

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

By

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To my saintly mother and father, for never letting me forget the awesome power and responsibility education brings.

To my amazing nieces and nephews, I do this work for you, so that there never need be another dream deferred.

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CHAPTER I

INTRODUCTION

Objective

Undergraduate debt is an area of higher education policy that has drawn intensive scholarly and practical interest. American student loan debt has officially exceeded one trillion dollars since late 2011, as witnessed by headlines such as these: “40 million Americans now have student loan debt,” “How the \$1.2 Trillion College Debt Crisis Is Crippling Students, Parents and the Economy,” and “College Debt Is Crippling Black Graduates’ Ability to Gain Wealth” (Berman, 2015; CNN, 2014; Denhart, 2013). The size of the debt stems in part from the fact that from academic year (AY) 2000–2001 to 2010–2011, in constant 2011–2012 dollars, federal grant disbursements grew from \$10.4 billion to \$37.8 billion (4,059 to 10,517 recipients, in thousands) while federal loan disbursements grew from \$43.3 billion to \$108.6 billion (7,544 to 19,174 recipients, in thousands; U.S.D.O.E. National Center for Education Statistics, 2013). Baccalaureate degree holders with over \$40,000 in debt grew from 2% (AY 2003–2004) to 18% (AY 2011–2012), in constant 2012 dollars. In addition, the rebuilding of the economy and labor markets after the Great Recession increased students' need to borrow to finance education and decreased the likelihood of their being able to meet repayment requirements. The year 2011 saw the highest cohort default rate on federal student loans in more than 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 (U.S.D.O.E. National Center for Education Statistics, 2013).

High payments and default on undergraduate debt have consequences; they are of national concern if aversion to debt deters students from making optimal postbaccalaureate decisions on postbaccalaureate educational aspirations, enrollment, and early-career occupation. With regard to aspirations and enrollment, on average, the economic return on earning a postbaccalaureate degree is growing. Researchers have found that, over the past five decades, people who hold postbaccalaureate degrees have increased their wages relative to all workers and specifically in comparison with baccalaureate degree holders (Acemoglu & Autor, 2010; Avery & Turner, 2012; Lindley & Machin, 2011). Lindley and 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 nonprofit industries can often lead to positive social externalities (Preston, 1989) and higher personal job satisfaction and nonpecuniary benefits even when controlling for salary (Benz, 2005). Potentially, with more undergraduate debt, people will be less likely to make decisions that yield the most happiness/satisfaction or benefit to society.

This apprehension to the negative effects of debt exacerbated by the disproportionate numbers of African American and Latino students who hold excessive debt burdens (Price, 2004), as these students are less likely to pursue postbaccalaureate education (Carter, 1999; Malcom & Dowd, 2012; Mullen, Goyette, & Soares, 2003; Sibulkin & Butler, 2011). Public-sector and low-salary industries have been seen as havens for women and African Americans entering the labor market (Cooper, Gable, & Austin, 2012). At the same time, there is growing evidence that increased debt makes students less likely to work in low-salary industries (Rothstein & Rouse, 2011). Female and African American

students choosing high-salary occupations is not inherently bad; however, as discussed in the Contributions to Theory and Practice section below, this shift could deplete certain fields of a diverse supply of potential workers. For example, Motoko Rich observed in the *New York Times* that, while United States public schools have become majority minority (Pew Hispanic, 2014; U.S. Department of Education, 2014a), more than 80% of teachers are White (Rich, 2015). Rich posited that this disparity is due to the fact that minority college graduates “may carry significant debt and have high expectations for future salaries” (para. 12) which would lead them away from entering the education field.

Research Questions

The purpose of this dissertation is to expand our general understanding of how undergraduate loans influence and potentially constrain students’ postbaccalaureate decision-making. I seek to answer the following research questions:

