Racial Disparities in Education Debt:

Evidence from Propensity Score Matching and Two-Part Modeling Analyses
Abstract

Recent evidence has suggested that minority and lower-income students accumulate disproportionate levels of student debt compared to their white and upper-income peers, contributing to greater post-college social and economic hardship. This study is one of the first to evaluate whether racial disparities in education debt accumulation extend to low- and moderate-income (LMI) populations. Using a national sample of LMI households (n = 17,684) from the Refund to Savings (R2S) study, we perform robust two-part modeling and propensity score matching analyses. Taken together, we find that LMI black students are both significantly more likely to utilize loans to pay for college and accumulate increasing levels of education debt. Equally, we find that black students accumulate the greatest amount of education debt among other LMI racial and ethnic groups, most notably in comparison to LMI white students. These debt disparities persist even after black students graduate with a college degree. These findings highlight the importance of considering racial wealth and debt gaps among all socioeconomic groups and point to greater economic stratification and inequality among black students who use education loans. Implications of this evidence for education financing policies are discussed.

Keywords: Education debt, student debt, racial disparities, Refund-to-Savings (R2S), low- and moderate-income (LMI), college, higher education, propensity score matching
1. INTRODUCTION

Student debt has reached an alarming $1.2 trillion dollars in the United States, surpassing credit cards as the largest form of consumer debt (Chopra, 2013). This dramatic increase in student debt has closely followed the rising tuition costs at American colleges and universities, which increased by an average 82 percent among all institutions of higher education between 1981 and 2012 (National Center for Education Statistics, 2013). In an attempt to meet the demands of these rising education costs, 71 percent of all college students in the U.S. will rely on education loans to cover the mounting costs of attendance (COA). Highlighting this trend, the average college graduate in 2012 was estimated to have borrowed $29,400 over the course of their studies (Reed & Cochrane, 2013).

While education debt has become commonplace for many current and former college students today (Houle, 2014), students of color are disproportionately affected by the short- and long-term burden of this debt (Chen & DesJardins, 2010; Goldrick-Rab, Kelchen, & Houle, 2014; Kerby, 2012; Kerby, 2013; Kim, DesJardins, & McCall, 2009), especially those pursuing postsecondary education (Long & Riley, 2007). Given the dwindling availability of secure, stable and affordable funding sources such as need-based financial aid or federal grants, low-income or minority students may be designedly pushed into the subprime education market or steered into nontraditional, and oftentimes underperforming, educational institutions (Elliot, 2014). The acceleration of lower income and minority students into the subprime education market is embodied in their overrepresentation at institutions commonly cited for diminished post-college returns compared to traditional public and private nonprofit colleges, with private
RACIAL DISPARITIES IN EDUCATION DEBT

for-profit (Bailey, Badway, & Gumport, 2001; Fry, 2010) and public community colleges (Cochrane & Szabo-Kubitz, 2014) enjoying the largest enrollment of these students. Minorities account for over 47 percent of all private for-profit enrollments, with black students comprising as much as 29 percent of the national for-profit student population (National Center for Education Statistics, 2014). This is in contrast to public and private nonprofit institutions, where black students represent 12 and 13 percent of all students, respectively.

The sorting of minority students into these underperforming markets initially clarifies some of the increased risks that minorities face in student debt accumulation: Compared to graduates of traditional public (66 percent) and private nonprofit (77 percent) institutions, eighty-eight percent of for-profit college graduates have student debt. By the time a cohort of for-profit college graduates prepare to enter the labor market, their accrued debt burdens will be on average $10,550 higher than their equally-educated counterparts at nonprofit institutions (Institute for College Access & Success, 2014).

Despite a robust literature on the pitfalls of a for-profit degree and the growing concern among policymakers regarding for-profit industry practices (S. Rep. No. 112-37, 2012), this education sector is not alone in its contributions to educational and financial gaps between minority or low-income students and their white peers. Community colleges have also received increasing attention in recent years, drawing similar concerns regarding equitable outcomes for the minority student population (Dowd, 2007). At many two-year institutions, minority students have lower graduation rates, diminished educational and social adjustment, and longer time-to-degree trajectories (Bragg, 2001; Calcagno et al., 2008). The affordability of a community college education has also been scrutinized. While community colleges remain more accessible and affordable than four-year institutions, many public two-year college students incur more
education debt over the course of their studies (González Canché, 2014). Consequently, though minority and low-income students enroll at for-profit or community colleges in anticipation of improved career prospects, a disproportionate number of these students may face the contradictory reality of excessive debt burdens and abbreviated educational opportunities.

Consequently, the evidence on variations in student debt allocation and the impact of this debt by race or ethnicity has been growing for nearly two decades. The Government Accountability Office (1995) found that federal student loans were more positively associated with the degree completion prospects of white students compared to minority students. Additionally, evidence has indicated that grants or other need-based aid are better predictors of degree completion for minority or low-income students, greatly reducing the risk of dropout or attrition (GAO, 1995). Considering that these students’ are more reliant upon loans to cover education costs (Price, 2004), there are inherent risks involved for minority or low-income student borrowers that are distinct from the financial lives of more economically stable, upwardly mobile student subpopulations. Here, other important demographic and household factors such as family assets, socioeconomic status (SES), and household debt levels play crucial roles in predicting minorities’ access to mainstream funding mechanisms, and thus, higher education (Bozick & DeLuca, 2010; Charles, Roscigno, & Torres, 2007; Paulsen & St. John, 2002).

