Journal of Student Financial Aid

Volume 53 | Issue 3 Article 3

March 2025

Loans in the Long Game: How Student Debt Affects Financial Stress Post-Graduation

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Cover Page Footnote

This material is based upon work supported by the Association for Institutional Research and the National Center for Education Statistics. Additionally, travel to present findings was sponsored in part by the National Science Foundation's Advanced Technological Education (ATE) program through award 2000799.

Loans in the Long Game: How Student Debt Affects Financial Stress Post-Graduation

Politicians, the press, and the public frequently consider the costs and benefits associated with pursuing a postsecondary credential, particularly as it relates to student loan debt (Berman, 2018). Increasing calls for policy reforms aimed at alleviating the financial burden placed on students and families in pursuit of a postsecondary credential include: student debt cancellation (Nova, 2022; Warren, 2020), including the attempt by the Biden Administration to cancel at least some debt for millions of student loan borrowers (Federal Student Aid, 2022); tuition-free college options (Nova, 2019); and federal and state oversight of college costs (Flores, 2021; McCann et al., 2021). These proposals highlight the importance that students and families place on college affordability, particularly as economists and labor market analysts estimate that approximately two-thirds of all vacant jobs now require a college credential (Carnavale et al., 2013). Federal student loan debt plays an outsized role in ongoing affordability discussions, particularly as it relates to issues of equitable access to and attainment of postsecondary education. Additionally, the effects of student debt on common milestones expected in adulthood, such as marriage, homeownership, and child-rearing, have become a topic hotly debated in the policy sphere (Gicheva, 2016; Houle & Berger, 2015).

Central to these issues surrounding college affordability and student debt is the concept of financial stress and the effects of that stress on outcomes starting with access to postsecondary education and ending with post-collegiate life. Researchers have sought to understand how the financial stress caused by student loan debt, both perceived and actual, impacts college choice (Kang & Torres, 2021; Smith et al., 2013), student persistence and attainment (Chen & DesJardins, 2010; Dwyer et al., 2013), and post-collegiate decision making and satisfaction (Baker et al., 2017; Rothstein & Rouse, 2011). Furthermore, studies have started to investigate disparate effects of student loans across demographic groups, institutional sectors and degree types (Braga, 2016; Baum & Looney, 2020; Hanson, 2021). Though each of these lines of inquiry are important, few attempts have been made to link these discussions for a more robust understanding of the post-collegiate effects of student loan debt. In this study, we aim to answer the following research questions using publicly available data from the National Center for Education Statistics' (NCES) Baccalaureate and Beyond (B&B) survey:

RQ1) What is the relationship between the amount of student debt at graduation and individuals' financial stress post-graduation—as measured by their ability to meet their fiscal obligations—and how does this relationship vary by individuals' race/ethnicity?

RQ2) What are the postgraduate financial experiences of students who graduate from Hispanic Serving Institutions, Historically Black Colleges and Universities, or Black-serving non-HBCU?

Importantly, we must acknowledge a disconnect in terminology commonly referenced in the higher education literature and the definitions employed by NCES in the B&B study. Specifically, scholars will often refer to non-HBCUs that serve high proportions of Black students as Predominantly Black Institutions (PBI). Indeed, a definition of the term "Predominantly Black Institution" is provided in the text of the 2008 reauthorization of the Higher Education Act (Higher Education Opportunity Act, 2008), and applies to institutions of higher education that meet the following criteria:

> (A) An eligible institution with not less than 1,000 undergraduate students;
> (B) Not less than 50 percent of the undergraduate students enrolled at the eligible institution are low-income individuals or first-generation college students; and
> (C) Not less than 50 percent of the undergraduate students are enrolled in an educational program leading to a bachelor's or associate's degree that the eligible institution is licensed to award by the State in which the eligible institution is located.

The B&B study, however, does not include PBI as a variable value in its dataset. Instead, the study's MSISTAT variable refers to "Black-serving, non-HBCU" institutions, and defines these as being "institutions where Black students constitute at least 25 percent of the undergraduate enrollment while students of all other individual minority groups each constitute less than 25 percent of the undergraduate enrollment" (National Center for Education Statistics, n.d.). In order to maintain consistency and accuracy in conveying the analysis of the B&B data, we utilize the term "Black-serving, non-HBCU" throughout our results and discussion sections despite the fact that this is not a recognized institutional category in the U.S. Code.

Literature Review

The present literature on student loan debt is multifaceted, with various contexts and specificities examined. Here we discuss the literature most pertinent to our research questions. We start with the broad research findings on the relationship between college costs, student loans, and college outcomes. Next, we turn to studies that have found disparities in the student loan debt incurred between students of different racial and ethnic backgrounds. Following this, we provide literature examining the post-graduate impacts of student loan debt and conclude the section by discussing studies that have tied these three major themes together.

College Costs, Student Loans, and College Outcomes

One of the most prominent topics in the student loan debt literature focuses on the effects of loans on student access and attainment rates. In particular, scholars have sought to understand how college costs affect college choice, both in terms of initial enrollment and persistence (Baker et al., 2017; Boatman et al., 2017; Evans et al., 2019; Kang & Torres, 2021). Importantly,

findings suggest that some student groups are more sensitive to the prospect of incurring student debt than others (Baker et al., 2017; Chen & DesJardins, 2010), leading in some cases to students opting for more affordable and less selective options (Kang & Torres, 2021; Smith et al., 2012) while leading others to reconsider the value of enrollment altogether (Cho et al., 2015; Dwyer et al, 2012).

Researchers have consistently found that the prospect of incurring student debt has disparate effects on Black, Indigenous, and People of Color (BIPOC)—inclusive of Black students; Indigenous students including Native American, Native Hawaiian, Pacific Islander, and Alaskan Native students; Asian and Asian American students; and Hispanic and Latinx students—and students from low-socioeconomic backgrounds in access and enrollment (Baker et al., 2017; Eichelberger et al., 2017; Jackson & Reynolds, 2013; Kang & Torres, 2021; Smith et al., 2012). Specifically, Smith et al. (2012) found that students from low-socioeconomic backgrounds are more likely to undermatch than higher-socioeconomic status students at all access levels (two-year versus four-year institutions; non-selective versus selective institutions) and postulate this is in large part due to higher debt levels that are often attached to institutions with higher levels of selectivity (Smith et al., 2012). Similarly, Kang and Torres (2021) discovered a link between undermatching and student debt among BIPOC students, stating that it is possible (and understandable) that these students are more risk-averse when it comes to taking on student loans to pay for postsecondary education (Kang & Torres, 2021).

Current research has also uncovered relationships between institutional characteristics—such as the proportion of minority students enrolled at the institution or institutional designation as a Minority Serving Institution, Historically Black College or University, or Hispanic Serving Institution—and student outcomes (Baker, 2019; Carales & Molina, 2023; Ishitani & McKitrick, 2016; Noopila & Pichon, 2020; Saunders et al., 2016). For example, Ishitani and McKitrick (2016) found that the proportion of minority students at an institution is positively correlated with institution-level student loan cohort default rates. Similarly concerning results have been found in studies focusing on MSIs, HBCUs, and HSIs. Noopila and Pichon (2020) found that even low levels of debt at an HSI in the Southwest U.S. were negatively correlated with student persistence, while a qualitative study by Carales and Molina (2023) provided some evidence that students at HSIs are stressed about repaying student loans. Particularly concerning findings have been uncovered at HBCUs (Baker, 2019), institutions in which as much as 80 percent of the student population relies on federal loans to pay for college (Saunders et al., 2016). In the second round of interviews in a longitudinal study conducted with six students at an HBCU, Baker (2019) found that four of the six had changed their career plans despite originally stating that student loan debt would not impact their postbaccalaureate plans.

Researchers have also observed relationships between student debt levels and persistence and completion outcomes (Baker et al., 2017; Dwyer et al., 2013: Jackson & Reynolds, 2013). In their summary of available literature, Baker et al. (2017) highlighted that the relationship

between student loan debt, persistence and completion seems to depend on the outcome variable of interest. In particular, student loan debt has been found to be positively associated with short-term outcomes, such as persistence from the first year to the second year of postsecondary education, while a negative association has been observed for longer-term outcomes such as completion (Baker et al., 2017). Similar findings have been observed with regard to gender. In particular, Dwyer et al. (2013) found that while both men and women experience reduced probabilities of degree completion with increasing levels of student debt, the debt threshold at which men leave postsecondary education is lower than that of women (Dwyer et al., 2013).

These results suggest that student loan debt generally reduces the probability of degree completion. More concerning, however, is that student loans are correlated with disparate impacts on access and degree attainment across student demographic groups. This means that certain types of financial aid meant to extend a lifeline to historically marginalized student groups in affording a postsecondary education may harm the chances of enrollment, persistence, and degree attainment for these students. As such, it is important to further understand who incurs postsecondary debt and, for those students who do leave college with a postsecondary credential, how student loan debt impacts their ability to meet financial obligations post-graduation.

Who Incurs Postsecondary Debt?

