An Examination of the Effects of Undergraduate Debt on Postbaccalaureate Decision-Making

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Dominique J. Baker

Note: This dissertation grant (which no longer exists in the form that it did when I applied) had several sections where I uploaded text (instead of a single pdf for the proposal narrative). I include the prompt for each section and then my response below it. This document ends with the addendum that I included with my proposal.

Statement of the research problem and national importance (limit 750 words):

- **What is the research problem this proposal intends to address?**
- **Why is this topic of national importance?**
- **Why is it timely to conduct this research at this time?**

Undergraduate debt is an area of higher education policy which has drawn intensive scholarly and practical interest. American student loan debt has officially exceeded one trillion dollars since early 2012 leading to articles like CNN's "40 million Americans now have student loan debt," Forbes' "How the $1.2 Trillion College Debt Crisis is Crippling Students, Parents and The Economy," and Huffington Post's "College Debt is Crippling Black Graduates' Ability to Gain Wealth" (Berman, 2015; CNN, 2014; Denhart, 2013). This is, in part, due to the fact that from AY 2000-2001 to 2010-2011, in constant 2011-2012 dollars, federal grants disbursements grew from $10.4 billion to $37.8 billion (4,059 to 10,517 recipients, in thousands) and federal loan disbursements grew from $43.3 billion to $108.6 billion (7,544 to 19,174 recipients, in thousands; Condition of Education, 2013). In addition, the rebuilding of the economy and labor markets after the Great Recession increased the need to borrow to finance education and decreased the likelihood of being able to meet repayment requirements. The year 2011 saw the highest cohort default rate on federal student loans in over 15 years (College Board, 2012). Further, the percentage of total outstanding student loan debt held by consumers that was 90 days or more delinquent grew from 6.1% in 2003 to 11.0% in 2012 (Condition of Education, 2013).

High payments and default on undergraduate debt have consequences. These high payments and defaults are national concerns if aversion to those consequences deters students from making optimal postbaccalaureate decisions, e.g., postbaccalaureate education aspirations, enrollment, and early-career occupation. With regard to aspirations and enrollment, on average, the economic return to earning a postbaccalaureate degree is growing. Researchers have found that people who hold postbaccalaureate degrees have increased their wages, relative to both all workers and specifically in comparison with baccalaureate degree holders (Acemoglu & Autor, 2010; Avery & Turner, 2012; Lindley & Machin, 2011). Lindley & Machin (2011) also found that an increase in demand for postbaccalaureate degree holders was driving this change. Moreover, early-career occupations in low-salary or non-profit industries can often lead to positive social externalities (Preston, 1989) and higher personal job satisfaction and non-pecuniary benefits even when controlling for salary (Benz, 2005). Therefore, there is concern that, with more undergraduate debt, people will be less likely to make decisions that give them the most happiness/satisfaction or benefit society.

The purpose of this work is to expand our general understanding of how undergraduate loans influence and potentially constrain the postbaccalaureate decision-making for students. The barrier of undergraduate debt could exacerbate the relatively stable trend of disproportionate graduate school attendance depending on a students' race and income level (Carter, 1999; Malcom & Dowd, 2012; Mullen, Goyette & Soares, 2003; Silbulkin & Butler, 2011). And even though public sector and so-called low-salary industries have been seen as havens for females and African Americans entering the labor market (Cooper, Gable & Austin, 2012), there is growing evidence that increased debt makes students less likely to work in low-salary industries (Rouse & Rothstein, 2011). Research illuminating the effects of undergraduate debt on postbaccalaureate decision-making and how these students create their belief structures on undergraduate debt and postbaccalaureate options could aid in explicating why these students do not appear to make the same choices as their peers.

Moreover, my methodological addition to the field is twofold. First, I add a new way to identify causal estimates from undergraduate debt via using changes in cost of attendance as an excluded instrument. This technique could be used in multiple scenarios beyond investigating the specific dependent variables I have chosen as long as the change in tuition has no outside effect on the outcome variable. And this could be more widely applicable when investigating debt's impact versus the previous methods. Second, as I employ a mixed methods analytical approach, I am able to investigate not only the causal effect of undergraduate debt but the ways in which students conceptualize their debt and the underlying reasoning behind their postbaccalaureate decision-making.

