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# **Where's the Crisis? How Undergraduate Enrollment Patterns Influence Growth in Student Debt**

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## **Where's the Crisis? How Undergraduate Enrollment Patterns Influence Growth in Student Debt**

### **Abstract**

When planning for college, students face a range of constrained choices governed in part by variation among institutions. What are the economic consequences of those decisions and constraints during and after college? We know borrowing patterns vary by institutional sector, yet colleges within a sector vary considerably by admission and graduation rates, returns to degrees, and costs for students. Using data from the Beginning Postsecondary Students and Baccalaureate and Beyond studies, we evaluate undergraduate student loan debt and labor market outcomes differentiated by institutional sector and competitiveness. First, we corroborate previous research finding that recent growth in educational debt is mainly confined to the top fifth of borrowers. Second, we find that the sector and selectivity of institutions predict both graduation rates and higher borrowing. In-state public institutions provide a haven from high debt relative to public out-of-state and less competitive private colleges. Finally, we find this differential risk of exposure to high borrowing is what matters for labor market outcomes of graduates from less-competitive institutions. Once these students enter the top fifth of borrowing, early labor market experiences have more influence than what kind of college students attend.

# Where's the Crisis? How Undergraduate Enrollment Patterns Influence Growth in Student Debt

Jaymes Pyne and Eric Grodsky

Public concern over student debt has increased sharply in recent years, with federal student loan debt reaching \$1.2 trillion by 2015 (Elvery, 2017). Despite continued media attention to aggregate figures and small numbers of students with extreme levels of college debt, recent literature has challenged the notion of a looming debt crisis. Sharp increases in student debt appear to be largely confined to the top of the borrowing distribution, largely held by those who complete bachelor's degrees (e.g., Akers & Chingos, 2016). At the other end of the debt distribution, college dropouts with relatively modest amounts of debt are at substantial risk of default, due in part to their relatively modest earnings (e.g., Dynarski & Kreisman, 2013; Wei & Horn, 2013).

Enrollment patterns influence borrowing trends at four-year colleges due not only to large overall increases in undergraduate enrollment over time (from about 7.5 million students in 2000 to 10.5 million students in 2015), but also due to the types of institutions students attend. Non-profit and for-profit colleges appear to be driving high borrowing much more than public colleges (Hershbein & Hollenbeck, 2015). Yet institutions *within* these sectors can vary widely by selectivity of admissions, graduation rates, returns to degree completion, and funds needed for students to cover gaps in required tuition and fees. How, if at all, do college sector *and* selectivity contribute to (a) patterns of borrowing and (b) economic returns to completion in the early part of a career?

In this paper, we consider debt burdens of students by institutional sector and competitiveness. Students face a series of choices and constraints that determine their ultimate college of attendance. First, aspirations, family tastes, perceptions of college quality, economic resources, and willingness to move away from home influence students' choices of where to apply (Perna, 2006). Students are then constrained by the set of colleges that accept them. The likelihood of acceptance to a college can depend on the competitiveness of admissions within and across institutions, which partially plays out through admissions officers' perceptions of students' relative academic abilities and overall fit with the institution (Alon, 2009).

Still, students who are constrained to choose among relatively uncompetitive colleges typically have a range of choices across sectors, many of which are near home. For example, in our state, the University of Wisconsin System includes a competitive flagship university in Madison, 12 four-year public options that are less competitive, 24 private non-profit, and 16 for-profit private colleges that range in competitiveness, and two-year technical colleges that offer transfer degrees to four-year campuses. Colleges in bordering states are additional options. Of course, students may choose to enroll in exclusively or largely online degree program. With all the options available, even to students constrained by finances and admissions standards, it is difficult to think of college attendance patterns as the result of social forces alone. Sociological inquiries into the nature of educational debt that acknowledge the above choices students face alongside their constraints will be better equipped to inform student debt policies in higher education.

## Where's the Crisis?

We extend recent student debt research by taking a closer look at how undergraduate student enrollment patterns by institutional sector and college selectivity influence changes in and levels of debt in the first decade of the 21<sup>st</sup> century. We also evaluate the short-term economic returns to enrollment choices as well as the ratio of educational debt to income early in the post-college career. We examine this period because it represents a window of time in which aggregate student loan debt increases rapidly, and it allows us to take advantage of detailed longitudinal data on college students. Although these data pertain to students who attend college nine or more years ago, they allow us to track students into the labor market following their on-time graduation.

First, we distinguish between how changes in student attendance patterns, and changes in tuition and fees, affect secular increases in student debt. Next, we look at how debt burden has changed over time across the cumulative distribution of debt, from students owing the least in their cohort to those owing the most. Finally, we examine how students in the most recent cohort fared in the labor market in terms of employment and earnings shortly after leaving college—a time when repayment is most difficult for graduating students (Dynarski & Kreisman, 2013). Although educational debt continues to accumulate in more recent years, data constraints do not allow us to examine debt levels and labor market outcomes of more recent cohorts of undergraduate students.