Minorities pursuing advanced research or graduate-level education face similar risks of excessive debt, particularly in fields with historic underrepresentation of minorities. Dugger and colleagues (2013) recently assessed variations in anticipated student debt allocation among medical students, finding that black medical students consistently reported significantly higher
levels of accumulated and expected debt burdens than peers from all other racial or ethnic groups. At nearly 70 percent of the accredited medical schools in the U.S., more than 77 percent of black medical students reported anticipated debt levels in excess of $150,000, as compared to 65 percent of white and just over 50 percent of Asian medical students. Concomitantly, the mere anticipation of a greater debt commitment follows closely its actual distribution among medical school graduates. The Association of American Medical Colleges (2013) found that black graduates reported a median indebtedness of $184,125 as newly-minted doctors, an average of over $27,000 more in debt compared to their white and non-black (Asian, Hispanic, other) graduating peers. Elsewhere in graduate-level science, technology, engineering, or medicine (STEM), or social, behavioral, and economic (SBE) sciences, minority students carry the disproportionate share of student debt incurred during pursuit of doctoral education. Black doctoral graduates remain twice as likely as their white counterparts to report postdoctoral, PhD-related debt in excess of $30,000 (Zeiser, Kirschtein, & Tannenbaum, 2013).

In part, these comparatively higher graduate student debt totals may be accounted for by the longer time-to-degree trajectories of minority students pursuing graduate study (Kim & Otts, 2010). Yet in the context of American higher education, the consistency of these advanced levels of debt among minorities may be indicative of deeply rooted disparities in educational achievement, socioeconomic background, and institutional mechanisms of support between white and minority students (Dwyer, McCloud, & Hodson, 2012). As a result, education loans place minority students in an economic quandary, leaving already-vulnerable students “paying a higher price of opportunity in pursuit of a college degree” (Jackson & Reynolds, 2013, p.359). Although having student loans is associated with an overall increased likelihood of degree completion, the risks of non-completion and dropout promptly increase for minority students.
(black and Hispanic) with more than $10,000 of student debt (Zhan, 2013). Furthermore, from the time of enrollment in college, family or household debt levels differentially predict graduation for white and minority students, forecasting degree non-completion among minority students above and beyond that of white students (Zhan & Lanesskog, 2014).

Well into the post-college years, education debt can remain an inordinate burden on minority graduates. Compared to 20 percent of white graduates, 25 percent of black and Hispanic college graduates prior to the Great Recession left school with excessive debt burdens (Price, 2004). More recent evidence from the Beginning Postsecondary Students (BPS) study indicated that black college graduates routinely incur the highest amount of federal student debt among the college-enrolled population, which may contribute to these graduates’ difficulties with loan repayment (Jackson & Reynolds, 2013). In this nationally representative sample, minority respondents graduated from college with an average $3,427 more in education debt than white graduates ($20,152 vs. $16,725, respectively).

While much is to be said of the observed long-term social, psychological, and economic potential attributed to the attainment of a college degree (Hershbein & Kearny, 2014; Hummer & Lariscy, 2011; Perna, 2003), degree-associated returns may have a gradient effect. Put another way, variations within the student population can have the unexpected outcome of producing heterogeneous, if not asymmetrical, returns to a postsecondary education that moderately favor those with a predisposition for college attendance (Carneiro, Heckman, & Vytlačil, 2011). Accordingly, research on the average salaries of white and minority graduates has suggested this economic stratification (Price, 2004; Strayhorn, 2008), indicating a negative post-college earnings gap between minority and white graduates that may be increasing over time (Zhang, 2013). Valuable investment decisions and wealth-building vehicles may also be adversely
impacted by education debt. Evidence from an analysis of the Survey of Consumer Finances (SCF) suggests that education debt may be negatively associated with homeownership rates and greater losses in home equity among black homeowners than among white or Asian homeowners (Elliot, Grinstein-Weiss, & Nam, 2013). Due in part to the substantial number of minorities with excessive student debt, minority graduates may additionally experience barriers to asset accumulation attributable to debt-related postponement of investments and major career choices (Baum & Saunders, 1998; Roots, 1999).

Net of any barriers that student debt may pose to labor market participation or homeownership, excessive student debt in the post-college years may conceivably stifle basic long-term financial stability via default, as well. Six years following the enrollment of a national cohort of college students, over 14 percent of black respondents were in default compared to just fewer than 3 percent of white respondents (Jackson & Reynolds, 2013). Given this heightened risk of student loan default among minorities, fundamental disparities in the allocation of education debt and its effects on post-college opportunities are likely to exacerbate repayment troubles. Supporting this connection, a comparison of education debt levels among white and minority graduates currently in default noted significant demographic variation in loan allocation among borrowers in default. In that sample, black graduates in default reported an average debt burden that was $7,626 greater than the debt levels of similarly-defaulted white graduates ($27,176 vs. $19,550, respectively; Jackson & Reynolds, 2013). Notwithstanding conventional issues of self-selection by major, degree type, earnings potential, or institutional quality, a rigid pattern of pervasive debt asymmetry emerges that may inadvertently amplify the important financial and wealth-building roadblocks many minorities continue to face even after completion of a postsecondary degree.
College attendance and enrollment for minority students is higher today than in previous decades (Carnevale & Strohl, 2010). In an effort to achieve a level of mobility comparable to that of other college graduates, however, racial or ethnic minorities may assume disproportionate, encumbering levels of education debt, in turn attenuating their financial trajectories and magnifying the degrees of racial disparity. In an educational landscape that has seen marked decreases in the availability of federal funding and significant cuts to the Pell Grant program, the recognition that minority students have excessive debt burdens should be concerning for policymakers, educational practitioners, and college or university administrators. The education debt obligations of low-income or minority students are uniquely important for reasons that underscore the challenges faced by financially at-risk populations, particularly the unexamined likelihood of hindered upward mobility through mechanisms of a traditional higher education. Certainly, such a counterintuitive hindrance invokes recognition of patterns of institutional and societal exclusion that have historically diminished access to these educational institutions and their expansive resources for minority and low-income populations.

