specific degrees? Table 4 presents the results for the three vintages in Panels A, B, and C.

While average balances at exit among student loan borrowers (column 1) fell for the Bachelor’s Degree category between the 1980-99 and 2000-10 vintages (from \$28,230 to \$22,606), balances at

TABLE 3 (CONTINUED)

	All Vintages (1)	Pre-1980 (2)	1980-99 (3)	2000-10 (4)	F-test ^a
Panel D					
Breakdown by loan type (percent)					
Federal/state-only	70.22	72.54	70.00	69.38	0.9204
Private-only	9.93	17.64	8.33*	7.14*	0.0969
Combination	19.85	9.80	21.66*	23.46**	0.1204
Panel E					
Loan balance at exit (thousands of dollars)	25.58 [17.94] (30.63)	20.81 [12.58] (24.23)	26.01 [17.05] (36.08)	28.02* [20.83*] (26.29)	0.4007
Panel F					
Percentage of loans in good standing	74.55	81.48	73.33*	72.72	0.4438

Source: Authors' calculations, based on data from the American Life Panel (ALP), January 2011.

Notes: For continuous variables, the mean is reported in the first row, the median in square brackets, and the standard deviation in parentheses. The table reports a pairwise Wilcoxon test for equality of proportion/mean against pre-1980. The median test (for equality of median against pre-1980) is also reported. All dollar amounts are adjusted to 2011 dollars.

^a The p -value of the F -test is reported for equality of means across columns (vintages), excluding column 1.

*Significant at the 10 percent level.

**Significant at the 5 percent level.

***Significant at the 1 percent level.

exit for Associate's and Post-Bachelor's Degrees rose (\$13,093 to \$15,865 and \$35,510 to \$44,795, respectively). Next, consider current balances (column 2). Current balances in the last vintage are artificially inflated because we are observing them close to the degree completion date, but it is still instructive to study whether the change in current balances between vintages was similar or different across degrees and institution types. Current loan balances for Associate's Degrees in the 2000-10 vintage were 11 times the current balance in the 1980-99 vintage. In contrast, the current balances for Bachelor's and Post-Bachelor's Degrees were respectively 5 and 9.5 times higher than the corresponding 1980-99 balances.²⁰

Just as current balances in the last vintage were artificially high, the percentage of loans in good standing may be artificially deflated in the last vintage—again because we are observing individuals relatively closer to their start of repayment. Still, it is informative to compare whether the change in this variable between vintages differed across degrees and institution types. Percentage of loans in good standing (column 3) progressively declined over the vintages for both Associate's and Post-Bachelor's Degrees, though the difference was not statistically significant. In results not presented here, we found that the deterioration in repayment behavior for

TABLE 4
 Relationship between Degree Type and Student Loan Characteristics, across Vintages

	Balance at Exit (1)	Current Balance (2)	Good Repayment History (3)	Private Institution (4)
Panel A: Pre-1980				
Associate's Degree	12,463	0	0.77	0.25
	[9,300]	[0]	[1]	[0]
	(8,766)	(.)	(0.44)	(0.45)
Bachelor's Degree	25,425	0	0.81	0.47
	[16,680]	[0]	[1]	[0]
	(29,170)	(.)	(0.40)	(0.51)
Post-Bachelor's Degree	15,666	0	0.89	0.33
	[9,480]	[0]	[1]	[0]
	(14,550)	(.)	(0.33)	(0.50)
<i>F</i> -test	0.251	.	0.786	0.397
<i>N</i>	50	51	54	53
Mean	20,817	0	0.81	0.40

(CONTINUED ON NEXT PAGE)

Post-Bachelor's Degrees is mostly attributable to increases in current balances and the worsening of repayment behavior in loans for master's and professional degrees.

Column 4 shows an increased tendency in the last vintage for Associate's and Post-Bachelor's Degree students to attend private institutions, which may reflect the disproportionate growth of the private, for-profit sector (Deming, Goldin, and Katz 2012; Chakrabarti, Lovenheim, and Morris 2016). It is noteworthy that for-profits mostly confer associate's degrees, undergraduate certificates, and master's degrees. For example, Cellini and Goldin (2012) report that, in 2008-09, for-profits produced 42 percent of vocational certificates, 18 percent of associate's degrees, 5 percent of bachelor's degrees, and 10 percent of master's degrees.