Consistent with recent literature (Akers & Chingos, 2016; Elvery, 2016), we first confirm that changes in student borrowing patterns are uneven across the debt distribution during this period, with slight increases for most borrowers and substantial increases for the top fifth of borrowers. Second, we find debt burdens have not differed substantially across social class, gender, or racial or ethnic identification over time; instead, the growth in debt is uneven across types of postsecondary institutions students attended. In-state public schools provide a relative haven from high debt—the risk of high debt being substantially greater for students attending less competitive private colleges and out-of-state public colleges. Once a student borrows a large amount, the actual burden of high borrowing is similar across types of institutions. Finally, we find that the magnitude of many early labor market returns do not differ much by institutions type among high borrowers. Competitiveness of institution is a better indicator of early default and continuation rates than institutional sector for high borrowers in public and private non-profit institutions, while for-profit graduates stand out as considerably worse off than others on these two indicators. Taken together, these results suggest that the *risk* of entering into high debt differentiates schools by sector and selectivity, but type of college attended generally does not influence the consequences of those who end up in high debt.

## Background

Although socioeconomic background and race are both associated with the probability that students go into debt to pay for their postsecondary education, these factors are not associated with average debt levels among borrowers (Goldrick-Rab, Kelchen, & Houle, 2014; Houle, 2014). Attendance patterns might instead contribute to rising debt across the debt distribution. With increases in college attendance, a larger share of students might seek to distinguish themselves from their peers based on perceived college quality and might be willing to pay more

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for that quality (Alon, 2009). This proclivity was anticipated by Thresher (1966) and developed by Lucas (Lucas, 2001) under the rubric of “effectively maintained inequality.” Constrained state budgets have driven public institutions to increase tuitions over time, but public colleges still have substantially lower sticker prices compared to prestigious and even less-competitive non-profit private colleges (College Board, 2017; Snyder & Dillow, 2013). Alternatively, students might see in for-profit colleges a client-centered path to a four-year credential (Deming, Goldin, & Katz, 2012; Holland & DeLuca, 2016). Attracted by agile marketing, ample student services and flexible hours of enrollment (including online options), these students might believe that they will easily discharge the substantial levels of debt they incur once they complete their course of study.

As student borrowing has increased over time, economic returns to baccalaureate degrees have remained quite high (Abel & Deitz, 2014; Daly & Bengali, 2014), and returns to graduate and professional degrees, part of the option value of a baccalaureate degree, have grown even faster than undergraduate returns (Julian, 2012; Ryan & Siebens, 2012). Any student debt problem is more likely due to graduation rates and the structure of student loan repayments than overall increases in borrowing. Although the returns to a college degree over the life course greatly outweigh the costs to attend college, graduates are expected to begin to repay their loans when their earnings are at their lowest and most uncertain (Akers & Chingos, 2016; Baum, 2017; Delisle, 2014; Dynarski & Kreisman, 2013). If students' labor market outcomes appreciably outpace the amount of debt they incur from their undergraduate education, increases in borrowing could be less concerning than some reports claim.

Even so, we expect variation in returns to college by institutional sector and selectivity of alma mater. Those graduating from selective colleges can expect greater earnings returns to their degrees than otherwise comparable students from less selective colleges (Andrews, Li, & Lovenheim, 2016; Witteveen & Attewell, 2017). Those from more selective private and public universities are also more likely to enroll in graduate degree programs, particularly more lucrative professional and doctoral programs (Mullen, Goyette, & Soares, 2003). On the other end of the distribution of institutions, for-profit bachelor's degree earners earn about the same as public and nonprofit college graduates in their early career (Denice, 2015), but could be far less likely to receive a callback on a job compared to those with noncompetitive public degrees (Deming, Yuchtman, Abulafi, Goldin, & Katz, 2016).

## Debt and Enrollment Trends for Undergraduate Students

### Data and Method

Undergraduate student data come from the two most recent complete cohorts of the Beginning Postsecondary Students Longitudinal Study (BPS), first-time undergraduates who initially entered college in 1996 and in 2004. Because independent students typically do not report parental socioeconomic information, we restrict our sample to dependent undergraduates. Additionally, because we are interested in students' enrollment patterns in pursuit of bachelor's degrees, we further restrict our sample to those ever attending a four-year U.S. institution within five years of initially enrolling in undergraduate studies (including those who begin at two-year

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institutions). The remaining sample of students makes up about 70% of first-time beginning students who hold 87% of the educational debt in these datasets (85% in 1996 and 89% in 2004). The main strength of using BPS over other datasets such as the National Postsecondary Student Aid Study from which it is sampled is that BPS follows students longitudinally, allowing us to track their institutional enrollment patterns, graduation dates, and debt levels over five years. One limitation is that many students continue to accrue undergraduate debt and/or graduate with a degree after five years of initial enrollment. We can only observe the first five years after enrollment.

We draw data on total student borrowing for undergraduate education from 1996 to 2001 and 2004 to 2009 using student self-reports and National Student Loan Data System. The system's data include timing and amounts of all federal borrowing for undergraduate education. If student self-reports are higher than system reports, we use self-reports with the assumption that students are also reporting private loans. One limitation to these data are that we cannot directly measure private loans students carry, which might underestimate their undergraduate debt burdens. We convert all amounts to 2009 dollars based on the Consumer Price Index for All Urban Consumers. Although large amounts of debt are incurred in pursuit of a graduate or professional degree (e.g., Baum & Steele, 2018), we do not measure graduate school debt in this study.