The evidence to date suggests that, despite dramatic improvements in access to these institutions for minorities, the untimeliness of wholesale growth in college COA, reductions in federal student aid programs, and education loan restructuring threaten to exacerbate socioeconomic disparities vis-à-vis the disproportionate allocation of education debt. Equally, findings have concluded that there is a greater reliance on student loans among minority and low-income college-goers, paired closely with stronger, more complementary increases in debt-associated difficulties. However, with noted exceptions (DesJardins & McCall, 2014; Lyons, 2004; Strayhorn, 2008; Yarbrough, 1989), the bulk of evidence on education debt allocation has emerged primarily from large investigations of variation in debt burden and loan utilization.
across a myriad of socioeconomic groups (Baum & Saunders, 1998; Baum & Steele, 2010; Chen & DesJardins, 2010; Houle, 2014; Price, 2004). The conclusions of this prior research hint at the stratifying effects of education loan schemes in the U.S., denoting a pattern of increasing debts and diminished gains concentrated near the bottom of the socioeconomic ladder.

However, the degree to which within-group variation in education debt allocation emerges in low-income populations has not been thoroughly examined in the literature. Specifically, evaluations of a potential gradation of debt burden within the low- and moderate-income (LMI) population are missing (e.g., LMI white vs. LMI black students). In many ways, this population is similarly positioned on aggregate SES measures, and remains doubly vulnerable to financial instability during the college years. Lyons (2004) investigated the financial lives of a sample of college students at a large public university and found that financially at-risk students may comprise as much as 47 percent of the campus population, identifiable in their tendency to be of minority status, have outstanding or delinquent credit card balances, and come from LMI households. The common financial risks of this vulnerable student population within U.S. higher education—in addition to current trends suggestive of increasing disparities in the allocation of student debt—necessitate further investigation. Moreover, the absence of investigations examining the differential allocation of education loan debt by race leaves policymakers and researchers with missing evidence to evaluate crucial reforms that can reduce racial and economic disparities in debt.

The current study seeks to build upon the robust body of literature on education loan debt by examining variations in debt burden by race or ethnicity. More specifically, the present analysis aims to parse the effects of self-reported race or ethnicity from associated socioeconomic or exposure variables known to place college students at risk of overreliance on
education loans and thus accruing excessive levels of debt. To address noted gaps in previous research on this topic, the current study analyzes a unique dataset of LMI American households from the Refund-to-Savings (R2S) tax-time study. Using this data, we examine variation in education debt burden by race or ethnicity. By evaluating patterns of education debt within an LMI sample, we seek to determine the effects of race or ethnicity puts students at risk for detrimental debt above and beyond financial risk factors.

2. DATA AND METHODS

2.1. Data sources

To examine variations in education debt, we analyzed panel data from a national investigation of saving behavior among LMI households, the Refund to Savings (R2S) initiative (Grinstein-Weiss et al., 2015). The R2S study was developed and implemented through the collaboration of Intuit, Inc., the makers of TurboTax software (Intuit, 2014), and academic researchers from Washington University in St. Louis and Duke University.

The R2S experiment evaluated the effectiveness of a large-scale intervention that employed varying messages and study designs intended to encourage tax-filers to save their federal income tax refunds. The R2S intervention was embedded in TurboTax Freedom Edition (TTFE) tax-filing software and leveraged the “golden opportunity” of tax-time to prompt direct deposit of refunds into a saving or checking account. Required of participation in the Internal Revenue Service’s (IRS) Free File Alliance program (IRS, 2014), Intuit offers the no-cost TTFE online software to tax-filers who meet certain income or military service criteria. In 2013, tax-filer eligibility to use the TTFE software was determined using the following criteria: (a) household gross income of less than $31,000, (b) qualification for or receipt of the Earned
Income Tax Credit (EITC), or (c) active duty service in the military with a reported household gross income of less than $57,000.

Early in the 2013 tax season, tax-filers using TTFE who expected the receipt of a federal income tax refund were presented with a link inviting them to complete a comprehensive post-filing survey on household financial information. The Household Financial Survey (HFS) ascertained the presence and amount of household education loan debt, in addition to detailed demographic information about the respondent and the respondent’s household. A nationwide pool of TTFE users who filed taxes between January 31 and April 17, 2013 ($N = 689,922$) were invited to participate in the survey. Data for the current analysis on education loan debt come from responses to the tax-time HFS and administrative data collected by the TTFE software during completion of the online tax-filing process. Household Financial Survey data were collected using Qualtrics online software (Qualtrics, 2014).

Consent to participate in the current study was gathered from respondents at the beginning of the survey. All respondents who completed the online survey completed the necessary consent process. Participants also indicated consent for the collection of administrative tax data pursuant to Title 26, section 7216, of the Internal Revenue Code, which permits the electronic pairing of survey and administrative data obtained through the TTFE software (e.g., gross income, filing status).

2.2. Participants and variables

Respondent demographics were obtained from the HFS. These included demographic characteristics (e.g., age, gender, race and ethnicity) and nativity status. Variables specific to education included enrollment status (currently enrolled or not), and level of educational
attainment (less than high school, high school, some college, college degree, some
graduate/professional school, and graduate/professional degree).