The fact that loans relating to associate's degrees, undergraduate certificates, and master's and professional degrees performed worse than loans relating to bachelor's degrees in the last vintage is telling. The growth of for-profits in the last vintage, along with the fact that for-profits mainly grant associate's degrees and undergraduate certificates and master's degrees, suggests that for-profit institutions played an important role in the worsening of student loan behavior. Table 4 does not distinguish the loan behavior of students at public institutions from that of students at private institutions. The declining loan performance of degrees in which for-profit institutions are concentrated is suggestive of for-profit trends, but the pattern could also reflect loan behavior at public and private not-for-profit institutions. In the next section, we examine differences in student loan behavior among students attending public and private institutions in the three vintages. And in Section 3.5, we drill down deeper, analyzing student loan behavior by degree and type of institution across and within the three vintages.

TABLE 4 (CONTINUED)

	Balance at Exit (1)	Current Balance (2)	Good Repayment History (3)	Private Institution (4)
Panel B: 1980-99				
Associate's Degree	13,093 [10,578] (9,593)	946 [0] (2,488)	0.61 [1] (0.50)	0.14 [0] (0.36)
Bachelor's Degree	28,230 [20,900] (39,954)	3,255** [0**] (8,666)	0.73 [1] (0.45)	0.39 [0] (0.49)
Post-Bachelor's Degree	35,510 [18,590] (41,568)	3,630 [0] (8,574)	0.88 [1] (0.33)	0.38 [0] (0.49)
<i>F</i> -test	0.065	0.344	0.082	0.058
<i>N</i>	116	116	120	119
Mean	26,020	2,772	0.73	0.33
Panel C: 2000-10				
Associate's Degree	15,865 [13,550*] (12,347)	10,316*** [9,250***] (8,746)	0.58 [1] (0.50)	0.29 [0] (0.46)
Bachelor's Degree	22,606 [21,110] (17,213)	16,230*** [17,000***] (13,610)	0.75 [1] (0.44)	0.30 [0] (0.46)
Post-Bachelor's Degree	44,795** [36,720] (35,225)	34,555*** [22,000***] (32,619)	0.81 [1] (0.40)	0.48 [0] (0.51)
<i>F</i> -test	0.000	0.000	0.169	0.209
<i>N</i>	97	98	99	98
Mean	28,029	20,578	0.73	0.36

Source: Authors' calculations, based on data from the American Life Panel (ALP), January 2011.

Notes: For continuous variables, the mean is reported in the first row, the median in square brackets, and the standard deviation in parentheses. The table reports a pairwise Wilcoxon test for equality of proportion/mean against pre-1980. All dollar amounts are adjusted to 2011 dollars.

*Significant at the 10 percent level.

**Significant at the 5 percent level.

***Significant at the 1 percent level.

3.4 Do Student Loan Characteristics by Institution Type Differ across Vintages?

In this section, we investigate whether the differences in student loan behavior observed across the three vintages came more from student loan borrowing at private institutions or from borrowing at public institutions. Table 5 presents the results. Panels A, B, and C show the patterns for the pre-1980, 1980-99, and 2000-10 vintages, respectively. As might be expected, in each of the vintages, both at-exit and current loan balances at private institutions exceeded those at public institutions.

However, there are interesting variations across the vintages. Balances at exit (column 1) steadily increased in succeeding vintages, but this pattern is more pronounced at private institutions. Turning to current balances (column 2) and comparing vintages and institution types, we find that current balances at public institutions in the 2000-10 vintage were 6.4 times the corresponding balances in the 1980-99 vintage, while current balances at private institutions were 8.8 times those of the corresponding balances in the previous vintage. Thus, we find that both balances at exit and current balances for education loans have risen faster at private institutions than at public institutions.

The loan performance patterns presented in column 3 are consistent with this picture. Repayment behavior for loans taken out to attend private institutions showed a steep fall (from 0.85 in the 1980-99 vintage to 0.77 in the 2000-10 vintage), though this difference is statistically different from zero only at the 16 percent level, which can be explained in part by small sample sizes.