We distinguish among seven types of colleges by sector and competitiveness and assign each student to the school where s/he spent the most time enrolled.<sup>1</sup> We further distinguish between in-state and out-of-state public colleges and universities based on student state of residence prior to attendance, and differentiate in-state public flagship colleges from other in-state public institutions to reflect student decisions to attend more or less competitive public institutions. We construct three levels of competitiveness for private institutions based on the *Barron's* 2004 data on school selectivity: least competitive (nonselective/less selective), moderately competitive (selective/very selective), and most competitive (highly/most selective). Observers disagree about the validity of such school rankings at the institutional level. We do not use *Barron's* to compare individual institutions; following prior research, we consider these broad categories of rankings useful for a general understanding of the relative competitiveness of private non-profit colleges across the country (e.g., Carnavale & Van Der Werf, 2017; Hoxby & Avery, 2013). Our final category is for-profit private colleges. Social origin measures include parental education and income, student race/ethnicity, and student gender.

To study how those graduating in and near the 2004 BPS cohort likely fared economically in the consequential early years after college, we use data from the Baccalaureate and Beyond 2008/2012 cohort of students (N=13,497). This survey samples students who earned their bachelor's degrees in the 2008 interview year of National Postsecondary Student Aid Study, meaning Baccalaureate and Beyond students are not the same as students followed for the 2004 BPS cohort. A strength of Baccalaureate and Beyond is it allows us to analyze early career labor market outcomes of students who closely resemble the later BPS cohort. These data have at least two limitations. First, they do not include non-completing undergraduate students, who are the

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<sup>1</sup> In our BPS sample, 67% of students attended only one school, 27% attended two schools, and 6% attended three or more schools within five years of beginning college.

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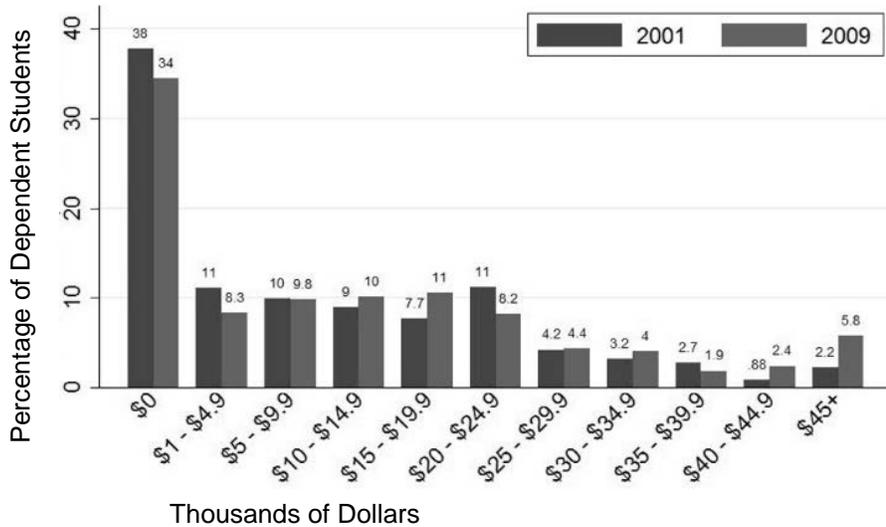
most at risk for having repayment troubles. Second, these data only track students for four years after graduation, which prevents an analysis of long-term labor market outcomes.

We first differentiate between high borrowers, defined as holding educational debt that would place them in the top 20% of borrowers in the BPS 2004 cohort (\$31,034 or more of educational debt) and low/moderate borrowers (below \$31,034 but above \$0 of educational debt). Next, we examine the association between the types of institutions students attended upon completing their degree (as discussed above), students' 2012 average income, and total amount borrowed for their undergraduate degree. We also construct a debt-to-income ratio by dividing each students' 2012 income by their total reported undergraduate borrowing. Although this ratio does not give us a definitive sense of whether students are able to repay educational loans, it provides an index of the relative costs and benefits that come with choosing one type of college over another. Other measures include average hours worked per week for graduates in 2012, average continuous employment rates since graduating in 2008, the mean number of simultaneous jobs graduates held in 2012, the proportions of graduates who defaulted on student loans by 2012, and the proportions of students enrolled in graduate school within each institution sector.

### Risk and Level of Borrowing among Undergraduates

We first determine which share of respondents from each BPS cohort did and did not borrow to pay for college, and the amount borrowed. Figure 1 displays the weighted share of dependent baccalaureate students incurring different levels of undergraduate debt (in thousands of real 2009 dollars) five years after initially enrolling in college in 1996 or 2004. The share of students who did not borrow for college declined, from 38% in 2001 to 34% in 2009, while the share of those who borrowed \$25,000 or more rose from 13% to 19%. At the highest levels of debt, 6% of students borrowed \$45,000 or more in 2009, more than twice the share in 2001.

