*College on credit: a multi-level analysis of student loan default*

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Abstract

One in ten student loan borrowers enter into default within three years of repaying their federal student loans. This figure has been rising for the past decade and it is likely that default rates will be on the rise for the foreseeable future. Using a nationally-representative sample of postsecondary students, this analysis implements a multilevel regression model to find that the odds of defaulting are a function of both student-level and institutions-level characteristics. Results offer an update to the default literature, while offering insights into ongoing public policy debates related to reducing default risks.

Keywords: *student financial aid, student loan default, federal higher education policy*

Public policymakers in the U.S. often view postsecondary education as a pathway to the middle class and an engine of economic prosperity.  Citing examples of how college graduates are expected to earn more money than high school graduates and have lower unemployment rates, many state governments (in addition to the federal government) have adopted "completion agendas" where they are encouraging more individuals to enroll and persist through college (College Board, 2011a).  While these efforts may expand educational opportunities for students who have been traditionally under-represented in higher education, they will also expand the number of students who rely on financial aid to fund their educational pursuits. Approximately two-thirds of students borrow loans to pay for college and today's college graduate is expected to accumulate more than $25,000 in student loan debt (Avery & Turner, 2012; Reed, 2011). Efforts to expand postsecondary educational opportunities will likely result in the expansion of students' reliance on loans to fund their educations.

The increasing reliance on student loans is a function of several factors, including the federal government's policy shift away from a grants-based aid system, which does not require that aid recipient repay their awards, to one designed around repayable student loans (Hearn & Holdsworth, 2004).  It is also due in part to the rising price of attending college, which has outpaced inflation rates and median family income levels for at least a decade (College Board, 2011b).  Additionally, recent enrollment trends in the for-profit sector have put upward pressure on the student loan system, as much of the new growth in student loan volume can be attributed to rapid enrollment growth in this sector (Deming, Katz, & Goldin, 2012).  To the extent that these conditions will persist, it is likely that even more college students will rely on federal student loans to fund their postsecondary educations.

The steady shift towards a loan-based system has not only resulted in more students accumulating greater levels of debt, but it has also resulted in greater numbers of students unable to repay their debts upon leaving college. Today, approximately one in every ten federal student loan borrowers now defaults on their payments within three years of entering into repayment (U.S. Department of Education, 2012). Student loan default is an undesirable consequence of the federal government's reliance on a loan-based financial aid system because it costs borrowers, taxpayers, and colleges and universities additional time and money to manage student loan default risks. For example, once a borrower defaults on his or her federal student loan, the federal government can garnish the borrower's wages; seize borrowers' tax refunds; impose collection costs; initiate litigation; and restrict borrowers from receiving additional federal student aid or Social Security benefits (Loonin, 2006). After entering into default, the borrower's credit score will be diminished, making it more expensive to borrow other forms of credit. Furthermore, student loan debt (unlike other forms of credit) generally cannot be discharged in bankruptcy court. In 2009, the federal government spent approximately $9.2 billion on "rehabilitating," servicing, and monitoring defaulted loans (U.S. Department of Education, 2010a), causing federal policymakers to become increasingly concerned about preventing the amount of borrowers who fail to repay their student loan debts. The individual and societal costs of defaulting on student loan debts are significant, so policymakers and students are questioning what can be done to prevent high levels of default.

Despite the potential burdens associated with increasing students' reliance on loans, it is important to note that financing a college education on credit is not necessarily perceived to be a public policy *problem*; in fact, the expansion of student aid has probably increased educational opportunities for millions of students. However, when rising shares of students are unable to

repay their education debts, it calls into question the efficacy of the current ways we pay for higher education in the U.S. With this context in mind, the primary purpose of this study is to examine the factors associated with defaulting on federal student loan debt.

If there are systematic patterns with regard to "who" defaults on these loans, then perhaps public policy interventions could be designed to help reduce the odds of defaulting for those who borrow federal aid. In order to make this policy connection, it is important that the research literature is updated and that it takes advantage of the methodological advances that have developed over the past several years. In an extensive literature review of the default literature, Gross, Hossler, Cekic, Hillman (2009, p. 10) were "struck by the relative dearth of recent research on student loan defaulting using national data sets and rigorous statistical methods." Accordingly, the following analysis implements a multilevel regression model, using the nationally-representative Beginning Postsecondary Students survey, to update the default literature. The primary research questions ask: *to what extent are students' socioeconomic, academic, or demographic characteristics associated with defaulting on student loans? Additionally, to what extent are institutional characteristics related to default rates?*

The paper is organized as follows. First, it offers a brief discussion of key policy changes that impact the way default is calculated and defined; next, is a summary of key themes found in the existing default literature as well as a theoretical framework that guides the analysis. The data and analysis section describes the multilevel model that was designed for this study, and the paper concludes with key findings and a brief discussion of policy implications. The overarching aim of this study is to contribute to the academic literature on student loan default trends, while also offering points of departure for ongoing public policy debates.

*Policy context*

Since the introduction of the Higher Education Act of 1965, the U.S. federal government has been the nation's primary provider of student financial aid. Non-repayable grants (e.g. Pell Grants) originally accounted for the majority of federal student aid, but subsequent reauthorizations of the Higher Education Act have gradually shifted federal policy away from a grant-based system towards one based on student loans (Hearn & Holdsworth, 2004; Avery & Turner, 2012). This policy shift has fundamentally changed the way students pay for college, as nearly half of all undergraduates now borrow money from the federal government to finance their educations (U.S. Department of Education, 2010a). In 2010, the average college graduate owed over $25,000 in student loan debt (Reed, 2011), and this number has historically varied according to students' socio-demographic characteristics, degree attainment, and by the college in which they enrolled (Dillon & Carey, 2009).

This reliance on loans has been designed through federal student financial aid policies, where the student aid "industry" is now one of the larger financial enterprises in the country. According to the New York Federal Reserve Board (2012), which monitors national trends in consumer debt, the total amount of outstanding student loan debt at the end of 2011 was approximately $867 billion. To put this value into perspective, the volume of student loan debt now is higher than other lines of credit such as: auto loans; home equity loans; and credit card debt. Granted, each of these lines of credit serve fundamentally different purposes than student loans (Baum & McPherson, 2011), but this comparison shows that the student loan "industry" has evolved into a multi-billion dollar enterprise since more students are now financing their educations on this form of credit.