Also of interest is that trends in repayment behavior between the first two vintages reversed in the last vintage. While repayment behavior for private institution loans improved economically and statistically in the second vintage, it worsened in the last vintage—the period that saw disproportionately large growth of for-profit institutions. This finding suggests that for-profit institutions may have played a significant role in the deterioration of repayment behavior for loans taken out for study at private institutions in the 2000-10 period.

3.5 Studying Student Loan Characteristics by Degree and Institution Type: Does Loan Vintage Matter?

In this section, we study whether the 2000-10 worsening of repayment behavior for loans associated with private institutions relative to those associated with public institutions can be explained by loan performance in specific degree categories. In the previous section, we offered evidence that performance deteriorated for loans taken out to attend private institutions in the last vintage relative to loans taken out to attend public institutions. And in Section 3.3, we presented evidence that, in the last vintage, the performance of loans associated with associate's degrees, undergraduate certificates, master's degrees, and professional degrees was relatively worse. Is it the case, then, that the last vintage was characterized by worse performance of loans for these degree categories at private institutions?

The results of a regression of each loan outcome variable, including balance at exit, current balance, and good repayment, on a 1-0 private institution dummy and a constant term, are

TABLE 5

Relationship between Institution Type and Student Loan Characteristics, across Vintages

	Balance at Exit (1)	Current Balance (2)	Good Repayment (3)
Panel A: Pre-1980			
Public institution	16,944 [10,008] (20,300)	0 [0] (.)	0.84 [1] (0.37)
Private institution	27,701 [26,100] (29,379)	0 [0] (.)	0.76 [1] (0.44)
<i>F</i> -test	0.133	.	0.466
Number of observations	50	50	53
Mean	20,817	0	0.81
Panel B: 1980-99			
Public institution	20,493 [16,000] (24,533)	2,630* [0*] (7,097)	0.68 [1] (0.47)
Private institution	37,184 [24,000] (51,176)	3,134*** [0***] (8,814)	0.85* [1] (0.37)
<i>F</i> -test	0.020	0.742	0.049
Number of observations	115	115	119
Mean	26,009	2,796	0.73

(CONTINUED ON NEXT PAGE)

presented in Table 6. This regression is repeated for each vintage and degree bucket combination. The constant term captures the loan outcome for loans taken out to attend public institutions; the coefficient of “private institution” captures any differential loan outcome for study in private institutions. We note that the results for the Post-Bachelor’s Degree category in each of the vintages are driven by changes in loans for master’s and professional degrees only. There are very few, or no, observations for doctoral degrees in these cells, and they do not have enough variation across institution type to permit estimation.

The results in Table 6 show larger increases in the last vintage of private institution loan balances at exit than in the last vintage of public institution balances at exit for Associate’s and

TABLE 5 (CONTINUED)

	Balance at Exit (1)	Current Balance (2)	Good Repayment (3)
Panel C: 2000-10			
Public institution	21,592 [19,295**] (22,268)	16,759*** [13,500***] (21,700)	0.70 [1] (0.46)
Private institution	39,432 [33,600] (29,212)	27,452*** [25,000***] (23,694)	0.77 [1] (0.43)
<i>H</i> -test	0.001	0.026	0.443
Number of observations	97	98	98
Mean	28,029	20,578	0.72

Source: Authors' calculations, based on data from the American Life Panel (ALP), January 2011.

Notes: The table reports a pairwise Wilcoxon test for equality of proportion/mean against pre-1980. The median test (for equality of median against pre-1980) is also reported. Medians appear in brackets and standard deviations in parentheses. All dollar amounts are adjusted to 2011 dollars.

*Significant at the 10 percent level.

**Significant at the 5 percent level.

***Significant at the 1 percent level.

Post-Bachelor's Degrees (columns 1 and 7 respectively). In the 1980-99 vintage, balances at exit for Associate's Degrees in private institutions were \$6,507 higher than those in public institutions. In the 2000-10 vintage, this number was \$13,011. For Post-Bachelor's Degrees, while balances at exit were actually \$4,983 lower in private institutions in the 1980-99 vintage, they were \$18,404 higher in the 2000-10 vintage.

Current balances (and good repayment) in the latter vintages are subject to the caveat that we are observing these loans for a shorter time after the borrowers' degree completion date, but balances at exit do not suffer from this problem. The huge increases in the balances at exit for private institution Associate's and Post-Bachelor's Degrees are especially noteworthy.