Total federal student loan debt has risen to more than $1.6 trillion among 43 million Americans (Federal Student Aid, 2021a), and the amounts of debt are not equally incurred across populations. Recent studies suggest that typical borrowers average $30,000 in debt (Institute for College Access and Success, 2016), and that student default rates are greatest amongst those who attend private for-profit institutions, followed by public non-profit institutions (Federal Student Aid, 2021b). Demographic data indicate that adults 35 to 49 (14.45M) have the greatest amount of outstanding student loan debt ($622.91B), although the number of borrowers is slightly greater for students between the ages of 25-34 (14.87M), with a majority of borrowers in this age group (3.63M) owing 20-40K (Federal Student Aid, 2021c). Studies investigating who incurs the most educational loan debt have been explored by race/ethnicity, gender, socioeconomic status, degree type, institutional sector, and loan type.

Disparities in student loan borrowing by sex and race/ethnicity have gained increased attention in recent years. Specifically, women borrow more than men (although they also attain more degrees overall), and women hold 58% of all outstanding student debt (American Association of University Women [AAUW], 2021). With regard to race and ethnicity, Black students have been found to borrow greater amounts and borrow more often, followed by White, Hispanic, and Asian students (Braga, 2016). Debt-to-earning incurred among undergraduate students by major has also been explored, with the top 10 majors with the highest earnings-to-debt ratio in STEM (Hanson, 2021; Velezet al., 2017). Figures such as these and disparities

between various demographics beg the question as to whether differences exist in the association between student debt incurred and financial stress experienced by borrowers in meeting financial obligations, such as loan default or inability to pay for necessary expenses (e.g., food and housing) after graduation among different student demographics and/or postsecondary sectors.

Regarding degree type, the 2019 Survey of Customer Finances by the Board of Governors of the Federal Reserve System (2020) indicates that 36% of student debt holders with federal and/or private loans held a master's degree, followed by 20% of those with a bachelor's degree, 20% for professional or doctoral degrees, 7% for associate degrees, and 8% with no postsecondary attainment (Baum & Looney, 2020). Research using the Beginning Postsecondary Students Longitudinal Study (BPS): 04/09 also suggests that though cumulative federal student loan debt was similar regardless of family income, disparities exist between the type of institution attended and the highest degree earned by low-income students compared to high-income students. In particular, students whose parents were in the lowest-income quartile borrowed more for undergraduate studies at less competitive institutions, while students with parents in the highest income quartile borrowed more to attend an elite institution and/or borrowed at the graduate level (Looney, 2021). The disparities uncovered in extant literature demonstrate that accumulated student debt varies between demographic groups, degree type, institutional sector, and loan type. The post-graduation effect of the debt on students needs to be further explored if we are to determine whether these disparities contribute to continued inequity post-graduation.

Student Loans Post-Graduation

If a graduate experiences financial stress from the burden of student loan debt in the first year after graduating, then missing payments on loans may be a response. Unsurprisingly, defaulting on loans is one of the most unfortunate realities after borrowing. Data on student loan defaulters taken from BPS: 04/09 indicates that 90% of defaulters received a Pell Grant and 70% were first-time-in-college (Miller, 2017). Three out of every ten student loan defaulters are Black, and of those, nearly half never finish college; of the students who defaulted, 45% were unable to get back in good standing, while 10% defaulted on their loans for a second time (Miller, 2017). Moreover, almost half of Black borrowers who default on their loans also have repayment solutions that fail (Miller, 2017).

Empirical studies on student loans have long examined the subsequent effects of borrowing through various outcomes. Among measures of post-graduation effects of student loans, the literature explores the associations with well-being (Elliott & Lewis, 2015; Korankye & Kalenkoski, 2021; Sommer, 2020; Walsemann et al., 2020), homeownership (Bleemer et al., 2021; Houle & Berger, 2015; Mezza et al., 2020), marriage (Bozick & Estacion, 2014; Gicheva, 2016), and spending within the economy (Korankye & Guillemette, 2021; Zhang et al., 2020). The results are mixed in that there are both negative and neutral effects (see Walsemann et al.,

2020), but the general consensus of these studies is that student debt is not positive in the long term.

Beyond delaying or foregoing traditional markers of adulthood due to high student loan levels, studies have demonstrated a negative correlation between student loan levels and overall wellness. For example, Korankye and Kalenkoski (2021) analyzed the United States (U.S.) Panel Study of Income and found that having student debt (and greater amounts of such debt) increases the head of household's probability of not being satisfied. Similarly, in the U.S. Bureau of Labor Statistics' National Longitudinal Survey of Youth, Walsemann et al. (2020) found that having greater debt amounts was significantly associated with fathers having more depressive symptoms and worse mental health, though no relationship was found for mothers. The outward emotional evidence of financial stress in these studies is complemented by results demonstrating financial stress in the form of inability to meet financial obligations in studies by Martin and Dwyer (2021). These studies inform our approach to filling in a missing element of financial stress, analyzing the reported ability to meet financial obligations by graduates in the National Center for Education Statistics' (NCES) Baccalaureate and Beyond Survey (B&B) longitudinal cohort studies from 2016/2017 and 2008/2018.

Connecting the Extant Literature

Increased attention is being paid to the role of student debt in overall financial stress before, during, and after college (Baum & O'Malley, 2003; Dowd & Coury, 2006; Herzog, 2018; Jones-White et al., 2014; Martin & Dwyer, 2021; Nora et al., 2006; Robb et al., 2012). In general, research on pre-college perceptions of debt focuses on financial literacy (Lee & Mueller, 2014; Markle, 2019; Norvilitis & Linn, 2021), aversion to debt as a means to pay for college (Zerquera et al., 2017; Ziskin et al., 2014), and satisfaction with college costs (Baum & O'Malley, 2003; Dowd & Coury, 2006). This literature has raised an intriguing agenda for researchers and policymakers alike as to the future of federal loans.

Generally during college, student debt negatively correlates with persistence among college students (Dowd & Coury, 2006; Herzog, 2018; Jones-White et al., 2014; Nora et al., 2006), but evidence also suggests that this association is experienced differently by BIPOC students (Baker & Montalto, 2019; Kim, 2007). For instance, Kim (2007) observed that Black students experienced a negative correlation between degree attainment and student loan increases (measured in $1,000 increments). Furthermore, regardless of race/ethnicity, as student debt increases degrees are more likely to be obtained following at least one transfer of institutions (Jones-White, 2014).

Some researchers have explored the relationship between student debt and stress among students attending an HBCU (Dzokoto et al., 2007; Lindsey et al., 2011; Peters Jr. et al., 2011; Rodney & Mincey, 2020). For instance, Rodney and Mincey (2020) found that Black female students were concerned with their ability to repay their student loans and manage the amount of

student debt they'd need to incur to continue their education beyond the baccalaureate level. Similarly, respondents to a survey by Lindsey et al. (2011) reported financial burdens as a top-five indicator of stress in college, while Peters Jr. et al. (2011) found that perceived difficulties attaining adequate financial aid were correlated with behavioral and psychosocial effects. Highlighting the importance of these findings, Dzokoto et al. (2007) found that finances were a significant source of stress for over 30 percent of the more than 500 students surveyed who attended an HBCU, while 8.4 percent of these same students reported having suicidal thoughts in the last two weeks. These findings suggest that students who attend an HBCU may experience disproportionate stress levels caused by financial burdens, resulting in severe barriers to student success in comparison to students attending other institutional types.

A few notable studies have investigated student debt and financial well-being post-graduation. One study found that during the Great Recession Black and Hispanic households, compared to their White peers with student debt, were more likely to encounter financial stress—defined as and measured by indicators such as loan repayment status and spending levels exceeding income in the past year (Martin & Dwyer, 2021). Other research has shown evidence that Latinx/Hispanic students may take steps such as changing career plans due to worries about debt repayment (Carales et al., 2020). Similarly, Black graduates are more likely to report feeling burdened by debt such that they have changed career plans and feel regret about the amount of debt borrowed (Baum & O'Malley, 2003).

Although these present studies are important for understanding the association of student debt on access, attainment outcomes, and post-graduation success, few studies have connected these themes by exploring the relationship between student debt, student demographic characteristics such as race/ethnicity, institutional type, and the ability to meet financial obligations (i.e., level of financial stress) post-graduation. Specifically, no study to date has investigated whether differences exist in post-graduation financial stress experienced by BIPOC students at Predominantly White Institutions versus institutions that have specific federal designations, such as Minority Serving Institutions, Historically Black Colleges and Universities, or Hispanic Serving Institutions. The present study seeks to investigate this relationship by employing data from the National Center for Education Statistics' 2016/2017 and 2008/2018 Baccalaureate & Beyond Longitudinal Studies to compare financial well-being post-graduation among college graduates with different social characteristics who graduated with varying levels of student debt.

Methodology

Study Design and Datasets

Retrospective data from the National Center for Education Statistics' (NCES) Baccalaureate and Beyond Survey (B&B) longitudinal cohort studies from 2016/2017 and 2008/2018 are used in

this study, consisting of 19,000 and 26,000 sample members drawn from NPSAS:08 and NPSAS:16, respectively. The surveys contain data on undergraduate students who were graduating seniors and then followed these students one, four, and ten years after their senior year.[1]

A logistic regression model was used to calculate an estimate of the financial stress on a student after graduation. This model analyzes the relationship of the outcome variable (dependent) to several explanatory variables (independent variables). We conducted the analyses separately using two B&B surveys in order to ascertain findings from two distinct periods of time and to determine whether the findings changed between the cohorts. We used NCES' PowerStats to analyze the results. PowerStats employs a weight variable to estimate population-level statistics based on the representative sample surveyed. We opted to utilize the recommended weight variable WTA000 for our analyses.