The expansion of the student loan industry has likely helped millions of students access and persist through college, so student loan debt may be viewed as a socially desirable policy

intervention.  However, when debt becomes unmanageable, excessive, and results in borrowers'

inability to repay, then public policy problems begin to emerge.  During the past decade, the

number of student loan borrowers who entered into default has doubled (see Figure 1).

*[insert Figure 1 about here]*

When a student borrows federal loans, they are required to begin repaying their debt's

principal and interest within six months of leaving college. After this grace period, students who

fail to make payments for 270 consecutive calendar days will enter into default.  To help prevent

default, the federal government introduced default protection programs (e.g. deferment and

forbearance) during the 1986 Higher Education Act reauthorizations to safeguard students from

burdensome and unmanageable debt levels, and they first began tracking student loan default

data in 1987.

In these early years, borrowers were only allowed 180 days of delinquency before their

loans entered into default.  With this short time horizon, 22.4 of all federal student loan

borrowers defaulted on their loans within two-years of entering repayment during the 1990 fiscal

year. This figure pushed federal policymakers to conduct a review of student loan default trends,

culminating in a revised default policy in the 1998 reauthorization of the Higher Education Act,

which extended the length of time (from 180 to 270 days) that a borrower could delay repayment

before entering into default. With this new definition, in addition to other default prevention

policies, national default rates declined during the 1990's to a historic low of 4.5 percent in 2003.

However, the number of borrowers defaulting within two years of leaving college has been rising

in recent years, as seen in Figure 1.

In the 2008 reauthorization of the Higher Education Act, the federal government again

took action to address the rising default problem.  Rather than focusing on individual

interventions, the policy emphasized reforming colleges' and universities' roles in reducing

default.  To maintain eligibility for Title IV federal financial aid, the Higher Education Act

required institutions to maintain "two-year cohort default rates"[1] below 25 percent. In the most

recent reauthorization, federal policymakers extended the time horizon to three (rather than two)

years upon repayment, but they also increased the 25 percent threshold to 30 percent.  The new

policies which go into effect at the beginning of 2012 stipulate that institutions with cohort

default rates beyond this threshold for three consecutive years (or 40% in any given year) will

face Title IV funding sanctions. For many for-profit colleges, this is a significant policy concern

as Title IV funding makes up a large proportion (sometimes as high as 90%) of their revenue

streams (Scott, 2010). Over time, federal policy efforts to reduce default rates have evolved in a

way that now emphasizes both student-level and institution-level incentive structures; and we

can expect policymakers to continue to emphasize the shared responsibility both parties play in

preventing student loan default.[2]

*Review of the Literature*

The following literature review integrates findings from various national analyses and

case studies of student loan default trends. This review is limited to studies utilizing multivariate

regression analysis that predict the likelihood of defaulting on a federal student loan. A wide

range of survey designs, data sources, and units of analysis are found in this literature, as

summarized by Gross, Hossler, Cekic, and Hillman (2009). The following review is organized

around the most common factors found to be associated with student loan default: *student*

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[1] The two-year cohort default rate is calculated by taking the number of borrowers in a cohort who entered into default within two years of repayment,  and dividing that figure by the total number of borrowers in that cohort.  For more information, see U.S. Department of Education (2012).
[2] For more information about historical changes in federal student loan default policy, see Gladieux (1995) and Kantrowitz (2012).

*demographics*; *socio-economic factors*; *academic experiences*; *post-collegiate employment;* and *institutional characteristics.*

   *Student demographics.* In most studies, the racial/ethnic background of students emerges as a consistent predictor of default, where white students are less likely to default than students of color. For example, a study of borrowers at University of North Carolina Greensboro (Greene, 1989) found African American students had grater default rates than their non-African American peers. Wilms, Moore, and Bolus (1987) reached a similar conclusion in a case study of California, where African American borrowers were more likely to default that whites. In more recent case studies at the Texas A&M (Steiner & Teszler, 2005) and the University of Texas (Herr & Burt, 2004), similar patterns emerged, although Herr & Burt (2004) found that Hispanic borrowers default rates were also significantly greater than whites.

   In addition to a race and ethnicity, a borrower's age and gender also appears to be associated with default. Interestingly, the evidence is mixed on the nature of this relationship. Christman (2000),  Harrast (2004), Herr & Burt (2004), and Woo (2002) found age to be positively associated with default; as age increases, so too does the probability of defaulting. However, Knapp and Seaks (1992) found no relationship with age and default, while Steiner and Teszler (2005) found this pattern only among students older than 34. Shifting towards gender, Woo (2002), Podgursky et al. (2002), Steiner and Teszler (2005), and Herr and Burt (2004) found men's probability of default to be significantly greater than women's, while others have failed to find relationships between gender and default (Harrast, 2004; Volkwein & Szelest, 1995). Taken together, race, age, and gender are likely to account for a degree of variation in default probability, but the nature of these relationships (particularly age and gender) is not entirely clear.

*Socio-economic factors.* Students with less access to financial resources have a greater reliance on student financial aid and they often carry greater debt burdens than their upper-income peers (Choy & Li, 2006; Kesterman, 2006). As a result, they may be more likely to default of their loans if debt becomes unmanageable. In contrast, students who come from upper-income families are more likely to have family members help in repaying their debts, which reduces the likelihood of defaulting among wealthier students (Baum & O'Malley, 2003; Gross, et al, 2009). Similarly, studies have found that borrowers who have children or other dependents are expected to have more financial obligations than borrowers who do not have dependents, which can result in greater probabilities of defaulting (Dynarski, 1994; Volkwein, Szelest, & Cabrera, 1998; Woo, 2002). Taken together, socio-economic factors are expected to have a significant relationship with default, where individuals who are not socio-economic privileged will be expected to face greater challenges in terms of debt repayment.

*Academic experience.* In their analysis of students who left college before earning degrees, Gladieux and Perna (2005) explain that these individuals have the "worst of both worlds," since they are often left with high degrees of debt but no credential to compete in the labor market. To illustrate this point, they report that students who left college without a degree were ten times more likely than their peers to default. Podgusrky et al (2002) and Flint (1997) also provide evidence that completion and default are tightly associated, as students who stay continuously enrolled in college and earn degrees have significantly lower odds of defaulting. Examining loan records of more than 8 million records from various Guarantee Agencies, Cunningham and Kienzl (2011) found that, between 2005 and 2009, more than one in four borrowers who left school without a credential had entered into default. As one researcher summarizes,

"…college success plays a bigger role in predicting who will default than either the background of the borrower or the type of institution attended. All else being equal, students who are successful in their studies tend to have lower default rates than those who are not." (McMillon, 2004).