**Figure 1: Total Borrowing Trends for Dependent Students Attending Four-year Institutions from 1996-2001 and 2004-09**



Notes: BPS panel weights applied to both cohorts. Amounts are equal to the total reported borrowing within each BPS cohort by 2001 and 2009, respectively.  
Sources: BPS 1996 and 2004

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Employing a method developed by and named for Kitagawa (1955), we then decompose changes in debt levels across cohorts of borrowers into changes associated with the types of institutions students attend (*flow*) and changes associated with levels of debt across types of institutions (*rate*) (see Appendix A for details). Table 1 displays the results of the Kitagawa decomposition of rising undergraduate debt among dependent students. Each row of the table reflects the contribution of changes in patterns of attendance and average levels of debt for students attending each type of institution to the overall change in average debt. For example, given small changes in shares attending in-state non-flagship public schools (row 1), changes in patterns, or *flow*, of attendance contributed little to changes in debt (about \$49). On the other hand, changes in the average level, or *rate*, of debt among debtors at these schools accounted for almost a third (\$997) of the \$3,300 increase in debt associated with increasing levels of debt within types of institutions.

Real borrowing increases have not been uniform across different types of colleges. Among in-state public sector students, average debt burden rose from \$15,300 to \$17,428 (an increase of \$2,128, or 14%). In contrast, average debt burden for students attending for-profit colleges increased by almost from \$13,853 to \$21,551 (an increase of \$7,700, or 56%). Averaging across all types of institutions, the debt burden for baccalaureate attendees increased by about \$2,912 between the 1996 and 2001 BPS cohorts (the sum of bolded numbers in the last row, columns 5 and 6 of Table 1). The debt increase would have been about \$390 *greater* had the distribution of students across institutions remained the same over time (as shown in the bottom of the “change due to attendance patterns column”). In fact, changes in postsecondary destinations suppressed what would have been a \$3,302 average increase in debt due to changes in debt across types of institution (shown in the bottom of the “change due to debt rate” column). In sum, changes in postsecondary destinations have been modest and, as a result, do not appear to contribute to baccalaureate debt increases among borrowers over the first decade of the 21<sup>st</sup> century.

**Table 1: Kitagawa Decomposition of Student Debt for Dependent Borrowers**

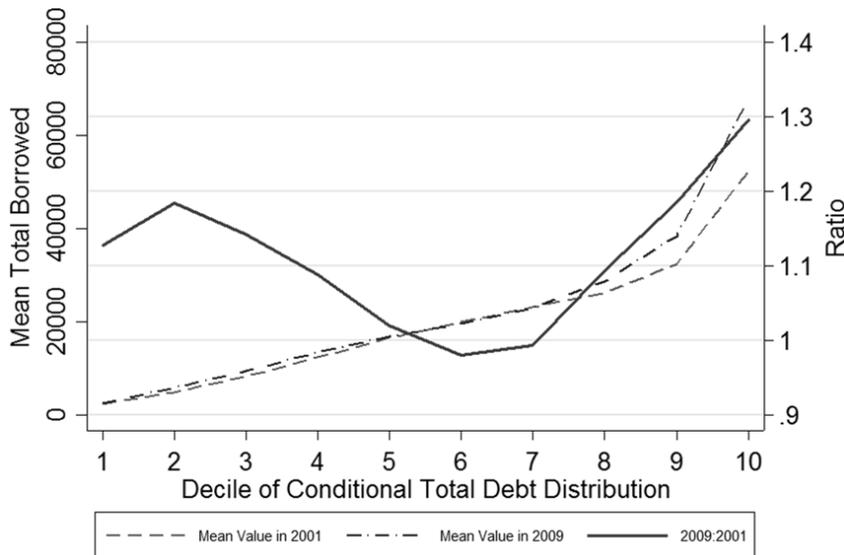
Institution Type	1996– 2001 Proportion Enrolled	2004–09 Proportion Enrolled	Average Borrowed in 1996– 2001	Average Borrowed in 2004–09	Amount of Change Due to Attendance Patterns (Flow)	Amount of Change Due to Debt Rate
<i>Public</i>						
In-state, Non-flagship	47%	47%	\$15,300	\$17,428	\$49	\$997
In-state, Flagship	7%	8%	\$17,656	\$18,995	\$114	\$101
Out-of-state	12%	8%	\$18,213	\$22,934	\$(798)	\$459
<i>Non-profit Private</i>						
Least Competitive	7%	8%	\$19,520	\$21,460	\$391	\$145
Moderately Competitive	17%	16%	\$20,291	\$26,599	\$(467)	\$1,041
Most Competitive	8%	6%	\$24,217	\$26,781	\$(706)	\$179
<i>For-profit Private</i>						
Sum	1.000	1.000			<b>\$(390)</b>	<b>\$3,302</b>

If changes in the distribution of students among colleges and universities does not account for recent increases in student debt, perhaps there have been varying increases in student borrowing across institutions over time. Next, we examine average debt by decile of borrowers