Review the literature and establish the theoretical grounding for the research (limit 1000 words):
What has prior research found about this problem?
What is the theoretical/conceptual grounding for this research?

Prior Research

There is a significant, if contradictory, body of research on the relationship between debt levels and graduate school aspirations, application, and enrollment. Researchers reported a variety of findings that range from negative effects of debt (Baum & Saunders, 1988; Baum & Schwartz, 1998; Choy & Gies, 1997; Fox, 1992; Malcom & Dowd, 2012; Millett, 2003; Tsapogas & Cahalan, 1996; Weiler, 1994; Wilder & Baydar, 1991; Zhang, 2013) to neutral or insignificant/positive effects, grouped together because these effects would suggest that debt is not inhibiting students (Baird, 1973; Bedard & Herman, 2008; Carter, 1999; Choy, 2000; COFHE, 1983; Ekstrom et al., 1991; Heller, 2001; Kim & Eyermann, 2006; Murphy, 1994; Perna, 2004; Rothstein & Rouse, 2011; Sanford, 1980; Schapiro, O'Malley & Litten, 1991; Weiler, 1991). This is in contrast to research on early-career occupation, which, while smaller, reflects a primarily negative effect of debt (Rouse & Rothstein, 2011). As students increase their undergraduate debt they are less likely to select careers in the public sector or in so-called low-salary industries.

In all of the research on debt's influence on postbaccalaureate decision-making, there is a fundamental issue of endogeneity. For example, using postbaccalaureate aspirations, the amount of debt students borrow could, and most likely is, a function of the students' postbaccalaureate plans (e.g., students planning to earn a JD may be more willing to borrow in comparison with students planning to be primary school teachers). If this is the case, then changes in debt do not cause changes in graduate school aspirations, changes in graduate school aspirations would cause the changes in debt. Therefore, debt would be an endogenous predictor.

Few studies, such as Rothstein and Rouse (2011) and Zhang (2013), deal with the potential endogeneity in their debt measures. Rothstein and Rouse (2011) used administrative data from 1999-2006 from one institution which implemented a no-loan policy for all students receiving financial aid in 2001. The researchers employed difference-in-differences and instrumental variables estimation (excluded instrument created from a simulated loan offer based on administrative data). While the estimation strategy is strong, there is a lack of generalizability because the authors only studied one institution, an institution that is extremely selective, with large endowments and a more privileged student body than at the majority of other American institutions of higher learning. Zhang (2013) used the percentage of gift aid relative to loans given by the student's undergraduate institution and the percentage of students at said institution

who received any form of financial aid as excluded instruments. However, Zhang (2013) used older data, B&B: 93/97, and there was not strong enough evidence that his instruments did not suffer from finite sample bias for private institutions. Also, there was no measure of whether any of these college graduates ever actually aspired to enter graduate school.

Previous research on debt's association with postbaccalaureate decision-making either uses older, nationally representative data or newer, single-institution/single-subject area data. New research is needed which analyzes the causal effects of debt for a representative sample. Therefore, I propose to use a new excluded instrument, change in cost of attendance, while filling in these gaps in the literature using newer, nationally representative data rich with financial aid and indebtedness measures.