Debt levels should rise in relation to the amount of time a student stays enrolled in college, where longer periods of enrollment are expected to be associated with greater levels of debt accumulation.  When students accumulate large levels of debt, they have a greater likelihood of defaulting (Choy & Li, 2006).  Alternatively, individuals who stop-out without earning a degree are expected to carry less cumulative debt than degree completers (Long & Riley, 2007).  Woo's (2002) case study of California borrowers contradicts Choy & Li's (2006) findings, as debt burden was *not* a significant predictor of student loan default.  Does debt have a positive or negative relationship with default?  Surprisingly, the literature has not fully explored this issue in recent years and (based on the aforementioned studies) the results suggest that debt is both, positively and negatively, related to defaulting.

In addition to these issues with degrees and debt burdens, scholars have found that academic majors and grade point averages are also associated with the odds of defaulting.  Since some majors tend to be more resilient to labor market conditions and they may require students to accumulate less debt (Harrast, 2004), it is possible that students choosing some majors have less likelihood of defaulting.  Volkwein and Szelest (1995) found that students who majored in "science and technology" faced lower default rates.  Similarly, Lochner, Monge, and Naranjo (2004) found that humanities majors were significantly more likely to default when compared to students who majored in health profession.  Students who maintain higher grade point averages are also less likely to default on their debts (Christman, 2000; Podgursky, et al, 2002).  With this

body of evidence, we may expected to find that science, technology, and health majors, and those who maintain high GPA's, are less likely to enter into default.

   *Post-collegiate employment.* If a student is unable to find employment upon leaving college, or if they become unemployed at some point during repayment, then they may face greater risks of entering into default. Similar to her findings regarding degree completion, Woo (2002) found that unemployment also increased students' odds of defaulting. This finding has been consistent across other default studies since job loss results in fewer financial resources to repay student loan debts (Dynarski, 1994; Monteverde, 2000). One recent study found that default was particularly acute for students attending for-profit institutions, compared against students who attended public or nonprofit institutions (Deming, Goldin, & Katz, 2012). Among the reasons behind greater default risk in the for-profit sector, poor job-placement records stands out at a reason for high default rates. To the extent that these institutions do not equip students for "gainful employment," students will have a more difficult time repaying the large debt burden that they accumulate by attending for-profit institutions.

*Institution-level predictors of default.*

   The Deming, Goldin, and Katz (2012) study raises an important question: is default the result of student-level factors (e.g. students' background characteristics and academic experiences) or might default be a function of the business model of some institutions? As with most public policy issues, the "truth" lies somewhere in between; however, the current literature does not provide much convincing evidence in either direction. Some researchers conclude that institutions (particularly for-profits) have no impact on student loan default; rather, they are simply serving a high-risk pool of students who are likely to default regardless of their

institutional choice. For example, Guryan and Thompson (2010, p. 1) summarize the literature by stating:

> "There has been no analysis of whether differences in debt levels or differences in default or delinquency rates across types of schools are the result of actions by the schools or due to differences in the types of students that the schools serve."

These authors are drawing from a series of studies in the 1980's and 1990's that concluded that institutions play *no* role in predicting students' repayment outcomes (Greene, 1989; Knapp & Seaks, 1992; Monteverde, 2000; Volkwein & Szelest, 1995). These studies established, and quite unequivocally, that student loan default is a "pre-existing condition" of the students attending certain sectors (Monteverde, 2000). Colleges with high default rates are simply serving a high-risk clientele that is likely to default regardless of which higher education sector they attend. Accordingly, it would be "inappropriate" to hold *institutions* accountable for serving a clientele that has a high risk of not repaying their debts (Knapp & Seaks, 1992).

Controlling for various student characteristics in addition to institutional enrollment size, sector, control, and tuition level, Knapp and Seaks (1992) found no significant relationship between institution-level characteristics and default outcomes. In fact, the authors conclude, "our findings point strongly to the inappropriateness of penalizing individual colleges solely because of high observed default rates." Interestingly, Knapp and Seaks' (1992) case study of Pennsylvania did not include for-profit colleges, which may be a reason why their results counter other studies. However, Volkwein and Szelest's (1995) national analysis includes for-profit, nonprofit, and public four-year and two-year institutions and draws similar conclusions.

Other studies have found evidence to the contrary, where institutional characteristics have systematic relationships with defaulting even after controlling for the "type" of students enrolled.

When restricting his analysis to student-level characteristics, Wilms et al. (1987) were accurately able to predict nearly two-thirds of all defaults among California students. But when adding institutional type to the model, the authors conclude that it makes marginal improvement to the model. Woo (2002) also studied loan repayment behavior among California residents. Her analysis includes public and private four-year institutions and complements Wilms et al's (1987) findings – attending public community colleges and private for-profit schools increase the likelihood of defaulting on loans. In a case study of Missouri colleges, Podgursky, et al. (2002) conclude that attending four-year selective institutions is associated with lower default rates, even after controlling for student-level characteristics. Taken together, these latter studies suggest that institutions play a non-trivial role in preventing and managing student loan default risks.

*Theoretical Framework*

As described in the literature review, evidence suggests that student-level and institution-level factors contribute to students' repayment outcomes. Similarly, federal financial aid policy holds both institutions and students accountable for defaulting on their debts.  The federal government, for example, sanctions institutions from receiving Title IV funding if their "three-year cohort default rate" exceeds 30 percent for three consecutive years.  Federal policy also penalizes individual defaulters by garnishing their wages or restricting access to future public subsidies.  The theoretical and policy context suggests that default is a combination of student-level and institution-level factors.

For students, the decision to invest in higher education is one that weighs the perceived costs and benefits accrued through the educational process. These outcomes are unknown in advance (Becker, 1993) and it is possible that students borrow more money than they are able to

repay. Borrowers can only repay their debts in accordance with their budget constraints, so when

a repayment plan falls beyond an efficient budget line, a borrower may face the unintended

consequence of defaulting. These decisions are conditioned by various socioeconomic,

demographic, and academic factors in addition to their financial needs while enrolled in college

(DesJardins, Ahlburg, & McCall, 2006; Goldrick-Rab, Harris, & Trostel, 2009; Hossler, Ziskin,

Gross, S. Kim, & Cekic, 2009; St. John, 2000).

For institutions, theories of firm behavior are utilized to guide the conceptual model.