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(the conditional debt distribution) from those who borrow the least in each cohort (the bottom decile) to those who borrow the most (the top). Figure 2 plots the mean values of debt in each decile by each cohort in dashed thin lines on the left y-axis in constant 2009 dollars, and the ratio of average debt in 2009 to average debt in 2001 by debt decile in a solid thick line corresponding to values on the right y-axis. Debt in the bottom decile grew by about 12% from 2001 to 2009 (\$299 on average), while debt in the sixth and seventh deciles stayed essentially the same in real 2009 dollars. Among students from the 2009 cohort in the ninth and 10<sup>th</sup> deciles, however, debt began to increase notably. The lower bounds at the ninth decile in 2001 and 2009 are \$27,982 and \$31,034, respectively, in 2009 dollars. The lower bounds at the 10<sup>th</sup> decile between cohorts are \$36,451 and \$47,000, respectively. Average debt among students in the highest decile (about 6% of all students, including those without debt) increased almost 30%, from about \$50,000 to over \$60,000 dollars. Overall, the debt levels of most students increased fairly modestly over time. If there is cause for concern about undergraduate borrowing over this period, it seems to be restricted to those borrowers in the highest 20% of debt.

**Figure 2: Mean and 2009:2001 Ratio of Total Borrowed for Dependent Students Attending Four-Year Institutions, by Decile (in constant 2009 dollars)**



Notes: BPS panel weights applied to both cohorts. Left y-axis applies to the mean value amounts borrowed. Right y-axis applies to the ratio.

Sources: BPS 1996 and 2004

### High-Borrowing Undergraduates

What might account for the sharp increases in debt for high borrowers between cohorts? Table 2 compares demographic, enrollment, and institutional characteristics of those in the top two deciles of debt to the bottom 80% of borrowers over this period. Median family incomes barely changed for high borrowers, at about \$61,000 in the ninth decile and \$72,000 in the 10<sup>th</sup> decile. In both cases, however, the data suggest that neither decile is economically disadvantaged relative to those who borrowed less in each cohort. Across levels of debt, there are fewer parents who ended their education after high school and more parents with some college education but not a bachelor's degree, reflecting the general upgrading of education in the U.S. population. In

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the case of the top decile, the share of students whose parents completed college or earned a graduate or professional degree declined across cohorts, coming more in line with the bottom 80% of borrowers. Undergraduate borrowers' own degree attainment increased by about two percentage points for lower borrowers but declined across cohorts in the ninth and tenth deciles, though their rates remained appreciably higher than the cohort average. Even with these slight decreases in attainment, time enrolled in college stayed largely unchanged for the average borrower, including those at the top of the distribution.

**Table 2: Median and Percentage Differences between Cohorts on Family Background and Institutional Characteristics of Dependent Borrowers Attending 4-year Institutions in the Top Two Deciles of the Conditional Debt Distribution**

Median data are in italics.

	Bottom Eight Deciles		Ninth Decile		10th Decile	
	1996-2001	2004-2009	1996-2001	2004-2009	1996-2001	2004-2009
Parent Income (median)	<i>\$64,252</i>	<i>\$66,158</i>	<i>\$61,167</i>	<i>\$60,910</i>	<i>\$72,331</i>	<i>\$71,598</i>
Parent Education						
Less than High School	2.5	3.2	1.8	2.3	0.6	2.2
High School	30.6	20.1	34.2	20.9	24.4	18.9
Some College	19.9	27.7	19.7	32.4	17.1	31.4
BA or Higher	47.0	48.3	44.3	44.4	57.9	47.4
Race/Ethnicity						
White	72.0	66.9	71.2	65.4	71.7	71.1
Black	10.6	11.8	13.5	17.8	17.0	10.6
Hispanic	10.0	11.9	9.8	8.8	5.5	8.8
Asian	6.8	4.7	5.2	2.3	4.6	4.7
Other race or ethnicity	0.8	4.7	0.3	5.7	1.3	4.7
BA Attainment	52.7	54.6	74.2	67.3	75.4	75.5
Months Enrolled	38	40	46	47	45	46
Institution Type						
Public						
In-State, Non-Flagship	48.6	48.1	38.3	35.5	27.0	26.4
In-State, Flagship	7.3	7.9	8.4	7.1	7.8	5.8
Out-of-State	10.4	7.4	12.0	12.2	15.0	10.0
Non-Profit Private						
Least Competitive	6.6	8.5	6.3	8.0	9.5	10.4
Moderately Competitive	17.5	14.7	19.2	23.8	25.6	27.8
Most Competitive	7.7	5.6	15.0	5.8	14.0	10.2
For-Profit Private	1.9	7.8	0.8	7.5	1.0	9.4

Note: BPS panel weights applied to both cohorts. Some percentages might not equal 100 due to rounding. Institution data are based on the institution the student attended for the longest period of time. The top two deciles of borrowing include dependent students who borrowed more than \$27,982 for the 1996–2001 cohort and \$31,034 for the 2004–09 cohort, in constant dollars.

Enrollment shares at in-state public universities among most borrowers remained stable for the most part, with modest declines in the share of students in the top two deciles of borrowing

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attending in-state public colleges. Among borrowers attending moderately competitive private non-profit universities, those in the bottom 80% of debt decreased their share of the higher education market by three percentage points but those in the top 20% of debt increased their share by two to four percentage points. The most competitive non-profit colleges decreased their share of the market among lower borrowers but also accounted for a smaller share of high borrowers in 2009 than in 2001. For-profit colleges increased their market share and accounted for an appreciably greater share of high borrowers in 2009 than in 2001. Even so, 8% to 9% of those in the top borrowing quintile in 2009 primarily attended proprietary colleges.