Variables

The predictor (independent variable of interest), response (dependent variable), and controls (independent variables) used in the analyses are provided below as defined by the NCES B&B Survey:

Predictor. Debt at Graduation (FEDCUM 1, independent/predictor variable, continuous) is labeled as "Cumulative federal loan amount for undergrad." The independent variable, FEDCUM1, from NCES' B&B: 2016/17 and 2008/18 studies report "the cumulative federal loan amount for undergraduate education" (NCES, n.d.) using data from the National Student Loan Data System's (NSLDS) loan data. This variable includes each of the federal student loans that can be borrowed by students. These loans are in the student's name and do not require a co-signer and exclude federal loans issued to the parent(s) of the student.

Outcome Measure. Financial Stress (2016/17, BISTRESS, predicted variable, categorical) is defined as "had difficulty, within 12 months before B&B: 16/17 interview." The dependent variable, B1STRESS, from NCES' B&B: 2016/17 reflects a student's self-reported ability to meet financial responsibilities necessary to maintain a basic standard of living, such as mortgage/rent payments, utilities, or medical care, in the 12 months prior to the interview (NCES, n.d.). This categorical variable, answered yes or no, provides the framework for establishing financial stress from a student's inability to pay expenses related to a basic standard of living. For the 2008/18 B&B survey, the corresponding **B2FSTRESS** variable was used, and based on the 2012 interview.

Control Variables.

[1] The 2016/2017 survey is still in progress and is scheduled to conclude in 2026.

- **Race/ethnicity (with multiple)** (**RACE**, control variable, categorical). The rationale for including race/ethnicity is to see if this variable correlates with the dependent variable. RACESEX was excluded because it includes foreign students, who are by definition ineligible to receive federal loans, our independent variable of interest.
- **Gender** (**GENDER**, control variable, categorical). The rationale for including Gender (GENDER) is to see if this variable correlates with the dependent variable.
- **Accreditation Type** (2016/2017, **ACCREDTYP**, control variable, categorical) – refer to regional, national, and specialized accreditation agencies currently recognized by the U.S. Department of Education. Note: Accreditation was not included in 2008/18, as it was not a variable included in the survey.
- **Institutional Control of Affiliation** (**CNTLAFFI**, control variable, categorical) – An educational institution whose programs activities are operated by publicly elected or appointed school officials and which is supported primarily by public funds. The rationale for including institutional control of affiliation (CNTLAFFI) is that this will allow us to measure correlations between institutional status as a public, private non-profit, private for-profit, and/or religious institution and our dependent variable.
- **Carnegie Classification, Collapsed** (2016-17, **CC2015C**, control variable, categorical) – institutional classification based on 2015 IPEDS Institutional Characteristics Header File. The rationale for including Carnegie Classification 2015: Basic classification (CC2015C) is that this will allow us to measure whether institutional mission is correlated with our financial stress variable. **CC2005C** was used as the corresponding variable for the B&B 2008/2018 study.
- **Minority Serving Indicator** (**MSISTAT**, control variable, categorical) – Indicator of HBCU, Black -serving non-HBCU, Hispanic Serving, Asian Serving, American Indian-Serving, Other Minority Serving, and Non-Minority Serving. The rationale for including the Minority Serving Institution indicator (MSISTAT) is that it will allow us to analyze whether status as a Black-serving non-HBCU, HBCU, Hispanic Serving Institution, American Indian-serving or Tribal College or University, or other Minority Serving Institution has any relation to meeting financial obligations post-degree. It should be noted that the Minority Serving Indicator was not included in the original design of the 2008/2018 survey. The variables OCRHSI and HBCU were used as substitutes to gather information about these indicators.
- **Selectivity** (2016-17, **SELECTV3**, control variable, categorical) indicates the selectivity of the institution attended, including private for-profit 4-year institutions. The rationale for including Selectivity (All 4-year institutions) (SELECTV3) is to understand whether selectivity of the institution impacts financial stress. The corresponding variable for the 2008-18 survey was **SELECTV2.**
- **Expected Family Contribution (EFC)**. Refers to an index used to determine eligibility for federal student financial aid. The rationale for including EFC is to understand whether

Pell eligibility, a measure of socioeconomic status, impacts financial stress. EFC is employed as a categorical (binary) variable, with scores less than 5864 serving as an indicator of Pell eligibility and scores of 5865 or above indicating that the student is likely ineligible for the Pell Grant. EFC was imputed in the survey using 2015-16 EFC formulas for dependent students, independent students without dependents (besides spouse), or independent students with dependents (besides spouse). For the 2008/2018 Survey, the primary EFC was imputed from the 2007-08 FAFSA.

Table 1 summarizes the variables and the labels provided in B&B for the surveys in 2016-2017 and 2008-2018 as used in this study. Although we use "predictor" and "control" in our text for accessibility, this is a descriptive study—we do not make causal claims.

Insert Table 1 Here

Data Analysis

To analyze these data, we employed several statistical procedures using NCES' DataLab PowerStats. The benefits of this program are its accessibility to the public, replicability of study results, the data being preloaded and clean, and the ease of statistical modeling with NCES-approved weighting. The limitations, however, are that the regressions are rather simple and do not allow for more robust procedures for handling missing data (i.e., multiple imputation techniques). For our analysis, we explored means and standard errors to better understand the sample at hand and the distributions of our key variables. Following these descriptive statistics, a series of Pearson's correlations were performed to test the linear relationships of all the study's variables. This helped us identify any collinearity issues before employing the regression models.

Given that the dependent variable (i.e., financial difficulty 12 months before the B&B interview) is dichotomous, we used logistic regressions with appropriate panel weights. Most of the variables did not have missing cases, although there were some cases excluded by PowerStats automatically. It is important to note that missing cases are expressed as weighted proportions of the population estimates and that the Ns are also expressed as weighted Ns of the population estimates as opposed to the analytic Ns of the actual sample size. In the 2008-18 survey, 1.81% (n=25,953) of the weighted sample skipped the SELECTV3 question. Cases not included in the 2016-17 survey were for CNTLAFF1 (i.e., .35% missing, n=7,161) and also ACCREDTYP (i.e., 7.91% skipped, n=161,249; and .41% missing, n=8,398).

For the regression models, we employ two iterations. First, we analyzed the data with the primary variables of interest (as noted above) followed by a second model with covariates to better estimate the magnitude of our key variables before and after controls. For instance, we want to know whether student loan debt significantly affects financial stress, as measured by the ability to meet financial obligations, after controlling for race and institutional type. To reiterate, PowerStats is limited and does not allow for interaction terms or changes in probability (i.e.,

margins). That said, we were nonetheless able to test relationships and describe the results of the odds ratio and statistical significance for our key variables and covariates. The results for individual coefficients were analyzed, and model fit statistics were used to describe the extent to which the models fit the data.

Results

From the analysis of the National Center for Education Statistics' (NCES) Baccalaureate and Beyond Survey (B&B) longitudinal cohort studies from 2016/2017 and 2008/2018, we hypothesize that students with higher student loan burdens experienced more financial stress and self-reported that they experienced financial difficulty in meeting all essential expenses during the twelve-month period immediately preceding the B&B interview. In the 2016/2017 survey administration, the time of responses was within the first year of graduating from an institution of higher learning. In the 2008/2018 survey, the same question of experiencing financial difficulty in the previous twelve months was presented in 2012, approximately four years after the student graduated. Given that 2008 graduates entered the workforce during a major economic shock (the Great Recession of 2007-2009), our results focus more on the 2016/2017 results. However, it is worth noting that the 2008/2018 results revealed similar findings with regard to the research questions.

Tables 2 and 3 provide descriptive statistics for the 16-17 and 2008-18 cohorts, respectively. Tables 4 and 5 include the corresponding regression analysis for the 16-17 cohort and the 08-18 cohort, respectively.

Insert Tables 2-5 Here

Debt and Financial Stress

For the 2016/2017 survey, 20% of the respondents reported financial difficulty in the previous 12 months. The analysis of descriptive statistics shows that as student loan amounts increased, the proportion of students experiencing financial stress also increased. For students without federal loan debt from their undergraduate experience, 11% of students reported difficulty paying essential expenses. For students with student loan debt from $1 - $16,750, the percentage who experienced financial stress was 17%; for student loan debt amounts from $16,751 - 27,000 was 19%; for student loan debt amounts from $27,001 - $35,500 was 26%; and for students in the highest category, with student debt of $35,501 or more, 40.4% reported that they experienced financial difficulty. Figure 1 illustrates that the higher amount of student loan debt aligns with increased financial stress.

Insert Figure 1 Here

As depicted in Figure 1, there is a positive relationship observed between higher amounts of debt and financial stress one year after graduation.