Firms (e.g. colleges and universities) operate in quasi-markets where they must compete for

resources such as funding, students, faculty, and other various indicators of reputation or market

position (Brewer, Gates, & Goldman, 2002; Lane & Kivisto, 2008; Winston, 1999; 2004). There

is a wide variation in these "markets," particularly in terms of institutional control, sector, and type

(Heller, 2001; McPherson & Schapiro, 2006). Within this marketplace, public, private non-profit,

and private for-profit institutions compete for students and, to a growing extent, their associated

financial aid dollars.  Similarly, four-year institutions compete for different students than two-year

institutions.  As described in the literature review, the evidence is mixed with regard to college and

university organizational attributes and market conditions as they relate to students' ability to repay

their debts.

*[insert Figure 2 about here]*

*Data and analytical techniques*

*Sample and outcome variable*

This study uses nationally representative survey data following postsecondary students

from their first year of college.  The National Center for Education Statistics (NCES) collected

this longitudinal data via their Beginning Postsecondary Students (BPS) survey for the years

2003-04 through 2008-09.  Participants in this survey (n≈16,700) attended public, private non-

profit, and private for-profit institutions in the U.S. and approximately 9,500 of the respondents

had borrowed federal student loans while enrolled in college.  Among these borrowers,

approximately 5,400 were making on-time student loan payments in 2009 while 573 were in

default.  Due to BPS' complex sampling strategy, the analysis is weighted (WTA000) to account

for survey design effects.  The weighted number of borrowers who were "in repayment" and "in

default," respectively, is approximately 2,080,000 and 589,000.

While the sample includes other students who either did not take out loans, or who were

either in deferment, forbearance, or not yet in repayment, the aim of this study is to compare

borrowers who defaulted versus those who were in standard repayment.  Accordingly, the binary

outcome is set to "1" for defaulters and "0" for those who are in repayment during 2009.   When

looking at the last institution attended for those borrowers who were in default, the majority

(61%) were enrolled in for-profit institutions.  The remaining 39% of defaulters attended public

or private non-profit institutions, with the largest share attending public two-year colleges, as

seen in Figure 3.

*[insert Figure 3 about here]*

*Analytical technique*

Because borrowers' repayment outcomes are categorical in nature, this study implements

a binary logistic regression model to compare borrowers who defaulted against those who made

standard "on-time" repayments. Binary logistic models have been the most common analytical

technique for studying default; however, many of these studies compare defaulters to "all other

students," regardless of whether these "other" students had already repaid their loans, were

currently repaying loans, or were in emergency protection.  The logistic relationship is expressed

in the general form:

$$Y = \ln\left[\frac{P(Y)}{1-P(Y)}\right]$$

where P is the probability of defaulting and ln[P(Y)/(1-P(Y)] is the natural log of the odds of

defaulting on a federal student loan (Y) relative to being in standard repayment.

Since the theoretical framework and literature review suggests that students' repayment

statuses are a function of both student-level and institution-level factors, the logistic extension is

applied to a hierarchical generalized linear model (HGLM).  Hierarchical (or multi-level) models

offer advantages over single-level regression designs.  Single-level regression models are

designed with an assumption that individuals within the sample share no common characteristics

with one another or with overarching structures or groups (Heck & Thomas, 2008). This

assumption requires all of the residual values to follow no systematic patterns and then all

"macro-level" influences that exist would be incorporated into the error term. If macro-level

characteristics do indeed influence individual-level outcomes, single-level models will be unable

to accurately identify them. By using a single-level model that assumes independence of error

terms, one will over-estimate the model and perhaps commit Type 1 error (Tabachnick & Fidell,

2006).  In addition to the theoretical justification for implementing a hierarchical model, the high

intra-class correlation (0.32) offers an additional statistical justification for a hierarchical

analysis. The full model is expressed in the following equation, where Level 1 represents the

student-level and Level 2 represents the institution-level variables.

Level 1:

$$Y_{ij} = \beta_{0j} + \beta_{1j} * (DEM)_{ij} + \beta_{2j} * (SES)_{ij} + \beta_{3j} * (ACAD)_{ij} + \beta_{4j} * (POST)_{ij} + r_{ij}$$

Subscript $i$ denotes the student, $j$ denotes the institution. DEM represents a vector of

demographic variables (e.g. age, race, gender), SES controls for parent's educational attainment

level, income, and whether the borrower has dependents, ACAD represents college experience

variables (e.g. major, degree completion, financial aid) and POST controls for the students'

degree completion status (e.g. earned degree, still enrolled, or did not earn degree). The error

term, $r_{ij}$, represents the variation between individuals within each institution.  $\beta_{oj}$ is the intercept

which is allowed to vary across institution type (Raudenbush & Bryk, 2002):

Level 2:

$$\beta_{0j} = \gamma_{00} + \gamma_{01} * (LEVEL) + \gamma_{02} * (CONTROL) + \mu_{0j}$$

$$\beta_{kj} = \gamma_{k0} + \gamma_{k1} * (LEVEL) + \gamma_{k2} * (CONTROL) + \mu_{kj}$$

where $\beta_{oj}$ is the Level 1 intercept in Level 2 unit $j$, and $\beta_{kj}$ is the Level 1 slope in Level 2 unit $j$.

The term $\gamma_{00}$ represents the average default rate for students after controlling for institutional

LEVEL (e.g. two-year or four-year) and CONTROL (e.g. public, private non-profit, or for-

profit), and $\gamma_{k0}$ is the mean value of the Level 1 slopes and $\gamma_{k1,2}$ are the effects of Level 2

predictors on the outcome (Luke, 2004).  The institution-level error terms are expressed by $\mu_{0j}$

and $\mu_{kj}$.

*Limitations*

        Despite the contributions this analysis can make to the default literature, it is limited in

the following ways.  First, the analysis focuses on the *last* institution a student attended, while

controlling for students' transfer status. A more nuanced investigation into the educational

pathways beyond this "transfer" dummy variable may yield insightful information beyond what

is known about the "last institution attended." This could be particularly helpful in terms of

understanding the impacts of holding transfer-receiving institutions accountable (via Title IV

cohort default rate sanctions) for the debt transferred in from other institutions.  And second, as

is often the case in quantitative research, this study is limited by data availability.  This is

particularly true with regard to the second-level of the HGLM model which includes private non-

profit, public, and for-profit institutions. It is difficult to control for additional institution-level

characteristics since each sector has different reporting standards.  For example, many for-profit

institutions do not report financial, enrollment, or completion records in the same way that public

or non-profit institutions, thus resulting in several missing values for for-profit institutions.  The

trade-off to avoiding the missing data problem is addressed by choosing only the lowest common

denominator that is consistent across all institutions, such as institutional level and control.