The results for good repayment (columns 3, 6, and 9) show a pattern similar to that for balance at exit. Relative to the repayment behavior for public institution loans, the repayment behavior for private institution loans deteriorated for all degree types in the last vintage. However, the decline is by far the largest in the Associate's Degree category (from a 0.458 higher likelihood of good repayment relative to public institutions in the 1980-99 vintage to 0.185 in the 2000-10 vintage), followed by the Post-Bachelor's Degree category (from 0.0222 to -0.0125). The decline in private institution loan performance relative to public institution loan performance for the Associate's Degree is also statistically different from the decline in both the Bachelor's and Post-Bachelor's categories. It is noteworthy that repayment behavior for public institution loans for Associate's Degrees steadily declined (though not statistically) over vintages, as can be seen by comparing the

TABLE 6
Student Loan Performance by Institution and Degree Type, across Vintages

	Associate's Degree			Bachelor's Degree			Post-Bachelor's Degree		
	Balance at Exit (1)	Current Balance (2)	Good Repayment (3)	Balance at Exit (4)	Current Balance (5)	Good Repayment (6)	Balance at Exit (7)	Current Balance (8)	Good Repayment (9)
Panel A: Pre-1980									
Private institution	-2,417.2 (3,540.57)	-	0.333* (0.17)	5,962.8 (11,270.67)	-	-0.275* (0.14)	28,100.8*** (3,162.62)	-	0.167 (0.17)
Constant	12,902.2*** (3,375.94)	-	0.667*** (0.17)	22,841.5*** (6,251.91)	-	0.941*** (0.06)	6,299.2*** (1,451.85)	-	0.833*** (0.17)
R ²	0.012	-	0.111	0.011	-	0.123	0.933	-	0.063
Number of observations	11	-	12	30	-	32	9	-	9
Panel B: 1980-99									
Private institution	6,507.1 (7,048.57)	-1,103.3* (551.87)	0.458*** (0.11)	21,847.4* (12,006.25)	1,964.0 (2,402.12)	0.125** (0.11)	-4,983.1 (18,126.09)	-5,012.8 (3,149.54)	0.0222 (0.14)
Constant	12,162.9*** (1,754.79)	1,103.3* (551.87)	0.542*** (0.11)	19,827.3*** (2,817.55)	2,500.0** (1,150.86)	0.683*** (0.07)	37,922.0*** (13,046.78)	5,846.2* (3,039.84)	0.867*** (0.09)
R ²	0.058	0.025	0.108	0.072	0.012	0.019	0.003	0.001	0.001
Number of observations	28	28	28	65	65	67	22	24	24

(CONTINUED ON NEXT PAGE)

TABLE 6 (CONTINUED)

	Associate's Degree			Bachelor's Degree			Post-Bachelor's Degree		
	Balance at Exit (1)	Current Balance (2)	Good Repayment (3)	Balance at Exit (4)	Current Balance (5)	Good Repayment (6)	Balance at Exit (7)	Current Balance (8)	Good Repayment (9)
Panel C: 2000-10									
Private institution	13,010.9*	2,444.8	0.185	10,724.4*	6,781.9	0.0359	18,404.3	11,066.73	-0.0125
	(6,353.96)	(4,125.19)	(0.22)	(6,310.63)	(4,892.71)	(0.15)	(12,402.72)	(11,642.25)	(0.15)
Constant	12,069.7***	9,602.9***	0.529***	19,286.3***	14,179.6***	0.733***	35,889.7***	29,199.9***	0.813***
	(1,970.30)	(2,094.69)	(0.13)	(2,711.57)	(2,242.34)	(0.08)	(8,756.54)	(9,177.5)	(0.10)
R ²	0.239	0.017	0.029	0.085	0.054	0.001	0.070	0.000	0.000
Number of observations	24	24	24	42	43	43	31	31	31

Source: Authors' calculations, based on data from the American Life Panel (ALP), January 2011.