Conceptual Framework

I establish two competing hypotheses that could explain the postbaccalaureate decision-making of students as my conceptual framework for my three research questions. Human capital theory aids in understanding how students make decisions (Becker, 1964; Bound et al., 2009). According to Becker (1964), students must evaluate the costs of enrolling in college, both in the direct costs of attendance and in foregone earnings, and the potential economic returns to the increase in their human capital by acquiring new skills and knowledge (often signaled by the earning of a degree). This would directly apply when students are considering whether or not to aspire to and enroll in postbaccalaureate study. Students could evaluate the amount of undergraduate loan debt they have borrowed and decide that the only way to pay the debt back is to attend graduate school in order to attain higher earnings over their lifetime. This is a particularly popular decision during recessions and times when unemployment is high (Fry, 2010). Or, in regards to students who directly enter the labor market, students more comfortable with debt and an understanding of lifetime utility could be more likely to work in low-salary industries. This theory would be complicated by the increased prominence of Income-Based Repayment (IBR) plans which would allow students to pay a set portion of their income on their *federal* loans instead of a flat payment based on the amount borrowed (U.S. Department of Education, 2014). Still, approximately 14 percent of students in repayment on their Direct Loans in 2014 used IBR (College Board, 2014) so this is a marginal portion of the population.

However, scholars also posit that, instead of following human capital theory, students will make decisions based on their risk aversion with regard to debt (Burdman, 2005). Following this theory, with regards to postbaccalaureate education students would react to increased undergraduate debt load by lowering their aspirations for or choosing not to enroll in postbaccalaureate study and instead deciding to enter the labor force more quickly in order to begin repayment of loans. Additionally, students entering the labor market would choose to work in an industry that returns a higher salary in order to pay back loans quicker. In terms of differential effects, numerous scholars have found that different student populations—e.g., racial ethnic/minorities, students from low-income backgrounds—can often be risk averse when confronted with undergraduate student loans (Burdman, 2005; Callender & Jackson, 2005; Perna, 2000; Tomas Rivera Policy Institute, 2004). This is often posited to be due to structural income and wealth inequalities (Oliver & Shapiro, 1997). Therefore, students underrepresented in higher education could react more strongly to the increasing reliance on student debt for college funding. And this reluctance to borrow for undergraduate education could push these students to search for high paying employment (see Appendix A for Conceptual Model).

Describe the research method that will be used (limit 1000 words):
What are the research questions to be addressed?
What is the proposed research methodology?
What is the statistical model to be used?

Research Questions

I propose to address the following research questions in a separate paper:

1. To what extent does undergraduate student loan debt influence postbaccalaureate educational aspirations and postbaccalaureate educational enrollment?
2. To what extent does undergraduate student loan debt influence early-career occupational choices?
3. How do underrepresented students conceptualize undergraduate debt and their repayment options? How does this change closer to time of repayment?

Data

For the quantitative portion of my dissertation, research question one and two, I use two different datasets from the National Center for Education Statistics (NCES). Question one has two dependent variables. I use the Beginning Postsecondary Students (BPS): 04/09 dataset for the analysis of the dependent variable postbaccalaureate education aspirations and the Baccalaureate and Beyond (B&B) 2007-2008 graduating cohort for the analysis of the dependent variable postbaccalaureate education enrollment. For question two, I use B&B solely for the analysis of the dependent variable low-salary industry for early-career occupation (using the classification from Rouse & Rothstein, 2011). In all three cases, undergraduate debt is the endogenous independent variable. I supplement all the NCES datasets with cost of attendance (COA) figures from the Integrated Postsecondary Education Data Systems (IPEDS) and selectivity measures for the first postsecondary institution from the 2004 Barron's Admissions Competitiveness Index (year chosen because of proximity to when students started postsecondary education). The study sample is restricted to U.S. citizens and resident aliens (only students eligible for federal financial aid) who attend not-for-profit institutions. The estimated analytical sample for BPS is approximately 6400 and for B&B is approximately 17,100.

Analytic Approach

I will employ a mixed methods approach to answer my three separate research questions. I investigate research question one and two using a quantitative analytical method. Due to the previously discussed complex, and potentially endogenous, relationship between debt and postbaccalaureate decision-making, I implement instrumental variables estimation as an identification strategy to estimate causal effects. For research question one, I use the changes in COA from AY 2003-2004 to AY 2005-2006 for BPS (aligned with waves of BPS; model one) or the entire undergraduate period for that student for B&B at the institution the student attended their first year of postsecondary education (model two) as an identifying instrument for the change in student debt. For research question two, I use the entire undergraduate period for that student as I will use B&B again (model three). Change in COA could force students to borrow more as a higher COA would presumably lead students to rely on loans in order to finance their educations. However, change in COA should not influence the postbaccalaureate decision-making, unless it is through this channel of influencing the undergraduate debt a student holds.