In sum, consistent with Houle (2014), we see virtually no evidence to suggest that less advantaged students are disproportionately concentrated among those who incur the greatest levels of college debt. However, we do find that those with the highest levels of college debt differ from more typical debtors in the types of colleges they attend. We next consider how changes in college pricing might have contributed to changes in student debt.

As a final look at determinants of high borrowing, we evaluate several linear probability models to estimate the contributions of student and institutional characteristics to the probability that a student leaves college with substantial debt (the ninth or 10<sup>th</sup> decile). In this analysis, we include only students who borrowed for college, and we control for months enrolled in college, bachelor's degree attainment, gender, race, and parental education and income.

Table 3 shows the average marginal effects of selected characteristics on the probability of entering the top fifth of the debt distribution, modeled separately by cohort. Institutional predictors of high debt change modestly across cohorts with the exception of attending moderately competitive private non-profit or for-profit colleges. Students who attend out-of-state public and non-profit private institutions are more likely to incur high levels of debt than those who attend in-state public institutions, and those who attend out-of-state public, moderately competitive non-profits, or for-profits are at somewhat greater risk of going into high debt in the latter cohort than the former cohort.<sup>2</sup> Attending a for-profit college increased the probability of being in the top debt quintile by a non-significant five percentage points over in-state public non-flagships among 1996 entrants, while attending a for-profit college increased the probability of high debt by about 15 percentage points over the reference group in the later cohort.<sup>3</sup> Demographic and social background characteristics do not appear to contribute greatly to a student's probability of entering high debt. In fact, for both cohorts, the model that best fits the data according to the Bayesian information criterion assumes that entry into the highest debt quintile is conditionally independent of *all* social origin attributes on which we condition. Changes in the distribution of debt among those who borrow thus do not appear to be regressive or redistributive.

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<sup>2</sup> In results not shown, a pooled cohort model with cohort-by-institution-type interactions confirms statistically significant increases across cohorts in the risk for high debt experienced by students attending moderately competitive private non-profit and for-profit institutions (available upon request).

<sup>3</sup> We should note, however, that in the BPS 1996 cohort only nine students were in the top 20% of borrowing attending for-profit colleges (n=68 among all borrowers). In the 2009 cohort, there were n=78 of the same kind of students in the top 20% of borrowing (n=355 among all borrowers).

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**Table 3: Linear Probability Model Predicting Top 20% of Debt Distribution**

	1996-2001 Cohort			2004-2009 Cohort		
	(1)	(2)	(3)	(4)	(5)	(6)
Institution Type (Ref. = In-State Public Non-Flagship)						
In-State Public Flagship	0.06 (0.03)	0.05 (0.03)	0.05 (0.03)	0.02 (0.02)	0.02 (0.02)	0.02 (0.02)
Out-of-State Public	0.10** (0.03)	0.10** (0.03)	0.10** (0.03)	0.13*** (0.03)	0.13*** (0.03)	0.13*** (0.03)
Least Competitive Private Non-profit	0.09** (0.03)	0.09** (0.03)	0.09* (0.03)	0.09*** (0.02)	0.09*** (0.02)	0.09*** (0.02)
Moderately Competitive Private Non-profit	0.09*** (0.02)	0.08*** (0.02)	0.09*** (0.02)	0.17*** (0.02)	0.17*** (0.02)	0.17*** (0.02)
Most Competitive Private Non-profit For-Profit	0.17*** (0.03)	0.17*** (0.03)	0.16*** (0.03)	0.14*** (0.02)	0.13*** (0.02)	0.12*** (0.02)
	0.06 (0.03)	0.05 (0.03)	0.05 (0.03)	0.15*** (0.03)	0.15*** (0.02)	0.15*** (0.02)
Female	-0.02 (0.02)	-0.01 (0.02)		0.00 (0.01)	0.01 (0.01)	
Race (Ref. = White)						
Black	0.07** (0.02)	0.08** (0.02)		0.02 (0.02)	0.03 (0.02)	
Hispanic	-0.02 (0.03)	-0.02 (0.03)		-0.04* (0.02)	-0.03 (0.02)	
Asian American	-0.06* (0.03)	-0.06* (0.03)		-0.06* (0.02)	-0.05* (0.02)	
Other race or ethnicity	0.01 (0.06)	0.02 (0.06)		0.03 (0.02)	0.03 (0.02)	
Parental Highest Education (Ref. = Less than High School)						
High School	0.05 (0.03)			-0.01 (0.03)		
Some College	0.03 (0.04)			0.02 (0.03)		
Bachelor's or Higher	0.02 (0.03)			-0.03 (0.03)		
Parents' Income at Entry Divided by 10,000	-0.00 (0.00)			-0.00 (0.00)		
Total Months Enrolled	0.01*** (0.00)	0.01*** (0.00)	0.01*** (0.00)	0.01*** (0.00)	0.01*** (0.00)	0.01*** (0.00)
Attained Bachelor's Degree	0.08*** (0.02)	0.08*** (0.02)	0.07*** (0.02)	0.06*** (0.01)	0.05*** (0.01)	0.05*** (0.01)