In all, 20,813 TTFE users completed the HFS. Of these respondents, observations were
excluded from the current analysis if the respondent’s reported age was younger than 18 years
old (n = 289); cases indicated non-response or missing data on education loan items (n = 1,400);
outliers exceeded the 99th percentile for education debt amount ($200,000; n = 81) or credit card
debt amount ($40,000; n = 369); or predictor variables of interest had missing or incomplete data
(n = 990). These exclusions yielded an analytical sample of 17,684 LMI tax-filers (see Table 1
for sample characteristics). Over half of the sample (51 percent) reported education debt
obligations, and 7,715 (44 percent) respondents had completed a postsecondary or college
degree.

From these respondents, relevant demographic information was collected from items
measured in both TTFE and the HFS. The TTFE administrative data supplied information on the
respondent’s gross income and filing status (e.g., single, head of household, married filing
jointly, or married filing single). Remaining financial demographic information was pooled from
complete responses to the HFS: Amount of credit card debt, number of kinds of assets (e.g.,
savings account, retirement account, stocks, or bonds), and number of kinds of liabilities (e.g.,
unpaid medical bills, overdue rent, or payday loans). Respondents were first probed regarding
their education debt obligations using a dichotomous measure that assessed whether the
respondent held any education debt liabilities (1= ‘yes,’ 0= ‘no’).

An open-ended item captured the respondent’s amount of education debt. Most
respondents (97 percent) provided a dollar amount. For those respondents that indicated having
student debt, but did not provide a dollar amount (3 percent), a follow-up item prompted the
respondent to choose from a list of value categories. The categories consisted of: None, Less than $500, $501 to $1,000, $1,001 to $2,000, $2,001 to $5,000, $5,001 to $7,500, $7,500 to $10,000, $10,001 to $15,000, $15,001 to $25,000, $25,001 to $50,000, or More than $50,000). For those who responded with the categorical, rather than precise dollar amount (n = 254), values at the midpoint of each category were assigned (e.g., one endorsing “$5,000 to $7,500” would be assigned a value of $6,250). Those choosing the highest category were assigned a value at the midpoint between $50,000 and the 99th percentile (e.g., $200,000 was assigned at $125,000).

In a minority of cases (n = 1,476), tax data were not available due to error in matching tax records to the consenting participant’s name. For these individuals, gross income and filing status as self-reported on the HFS were used to fill missing values. Among those with known values from both sources, 98.6 percent of self-reported filing statuses concurred with the tax data. Among those self-reporting gross income less than $40,000, the self-reported value correlated highly with gross income in the tax data (r = .82, p < .001). Because this correlation held poorly for higher self-reported gross income, reported income over $40,000 (n = 142) was not used to replace missing values.

4. ANALYSIS

Bivariate analyses between owing education debt and various respondent characteristics were performed using two-sample proportions for categorical variables, and t-tests for continuous variables. Differences in the amount of education debt owed by racial and ethnic groups were examined using two methods. We first estimated a two-part (Duan et al., 1984) model with self-reported magnitude of education debt as its outcome. In the first part we used logistic regression to estimate the odds of having any education debt among the entire sample. In the second part we used a generalized linear model (GLM) with a gamma distribution (Manning,
Basu, & Mullahy, 2003; Manning, Basu, & Mullahy, 2005) to examine association between demographic and financial covariates and the amount of education debt among respondents with nonzero educational debt. The gamma distribution better represents the distribution of indebtedness among our respondents, and is recommended for expenditure analyses (Battese & Bonyhady, 1981). We present the combined marginal effect showing the joint impact of both differences in any (part 1), and magnitude of (part 2), education debt. To explore whether racial and ethnic differences in student loan burden are sustained beyond/despite degree completion, an additional two-part model was constructed, restricting analysis only to those respondents with a college degree or higher level of education (not shown in Tables).

As an alternate method to probe the robustness of the findings, and to explore and to minimize influence of observed confounders associated with both race and ethnicity and education debt, we implemented a propensity score matching approach (not shown in Tables) (Guo & Fraser, 2014). Specifically, we obtained estimates of a potential treatment effect of self-reported race and ethnicity on the magnitude of education loan indebtedness using a matching estimator, as developed by Abadie and colleagues (2004). With this method, values for the outcome (in this case, amount of student loan debt) are imputed for each individual in the group of interest (in this case, self-reported black race) as if they belonged to the counterfactual group (here, non-black) using the full set of covariates. Conversely, outcomes are imputed for each individual in the counterfactual group as if they belonged to the group of interest. The net effect of the condition of interest (self-reported race) is estimated by the average of the contrast of each individual with their hypothetical, imputed counterpart in the opposite condition (non-black). The values are imputed using information from a specified number of nearest neighbors (in our models, m = 4), who are the most closely matched on a list of observed variables. The statistical
method of vector norm and estimator of robust standard errors developed by Abadie and colleagues were used in the matching procedure. The variables to be matched in our models were similar to those used in the two-part model: race and ethnicity (other than black race, which is the factor of interest), age, age$^2$, sex, immigrant status, student status, level of education, filing status, gross income, amount of credit card debt, number of assets, and number of liabilities. We report the sample average treatment effect for the treated, which is the net difference of student loan debt for blacks compared to non-blacks.

All participants signified consent to participate in research with a process approved by Washington University’s Human Research Protection Office. Participants also signified separate consent pursuant to Title 26, section 7216, of the Internal Revenue Code, which permitted pairing of the survey data with administrative data from the TTFE software, including gross income and filing status.