Race and Gender as an Indicator of Financial Stress

Using descriptive statistics in the 2016-2017 sample, only 16.17% of White students and 14.11% of Asian students indicated that they had financial difficulty, while the percentage for Black students was twice as much at 38.70%. Other races were in between these ranges with percentages between 23.02% for mixed-race and 29.34% for Hispanic students. Gender tells a somewhat different story. Those self-identifying as male (16.04%) reported having financial difficulty less than those self-identifying as female (23.46%). Similar patterns are found in the 2008-2018 data. For example, 21.73% of White students reported not meeting all essential expenses and the percentage was twice as high for Black students (43.85%). As in the above categorization, females (28.48%) reported having financial difficulty more than males (19.02%). Figure 2 represents the financial difficulty of students by race and ethnicity in paying essential expenses within one year of graduation and highlights the effects of debt on vulnerable or underserved populations. The race and ethnicity categories are listed in order of most students with financial stress at the top to least percent with financial stress at the bottom.

Insert Figure 2 Here

For the logistic regression analysis in the first sample, we see that Black students' odds of having financial difficulty were 2.14 ($p < .001$) times that of their White counterparts, all else equal. A similar pattern was found for Hispanic students ($OR = 1.94$, $p < .001$). The only other race to be statistically different from White students in having financial difficulty was mixed-race ($OR = 1.43$, $p = .01$), controlling all other variables in the model. Gender in this sample also proved noteworthy. All else equal, the odds of having financial difficulty for those who identified as female were 1.46 ($p < .001$) times that for males. With the second sample, nearly identical patterns emerge in terms of statistical significance but to a lesser degree for coefficient magnitude. For starters, Black students' odds of having financial difficulty were 1.89 ($p < .001$) times that for White students, all else equal. In the same model, however, Hispanic students were 1.37 ($p = .001$) times that for White students to have financial difficulty. Furthermore, the odds ratio for mixed races compared to White students was also significantly greater ($OR = 1.67$, $p = .008$). Finally, concerning gender, the odds for females were still 1.55 ($p < .001$) greater than that for males, all else equal.

Minority-Serving Institution as an Indicator of Financial Stress

In this study, the researchers explored the extent to which students who attended Minority Serving Institutions (MSI) experienced financial stress using the MSI Status variable. Descriptive statistics from the 2016-17 B&B Survey revealed that only 17.7% of students who

attended non-minority serving institutions reported experiencing financial stress, whereas 28% of students who attended Hispanic Serving Institutions (HSI), 30.5% of students who attended Black-serving non-HBCU institutions, and 40.3% of students who attended HBCU reported experiencing financial stress. Of the MSI groups, only 13% of students who attended Asian, Native Hawaiian, and Pacific Islander Serving Institutions reported experiencing financial difficulty, compared to 18% of students from non-minority serving institutions, whereas students attending other MSI (i.e., HBCU, Black-serving non-HBCU, HSI) reported greater financial stress than students at non-minority serving institutions. In the 2016-17 survey specifically, students who attended HSI had 1.44 greater odds ($p < .001$) of experiencing financial difficulty than their non-minority institution-attending counterparts. Data from the 08-18 B&B survey also revealed differences between students who reported experiencing financial stress at HBCUs (55%) and HSIs (68%), compared to students at non-minority serving institutions, although the cohort findings were not statistically significant. Figure 3 shows the financial burden of students according to the type of institution they attended and highlights the burdens experienced by students at HBCUs, Black-serving non-HBCUs, and Hispanic-Serving Institutions (HSI), compared to non-minority serving institutions.

Insert Figure 3 Here

These results bring to the forefront the role that MSI might have in reducing the burden of students who report having the most financial difficulty: Hispanic and Black students. Whereas Black students in the 2016-17 B&B had the highest odds of resulting financial difficulty (OR=2.14, $p < .001$) compared to their White counterparts, Hispanic students from the 2016-17 survey were 1.94 times ($p < .001$) more likely to experience financial stress compared to their White counterparts, and students who attended HSI were just as likely to experience financial stress upon graduation (OR=1.44, $p < .001$). It is important to note that the HSI designation is based on an enrollment of at least 25% of students being classified as Hispanic and can denote institutions with varying levels of diversity.

In our initial regression analysis, we found that Black students who reported attending an HBCU did not report being financially stressed to a significant level, which seemed interesting given the findings Black students—not restricted to Black students attending HBCUs—were generally more likely to experience financial stress. These findings might also suggest that some MSIs might be more suited to meet the needs of their students than others, as HBCUs are Land Grant Institutions that have focused on the needs of Black students since 1890 or earlier. To further explore the degree to which students who attend HBCUs may experience financial stress, we ran the same logistic regression without controlling for race (given the prevalence of Black students at HBCUs) and found that attendance at an HBCU is not a predictor of students' financial stress. With the limited number of HBCUs (N=107) from which to study, and only 1.7% of the B&B 2016/2017 respondents reporting as having attended an HBCU, additional research and consideration of the findings is warranted.

Institutional Admissions Process Selectivity as an Indicator of Financial Stress

The influence of institutional selectivity on financial stress experienced post-graduation helps to further frame the relationship between race/ethnicity, socioeconomic status, and financial stress experienced post-graduation. Specifically, students in both the 2008-2018 and 2016-2017 datasets were most likely to experience financial difficulty post-graduation if they attended an open-admission institution. In the 2008-2018 cohort, students who attended an open admission institution were 1.72 ($p = 0.001$) times more likely than students at very selective institutions to experience post-graduation financial difficulty. In the 2016-2017 cohort, students who attended an open admission institution were 1.49 ($p < 0.01$) times more likely than students at *minimally* selective institutions to report difficulty meeting financial obligations post-graduation.

Figure 4 illustrates the students' reported financial difficulty from institutions of varied admissions selectivity. The less selective admission processes aligned with greater proportions of students experiencing difficulty paying expenses. Students in very selective institutions had the lowest percentage of students experiencing financial stress.

Insert Figure 4 Here

Degree Levels Offered at the Institution as an Indicator of Financial Stress

Students in the 2016-2017 survey who attended an institution with a Carnegie classification of Associate's had the highest level of financial stress with 32% reporting an inability to pay essential expenses. The burden from an associate's level institution was even greater in the 2008/18 survey with 43.5% of students reporting difficulty paying essential expenses four years after graduation. Nevertheless, the Carnegie classification was not found to be a statistically significant indicator of financial stress.

Institutional Control or Affiliation as an Indicator of Financial Stress

Institutions are listed by control or affiliation according to the primary source of revenue for the institution. Public institutions are sponsored by state funds and private institutions typically do not receive state support for educational programs based on student enrollment. Within private institutions, some colleges and universities have a not-for-profit model which mandates them to reinvest revenues into the institution. The highest percentage of students stating an institutional burden in repaying student loans attended a private for-profit institution. Eighteen percent of students at private not-for-profit institutions with a religious affiliation, 20% at a private-not-for-profit institution without a religious affiliation, 37% at private for-profit, and 19% at public institutions expressed difficulty paying essential expenses. Figure 5 represents the institutional control or affiliation of a student's college or university. Students who attended private institutions are listed at the top of the chart and public institutions are at the bottom.

Insert Figure 5 Here

Discussion

RQ1) To what extent does the amount of *debt at graduation* affect students' *financial stress* that they will be able to meet their fiscal obligations following graduation?

The results in the previous section reiterate the unfortunate reality that increases in student loan debt amounts correlate with students experiencing greater financial stress. Initially, this study set out to explore the extent to which the amount of *debt at graduation* affects students' *financial stress* post-graduation. Indeed, the timing of people entering the workforce during the Great Recession provides a backdrop that puts caution to our over-interpretation. However, we can say that at this point in time, overall, B&B participants (our postsecondary success stories) still struggled with financial stress after graduation significantly due to debt.

For individual demographics, the above results reiterate and complement unsurprising (but unfortunate) patterns found in the literature. For instance, Black and Hispanic students experienced significantly more stress than their White and Asian counterparts. This is consistent with the work of prior studies in the stress-specific space (Baum & O'Malley, 2003; Martin & Dwyer, 2021), as well as the broader literature concerning student loan debt's negative effects (Dowd & Coury, 2006; Herzog, 2018; Jones-White et al., 2014; Kim, 2007; Nora et al., 2006).

We further find that those who identified as female held higher reported levels of stress than those who identified as male. As discussed, females go to traditional colleges at higher rates than males (binary language notwithstanding), and thus borrow more (AAUW, 2021). However, the stress levels being as much as 46% in our odds ratio calculations should pose caution and consideration for policymakers and practitioners alike. In short, the promises of social mobility posited by higher education (for the very students the system intends to help) cannot be fulfilled if financial stress post-graduation is significantly affected by debt (a key way to pay for college).

RQ2) What are the postgraduate financial experiences of students who graduate from Hispanic Serving Institutions, Historically Black Colleges and Universities, or Black - serving non-HBCU?

Concerning this question about institution types, students coming from HSIs, open-access institutions and for-profit institutions experienced higher levels of financial stress post-graduation. These results bring to the forefront the role that MSI might have in reducing the burden of students who report having the most financial difficulty: Hispanic and Black students (as also noted above). In our initial regression analysis, we found that students who reported

attending HBCUs did not report being significantly financially stressed, which is interesting given the findings on the degree to which Black students experienced financial stress. This specific contrast suggests that some MSI might be more suited to meet the needs of their students than others, given that HBCUs are Land Grant Institutions that have focused on the needs of Black students since at least 1890. Conversely, we found that students attending HSIs were likely to experience financial stress. While this classification is simply related to the percentage of students served, the results suggest that those institutions should pay close attention to the population mix of their students to ensure gainful employment is met for these students in addition to the diverse experience purported through HSI designations.