In order to evaluate the competing hypotheses mentioned earlier, if the beta estimate on debt is statistically significant and negative, debt had a negative effect on the students' postbaccalaureate decision-making (e.g., lowered their aspirations to graduate school, made the student less likely to apply to graduate school). However, if the estimate is statistically significant and positive or statistically insignificant, but there is enough power to detect an effect, this would mean that there is evidence supporting that debt did not have an inhibiting effect on students' postbaccalaureate decision-making. Subpopulation analyses for underrepresented students (e.g., Black, Hispanic, low-income) will also be conducted for both research question one and two. Preliminary estimates do hold that the instrument has sufficient predictive power and that the instrument is exogenous. Complete details of this estimation strategy can be found in Appendix B, the statistical models addendum, attached to this proposal.

I investigate research question three using a qualitative analytical method. I will conduct descriptive phenomenological analysis of 20 undergraduate students who hold federal undergraduate loans attending an Historically Black College or University (HBCU). This type of institution was selected because these institutions have a concentrated population of students underrepresented within higher education. With the previously mentioned concerns with differential effects of undergraduate loans (Burdman, 2005; Callender & Jackson, 2005; Perna, 2000; Tomas Rivera Policy Institute, 2004), I wish to further unpack the experiences of underrepresented students. This is especially critical as research suggests that shifting higher education funding to loans instead of grants may disproportionately disadvantage underrepresented students, racial/ethnic minorities or from low-income backgrounds (Long & Riley, 2007). As recommended by Yin (2003), I have developed data collection protocols based on my conceptual framework and review of the literature. The focus will be on how students conceptualize undergraduate debt and their repayment options. One-on-one interviews will be conducted at two different time points by the PI with the participants. In phase one, the PI will interview students during April 2015 before the students graduate. A member of the Office of Financial Aid will send out a recruitment email to all students who will go through repayment counseling on their federal student loans. Those students may then choose to email me if they are interested in participating in the study. In phase two, the PI will re-interview those students again during October/November 2015 which will be closer to the time when the students must actually make repayment decisions with the federal government. After each interview, the audiorecording will be transcribed and I will create a theoretical memo summarizing the themes based on a phenomenological approach. This will involve delving into the lived common experience of the students in order to better understand how they perceive and make meaning of their undergraduate loans and their postbaccalaureate decision-making (Moustakas, 1994). This design has strong trustworthiness due to the credibility, transferability, dependability, and confirmability (Lincoln & Guba, 1985). Theses facets of trustworthiness are ensured due to the prolonged engagement/trust building activities, triangulation via informal discussion with the site coordinator, peer debriefing, and member check-ins (sending theoretical memos back to students in order to allow the students to give feedback on interpretations). The site coordinator has already written a letter of cooperation for the research.

Provide a timeline of key project activities.
At the time of application, the dissertation should be in the early stage of development. The major portion of the research should be completed between June 4, 2015 and June 10, 2016.

April 2015: I will conduct the first phase of interviews (answering the third research question).
May 2015: Transcription of those interviews and preliminary analysis. Preliminary theoretical memos will be sent to the participants for member checks.
June 2015-September 2015: Creation of the final compiled analytical dataset. Continued refinement of statistical models will occur, along with robustness checks, until final models are specified (answering the first and second research questions).
October 2015: Begin contacting interview participants to see if they are still willing to participate again. Begin conducting phase two interviews. Begin writing the results from the quantitative portion of the analysis leaving time if I need to re-specify the models.
November 2015: Continue conducting phase two interviews. Transcription will be taking place immediately after I conduct the interviews.
December 2015: Preliminary theoretical memos for the second interviews will be sent to the participants for member checks.
January 2016-March 2016: Writing of the majority of the results. March of 2016 I will defend my dissertation in order to graduate in May 2016.
During this entire time period I will be preparing manuscripts for publication and presenting results at academic conferences.