Notes: The table reports ordinary least squares estimates of a regression of the column variable on a constant term and a dummy for private institution. Standard errors are reported in parentheses. The table also reports a pairwise test for the difference between the coefficient on private institution in 1980-99 and 2000-10 and the coefficient on the dummy for private institution in the pre-1980 vintage. In cases where the pre-1980 vintage is not applicable, the test is against 1980-99. All dollar amounts are adjusted to 2011 dollars.

* Significant at the 10 percent level.

** Significant at the 5 percent level.

*** Significant at the 1 percent level.

constant terms across vintages in column 3. The declining performance of public institution loans for Associate's Degrees is especially problematic because the bulk of the Associate's Degrees are offered in public institutions, typically community colleges (two-year public institutions).

The steeper declines in loan performance in the last vintage for loans for private institution Associate's and Post-Bachelor's Degrees—and especially for Associate's—are consistent with sharp increases in attendance and borrowing, as well as deterioration in loan performance, at for-profit institutions. While we cannot distinguish between private for-profit and private not-for-profit institutions, associate's degrees and undergraduate certificates from private institutions are now overwhelmingly granted by for-profit institutions.

Our findings are consistent with those in Armona, Chakrabarti, and Lovenheim (2017). While their data do not enable them to parse out loans by institution and degree, they show that for-profit attendance leads to default rates that are higher than those seen with public college attendance. The results presented in our article reveal that the worst-performing loans in the last vintage were originated for degrees at private institutions in our Associate's Degree category. Given the explosive growth of private for-profit institutions in the past decade and their concentration in our Associate's Degree category, these results suggest that this relative worsening of loan performance at private institutions is driven by for-profit institutions.

4. CONCLUSION

While financial aid plays an indisputable role in financing a college education, the importance of student loans has been increasing. Student debt mounted steadily during the 2000s, even during the recession when other forms of household debt declined. By the end of June 2016, holdings had soared to \$1.26 trillion. And alongside the growth in student loan balances, delinquencies have been on the rise. Given the importance of student loans in facilitating human capital formation and their role in promoting economic growth, careful and detailed analysis of the student loan market is imperative. Yet the literature on student loan growth and repayment behavior has been limited. This study fills an important gap in the literature on student loans by examining student loan performance across institutions and degree categories, and by investigating whether these patterns have changed over time.

Using detailed survey data on loan balances, delinquency history, institution type, and a range of other factors, we find that student loan growth and performance has varied across degrees, institutions, and time. Specifically, we find that student loan balances at college exit for study in the degree programs at private institutions that we identified as Associate's and Post-Bachelor's Degrees increased sharply in the 2000-10 period relative to loans for corresponding degrees at public institutions. At the same time, the repayment of loans for these degrees at private institutions declined relative to loan repayment for corresponding degrees at public institutions, although the latter loans also saw a drop in repayment. These relative increases in loan balances at exit and declines in repayment during the last decade were most pronounced for Associate's Degree programs at private institutions.

These results strongly suggest that the relative worsening of loan performance at private institutions was concentrated among loans for study at for-profit institutions. Two bodies

of evidence support that conclusion: First, the 2000-10 period matches well with the rise of the for-profit sector. Second, among private higher education institutions, the bulk of associate's degrees and undergraduate certificates are conferred by for-profit institutions.

These findings have important policy and economic implications. First, to the extent that adverse loan performance reflects low or negative returns to an education investment, it raises questions about the quality of such programs and whether students enrolling in these programs were adequately prepared and informed. Second, our results point to potentially large negative consequences for the students affected. Those holding loans that are delinquent or in default may experience immediate financial hardship; down the line, they may see a reduction in their credit scores that makes it difficult for them to obtain home or car loans or even to find a job (since many jobs now make hiring conditional on a credit report check). Lack of credit access could further adversely affect consumption, which in turn could act as a drag on GDP growth.

Given the importance of student loans for both borrowers and the broad economy, more research is needed to improve our understanding of the patterns in this credit market. One potential avenue would be to compare the loan origination and performance of private for-profit and private not-for-profit institutions directly, analyzing the data by degree type. It would also be interesting to explore heterogeneity in average borrowing and loan performance across institutions within the private for-profit sector. Another line of research would be to examine whether the patterns described in this article persist as the economy extends its recovery and labor market conditions improve further for graduates: Specifically, are students at for-profit institutions continuing to hold larger loan balances at exit and to have more trouble paying back loans than their counterparts at other types of institutions? The answers to such questions promise to tell us much about the changes in the labor market, the returns provided by alternative types of post-secondary institutions, and the effects of institution type on human capital formation and labor market dynamics.