Our findings fit well with the present literature on undermatching among high-achieving BIPOC and low-socioeconomic status students, as these students disproportionately apply to and attend less selective institutions than their White, middle-income, and high-socioeconomic status peers (Black et al., 2015). Furthermore, these findings suggest that while the sticker price of postsecondary institutions tends to increase with increasing institutional selectivity, more selective institutions likely have institutional aid that reduces the overall debt burden of their students as compared to open-admissions institutions. A final alternative possibility is that though more selective institutions require students to incur more debt on average, the graduates of these institutions end up performing better in the labor market due to the prestige associated with their degrees.

Limitations

This study is not without its limitations. As discussed throughout the methods section, PowerStats is limited in its statistical utility (e.g., we cannot probe interaction terms), but the code for the descriptive results is replicable by other scholars. As such, although we use the terms “predict” and “control” to increase readability, we do not make causal claims or overly strong recommendations for policy changes given the sample and the methodology. It would be helpful to go deeper into purposeful sampling of HBCUs and HSIs to see how these classifications fare with more robust analyses. Furthermore, as alluded to, our population of interest is also the success stories of B&B, and it would be interesting to see how other people who do not complete postsecondary studies measure in terms of financial stress (in addition to replicating our results well-beyond the Great Recession). It is no secret that default rates are dramatically different for those who never finish (Federal Student Aid, 2021b; Miller, 2017), so including them in a sample may reveal higher levels of stress caused by student loans in general. Finally, due to the aforementioned limitations to statistical utility, we are unable to provide the demographic breakdown of missing and excluded cases. As such, it is possible that a particular group or groups of students were disproportionately excluded from certain analyses. In future studies, researchers should consider conducting similar analyses using a Restricted-Use License, which can be obtained through the NCES. Similarly, using a Restricted-Use License would allow

for analyses of interaction terms and could provide deeper descriptive statistics such as the breakdown of student loan amounts by student demographics.

Recommendations

As society in general, and higher education policymakers in particular, continue to focus on equity in access and degree attainment, our findings add a layer of understanding to the present literature demonstrating disparities in access, attainment, and student loan debt accrual based on race/ethnicity. Specifically, our findings suggest that the disparate student loan debt accrued by BIPOC students results in increased financial stress—measured by self-reporting on one's ability to meet financial obligations during follow-ups in the NCES Baccalaureate & Beyond Survey—demonstrating further disparity in financial impacts of student loans following graduation. Institutions and policymakers have a variety of possible interventions at their disposal that could combat the negative impacts of student loans, particularly for BIPOC communities, which are suggested here.

At the policy level, policymakers could pass programs aimed at reducing the need for student loans among students from low-socioeconomic backgrounds, such as the tuition-free promise programs that are presently gaining traction across the nation.[2] This could continue at the state and local levels, though a federal policy would broaden access at a much wider scale than the present patchwork of programs can provide. Additionally, policymakers can enhance the benefits of these programs by allowing grant-eligible students to use their federal grant dollars on educational expenses above and beyond tuition and fees. Such programs presently exist in some institutions and are often referred to as "first-dollar" promise programs. First-dollar promise programs allocate program funds to pay tuition and fees charged by the institution before grant and scholarship aid, such as the Federal Pell and Supplemental Education Opportunity Grants, is taken into account, allowing the federal grant aid to be used toward costs such as books and supplies, room and board, and transportation (Dowd et al., 2020).

At the institutional level, colleges and universities can curb the negative impacts of student loan debt by allocating and/or increasing resources dedicated to the financial education of students, focusing on targeted outreach to students lacking the social capital necessary to navigate the complexities of college costs and financial aid. Specifically, providing easily accessible tools and access to financial education/advising prior to matriculation for BIPOC, low-socioeconomic status, and first-generation students can provide these students with a better

[2] See the following promise programs enacted within the last decade: A+ School Program, 2016; An Act to Create the Arkansas Future Grant Program, 2017; California College Promise, 2017; Excelsior Scholarship, 2017; Hawaii Community College Promise Program, 2018; Higher Education Legislative Plan for Needy Students Grant, 2018; Montana Promise Grant Program, 2017; Nevada Promise Scholarship Program, 2017; Oregon Promise Program, 2015; Rhode Island Promise Program, 2017; Tennessee Promise Scholarship Act of 2014, 2014; Work Ready Kentucky Scholarship Program, 2019

understanding of the true cost of pursuing a college credential and the options available. Such resources can help students manage expectations and make concrete plans for reducing or, in some cases, eliminating the need to take on student loans to pay for postsecondary education. Furthermore, tailored advising prior to matriculation can assist students in determining how the financial aspect of college comes into play in terms of overall fit with a given institution, allowing students the opportunity to explore options that may be less costly in both the short and long terms.

Conclusion

Student loan debt contributes to baccalaureate degree recipients having financial difficulty paying essential expenses within twelve months of graduating. Twenty percent of graduates report experiencing stress in paying their bills, but there are some factors related to student demographics and institutional type that increase the likelihood of students having that difficulty. Students who are Black, identify as female, attend an HSI, attend an open enrollment institution, attend an institution that only offers associate degrees, or attend a private for-profit college are more likely to experience financial stress post-graduation.

In advancing equity in higher education, we should better understand the long-term effects of student loan debt. Moving forward, we would like to incorporate more advanced statistical methodology, such as interaction terms, to add more breadth to our understanding of how different debt amounts are related to financial stress across sub-groups and stress levels. Additional research regarding Minority-Serving Institutions is warranted, considering that only 1.7% of the B&B 2016/2017 respondents reported attending an HBCU and the limited number of HBCUs in the U.S. (N=107). We would also like to understand the student population of private for-profit institutions to see if there is a relationship between other variables or identify if the type of control correlates with increased financial stress. If there is a type of institution that helps alleviate financial stress or disproportionately contributes to financial strain, then communicating that information to policymakers and prospective students is important in ensuring success in college and beyond.

Acknowledgements

The authors would like to thank Tinsley Smith, Allison Bell, and mentors of the AIR-NCES Data Policy Institute for their steadfast leadership and guidance. Through this effort, we are empowered to explore national datasets to investigate the most pressing national issues. This study was partially funded by NSF 2000799.

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Table 1

B&B Variables

Dependent Variable		**Independent Variables**	
Ability to meet financial responsibilities of basic living expenses	2016-17 B1STRESS 2008-18 B2FSTRESS	Cumulative Federal Loans for undergraduate education	FEDCUM1 (16-17; 08-18)
		Control Variables	
		Race/ethnicity (with multiple)	RACE (16-17; 08-18)
		Gender	GENDER (16-17; 08-18)
		Institutional control of affiliation	CNTLAFFI (16-17; 08-18)
		Carnegie classification 2015	CC2015C (16-17) CC2005C (08-18)
		Minority Serving Institution indicator	MSISTAT (16-17) HBCU (08-18) OCRHSI (08-18)
		Selectivity – all 4 year institutions	SELECTV3 (16-17) SELECTV2 (08-18)
		Accreditation type	ACCREDTYP (16-17) Not included (08-18)
		Expected Family Contribution (A measure of socioeconomic status)	EFC (16-17; 08-18)

Table 2

Descriptive Statistics 2016-17

	Had financial difficulty, within the 12 months before B&B:16/17 interview		
	Yes	**No**	**Total**
	% (weighted *n*)	% (weighted *n*)	% (weighted *n*)
ESTIMATES			
Total	20.2923 (73,493)	79.7077 (1,624,886)	100% (2,038,556)
Cumulative federal loan amount for undergrad			
0	10.6665 (73,493)	89.3335 (615,515)	100% (689,008)
$1-16,750	17.2866 (58,424)	82.7134 (279,548)	100% (337,972)
$16,751-27,000	19.1910 (79,211)	80.8090 (333,538)	100% (412,749)
$27,001-35,500	25.4873 (67,117)	74.5127 (196,219)	100% (263,336)
$35,501 or more	40.3663 (135,425)	59.6337 (200,066)	100% (335,491)
Race/ethnicity (with multiple)			
White	16.1685 (213,328)	83.8315 (1,106,076)	100% (1,319,404)
Black or African American	38.6954 (79,605)	61.3046 (126,117)	100% (205,722)
Hispanic or Latino	29.3384 (76,408)	70.6616 (184,029)	100% (260,437)
Asian	14.1070 (23,792)	85.8930 (144,864)	100% (168,56)
American Indian or Alaska Native	29.7900 (3,263)	70.2100 (7,690)	100% (10,953)
Native Hawaiian/other Pacific Islander	29.3862 (1,761)	70.6138 (4,231)	100% (5,992)
More than one race	23.0191 (15,513)	76.9809 (51,879)	100% (67,392)
Gender			
Male	16.0358 (139,414)	83.9642 (729,975)	100% (869,389)
Female	23.4574 (274,256)	76.5426 (894,910)	100% (1,169,166)
Institutional control of affiliation			
{Missing}	24.3363 (1,743)	75.6637 (5,418)	100% (7,161)
Public	19.3805 (251,382)	80.6195 (1,045,707)	100% (1,297,089)
Private for-profit	36.7362 (44,993)	63.2638 (77,483)	100% (122,476)
Private nonprofit, no religious affiliation	19.5592 (57,204)	80.4408 (235,262)	100% (292,466)
Private nonprofit, religious affiliation	18.2702 (58,349)	81.7298 (261,016)	100% (319,365)
Carnegie Classification 2015: Basic classification (collapsed)			
Associate's	32.0191 (2,237)	67.9809 (4,750)	100% (6,987)