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

Background

Undergraduate financial aid in the United States generally takes three forms: federal/state grants, loans, and education tax benefits. Grants are direct transfers; students are not required to repay them. Eligibility for federal and state grants is often means-tested, though in recent decades merit-based state grants have gained popularity, particularly in the southeastern region of the United States (Doyle, 2006). Grants consist of

federal grants, institutional grants, private and employer grants, and state grants (College Board, 2014). Loans can be disbursed by the federal government or through private entities, which normally require families to meet additional creditworthiness measures, such as higher credit score. Loans consist of federal subsidized loans, federal unsubsidized loans, Parent PLUS loans, Perkins and other federal loans, and nonfederal loans (College Board, 2014). Tax benefits generally include parents' eligibility to claim their child as a dependent on their federal income taxes (until the student is 23, as long as the student is enrolled in higher education); varying amounts of tax deductibles (e.g., American Opportunity Tax Credit, interest on student loans; College Board, 2014). This category also includes savings plans, such as state 529 plans, which allow families to save for a child's eventual higher education costs. The benefit of these plans is that families do not have to pay taxes on these funds as long as the funds are used on educational expenses. These tax credits generally benefit middle- and upper-income families (Dynarski & Scott-Clayton, 2013).

Federal financial aid comprises Pell grants, funds to veterans and military members, other federal grants, education tax benefits, federal work-study, Direct Loans (subsidized and unsubsidized), PLUS loans, and other federal loans. Students qualify for the overwhelming majority of financial aid, federal and state, by completing the Free Application for Federal Student Aid (FAFSA). From the information shared in the FAFSA, the federal government calculates a student's Expected Family Contribution (EFC), the amount of money the student and her family are expected to be able to contribute to her education, and sends that information to the institutions the student has selected. Some institutions also require the student to complete a separate financial aid form, which asks

more in-depth questions, or to submit additional tax information in order to accurately estimate student eligibility for aid. Once the EFC is calculated and additional information taken into consideration, an institution subtracts the EFC from the total Cost of Attendance (COA) for the student. COA can fluctuate depending on the decisions of the student (e.g., if the student chooses to live on-campus versus off-campus). The amount of COA that remains after factoring in the EFC is the student's financial need. This is the amount of money the student will have to find from some extra source in order to attend the institution; financial aid generally covers it. Federal loans are the dominant source of financial aid. In AY 2013–2014, the three top sources of undergraduate student aid were federal loans (34% of all student aid), institutional grants (21% of all student aid), and federal Pell grants (18% of all student aid; College Board, 2014).

The research on the causal effect of grants, tax credits, and information access on financial aid is promising. Multiple researchers have found that a \$1,000 decrease in the net cost, due to a grant or tax benefit, to a student and his/her family causes a 3- to 6- percentage point increase in undergraduate enrollment (e.g., Abraham & Clark, 2006; Bound & Turner, 2002; Dynarski, 2002; Kane, 2007; Leslie & Brinkman, 1988; Seftor & Turner, 2002). Studies focusing on the Pell grant specifically do not find as strong a relationship; the complicated nature of applying for the Pell grant through the FAFSA is often thought to account for the discrepancy (Dynarski & Scott-Clayton, 2013). Bettinger and colleagues (2009) found that families randomly assigned to receive personalized information about eligibility for financial aid and personal help with completing the FAFSA increased the percentage of students enrolling in higher education, with suggestive

evidence of an increase in receiving Pell grants and gaining more college credit once enrolled.

In contrast, there is less evidence on undergraduate loans than other forms of financial aid (Dynarski & Scott-Clayton, 2013). Field (2009) randomly assigned law school students to receive a tuition waiver that would turn into a loan if the student did not enter public interest law, in which case the student would have to repay the tuition amount. Students not assigned to this condition would receive a loan for the amount of tuition, which would be forgiven if the student entered public interest law; the student would not have to repay the tuition amount only if the student entered a public interest occupation. Field (2009) found that students in the tuition waiver condition were 19–20 percentage points more likely to choose an occupation in public interest law. In analyzing the causal effects of loans on postbaccalaureate decision-making, Rothstein and Rouse (2011) found that, for a single highly selective institution, a \$10,000 increase in the cumulative amount of undergraduate loans decreased the likelihood of working in a low-salary occupation by 5–6 percentage points; increased annual salary by \$2,000; and decreased the likelihood of an annual salary below the 25th percentile by 6 percentage points.

Taken together, the research on financial aid suggests that grants, tax credits, and information on access to financial aid increase the likelihood of students enrolling in higher education. A small body of research on undergraduate loans finds that increasing cumulative amounts of debt decreases the likelihood of entering low-salary occupations. The amount of aid given as federal loans exceeds all other forms of aid (College Board, 2014), but the majority of research on financial aid focuses on grants (Dynarski & Scott-Clayton, 2013). This limited evidence likely reduces policymakers' ability to make decisions

based on research on students' and their families' ability to make informed decisions about financing higher education.