List deliverables such as research reports, books, and presentations that will be developed from this research initiative.

I plan to present the results of the papers at education, economics, and/or policy conferences. This may amount to more than three conference presentations (for example, the qualitative results may have more than one presentation in them). This work would also lead to more practitioner-based presentations through centers focused on either financial aid policy or Minority-Serving Institutions. Additional policy briefs/research reports targeted at policy and practitioner stakeholders will be produced.

How will you disseminate the results of this research (limit 250 words)?

In addition to having important implications for policymakers, the results of this study will be of great interest to education scholars and researchers. I anticipate disseminating my work both through academic conference presentations and publication in leading education and policy peer-reviewed journals. The intended conference outlets would be annual conferences in education, economics, or public policy, e.g. American Educational Research Association (AERA), Association for the Study of Higher Education (ASHE), and Association for Education Finance and Policy (AEFP). I would submit my three manuscripts to peer-reviewed journals in the same fields, e.g. Journal of Higher Education, Review of Higher Education, and Educational Evaluation and Policy Analysis. Additional efforts will be made to distribute policy briefs and research reports through financial aid policy networks like the National Association of Student

Financial Aid Administrators and Minority-Serving Institutions networks like the Center for Minority Serving Institutions at the University of Pennsylvania. I will also meet with and disseminate the results to stakeholders at the institution I conduct qualitative interviews. This work is intended for scholars and policymakers within the higher education and federal aid sectors.

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Appendix A
Conceptual Model

Below is my original framework combining human capital theory and the literature on risk aversion to conceptualize students' responses to increased undergraduate debt.

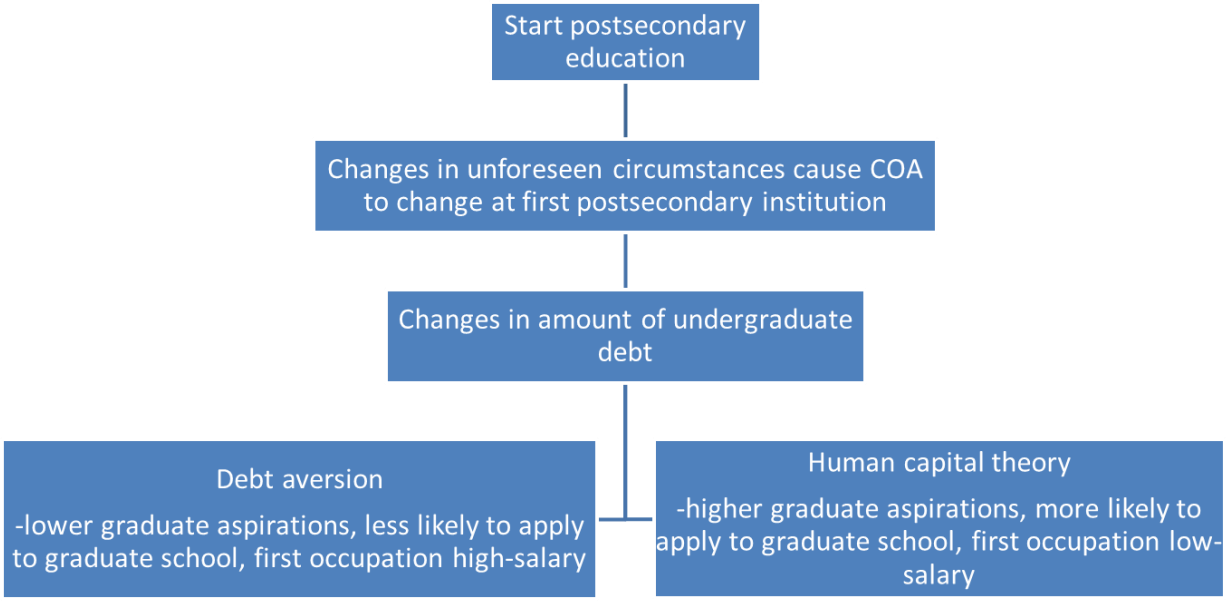

Figure 1. The conceptual model for understanding undergraduate debt's effect on postbaccalaureate decision-making.