Despite these limitations, the HGLM analytical technique along with the BPS sample offer a

nationally-representative sample of the factors associated with student loan default.  In the

following section, key findings are provided to update the student loan default literature while

also offering avenues for further research.

*Findings*

A variety of student-level and institution-level characteristics are associated with greater

odds of defaulting rather than making on-time payments for federal student loans.  One of the

primary findings is that, even after controlling for several student-level characteristics,

institutional type has a non-random relationship with student loan repayment outcomes.  It

appears that even beyond student-level characteristics, the institution in which a student enrolls

has a strong relationship with borrowers' ability to repay their federal student loan debts. This is

particularly the case within the for-profit sector, where students' odds of defaulting are 114 to

216 percent greater if they attended for-profit four-year and two-year colleges, respectively,

when compared to students attending public four-year institutions.  This finding contradicts

previous studies that found no relationship between institutions and students' repayment

outcomes (e.g. Knapp & Seaks, 1992; Monteverde, 2000; Volkwein & Szelest, 1995).

Perhaps a mediating factor behind why this systematic pattern emerges within the for-profit sector is because students do not complete degrees that result in "gainful employment." The positive relationship between unemployment status and default would suggest that borrowers who are unemployed face 70.5 percent greater odds of defaulting when compared to borrowers who were employed, *ceteris paribus*.  Similarly, students who did not complete a credential and were not enrolled in 2009 had even greater odds of defaulting; when compared against degree completers, the odds of defaulting were 131 percent higher for this group of borrowers.  To test whether there were mediating factors between degree completion and unemployment, a series of interaction effects were run but they yielded no systematic relationship.

In addition to borrowers' post-college employment status and their degree completion status, borrowers' cumulative debt burden emerged as a key finding.  Some scholars believe that default is a function of high debt levels (Choy & Li, 2006), while others (Woo, 2002) have found that defaulters often carry low debt burdens. Here, we find evidence to support Woo's (2002) conclusion, where cumulative student loan debt is negatively associated with defaulting; the greater amount of loans, the lower the odds of defaulting.  However, due to the mixed results in the literature, we should consider the possibility that debt burden and default risk may not operate in a linear relationship. What if the odds of defaulting begin to rise after a certain debt level?   By squaring the linear cumulative loan value, we can see that this is the appropriate relationship between debt and default; rather than a linear relationship, debt and default appear to have a gradual "u-shape" functional form, as reflected in the positive estimate for the squared cumulative debt variable. Interestingly, even after receiving federal grants to reduce the cost of

attending college (and, presumably to reduce the amount borrowed), students who receive Pell Grants had greater odds of defaulting than their non-Pell peers.

Turning to the other academic experiences of students, two general patterns emerge. First, there is a negative relationship between college GPA and default risk. As students' grade point averages decline, the odds of defaulting begin to rise. And second, major choice does not emerge as a systematic predictor of whether students will later default on their loans.

Neither of the demographic controls (male or age) offered patterns with regard to defaulting, though default rates are significantly greater for African American and Hispanic students as opposed to white students. This finding was consistent with the previous research, which had been limited to single-level analyses of student characteristics. After controlling for institutional profiles and various other student-level characteristics, minoritized groups have greater odds of defaulting than their white peers. A similar pattern emerges for those borrowers who are first in their family to attend college, where their odds of defaulting are significantly greater than their continuing-generation peers. Shifting to those borrowers who care for dependents, another positive relationship emerges, where these individuals face 36.9 percent greater odds of defaulting when compared to borrowers who have no dependents. Not only are the odds of defaulting greater for those who are from minoritized families, or who care for dependents, but borrowers who come from wealthier families are less likely to enter into default. In sum, there are some borrowers (e.g. white, middle and upper class, no dependents, highly-educated parents) who face little to no risk of defaulting on their federal student loans.

In summary, a picture of "who" defaults on their student loans begins to emerge. Even after controlling for individual characteristics, students who attend for-profit colleges are systematically (and to a greater magnitude) more likely to default than students attending other

sectors of higher education.  The sector in which students enroll emerges as one of the strongest

predictors of who defaults.  This finding is both statistically and practically significant, as it

illustrates the importance of institutional context in students' post-collegiate ability to repay their

student loan debts.  Interestingly, the level of student loan debt that one borrows is not the primary

factor that predicts default rates; rather, *where* students enroll and *whether* they earn a degree or gain

employment after leaving college are the strongest factors predicting students' default status.

When turning to the individual-level characteristics, students who come from upper-

income families or who are not first-generation students face lower odds of defaulting.

Alternatively, lower-income students, minoritized students, and students who care for

dependents face greater odds of facing defaulting when compared to their white and upper-

income peers who do not care for dependents.  To the extent that these institutional and

individual factors are predictors of default, federal financial aid policy may be favoring students

who have privileges, while sanctioning those who come from lower socio-economic classes.

Perhaps more importantly to public policy, the patterns observed within the for-profit sector are

particularly important.  To the extent that these institutions are recruiting low-income, minority

students, who are single-parents, then federal policy could do more to ensure that colleges are

not unjustly exploiting these individuals in order to capitalize on their financial aid dollars.  The

for-profit sector plays an important and growing purpose within the higher education market, so

it will be important to have a clear understanding of the reasons behind the systematically high

default rate in this sector that are not simply "pre-existing conditions" of students (Monteverde,

2000).  Further research could investigate whether these institutions have the administrative

capacity (e.g. financial aid counseling) or the academic quality (e.g. students' placement records)

to help manage default risks.  Since the current study finds evidence that for-profit institutions

are in fact associated with default risk, further research should examine which specific

institutional characteristics (e.g. tuition reliance, accreditation status, selectivity, etc.) serve as the strongest predictors of high institutional default rates.

*Policy implications and discussion*

As federal policymakers consider reauthorizing the Higher Education Act and additional policies that impact the student lending industry, they will continue to seek strategies that reduce student loan default risks.  Particularly in light of ongoing national efforts to expand college completion, the federal government should expect even more students to rely on the aid system in order to fund their college educations. Many of these students will likely be from socio-economic or racial/ethnic backgrounds that have been traditionally under-represented in higher education, which will likely result in greater reliance on federal student loans.  Additionally, many new students will likely find the convenience of for-profit institutions, which are often online, to offer certain advantages over traditional public and private non-profit colleges (Deming, Goldin, & Katz, 2012).  These factors may exacerbate rather than ameliorate the trends in student loan default.