Research & Doctoral	18.1704 (186,303)	81.8296 (839,008)	100% (1,025,311)
Master's	22.1349 (155,495)	77.8651 (546,994)	100% (702,489)
Baccalaureate	21.8161 (47,745)	78.1839 (171,106)	100% (218,851)
Special Focus & other	25.7776 (21,890)	74.2224 (63,027)	100% (84,917)
Not degree-granting	‡	‡	100%
Minority Serving Institution indicator			
{NPSAS:16 graduate or undergraduate only variable and thus not created for this respondent}	28.6754 (14,996)	71.3246 (37,299)	100% (52,295)
Non-minority serving	17.7298 (261,193)	82.2702 (1,211,992)	100% (1,473,185)
HBCU	40.3284 (13,982)	59.6716 (20,688)	100% (34,670)
Black/African American-serving, non-HBCU	30.5300 (33,481)	69.4700 (76,185)	100% (109,666)
Hispanic/Latino-serving	27.5181 (71,253)	72.4819 (187,677)	100% (258,930)
Asian/Native Hawaiian/Pacific Islander-serving	12.6577 (6,273)	87.3423 (43,283)	100% (49,556)
American Indian/Alaska Native-serving	‡	‡	100%
Other minority-serving	20.7393 (11,852)	79.2607 (45,296)	100% (57,148)
Selectivity (All 4-year institutions)			
{NPSAS:16 graduate or undergraduate only variable and thus not created for this respondent}	28.6754 (14,996)	71.3246 (37,299)	100% (52,295)
Not a 4-year institution	‡	‡	100%
Very selective	14.1085 (73,122)	85.8915 (445,162)	100% (518,284)
Moderately selective	20.7009 (245,532)	79.2991 (940,562)	100% (1,186,094)
Minimally selective	23.9690 (32,524)	76.0310 (103,168)	100% (135,692)
Open admission	32.4052 (47,120)	67.5948 (98,289)	100% (145,409)
Accreditation type			
{Missing}	33.5918 (2,821)	66.4082 (5,577)	100% (8,398)
{Skipped}	25.7434 (41,511)	74.2566 (119,738)	100% (161,249)
Regional	19.5517 (357,832)	80.4483 (1,472,355)	100% (1,830,187)
National	32.6736 (8,609)	67.3264 (17,740)	100% (26,349)
Specialized	‡	‡	100%
More than one type	23.4293 (2,784)	76.5707 (9,098)	100% (11,882)
Expected Family Contribution			

0 <= X <= 5846; Likely Qualifies for Pell	26.5718 (287,918)	73.4282 (795,629)	100% (1,083,547)
5847 <= X <= 775137; Likely Does not Qualify for Pell	13.1676 (125,752)	86.8324 (829,257)	100% (955,009)

Table 3

Descriptive Statistics 2008-18

	Financial difficulty in the past 12 months as of 2012		
	Yes, did not meet all essential expenses	No, Met all essential expenses	Total
	% (Weighted *n*)	% (Weighted *n*)	% (Weighted *n*)
ESTIMATES			
Total	24.4553 (406,515)	75.5447 (1,255,760)	100% (1,622,275)
Cumulative federal loan amount for undergrad			
$250-12000	21.5962 (67,069)	78.4038 (243,492)	100% (310,561)
$12001-24000	28.6021 (133,882)	71.3979 (334,202)	100% (468,084)
$24001-36000	43.5994 (68,686)	56.4006 (88,853)	100% (157,539)
$36001-56500	51.6744 (45,670)	48.3256 (42,710)	100% (88,380)
Race/ethnicity (with multiple)			
White	21.7335 (263,041)	78.2665 (947,261)	100% (1,210,302)
Black or African American	43.8548 (62,447)	56.1452 (79,947)	100% (142,394)
Hispanic or Latino	31.3805 (48,396)	68.6195 (105,828)	100% (154,224)
Asian	14.3715 (13,956)	85.6285 (83,151)	100% (97,107)
American Indian or Alaska Native	36.8855 (2,655)	63.1145 (4,543)	100% (7,198)
Native Hawaiian / other Pacific Islander	19.9646 (1,269)	80.0354 (5,089)	100% (6,358)
Other	40.4136 (1,558)	59.5864 (2,297)	100% (3,855)
More than one race	32.3058 (13,193)	67.6942 (27,645)	100% (40,838)
Gender			
Male	19.0176 (134,518)	80.9824 (572,818)	100% (707,336)
Female	28.4831 (271,996)	71.5169 (682,943)	100% (954,939)
Institutional control of affiliation			
Public	22.6784 (236,958)	77.3216 (807,900)	100% (1,044,858)
Private for-profit	43.8992 (33,686)	56.1008 (43,048)	100% (76,734)
Private nfp, no religious affiliation	26.4964 (68,473)	73.5036 (189,951)	100% (258,424)
Private nfp, religious affiliation	23.8783 (67,398)	76.1217 (214,860)	100% (282,258)
Carnegie: Basic classification collapsed			
Associate's	43.4698 (5,323)	56.5302 (6,922)	100% (12,245)
Research & Doctoral	20.2651 (150,747)	79.7349 (593,128)	100% (743,875)
Master's	27.4999 (169,758)	72.5001 (447,547)	100% (617,305)

Baccalaureate	27.0808 (60,294)	72.9192 (162,351)	100% (222,645)
Special focus & other	30.8028 (20,393)	69.1972 (45,813)	100% (66,206)
Not degree granting	‡	‡	100%
Historical Black college indicator			
No	24.1051 (393,713)	75.8949 (1,239,601)	100% (1,633,314)
Yes	44.2046 (12,802)	55.7954 (16,159)	100% (28,961)
Hispanic Serving Institution			
No	24.0057 (375,260)	75.9943 (1,187,953)	100% (1,563,213)
Yes	31.5505 (31,254)	68.4495 (67,807)	100% (99,061)
Selectivity (4-year institutions)			
Not public or private nfp 4-year	44.2620 (33,609)	55.7380 (42,323)	100% (75,932)
Very selective	19.2910 (93,602)	80.7090 (391,608)	100% (485,210)
Moderately selective	23.9203 (200,708)	76.0797 (638,364)	100% (839,072)
Minimally selective	29.6418 (50,884)	70.3582 (120,778)	100% (171,662)
Open admission	37.1429 (23,937)	62.8571 (40,509)	100% (64,446)
Expected Family Contribution			
1 <= X <= 5846	28.4577 (120,351)	71.5423 (302,562)	100% (422,913)
5847 <= X <= 127207	19.6159 (189,462)	80.3841 (776,395)	100% (965,857)

Table 4

Logistic Regression Analysis (2016-17)

	Odds Ratio	SE	Lower 95% CI	Upper 95% CI	t	p-value	b	b SE
Intercept	0.0848	0.0297	0.0427	0.1684	-7.0487	0.0000	-2.4679	0.3501
Cumulative federal loan amount for undergrad								
Cumulative federal loan amount for undergrad	1.0000	0.0000	1.0000	1.0000	14.7168	0.0000	0.0000	0.0000
Gender								
Reference Group: Male								
Female	1.4620	0.1026	1.2742	1.6776	5.4129	0.0000	0.3798	0.0702
Institutional control of affiliation								
Reference Group: Public								
Private for-profit	1.1494	0.1605	0.8742	1.5112	0.9971	0.3199	0.1392	0.1396
Private nonprofit, no religious affiliation	1.0976	0.1143	0.8950	1.3460	0.8945	0.3721	0.0931	0.1041
Private nonprofit, religious affiliation	0.8260	0.0760	0.6898	0.9893	-2.0774	0.0390	-0.1911	0.0920
Carnegie Classification 2015: Basic classification (collapsed)								
Reference Group: Associate's								
Research & Doctoral	0.9511	0.3209	0.4909	1.8425	-0.1487	0.8819	-0.0502	0.3374
Master's	0.9763	0.3259	0.5076	1.8781	-0.0717	0.9429	-0.0239	0.3338
Baccalaureate	1.1015	0.3827	0.5575	2.1765	0.2783	0.7811	0.0967	0.3475
Special Focus & other; Not degree-granting	0.9205	0.3107	0.4750	1.7838	-0.2455	0.8063	-0.0829	0.3376
Race/ethnicity (with multiple)								