5. RESULTS

5.1. Sample characteristics

Table 1 presents characteristics of the sample and their relationships to the presence of education debt. A greater proportion of non-Hispanic black respondents have education debt (65 percent) than do white respondents (49 percent). The percentage of people of other races and ethnicities having education debt is statistically equivalent to the percentage of non-Hispanic whites. A smaller percentage of males compared to females have education debt. In keeping with expectations, those with education debt tend to be younger than those without. A smaller percentage of those not born in the U.S. report having education loans compared to native-born U.S. respondents. A somewhat elevated percentage of people filing as head of household have education debt, while a lower percentage of households married and filing jointly have such debt. About 27 percent of respondents reported current postsecondary enrollment, with three-quarters
of these enrolled respondents having encumbered education debt. As expected, the proportion of education debt burden generally increases as level of education increases. About 16 percent of high school graduates have education loans, compared to about half of those with some college education and about two-thirds of those with educational attainment of a college degree or higher. Within this LMI sample, those with education loans have a gross income that is roughly equivalent to those without education loans. Education debt-holders also have significantly more credit card debt than those without education loans. Those with education loans have an equal number of kinds of assets, but a slightly higher number of kinds of liabilities – despite excluding the education loan from the count.

Table 1
Demographic characteristics of sample and association of traits with having education debt. Sample numbers are counts except for age and financial variables, for which means are shown with standard deviations in parentheses.

<table>
<thead>
<tr>
<th></th>
<th>Sample</th>
<th>Has Education Debt Burden (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sample size (n)</td>
<td>17,684</td>
<td>51</td>
</tr>
<tr>
<td>Race/Ethnicity</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Non-Hispanic White</td>
<td>13,221</td>
<td>49*</td>
</tr>
<tr>
<td>Non-Hispanic Black</td>
<td>1,974</td>
<td>65*</td>
</tr>
<tr>
<td>Non-Hispanic Asian</td>
<td>401</td>
<td>50</td>
</tr>
<tr>
<td>Hispanic</td>
<td>1,395</td>
<td>51</td>
</tr>
<tr>
<td>Other</td>
<td>693</td>
<td>55</td>
</tr>
<tr>
<td>Gender (Male)</td>
<td>6,904</td>
<td>46*</td>
</tr>
<tr>
<td>Age</td>
<td>40.4</td>
<td>32.5*</td>
</tr>
<tr>
<td>(15.8)</td>
<td>(10.5)</td>
<td></td>
</tr>
<tr>
<td>Immigrant status (Non-native U.S.)</td>
<td>968</td>
<td>47*</td>
</tr>
<tr>
<td>Filing status</td>
<td></td>
<td></td>
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<tr>
<td>Single</td>
<td>10,908</td>
<td>52</td>
</tr>
<tr>
<td>Head of household</td>
<td>3,887</td>
<td>53*</td>
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</table>
Married (joint-filing) 2,733 47*
Married (single-filing) 156 51

Enrollment status (Currently enrolled)

<table>
<thead>
<tr>
<th>Enrollment Status</th>
<th>Count</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Married (joint-filing)</td>
<td>2,733</td>
<td>47*</td>
</tr>
<tr>
<td>Married (single-filing)</td>
<td>156</td>
<td>51</td>
</tr>
<tr>
<td>Currently enrolled</td>
<td>4,690</td>
<td>74*</td>
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Education

<table>
<thead>
<tr>
<th>Education Level</th>
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<tr>
<td>Less than high school</td>
<td>676</td>
<td>12*</td>
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<tr>
<td>High school diploma</td>
<td>2,569</td>
<td>16*</td>
</tr>
<tr>
<td>Some college</td>
<td>6,724</td>
<td>53*</td>
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<tr>
<td>College degree</td>
<td>4,622</td>
<td>63*</td>
</tr>
<tr>
<td>Some graduate/professional school</td>
<td>1,417</td>
<td>68*</td>
</tr>
<tr>
<td>Graduate or professional degree</td>
<td>1,676</td>
<td>65*</td>
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</table>

Income (gross)

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<th>Income Level</th>
<th>Amount</th>
<th>Percentage</th>
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<tbody>
<tr>
<td>Gross income</td>
<td>$17,276</td>
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</tr>
<tr>
<td>Less than high school</td>
<td>$10,223</td>
<td>59%</td>
</tr>
<tr>
<td>High school diploma</td>
<td>$10,248</td>
<td>59%</td>
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<tr>
<td>Some college</td>
<td>$2,594</td>
<td>15%</td>
</tr>
<tr>
<td>College degree</td>
<td>$2,876</td>
<td>16%</td>
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Credit card debt

<table>
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<th>Credit Card Debt</th>
<th>Amount</th>
<th>Percentage</th>
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<tbody>
<tr>
<td>Credit card debt</td>
<td>$5,252</td>
<td>100%</td>
</tr>
<tr>
<td>Less than high school</td>
<td>$5,375</td>
<td>100%</td>
</tr>
<tr>
<td>High school diploma</td>
<td>$5,252</td>
<td>100%</td>
</tr>
<tr>
<td>Some college</td>
<td>$2,594</td>
<td>50%</td>
</tr>
<tr>
<td>College degree</td>
<td>$2,876</td>
<td>54%</td>
</tr>
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Diverse assets (n)