Moving forward, one way for the federal government to reduce the odds of students entering into default may be through increasing the amount (and quality) of counseling and information that colleges offer to students as they leave college and begin repaying their debts. Further research would be necessary to examine the extent to which students are well-informed about their repayment options, but given the literature on "how college affects students," (Pascarella & Terenzini, 2005) it seems feasible that counseling efforts could be one strategy for avoiding default.  To the extent that the federal government can offer incentives for increasing college's capacity to inform borrowers about the implications of defaulting, then default rates could be managed in a more strategic fashion.  A consortium of Historically Black Colleges and

Universities, for example, has been successful in reducing default rates via proactive and strategic management strategies. Perhaps other colleges could look to these institutions for best practices and policy guidance (see Dillon & Smiles, 2010, for case studies).  Results from this study suggest that students in certain majors (health), those who have low GPA's, and those who receive Pell grants have higher odds of defaulting, so perhaps counseling efforts could be targeted more intentionally to students who are experiencing these academic and financial conditions.

In addition to pre-default prevention strategies, the U.S. Department of Education's (2011) new rules on "gainful employment," which require career education programs (often housed within for-profit institutions) to report their students' debt-to-income ratios, repayment rates, and employment outcomes, should reduce default rates if the sanctions and incentives are sufficiently strong. Findings from this study suggest that post-college unemployment rates are strongly associated with defaulting, so these gainful employment rules may be effective ways to reduce default risk. If career colleges are not producing graduates who are prepared to secure employment, thus resulting in high default rates for borrowers, then the federal government may find the "gainful employment" rules to be an avenue to further regulate this sector in order to protect students from facing long-term consequences of defaulting on their debts.

While institutions and students share the responsibility of defaulting on federal loans, it is the individual borrower who seems to face the most significant federal sanctions.  Institutions that have high cohort default rates have several years to reduce their rates before federal sanctions take effect.  For example, a college that has a cohort default rate greater than 30% will be put "on notice" and they will be required to bring the rate down below that threshold within three years.  Only after three years pass will the federal government implement financial

sanctions on the institutions.  Alternatively, students only have one 270 day window of

opportunity to make their debt payments; once this date is passed, their loans enter into default.

Perhaps federal policymakers could extend (as they did in 1998) the repayment window to a

longer period of time.  If this is not politically feasible, then perhaps intermediate sanctions could

be put into place depending upon "how long" a student's loan is past-due.  For example, students

who enter into default, but quickly repay their debts currently face the same penalties (e.g.

downgraded credit, wage garnishment, restricted access to other federal benefits) as those who

default and do not repay for several years.  Perhaps these post-default penalties could be

implemented in flexible time periods, similar to the flexibility that institutions receive, where

borrowers have more than one window of opportunity to demonstrate due diligence towards

repaying their debts.  Regardless of the future outcomes related to student loan default policy,

this study should provide evidence that default is a shared-responsibility between students and

institutions.  Additionally, to the extent that certain student characteristics (e.g. race, income,

degree completion, etc.) are associated with defaulting, then policymakers may want to consider

ways to differentiate sanctions that take into context the diverse attributes of students who

default on their student loans.

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Figure 1: Number of borrowers entering default within two years of repayment, by cohort year
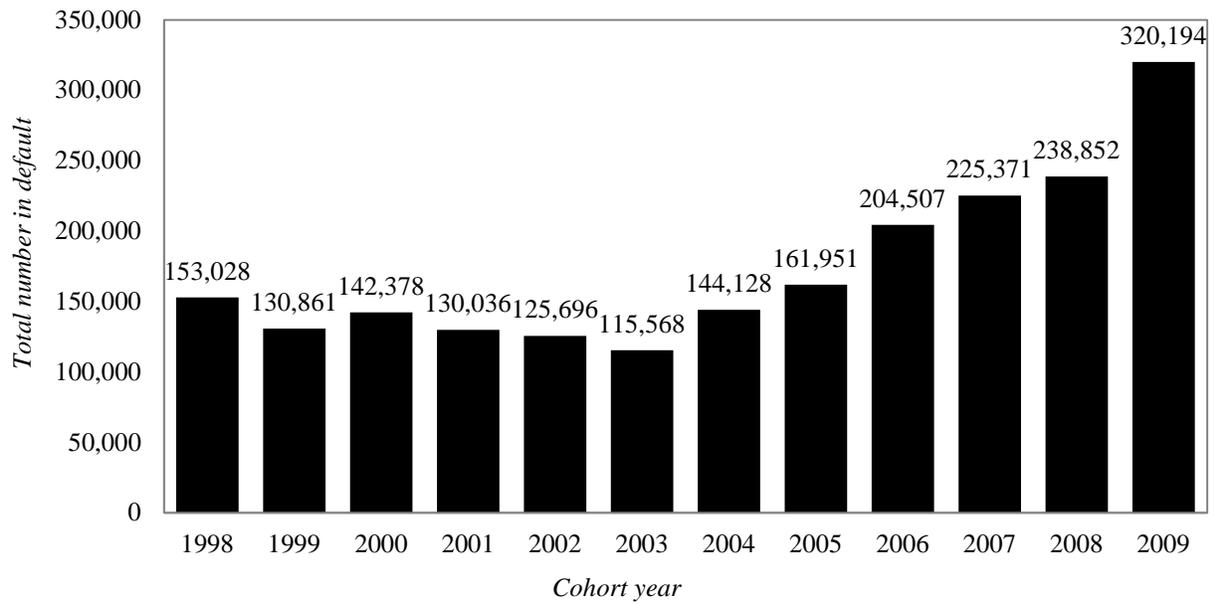


Source: U.S. Department of Education (2012)

Figure 2: Theoretical framework of factors associated with student loan default

**Student-level (level 1)**

*Demographics:*
- Age
- Gender
- Race/ethnicity
-

*Socio-economic status:*
- First-generation student
- Family income level
- Has dependents

*Academic experience:*
- Major choice
- College GPA
- Received Pell Grant
- Cumulative federal loan
- Took out private loans
- Transfer
- Degree completion

*Post-collegiate employment:*
- Employment status

**Primary loan repayment outcomes** *of interest:*
- **In repayment**
- **In default**

*Alternative loan repayment* *outcomes:*
- Repaid loans
- Emergency protection
- Not yet in repayment