NOTES

Acknowledgments: The authors thank Susan Dynarski, Lance Lochner, Sarah Turner, and Sam Zuckerman for helpful comments and suggestions. Maricar Mabutus and David Yun provided excellent research assistance.

¹ Institute for College Access and Success, “Quick Facts about Student Debt,” March 2014, https://ticas.org/sites/default/files/pub_files/debt_facts_and_sources.pdf.

² New York Fed Consumer Credit Panel/Equifax.

³ Federal Reserve Bank of New York, Quarterly Report on Household Debt and Credit, 2016:Q3, based on New York Fed Consumer Credit Panel/Equifax data.

⁴ These rates understate actual delinquency rates because many of these loans are currently in deferment, in grace period, or in forbearance, and are thus not in repayment. See Brown et al. (2012) for more details.

⁵ Bleemer et al. (2017) find that holding student loans adversely affects homeownership rates for those aged twenty-eight to thirty.

⁶ This article distinguishes between specific degrees and certificates (associate’s degree, undergraduate certificate/diploma, bachelor’s degree, master’s degree, professional degrees, and doctoral degree) on the one hand, and on the other, our three “degree program buckets,” which group degrees for analytical purposes: Associate’s, Bachelor’s, and Post-Bachelor’s. When referring to specific degrees, we use lowercase lettering; when referring to our three degree program buckets, we use initial capital letters.

⁷ In our preferred analysis, where we run regressions by loan vintage, degree, and institution type, we have very few or no observations for Ph.D’s. Thus, the results for the Post-Bachelor’s Degree category are driven by master’s and professional degree loans.

⁸ Unfortunately, we did not separately elicit from the respondents the type of private institution (private for-profit, private not-for-profit) they attended when their loan(s) was (were) originated. Consequently, we cannot directly distinguish private for-profit attendance from private not-for-profit attendance in the data.

⁹ Chakrabarti, Lovenheim, and Morris (2016) find that for-profit enrollment almost quadrupled between 2000 and 2011.

¹⁰ According to the Bennett hypothesis (named after former Education Secretary William Bennett), increases in federal student aid lead to increases in college tuition. Using data from the past decade and a half, Lucca, Nadauld, and Shen (25, no. 1, December 2019) find that federal aid increases have, in fact, been capitalized into tuition price increases.

¹¹ The New York Fed’s Quarterly Report on Household Debt and Credit provides data on defaults and delinquencies. A loan is in default if no payment has been made for 270 days or more after it enters repayment. A loan is delinquent if a borrower is at least 30 days late in making payment on it.

¹² The sample for our panel survey consists of respondents who had participated in the Thomson Reuters/University of Michigan Survey of Consumers between November 2006 and July 2010 and were subsequently recruited into the ALP.

¹³ Our three degree buckets—Associate’s, Bachelor’s, and Post-Bachelor’s—are mutually exclusive.

¹⁴ A student loan is current if payments are made on time. A deferment or forbearance allows the student loan holder to temporarily postpone payments. If payment on a loan is not made on time and no deferment has been granted, the loan becomes past due after 30 days and enters delinquency. If a loan is 270 days past due, it is considered to be in default. Under certain circumstances, federally backed student loans, such as Direct Subsidized Loans and Federal Perkins Loans, can be discharged or forgiven.

¹⁵ Note that we observe only the aggregate loan amount taken out for a program attended, although an individual may take out multiple loans for the program. Each student loan thus refers here to the aggregate loan amount taken out for a program.

NOTES (CONTINUED)

¹⁶ They allow deferment of student loan payments until after graduation, forbearance for economic hardship, and adjustment of repayment according to the borrower's income (under various income-dependent repayment programs).

¹⁷ Judith Scott-Clayton, "Student Loan Debt: Who Are the 1 Percent?," *New York Times*, December 2, 2011.

¹⁸ Deming, Goldin, and Katz report that enrollment in for-profit institutions increased from 4.3 percent of total enrollment in 2000 to 10.7 percent in 2009. These numbers pertain to Title IV degree and nondegree-granting higher education institutions.