<table>
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<tr>
<th>Diverse Assets (n)</th>
<th>Count</th>
<th>Percentage</th>
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</thead>
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<tr>
<td>Diverse assets (n)</td>
<td>2.9</td>
<td>100%</td>
</tr>
<tr>
<td>Less than high school</td>
<td>1.8</td>
<td>50%</td>
</tr>
<tr>
<td>High school diploma</td>
<td>1.8</td>
<td>50%</td>
</tr>
<tr>
<td>Some college</td>
<td>2.9</td>
<td>100%</td>
</tr>
<tr>
<td>College degree</td>
<td>2.9</td>
<td>100%</td>
</tr>
</tbody>
</table>

Diverse liabilities† (n)

<table>
<thead>
<tr>
<th>Diverse Liabilities† (n)</th>
<th>Count</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diverse liabilities† (n)</td>
<td>1.3</td>
<td>100%</td>
</tr>
<tr>
<td>Less than high school</td>
<td>1.3</td>
<td>100%</td>
</tr>
<tr>
<td>High school diploma</td>
<td>1.3</td>
<td>100%</td>
</tr>
<tr>
<td>Some college</td>
<td>1.8</td>
<td>50%</td>
</tr>
<tr>
<td>College degree</td>
<td>2.0</td>
<td>50%</td>
</tr>
</tbody>
</table>

Note. † excluding education loan. Education debt distribution presented in percentages (%) unless otherwise noted. Standard deviations for age presented in parentheses.

* Significant at p < .05

5.2. Results of the two-part model and propensity score matching estimator

According to the first part of the two-part model, as shown in Table 2, the odds of black respondents having education debt are roughly twice the odds of their white counterparts. In contrast, Asian participants have 40 percent lower odds of having education debt than whites. Male respondents in this sample have lower odds than females of having any education debt. With each one year increase in age, the odds of accumulating education debt increased by around 6 percent. Non-native (U.S.) respondents in our sample have significantly lower odds of education debt compared to U.S.-born respondents. As expected, currently-enrolled students
have much higher odds of having education debt; odds of indebtedness increases as level of education increases. Financial factors are also significantly associated with the outcome of education debt: higher income and a greater number of assets are associated with lower odds of having any education debt, while higher credit card debt and a greater number of liabilities are associated with higher odds of reporting education debt.

In the second part of the model (Table 2), restricted to those with any education debt, self-reported black race predicted a significantly higher burden of debt compared to whites. Holding all confounders constant, and taking into account both the risk for taking out a loan and predicted loan amount, black respondents had on average $7,175 more in higher education debt burden—and Asian respondents have a mean $1,391 lower debt—than white respondents. Among only those with education debt, gender is not significantly associated with the dollar amount currently accumulated. As in the first part of the model, estimated education debt burdens for non-native (U.S.) respondents is on average $3,842 lower than for native U.S respondents. As level of education increased, the amount of education debt increased. Limited to respondents not currently enrolled, a college degree recipient is be predicted to have $20,833 more debt, and one with a graduate degree $46,656 more debt compared to a similar respondent with a high school diploma. Measures of other debts (e.g., accumulated credit card debt, number of kinds of liabilities) are also associated with a greater amount owed on education loans. Higher income corresponded to lower amount of education debt, but the number of kinds of assets did not.
Table 2

Two-part model predicting likelihood of education debt burden (logistic regression, Part I) and amount of (generalized linear model, Part II) accumulated education debt.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Part I</th>
<th>Part II</th>
<th>Predictive Margins†‡</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>OR</strong></td>
<td><strong>SE</strong></td>
<td><strong>z</strong></td>
<td><strong>Coefficient†</strong></td>
</tr>
<tr>
<td><strong>Race/Ethnicity (Non-Hispanic White)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Non-Hispanic Black</td>
<td>1.92</td>
<td>0.12</td>
<td>10.52**</td>
</tr>
<tr>
<td>Non-Hispanic Asian</td>
<td>0.60</td>
<td>0.07</td>
<td>-4.25**</td>
</tr>
<tr>
<td>Hispanic</td>
<td>0.89</td>
<td>0.06</td>
<td>-1.71</td>
</tr>
<tr>
<td>Other</td>
<td>1.15</td>
<td>0.10</td>
<td>1.58</td>
</tr>
<tr>
<td><strong>Gender (Female)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>0.85</td>
<td>0.03</td>
<td>-4.19**</td>
</tr>
<tr>
<td>Age</td>
<td>1.06</td>
<td>0.01</td>
<td>5.25**</td>
</tr>
<tr>
<td>Age^2</td>
<td>1.00</td>
<td>&lt;0.01</td>
<td>10.28**</td>
</tr>
<tr>
<td><strong>Immigrant status (born in U.S.)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Non-native (U.S.)</td>
<td>0.78</td>
<td>0.07</td>
<td>-2.91**</td>
</tr>
<tr>
<td><strong>Filing status (Single)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Head of household</td>
<td>1.08</td>
<td>0.05</td>
<td>1.43</td>
</tr>
<tr>
<td>Married (joint-filing)</td>
<td>1.15</td>
<td>0.07</td>
<td>2.47*</td>
</tr>
<tr>
<td>Married (single-filing)</td>
<td>1.21</td>
<td>0.23</td>
<td>1.02</td>
</tr>
<tr>
<td><strong>Enrollment status (Not enrolled)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Currently enrolled</td>
<td>2.70</td>
<td>0.12</td>
<td>21.66**</td>
</tr>
<tr>
<td><strong>Education (Less than high school)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>High school diploma</td>
<td>1.67</td>
<td>0.23</td>
<td>3.80**</td>
</tr>
<tr>
<td>Some college</td>
<td>8.27</td>
<td>1.05</td>
<td>16.67**</td>
</tr>
<tr>
<td>College degree</td>
<td>18.94</td>
<td>2.46</td>
<td>22.65**</td>
</tr>
</tbody>
</table>
Some
graduate/professional
school
18.54 2.63 20.55** -3.47*10^{-5} 5.87*10^{-6} -5.91** $32,832
Graduate or
professional degree
27.88 3.90 23.76** -4.04*10^{-5} 5.86*10^{-6} -6.89** $48,792
Income (per $1,000)
0.99 <0.01 -2.6** 1.42*10^{-7} 3.05*10^{-8} 4.67** –
Credit card debt (per $1,000)
1.02 <0.01 6.14** -2.09*10^{-7} 4.02*10^{-8} -5.19** –
Diverse assets (n)
0.92 0.01 -8.13** -1.73*10^{-7} 1.70*10^{-7} -1.02 –
Diverse liabilities† (n)
1.38 0.02 20.51** -1.68*10^{-6} 2.23*10^{-7} -7.53** –
Constant
0.06 0.01 12.91** 7.29*10^{-5} 6.80*10^{-6} 10.73** $22,969