**Institution-level (level 2)**

*Control:*
- Public
- Private
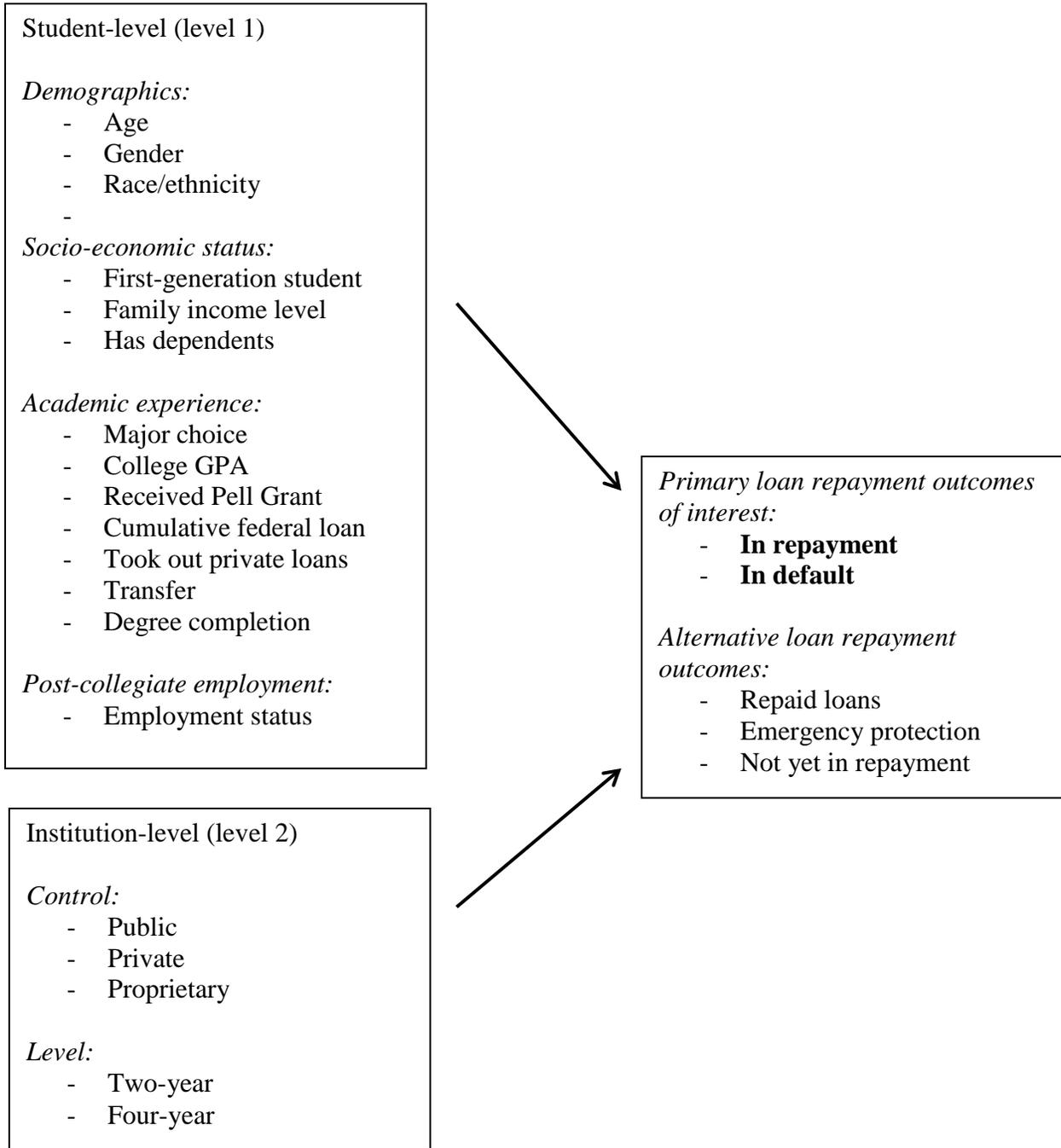- Proprietary

*Level:*
- Two-year
- Four-year

Figure 3: Distribution of student loan defaults by institutional level and control
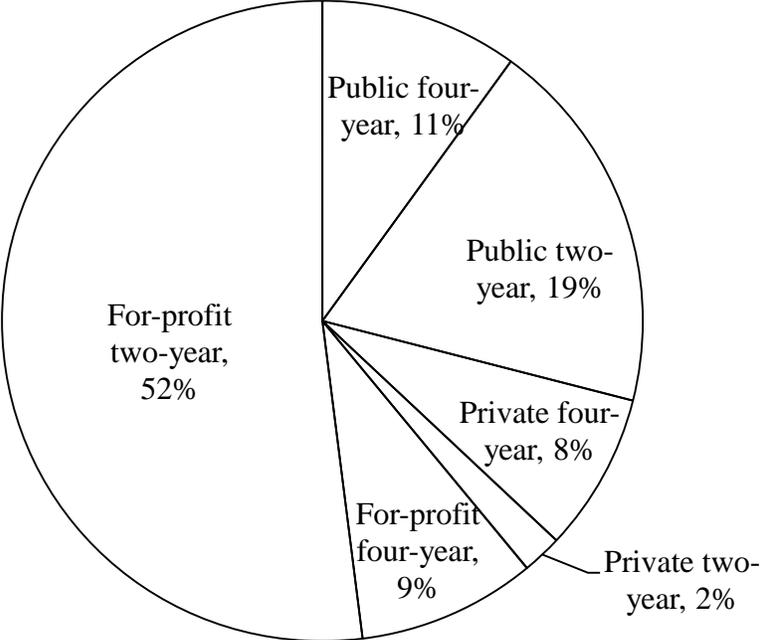
Table 1: Descriptive statistics of borrowers who are either in default or repayment