Appendix B
Statistical Models

Model 1

In model one, I investigate the first part of research question one, debt's effect on postbaccalaureate education aspirations. The model is:

First stage

$$debt_{it} = \gamma_0 + \gamma_1 \Delta coa_i + \gamma_2 highest\ degree\ expected_{it-1} + \boldsymbol{X_i}\boldsymbol{\alpha} + \varepsilon$$

Second stage

$$highest\ degree\ expected_{it} = \beta_0 + \beta_1 \widehat{debt_{it}} + \beta_2 highest\ degree\ expected_{it-1} + \boldsymbol{X_i}\boldsymbol{\delta} + u$$

where $\boldsymbol{debt_{it}}$ is the amount of undergraduate loans borrowed by 2005-2006 for student **i**; $\Delta\boldsymbol{coa_i}$ is change in COA from 2003-2004 to 2005-2006 for student **i;** $\boldsymbol{highest\ degree\ expected_{it-1}}$ is the highest degree expected to be earned in 2003-2004 (or the first wave) for each student **i;** $\boldsymbol{X_i}$represents a vector of individual and institutional covariates for student **i** including gender, race/ethnicity, parents' education, family or student income prior to postsecondary education, high school grade point average, college entrance examination score, institutional selectivity, institutional control, institutional level, time spent working, initial COA at first postsecondary institution, marriage status, and whether the student had children; and $\boldsymbol{highest\ degree\ expected_{it}}$ is the highest degree expected to be earned in 2005-2006 (or the second wave) for each student **i**. The second stage will run a linear probability model (as the outcome variable is dichotomous).

Model 2

For model two, I investigate the second part of research question two, debt's effect on postbaccalaureate education enrollment. The model is:

First stage

$$debt_{it-1} = \gamma_0 + \gamma_1 \Delta coa_i + \gamma_2 highest\ degree\ expected_{it-1} + \boldsymbol{X_i}\boldsymbol{\alpha} + \varepsilon$$

Second stage

$$postbaccalaureate\ enrollment_{it} = \beta_0 + \beta_1 \widehat{debt_{it-1}} + \beta_2 highest\ degree\ expected_{it-1} + \boldsymbol{X_i}\boldsymbol{\delta} + u$$

where $\boldsymbol{debt_{it-1}}$ is the amount of undergraduate loans borrowed for the undergraduate career for student **i**; $\Delta\boldsymbol{coa_i}$ is change in COA for undergraduate enrollment for student **i;** $\boldsymbol{highest\ degree\ expected_{it-1}}$ is the highest degree expected to be earned in 2007-2008 (when earning the baccalaureate degree) for each student **i;** $\boldsymbol{X_i}$represents a vector of individual and institutional covariates for student **i** including gender, race/ethnicity, parents' education, family or student income prior to graduation, high school grade point average, college entrance examination score, whether student worked while enrolled, undergraduate grade point average, marriage status, whether the student had children, first institution selectivity, first institution control, and first institution level; and $\boldsymbol{postbaccalaureate\ enrollment_{it}}$ is an indicator for graduate school enrollment in 2012 for each student **i** (=1 if student chose to enroll in graduate

school). The second stage will run a linear probability model (as the outcome variable is dichotomous).