†Note. Negative coefficients in a model using a gamma distribution result in higher values for dependent variable (in this case, greater education debt).
‡Predictive margins represent estimated mean dollar amount of education debt for a hypothetical white, 32-year-old female non-immigrant with two assets, two liabilities, gross income of $17,000, credit card debt of $2,600, single filing status, with a college degree and not currently enrolled as a student. All of these attributes are held constant except for the factor indicated on each row.
* p<.05; ** p < .01

Figure 1 illustrates the effect of self-reported race or ethnicity for a 32-year-old single, college-educated female born in the U.S. With other factors held constant, the mean difference in education debt between a black and a white respondent amounted to $7,175. In contrast, effects among other racial or ethnic groups are statistically equivalent for the estimated amount of education debt owed (see Figure 1).

Figure 1
Estimated education debt burden by race, among those with any education debt, with other factors held constant (calculated for a 32-year-old single, native-born female with a college degree not currently enrolled, with gross income $17,000, $2,600 in credit card debt, two kinds of assets and two liabilities (n = 9,079).
The estimated net effect of self-reported race or ethnicity from the matching estimator analysis is similar in magnitude to the results from the two-part model: This alternative method estimated that black participants in this low-income sample will have on average $6,482 more in education debt than non-black participants (not shown in Tables).

Among respondents who completed a college degree, results of the two-part model revealed the persistence of significant differences by race, as well. Holding all previous variables constant, results suggest that black respondents with a college degree will continue to have more education debt than college graduates of all other racial groups (not shown in Tables). The predicted mean education debt burden is $6,975 higher for a black respondent than the estimated debt burdens of their white counterparts—close to the marginal difference between black and white respondents in the full sample ($7,175). Alternatively, Asian college graduates were predicted to have $2,738 and $9,713 less in education debts when compared to their white and black counterparts, respectively.
6. DISCUSSION

Although considerable literature has uncovered the potentially negative effects of education debt on the average American postsecondary student, far less attention has been given to the disparate effects of student loan debt on low-income or black college students. Specifically, scant research has explored the uneven burden of education debt among low-income and minority populations, populations that face the highest risks of experiencing adverse economic consequences generally, and heightened effects of accumulated debt specifically.

This study fills these gaps by making three primary contributions to the literature on student debt and higher education. First, this analysis contributes to the literature by examining variations in the distribution of education debt by race or ethnicity among a sample of exclusively LMI households. To date, much of the research on this topic has not thoroughly evaluated the impact and distribution of education debt among lower income populations. Conversely, previous evidence has pointed to strong variation among large, socioeconomically diverse samples. In light of the observable increases in enrollment rates among minority and low-income populations (Krogstad & Fry, 2014), findings that indicate marked variation by race within lower income populations offer new insights.

Second, our findings add to the recent, growing body of evidence suggesting that substantial differences may exist in both the access to and use of postsecondary funding mechanisms among minority and lower income populations. While a college education remains a reliable predictor of financial security, and is frequently argued as a way out of poverty, our results suggest that LMI black college students and graduates are at greatest risk in this pursuit, remaining more likely than other racial or ethnic groups to both utilize education loans and incur
excessive amounts of this debt. More importantly, the significance of these variant debt burdens persisted after a black respondent completed a postsecondary education and obtained a college degree. These findings were consistent, holding true after controlling for associated variables and addressing concerns of selectivity bias between race or ethnicity and education debt in a lower income sample. Third and finally, this study provides a rigorous analysis of a robust sample using innovative and rigorous methods, including two-part analyses and propensity score matching to address concerns regarding selection bias and endogeneity, whereby the observed factors associated with race or ethnicity are observed to be similarly associated with accumulating education debt.