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	1996-2001 Cohort			2004-2009 Cohort		
	(1)	(2)	(3)	(4)	(5)	(6)
Constant	-0.15*** (0.04)	-0.14*** (0.03)	-0.14*** (0.03)	-0.13*** (0.03)	-0.15*** (0.02)	-0.15*** (0.02)
Bayesian information criterion	<b>3,194</b>	<b>3,170</b>	<b>3,156</b>	<b>5,251</b>	<b>5,244</b>	<b>5,222</b>
Observations	3,918	3,918	3,918	6,475	6,475	6,475
R-squared	0.084	0.082	0.075	0.083	0.079	0.076

Robust standard errors in parentheses. \*\*\* p<0.001, \*\* p<0.01, \* p<0.05. All tests are two-tailed tests.

**Table 4: Graduation Rates and 2008 Baccalaureate Labor Market Outcomes among those who Borrowed for their Education, by Institution Type**

	In-state Public Non- flagship	In-state Public Flagship	Out-of- state public	Most Competitive Private Non- profit	Moderately Competitive Private Non- profit	Least Competitive Private Non- profit	For Profit
<b>Low and Moderate Borrowers (&lt;\$31,034)</b>							
Graduation rate <sup>a</sup>	0.53	0.64	0.51	0.84	0.65	0.40	0.08
2012 income (median)	\$37,000	\$38,000	\$39,600	\$35,000	\$35,000	\$36,733	\$43,200
Total borrowed (median)	\$15,750	\$15,952	\$17,125	\$17,125	\$18,595	\$17,873	\$23,625
Median debt to 2012 income ratio	0.35	0.35	0.38	0.37	0.46	0.40	0.32
Hours worked/week in 2012	34	34	35	29	34	33	33
Continuous employment rate	0.44	0.44	0.44	0.39	0.43	0.44	0.46
Number of jobs in 2012	0.94	1.03	1.01	0.93	1.09	1.03	1.03
Loan default rate	0.02	0.04	0.03	0.01	0.01	0.03	0.03
Proportion enrolled in grad school	0.35	0.40	0.33	0.48	0.39	0.29	0.11
<b>High Borrowers (≥\$31,034)</b>							
Graduation rate <sup>1</sup>	0.70	0.79	0.74	0.90	0.79	0.59	0.38
2012 income (median)	\$33,465	\$40,352	\$34,570	\$48,000	\$37,440	\$37,660	\$40,000
Total borrowed (median)	\$40,000	\$41,616	\$44,660	\$50,000	\$44,611	\$44,582	\$45,593
Median debt to 2012 income ratio	1.06	0.95	1.05	1.00	1.13	1.05	0.97
Hours worked/week in 2012	33	33	32	35	34	31	32
Continuous employment rate	0.43	0.45	0.43	0.43	0.43	0.43	0.45
Number of jobs in 2012	1.09	1.08	0.87	0.99	1.04	1.03	0.96
Loan default rate	0.07	<0.01	0.03	<0.01	0.04	0.07	0.12
Proportion enrolled in grad school	0.33	0.36	0.33	0.48	0.38	0.34	0.20

<sup>a</sup> Graduation rate is based on graduating five years after first beginning college and is derived from weighted BPS 2004 cohort of all enrolled dependent undergraduate borrowers. All other figures are derived from weighted results from Baccalaureate and Beyond, 2008/2012

### Labor Market Outcomes among Undergraduate Degree-Holders

To examine student debt and labor market outcomes, we turn to Baccalaureate and Beyond 2008/2012 and *Barron's* data to derive real earnings and employment patterns of students who resemble on-time borrowing graduates of the BPS 2009 cohort (Table 4). Consistent with Table 2, we first note that students within institution type who borrow high amounts are much more likely to graduate than those who borrow low or moderate amounts. Most low and moderate borrowing graduates income-to-debt ratios ranged between 0.32–0.46, had similar average hours worked per week in 2012, rates of continuous employment, and number of jobs held at a time. Note that low and moderate borrowing graduates from the most competitive private non-profit institutions, are more likely to pursue graduate and professional degrees, hence their lower participation in the labor market.

Among high borrowers, hours worked per week, rate of continuous employment, and number of jobs held were similar across institutions regardless of institutional sector and selectivity. Stark differences by institutional competitiveness emerge when considering the default and continuation rates of high borrowers. In-state flagship public graduates and those from the most competitive private non-profit institutions had virtually no high-borrowing students defaulting on their loans within four years of graduating. Conversely, early default rates among high borrowers completing their degree at less competitive public and private non-profit universities were about 7%, and those of graduate of for-profit institutions about 12%. Graduate school enrollment rates in the first four years after college were highest for those attending elite non-profits (48%), followed by moderately competitive non-profits and in-state public flagships (36-38%), less-competitive public and non-profit colleges (33-34%) and finally for-profits (20%). Even though continuation rates were relatively low for high-borrowing graduates from for-profit institutions, these students were twice as likely to be enrolled in graduate school compared to lower borrowing for-profit graduates.