Model 3

For model three, I investigate research question two, debt's effect on postbaccalaureate early-career choice. The model is:

First stage

$$debt_{it-1} = \gamma_0 + \gamma_1 \Delta coa_i + \boldsymbol{X_i}\boldsymbol{\alpha} + \varepsilon$$

Second stage

$$low\ salary_{it} = \beta_0 + \beta_1 \widehat{debt_{it-1}} + \boldsymbol{X_i}\boldsymbol{\delta} + u$$

where $\boldsymbol{debt_{it-1}}$ is the amount of undergraduate loans borrowed for the undergraduate career for student **i**; $\Delta\boldsymbol{coa_i}$ is change in COA for undergraduate enrollment for student **i;** $\boldsymbol{X_i}$represents a vector of individual and institutional covariates for student **i** including gender, race/ethnicity, parents' education, family or student income prior to graduation, high school grade point average, college entrance examination score, whether student worked while enrolled, undergraduate grade point average, marriage status, whether the student had children, and first institution selectivity, first institution control, first institution level; and $\boldsymbol{low\ salary_{it}}$ is an indicator for the early-career industry in 2012 for each student **i (** =1 if student works in a low-salary industry). The second stage will run a linear probability model (as the outcome variable is dichotomous).

Appendix C
Variable List

Beginning Postsecondary Students

Note: Used for Model 1.	
Postbaccalaureate Education Aspirations (Outcome Variable)	
DGEVR06	Highest degree ever expected 2006
Undergraduate Debt (Endogenous Predictor)	
CUMULN06	Cumulative total student loan amount borrowed through 2006
Prior Postbaccalaureate Education Aspirations (Prior Measure of Outcome Variable)	
HIGHLVEX	Highest degree ever expected 2003-04
Pre-College (covariates)	
GENDER	Gender
RACE	Race/ethnicity
PAREDUC	Parent's highest level of education
CINCOME	Income: Parents and independent (continuous) 2003-04
HCGPAREP	High school grade point average (GPA)
TESATDER	Admissions test scores (ACT or SAT)
In-College (covariates)	
FCONTROL	First institution control 2003-04
FLEVEL	First institution level 2003-04
HRSWK06	Job while enrolled 2006: Hours worked per week
Current Family Structure (covariates)	
DEPEND5A	Dependency and marital status (separated=married) 2003-04
DEPCHILD	Dependent children: Any 2003-04
Weights	
WTB000	Weight

Integrated Postsecondary Education Data System

Note: When using BPS the years will cover AY 2003-2004 to AY 2005-2006. When using B&B the years will cover the entire undergraduate career of student. IPEDS has the same variable name regardless of the year of interest and in the interest of space I will only list the name of a single version of the variable.	
Cost of Attendance at First Postsecondary Institution	
cinson	Total price for in-state students living on campus
cotson	Total price for out-of-state students living on campus

Baccalaureate and Beyond Longitudinal Study

Note: Unless otherwise noted these variables would be used for both Model 2 & 3.	
Postbaccalaureate Education Enrollment (Outcome Variable, Model 2)	
B2HIENR	Highest post-bachelor's enrollment as of 2012
Intent to Attend Postbaccalaureate Education (Covariate, Model 2)	
HIGHLVEX	Highest level of education ever expected as of 2007-08
Early-Career Occupation (Outcome Variable, Model 3)	
B2CJOCC33	Occupation for primary job in 2012
Undergraduate Debt (Endogenous Predictor)	
B1BORAT	Cumulative loan amount borrowed for undergraduate through 2007-08
Individual Characteristics (Covariates)	
GENDER	Gender
RACE	Race/ethnicity (with multiple)
PAREDUC	Highest education level attained by either parent as of 2007-08
CINCOME	Income: Income (dependents' parents and independents) in 2006
HSGPA	Grade point average in high school
TESATDER	SAT I (SAT or ACT composite score)
JOBNUM	Number of jobs (excluding work-study) in 2007-08
GPA	Undergraduate GPA as of 2007-08
DEPEND5A	Dependency and marital status (separated is married) in 2007-08
DEPNUMCH	Number of dependent children in 2007-08
Institutional Characteristics (Covariates)	
I1CTRL	First postsecondary institution control
I1LEVEL	First postsecondary institution level
Weights	
WTE000	Weight

Barron's Admissions Competitiveness Index

Selectivity Index (Covariates)	
BARRONS04	Barron's Index for 2004