Our findings have especially relevant and far-reaching implications for understanding the barriers currently facing minority students pursuing postsecondary education, as well as the educational institutions serving them. Notably, college and university administrators should be concerned by the findings that suggest that the amount of education debt incurred by LMI black students may be consistently and predictably higher than all other LMI subgroups. These systematic patterns illustrate the wide gaps that exist between minorities and whites in the reliance on education loans and their increased risks of excessive debt accumulation, even among similarly positioned LMI households. Although a growing percentage of all U.S. college students are incurring high levels of student debt, we find that a significant gap (16 percentage points) exists between debt-holding white (49 percent) and black (65 percent) households. Equally disproportionate is the amount of debt encumbered between these two groups: On average, we find that black respondents’ student debt was $7,176 more than the debt balances of their white counterparts.
Generally speaking, education loans are a positive aggregate-level indicator of college attendance and educational outcomes (Callendar & Jackson, 2005). Certainly, the parity of educational attainment and student debt accumulation signals one of the beneficial outcomes from utilizing education loans to fund a postsecondary education. Unique to the experiences of minorities, however, overreliance on student loans and its resulting accrual factor less positively in predicting minority student success and degree completion. Prior research has established that for black students, higher debt amounts disproportionately increase the risk of college dropout (Long & Riley, 2007). This risk means that black students not only face the reality of accumulating sizable debts while pursuing the American Dream of a college education, but also incur this debt under a constant threat of degree non-completion, attrition, or academic difficulty (Chen & DesJardins, 2010; Kim, 2007; Zhan & Lanneskog, 2014).

Findings from our analysis of the effects of race or ethnicity on post-college outcomes have similar implications for the minority graduate entering the workforce today. Significant disparities in education debt burden persist even when our analyses considered only those respondents who remained in school and completed their degree. Put simply, the racial gaps in education debt burden among respondents of equal educational attainment are only marginally different from the gaps that emerge in the full sample. After completing a postsecondary degree, black graduates $6,975 more in student debt than white graduates. In addition, black graduates are predicted to accrue the highest levels of student debt among all racial or ethnic groups, a finding that has been consistently demonstrated in recent nationally-representative investigations (Houle, 2014; Price, 2004), but has gone unexamined in lower income populations.

The persistence of a racial debt gap after degree completion is also troubling in light of the evidence that suggests that student debt may more negatively affect the career trajectories
and financial security of minorities. Among minority or low-income borrowers, excessive levels of student debt are associated with significant, unplanned career changes, putting off graduate school, or resisting major investment decisions (Baum & Sanders, 1998). Chief among these disproportionate post-college risks are minority borrowers’ higher rates of default and delinquency, serving as an additional barrier to building credit and wealth. Such counterintuitive ripple effects of education loans signal what has been termed the “dual-sided” nature of these loans: Borrowing for postsecondary education can greatly improve access to college, but does so at a price that diminishes the intended outcomes of racial and economic equality (Jackson & Reynolds, 2013). To be sure, completion of a college degree can greatly improve social and economic opportunities for black and other minority graduates. Nonetheless, whereas a college degree was once considered the traditional mechanism of upward mobility for underrepresented groups, today’s historic levels of debt obligation and the ever-increasing cost of tuition may work in concert to offset upward social and economic movement for minority college-goers.

In accounting for these disparities, a particular concern is the dramatic increase in minority enrollment in for-profit colleges and educational programs. As compared with not-for-profit institutions, for-profit colleges and universities are the costlier option. Still, for first-generation college students, many of whom are black or low-income, the relative accessibility and convenience offered by for-profit institutions are incentives for these students to advance their opportunities in the labor market. However, the marketing tactics and financing structures often used by the for-profit industry appear to target lower-income and minority students, subtly guiding them towards large accruement of private and federal education loans. At these institutions, the COA can be twice the average cost of an Ivy League education and up to six times the cost of a community college degree (Appel & Taylor, 2014). Although determining the
underlying cause of for-profit minority enrollment rates was beyond the scope of this study, experts attempting to advance the understanding of racial disparities in student debt have drawn parallels between the targeting of LMI minorities by the for-profit education industry and that of subprime mortgage lenders (Braucher, 2012). Given this concern and our findings, further research is clearly warranted to investigate predatory practices among the for-profit education industry and to determine the degree to which these practices may be widening the racial gap in debt allocation.

The complex challenges posed by an over-indebted swath of minority college students present equally burdensome challenges for policymakers. Evidence has suggested that the educational success of low-income or minority students is significantly impacted by the availability of financial aid in the pre-enrollment stages (Kim et al., 2012). However, the trajectory of this aid has seemed less promising as of late. Recent years have seen dramatic reductions to student aid through state- or federal-level cutbacks to programs most utilized by at-risk students. Rather than being the first-line of funding for many low-income or minority students, programs such as Pell Grants, Work-Study, and the Supplemental Educational Opportunity Grant (FSEOG) may be inaccessible for the majority of students most in need of this funding. With fewer supportive funding options, a substantially larger number of minority students may rely on high-interest private loans or turn to non-traditional funding sources like credit cards to cover necessary education expenses.

By contrast, the introduction of enhanced income-based repayment (IBR) options has generated increased interest in these and the development of similar programs that would cap monthly loan repayment. Yet with generally low take-up rates, IBR options may suffer from insufficient awareness among most college students (Scott-Clayton, 2012). In this instance, a
default IBR program for all students may present an effective opportunity to reduce the risks of loan default and repayment hardship faced by many low-income and minority students (Akers & Chingos, 2014). While it is difficult to predict the fate of higher education funding in the current policy landscape, there are likely to be further implications if current efforts to reduce the heightened distribution and effects of education debt among minority or low-income students are not improved.

7. CONCLUSION

Although college attendance and graduation for minority students is higher today than in previous decades (Carnevale & Strohl, 2010), this study suggests that these gains may be at the cost of black students assuming disproportionate levels of education debt. While higher education continues to hold enormous potential for improving opportunity, more research is necessary to additionally uncover the distributive outcomes of education loan schemes and their concentrated effects on the social and economic wellbeing of financially at-risk student populations. Correspondingly, more evidence on the prospects and shortfalls of IBR and loan forgiveness programs may advance solutions to reduce racial disparities in debt allocation and mitigate the effects of these excessive debts.
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