Reference Group: White								
Black or African American	2.1420	0.2243	1.7446	2.6299	7.2749	0.0000	0.7617	0.1047
Hispanic or Latino	1.9442	0.1784	1.6241	2.3274	7.2440	0.0000	0.6649	0.0918
Asian	1.0559	0.1616	0.7823	1.4253	0.3555	0.7226	0.0544	0.1531
American Indian or Alaska Native	2.0586	1.2073	0.6522	6.4979	1.2312	0.2197	0.7220	0.5865
Native Hawaiian/other Pacific Islander	1.8479	1.1054	0.5721	5.9684	1.0265	0.3059	0.6140	0.5982
More than one race	1.4298	0.1966	1.0920	1.8722	2.6002	0.0100	0.3576	0.1375
Accreditation type								
Reference Group: Regional								
National	1.0455	0.2197	0.6925	1.5785	0.2118	0.8324	0.0445	0.2102
Specialized; More than one type	1.3805	0.2859	0.9199	2.0717	1.5571	0.1210	0.3225	0.2071
Minority Serving Institution indicator								
Reference Group: Non-minority serving								
HBCU	1.2008	0.3405	0.6888	2.0934	0.6453	0.5194	0.1830	0.2836
Black/African American-serving, non-HSI	0.9949	0.1568	0.7306	1.3549	-0.0325	0.9741	-0.0051	0.1576
Hispanic/Latino-serving	1.4489	0.1546	1.1755	1.7858	3.4760	0.0006	0.3708	0.1067
Asian/Native Hawaiian/Pacific Islander-serving;								
American Indian/Alaska Native-serving; Other minority-serving	1.0686	0.2248	0.7075	1.6141	0.3155	0.7527	0.0664	0.2104
Selectivity (All 4-year institutions)								

Reference Group: Very selective								
Moderately selective	1.2080	0.0967	1.0325	1.4132	2.3598	0.0192	0.1889	0.0801
Minimally selective	0.9329	0.1413	0.6933	1.2555	-0.4582	0.6473	-0.0694	0.1515
Open admission; Not a 4-year institution	1.3932	0.2331	1.0036	1.9340	1.9817	0.0489	0.3316	0.1673
Expected Family Contribution								
Expected Family Contribution	1.0000	0.0000	1.0000	1.0000	-4.1752	0.0000	0.0000	0.0000

Measures of Fit (2016-17)	
Negative log-likelihood (Pseudo R2)	0.0936
Log-likelihood (intercept only)	-898,094.2063
Log likelihood (full model)	-814,050.9271
Likelihood Ratio (Cox-Snell)	0.0884
Likelihood Ratio (Cox-Snell) Maximum	0.6279
Likelihood Ratio (Estrella)	0.0926
Degrees of Freedom	200
Number of Categories	25

Table 5

Logistic Regression Analysis (2008-18)

	Odds Ratio	SE	Lower 95% CI	Upper 95% CI	t	p-value	b	b SE
Intercept	0.1586	0.0794	0.0594	0.4233	-3.6765	0.0003	-1.8416	0.5009
Cumulative federal loan amount for undergrad								
Cumulative federal loan amount for undergrad	1.0000	0.0000	1.0000	1.0000	14.0771	0.0000	0.0000	0.0000
Race/ethnicity (with multiple)								
Reference Group: White								
Black or African American	1.8942	0.2039	1.5340	2.3390	5.9357	0.0000	0.6388	0.1076
Hispanic or Latino	1.3739	0.1323	1.1376	1.6592	3.2988	0.0011	0.3176	0.0963
Asian	0.7098	0.1145	0.5175	0.9736	-2.1257	0.0348	-0.3428	0.1613
American Indian or Alaska Native	1.8670	1.1549	0.5554	6.2760	1.0093	0.3141	0.6243	0.6186
Native Hawaiian / other Pacific Islander	0.7879	0.4964	0.2292	2.7086	-0.3784	0.7055	-0.2384	0.6300
Other	2.7308	2.2518	0.5425	13.7463	1.2183	0.2246	1.0046	0.8246
More than one race	1.6687	0.3180	1.1486	2.4245	2.6869	0.0078	0.5121	0.1906
Gender								
Reference Group: Male								
Female	1.5573	0.0985	1.3758	1.7628	7.0071	0.0000	0.4430	0.0632
Institutional control of affiliation								
Reference Group: Public								
Private for-profit	3.9422	37.4364	0.0000	477,707,104.1763	0.1444	0.8853	1.3717	9.4963
Private nfp, no religious affiliation	1.1632	0.1090	0.9681	1.3976	1.6136	0.1082	0.1512	0.0937

Private nfp, religious affiliation	0.9670	0.0872	0.8103	1.1540	-0.3720	0.7103	-0.0336	0.0902
Carnegie: Basic classification collapsed								
Reference Group: Associate's								
Research & Doctoral	0.8024	0.3920	0.3080	2.0903	-0.4507	0.6527	-0.2202	0.4885
Master's	0.9410	0.4489	0.3694	2.3971	-0.1275	0.8986	-0.0608	0.4771
Baccalaureate	0.9136	0.4303	0.3629	2.2999	-0.1918	0.8481	-0.0903	0.4710
Special focus & other; Not degree granting	0.7056	0.3434	0.2718	1.8316	-0.7164	0.4746	-0.3487	0.4867
Historical Black college indicator								
Reference Group: No								
Yes	1.2299	0.3078	0.7531	2.0086	0.8269	0.4093	0.2069	0.2502
Hispanic Serving Institution								
Reference Group: No								
Yes	1.1520	0.1535	0.8872	1.4957	1.0618	0.2896	0.1415	0.1332
Selectivity (4-year institutions)								
Reference Group: Very selective								
Moderately selective	1.0914	0.0869	0.9337	1.2757	1.0985	0.2733	0.0875	0.0796
Minimally selective	1.2533	0.1479	0.9945	1.5793	1.9135	0.0571	0.2258	0.1180
Open admission	1.7176	0.2843	1.2417	2.3759	3.2680	0.0013	0.5409	0.1655
Not public or private nfp 4-year	0.4592	4.3782	0.0000	60,014,685.3131	-0.0816	0.9350	-0.7783	9.5349
Expected Family Contribution								
Expected Family Contribution	1.0000	0.0000	1.0000	1.0000	-4.0393	0.0001	0.0000	0.0000

Measures of Fit (2008-18)	
Negative log-likelihood (Pseudo R2)	0.0838
Log-likelihood (intercept only)	-913,130.1568
Log likelihood (full model)	-836,650.4255

Likelihood Ratio (Cox-Snell)	0.0892
Likelihood Ratio (Cox-Snell) Maximum	0.6724
Likelihood Ratio (Estrella)	0.0930
Degrees of Freedom	200
Number of Categories	23

Figure 1

Percent of Students Experiencing Financial Hardship One Year After Graduation, by Amount of Debt

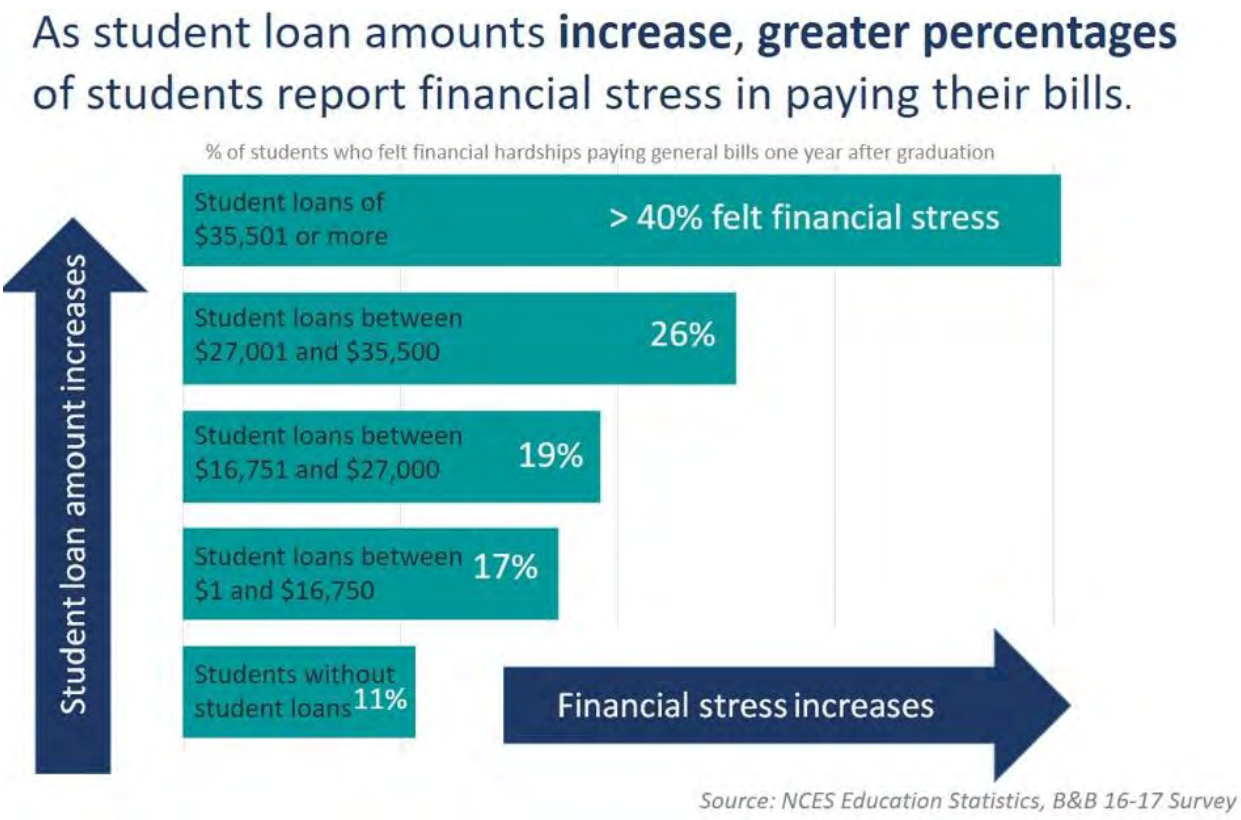

Figure 2

Percent of Students Experiencing Financial Difficulty in Paying Essential Expenses Within One Year of Graduation, by Race and Ethnicity