¹⁹ The declines in the years of study (and years of loan) in the last vintage may partly reflect the fact that we do not observe individuals long enough and they may still be in college.

²⁰ No positive current balances were reported for the pre-1980 vintage loans.

REFERENCES

- Armona, L., R. Chakrabarti, and M. Lovenheim.* 2017. “How Does For-Profit College Attendance Affect Student Loans, Defaults, and Earnings?” *Federal Reserve Bank of New York STAFF REPORTS*, no. 811, April.
- Bleemer, Z., M. Brown, D. Lee, K. Strair, and W. van der Klaauw.* 2017. “Echoes of Rising Tuition in Students’ Borrowing, Educational Attainment, and Homeownership in Post-Recession America.” *Federal Reserve Bank of New York STAFF REPORTS*, no. 820, July.
- Brown, M., A. Haughwout, D. Lee, M. Mabutis, and W. van der Klaauw.* 2012. “Grading Student Loans.” *Federal Reserve Bank of New York LIBERTY STREET ECONOMICS*, March 5, <http://libertystreeteconomics.newyorkfed.org/2012/03/grading-student-loans.html>.
- Cellini, S. R.* 2012. “For-Profit Higher Education: An Assessment of Costs and Benefits.” *NATIONAL TAX JOURNAL* 65, no. 1: 153-79.
- Cellini, S. R., and C. Goldin.* 2014. “Does Federal Student Aid Raise Tuition? New Evidence on For-Profit Colleges.” *AMERICAN ECONOMIC JOURNAL: ECONOMIC POLICY* 6, no.4 (November): 174-206.
- Cellini, S. R., and L. Chaudhary.* 2014. “The Labor Market Returns to a For-Profit College Education.” *ECONOMICS OF EDUCATION REVIEW* 43 (December): 125-40.
- Cellini, S. R., and N. Turner.* 2016. “Gainfully Employed? Assessing the Employment and Earnings of For-Profit College Students Using Administrative Data.” *NBER WORKING PAPER NO. 22287*, May.
- Chakrabarti, R., N. Gorton, M. Jiang, and W. Van der Klaauw.* 2017. “Who Is More Likely to Default on Student Loans?” *Federal Reserve Bank of New York LIBERTY STREET ECONOMICS*, November 20, <http://libertystreeteconomics.newyorkfed.org/2017/11/who-is-more-likely-to-default-on-student-loans.html>.
- Chakrabarti, R., A. Haughwout, D. Lee, J. Scally, and W. van der Klaauw.* 2017. “Press Briefing on Household Debt, with Focus on Student Debt.” *Federal Reserve Bank of New York*, April 3, <https://www.newyorkfed.org/medialibrary/media/press/pressbriefing-household-student-debt-april32017.pdf>.
- Chakrabarti, R., and J. Grigsby.* 2013. “Just Released: Lifting the Veil—For-Profits in the Higher Education Landscape.” *Federal Reserve Bank of New York LIBERTY STREET ECONOMICS*, November 20, <http://libertystreeteconomics.newyorkfed.org/2013/11/just-released-lifting-the-veilfor-profits-in-the-higher-education-landscape.html>.

REFERENCES (CONTINUED)

- Chakrabarti, R., M. Lovenheim, and K. Morris.* 2016. “The Changing Higher Education Landscape.” Federal Reserve Bank of New York LIBERTY STREET ECONOMICS, September 6, <http://libertystreeteconomics.newyorkfed.org/2016/09/the-changing-higher-education-landscape.html>.
- Deming, D. J., C. Goldin, and L. F. Katz.* 2012. “The For-Profit Postsecondary School Sector: Nimble Critters or Agile Predators?” JOURNAL OF ECONOMIC PERSPECTIVES 26, no. 1 (Winter): 139-64.

The Economic Policy Review is published by the Research and Statistics Group of the Federal Reserve Bank of New York. The views expressed are those of the individual authors and do not necessarily reflect the position of the Federal Reserve Bank of New York or the Federal Reserve System. Economic Policy Review articles may be reproduced for educational or training purposes, provided they are reprinted in full; include credit to the author(s), the publication, and the Bank; and include the publication's disclaimer.

© 2019 The Federal Reserve Bank of New York