| | In repayment | | In default | |
|---|---|---|---|---|
| | mean | st. dev. | mean | st. dev. |
| Student-level characteristics | | | | |
| **Demographics** | | | | |
| Age | 20.9 | (6.2) | 23.3 | (7.1) |
| Male | 40.0% | (49.0%) | 40.0% | (49.0%) |
| Female* | 60.0% | (49.0%) | 60.0% | (49.0%) |
| *Race/ethnicity* | | | | |
| White* | 66.0% | (48.0%) | 43.0% | (49.0%) |
| African American | 15.0% | (35.0%) | 28.0% | (45.0%) |
| Hispanic | 12.0% | (32.0%) | 22.0% | (41.0%) |
| Asian/Pacific Islander | 3.0% | (17.0%) | 2.0% | (13.0%) |
| Other | 5.0% | (21.0%) | 6.0% | (24.0%) |
| **Socio-economics** | | | | |
| First-generation | 63.0% | (48.0%) | 82.0% | (38.0%) |
| Returning-generation* | 37.0% | (48.0%) | 18.0% | (38.0%) |
| Family income level | $48,452.6 | ($41,858.8) | $21,409.0 | ($23,147.1) |
| Has no dependents* | 71.0% | (46.0%) | 39.0% | (49.0%) |
| Has dependents | 29.0% | (46.0%) | 61.0% | (49.0%) |
| **Academic experience** | | | | |
| *Major* | | | | |
| Social sciences and humanities* | 39.0% | (49.0%) | 13.0% | (33.0%) |
| STEM | 12.0% | (32.0%) | 3.0% | (16.0%) |
| Education | 6.0% | (23.0%) | 1.0% | (10.0%) |
| Health | 11.0% | (31.0%) | 9.0% | (29.0%) |
| Other / none | 33.0% | (47.0%) | 74.0% | (44.0%) |
| *College GPA* | | | | |
| 3.75 – 4.00* | 18.0% | (38.0%) | 17.0% | (37.0%) |
| 3.25 - 3.74 | 36.0% | (48.0%) | 23.0% | (42.0%) |
| 2.75 - 3.24 | 23.0% | (42.0%) | 19.0% | (39.0%) |
| 2.25 - 2.74 | 14.0% | (35.0%) | 19.0% | (39.0%) |
| 1.75 - 2.24 | 4.0% | (20.0%) | 10.0% | (30.0%) |
| 1.25 - 1.74 | 2.0% | (13.0%) | 4.0% | (19.0%) |
| 1.24 or below | 2.0% | (14.0%) | 7.0% | (26.0%) |
| *Transfer* | | | | |
| Never transferred* | 67.0% | (47.0%) | 74.0% | (44.0%) |
| Transferred | 33.0% | (47.0%) | 26.0% | (44.0%) |
| *Degree status* | | | | |
| Earned degree/certificate* | 61.0% | (49.0%) | 27.0% | (44.0%) |
| No degree, not enrolled | 31.0% | (46.0%) | 65.0% | (48.0%) |
| No degree, still enrolled | 8.0% | (26.0%) | 8.0% | (28.0%) |
| *Financial aid* | | | | |

| | | | | |
|---|---|---|---|---|
| Cumulative federal loans | $19,018.8 | ($16,368.0) | $8,255.0 | ($7,141.3) |
| Never took out private loan(s)* | 61.0% | (49.0%) | 64.0% | (48.0%) |
| Took out private loan(s) | 39.0% | (49.0%) | 36.0% | (48.0%) |
| Not Pell recipient* | 40.0% | (49.0%) | 11.0% | (32.0%) |
| Pell recipient | 60.0% | (49.0%) | 89.0% | (32.0%) |
| **Post-college employment** | | | | |
| Unemployed | 13.0% | (34.0%) | 30.0% | (46.0%) |
| Institutional characteristics | | | | |
| Public four-year* | 32.0% | (47.0%) | 11.0% | (31.0%) |
| Private four-year | 21.0% | (41.0%) | 8.0% | (26.0%) |
| For-profit four-year | 6.0% | (24.0%) | 9.0% | (28.0%) |
| Public two-year | 24.0% | (43.0%) | 19.0% | (39.0%) |
| Private two-year | 1.0% | (11.0%) | 2.0% | (15.0%) |
| For-profit two-year | 15.0% | (36.0%) | 52.0% | (50.0%) |

*Note: reference groups noted with asterisk*

Table 2: HGLM regression estimates for student and institutional relationships with student loan default

| | Odds ratio | Std. Err. | Sig. |
|---|---|---|---|
| Student-level characteristics | | | |
| **Demographics** | | | |
| Age | 0.992 | (0.008) | |
| Male (comparison = female) | 1.204 | (0.147) | |
| *Race/ethnicity (comparison = white)* | | | |
| African American | 1.449 | (0.208) | ** |
| Hispanic | 1.382 | (0.221) | ** |
| Asian/Pacific Islander | 0.698 | (0.283) | |
| Other | 1.421 | (0.333) | |
| **Socio-economics** | | | |
| Family income level | 0.990 | (0.003) | *** |
| Has dependents (comparison = has no dependents) | 1.369 | (0.174) | ** |
| **Academic experience** | | | |
| *Major (comparison = humanities and social sciences)* | | | |
| STEM | 0.748 | (0.254) | |
| Education | 0.443 | (0.242) | |
| Health | 1.422 | (0.330) | |
| Other / none | 1.868 | (0.334) | *** |
| *College GPA (comparison = 3.75 and above)* | | | |
| 3.25 - 3.74 | 1.359 | (0.241) | * |
| 2.75 - 3.24 | 1.849 | (0.343) | ** |
| 2.25 - 2.74 | 2.262 | (0.435) | *** |
| 1.75 - 2.24 | 2.303 | (0.558) | ** |
| 1.25 - 1.74 | 2.976 | (0.963) | ** |
| 1.24 or below | 2.772 | (0.781) | *** |
| *Transferred (comparison = never transferred)* | 0.837 | (0.112) | |
| *Degree status (comparison = degree completer)* | | | |
| No degree, not enrolled | 2.314 | (0.299) | *** |
| No degree, still enrolled | 2.088 | (0.471) | ** |
| *Financial aid* | | | |
| Cumulative federal loans (in thousands) | 0.919 | (0.010) | *** |
| Cumulative federal loans (squared) | 1.001 | (0.000) | ** |
| Took out private loans (comparison = no private loans) | 0.989 | (0.116) | |
| Pell recipient (comparison = not Pell recipient) | 1.400 | (0.255) | * |
| **Post-college employment** | | | |
| Unemployed (comparison = employed) | 1.705 | (0.214) | *** |
| Institutional characteristics (comparison = public four-year) | | | |
| Private four-year | 1.098 | (0.369) | |

| | | | |
|---|---|---|---|
| For-profit four-year | 2.143 | (1.005) | * |
| Public two-year | 1.318 | (0.402) | |
| Private two-year | 2.586 | (0.941) | ** |
| For-profit two-year | 3.161 | (0.988) | *** |

*Note: α<.001 "***"; α<.05 "**"; α<.1*"; Wald χ2 = 509.1***; Log likelihood = -1173.0*