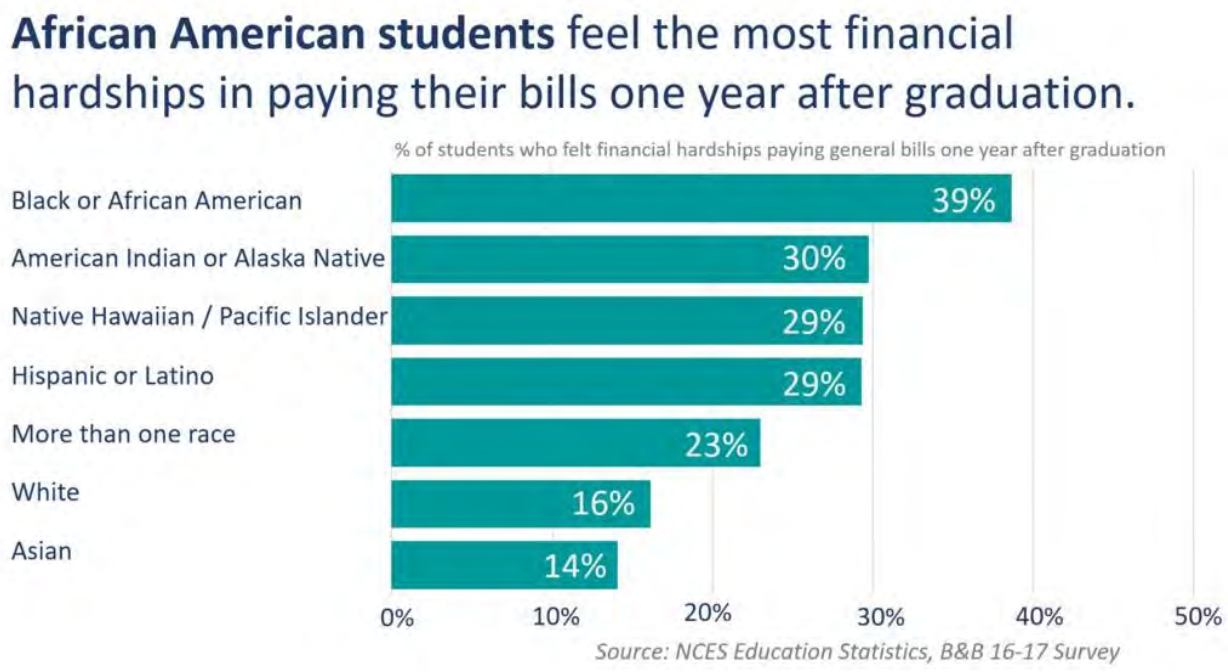

Figure 3

Percent of Students Who Felt Financial Hardship Paying Bills Within One Year of Graduation, by Type of Institution

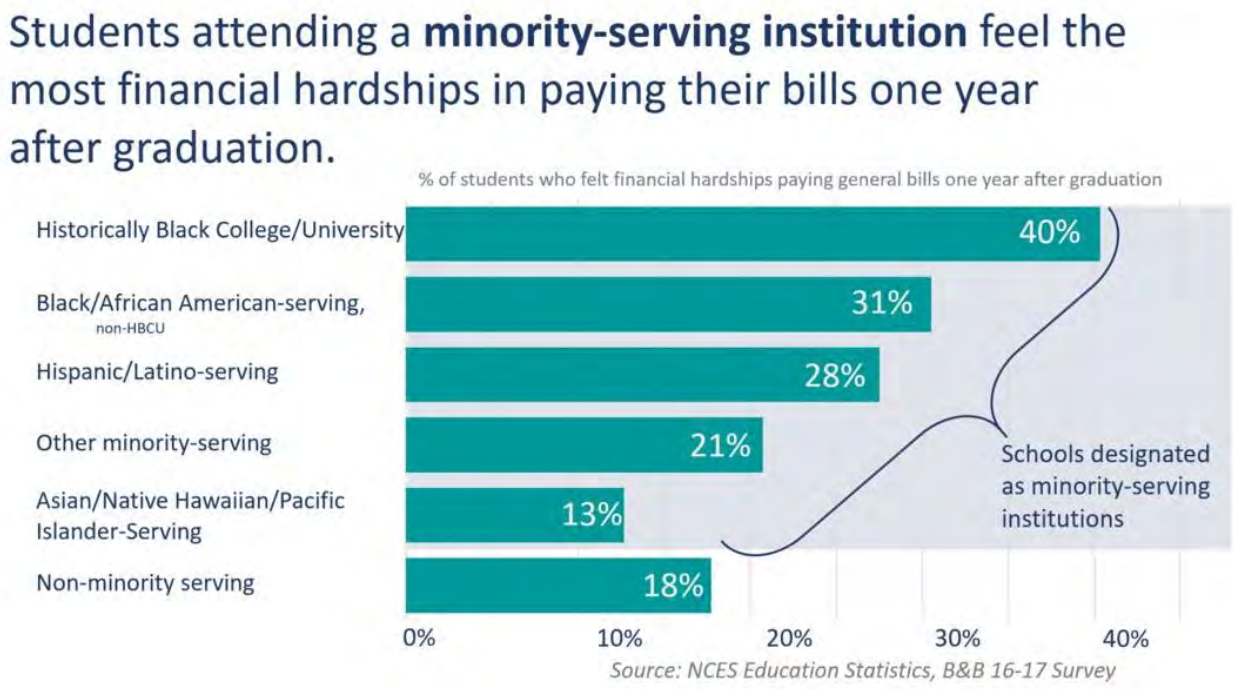

Figure 4

Percent of Students Who Felt Financial Hardship Paying Bills One Year of Graduation, by Institutional Selectivity

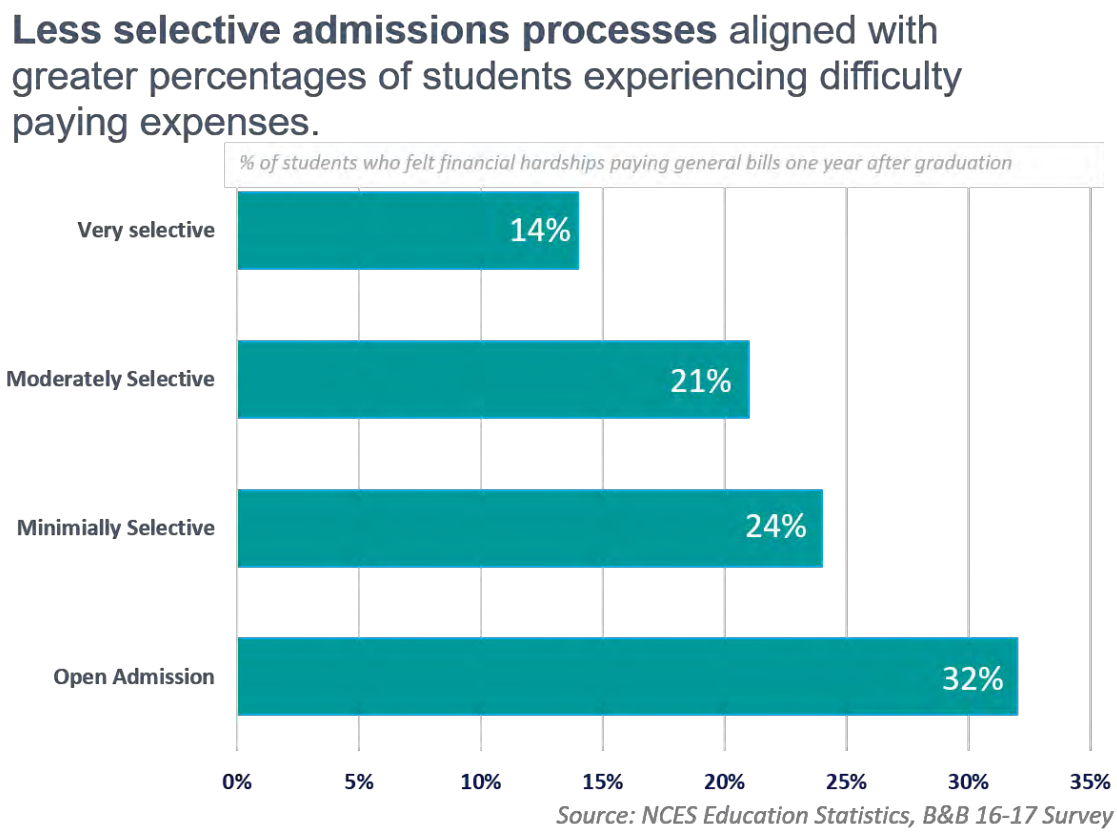

Figure 5

Percent of Students Who Felt Hardships Paying Bills Within a Year of Graduation, by Institutional Control of Affiliation