In sum, we confirm that increases in undergraduate debt in the first decade of the 21<sup>st</sup> century are largely confined to those in the top fifth of the borrowing distribution. Those who have high debt levels in either time period are not generally more disadvantaged than other borrowers. Instead, they are more likely to attend less-competitive private or out-of-state public colleges, and the relative risk of entering high debt at those types of institutions has increased over time. In general and within each institution type, high borrowers are more likely to complete a degree than the bottom 80% of borrowers. Yet regardless of borrowing amounts, students attending less-competitive public colleges are much more likely to graduate than those attending the least competitive private colleges. In the four years following graduation, high borrowers' debt-to-earnings ratios and employment outcomes are fairly similar regardless of competitiveness and sector of their institution. However, loan default rates are lower and education continuation rates are higher based mostly on competitiveness rather than sector. The one exception is that high-borrowing for-profit graduates are more likely to default on their loans early and are much less likely than others to take advantage of the option value of graduate or professional school shortly after completing their degrees.

## Conclusion

Young people considering the move to college face a range of choices when deciding where to attend. When prospective students shop for a college, even among institutions that are not brand names, they might not consider whether their choice of college affects their borrowing until well into attending (Winston, 1999). The complexity of the student loan system and the prospect of high amounts of debt might discourage students from completing college, or even attending college in the first place (Boatman & Evans, 2017; Callender & Mason, 2017; Hillman & Orosz, 2017). The *perceived* costs of college attendance, fueled by alarming anecdotal reports of unmanageable student debt, might act as a similar deterrent. Prospective college students benefit from weighing financially viable options for a degree regardless of their constrained choices based on competitiveness of admissions. Previous studies have implicated private non-profit and proprietary colleges in growing educational debt among undergraduate students. However, schools within sectors vary in terms of competitiveness. We clarify prior findings by differentiating among competitiveness of admissions at colleges in the public and private non-profit sectors and weighing post-baccalaureate outcomes against cost of attendance at each.

Our descriptive evidence shows college attendance patterns influence students' membership in the top 20% of educational debt over time. Consistent with prior research, we find changing membership among high borrowers does appear to be driven in part by private institutions, but specifically by those attending less-competitive non-profit and proprietary colleges. Counter to prior research, we find that students who attend out-of-state public colleges are at higher risk over time for incurring substantial levels of educational debt. These attendance choices may be based on information constraints regarding relative returns of higher education, debt burdens across types of colleges, or student or family tastes. Regardless of the reasons, chances are that most of these students could have chosen a path that led to lower levels of undergraduate debt.

Graduates from public flagship institutions and the most competitive private non-profit colleges are better off in the labor market than those attending less-competitive colleges, given their borrowing amounts. They are also more likely to take advantage of the option value of a graduate school education compared to those attending less competitive private institutions. For graduates of less-competitive colleges, the increased *risk* of high borrowing is what matters most in terms of enrollment patterns. Low and moderate borrowers in less competitive public colleges have higher graduation rates than those in less competitive private colleges, and those graduating from the former fare better in the early labor market than the latter. However, high borrowing graduates from less-competitive public and non-profit colleges have similar outcomes regardless of institutional sector. Consistent with Denice (2015), we find that early earnings for graduates of for-profit institutions are comparable to those of graduates from less-competitive public and non-profit colleges. However, for-profit graduates are far less likely than any others to enroll in graduate school shortly after completing their degree, suggesting their earnings might not keep pace with other comparable early career degree-holders in the long-run.

As we have shown, student debt burden and economic outcomes vary across and within college sectors, a pattern that has been under-appreciated in recent discussions about college affordability. Debt burden changed only modestly in the first decade of the 21<sup>st</sup> century; to a nontrivial degree, the changes in debt burden are a function of *where* students choose to go to college, not an inevitable outcome of baccalaureate attainment.

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### Appendix A. Kitagawa Decomposition

We use data on the types of institutions borrowers attended, employing the Kitagawa (1955) decomposition method to distinguish between contributions of composition rate changes and borrowing rate changes. The effect due to composition rate changes is calculated based on the difference in the proportion of students in each college type, weighted by the average tuition in that school type between cohorts:

$$\text{Composition Rate Effect} = \sum_i (C_i^{2009} - C_i^{2001}) * \left[ \frac{M_i^{2009} + M_i^{2001}}{2} \right]$$

where  $C_i^Y$  represents the the proportion of students in each school type  $i$  in year  $Y$  and  $M_i^Y$  represents the average borrowing of students in school type  $i$  in year  $Y$ . Sector-specific borrowing rate effects are determined by taking the sum of the difference in debt levels for students in 2001 and 2009 in each college sector, weighted based on the average proportion of students in each school type between both cohorts:

$$\text{Borrowing Rate Effect} = \sum_i (M_i^{2009} - M_i^{2001}) * \left[ \frac{C_i^{2009} + C_i^{2001}}{2} \right]$$

These results are then summed across all school types. To determine the degree to which composition and borrowing rates affected debt levels, the summed totals of composition and borrowing results are added together and each sum is divided by this grand total to give the proportional contribution of both.