One of the potential consequences of undergraduate borrowing is students defaulting on their loans and not being able to meet loan repayment requirements. Students default on their education loans when they miss payments for more than 270 days (Looney & Yannelis, 2015). Looney and Yannelis (2015) analyzed data representing a random sample of all federal student borrowers in the National Student Loan Data System (approximately 4%) from 1970 to 2014; they merged these data with earnings and income data from tax information from 1999 to 2014. The authors found that nontraditional students (i.e., those attending for-profit or two-year institutions) defaulted at higher rates than their traditional peers who attended not-for-profit four-year institutions and graduate schools. The general national trends in higher default rates in recent decades appeared to be driven by the larger numbers of nontraditional students entering higher education, who are more vulnerable to default. The authors also found that labor market characteristics, earnings, and income significantly contribute to the rise in student default from 2000 to 2011. This would mean that while defaulting on educational debt has primarily been on the rise for nontraditional students, the occupational earnings of students influenced the likelihood of students defaulting. This is one reason it is important to understand if and how undergraduate debt affects postbaccalaureate decision-making.

Undergraduate Debt and Postbaccalaureate Decision-Making

There is a substantial, if contradictory, body of research on the relationship between debt levels and graduate school aspirations, application, and enrollment. Researchers report a variety of findings, ranging from negative effects of debt (Baum & Saunders, 1998;

Baum & Schwartz, 1988; Choy & Gies, 1997; Fox, 1992; Heller, 2001; Malcom & Dowd, 2012; Millett, 2003; Weiler, 1994; Zhang, 2013) to insignificant/positive effects, which suggest that debt is not inhibiting students (Baird, 1973; Carter, 1999; Choy, 2000; COFHE, 1983; Ekstrom et al., 1991; Kim & Eyermann, 2006; Murphy, 1994; Perna, 2004; Rothstein & Rouse, 2011; Sanford, 1980; Schapiro, O'Malley & Litten, 1991; Weiler, 1991).¹ This is in contrast to research on early-career occupation, which, while smaller, reflects a primarily negative effect of debt (Baum & Saunders, 1998; Baum & Schwartz, 1988; Field, 2009; Heller, 2001; Minicozzi, 2005; Rothstein & Rouse, 2011; Sanford, 1980; Zhang, 2013). 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 the research on debt's influence on postbaccalaureate decision-making, the issue of endogeneity is fundamental (Cellini, 2008). For example, using postbaccalaureate aspirations, the amount of debt students borrow could be (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 cannot be said to cause changes in graduate school aspirations; changes in graduate school aspirations could cause changes in debt. Therefore, debt would be an endogenous predictor. Few studies focused on undergraduate debt: Malcom and Dowd (2012), Rothstein and Rouse (2011), and Zhang (2013) deal with the potential endogeneity in their debt measures. These often study a single highly selective institution, use older data, focus on specialized majors, or provide weak evidence that the analytical approach met the assumptions necessary to provide credible causal estimates.

¹ Previous literature groups the studies with positive and insignificant effects together. This also does not imply that the negative estimates are practically significant.

Also, these studies generally do not measure whether any of these college graduates aspired to enter graduate school. Therefore, I endeavor to use a new instrumental variable—change in cost of attendance—to investigate undergraduate debt’s effects while filling in these gaps in the literature using newer, nationally representative data rich with financial aid and indebtedness measures.

Conceptual Framework

Human capital theory aids in understanding how students make decisions (Becker, 1964; Bound et al., 2010). According to Becker (1964), students must evaluate the costs of enrolling in college, both the direct costs of attendance and 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 apply when students are considering whether to aspire to and enroll in postbaccalaureate study. Students might evaluate the amount of their undergraduate loan debt and decide that the only way to pay the debt back is to attend graduate school in order to obtain higher lifetime earnings. This is a particularly popular decision during recessions and times when unemployment is high (Bedard & Herman, 2008; Fry, 2010; Murphy, 1994). Alternately, students who directly enter the labor market would be more likely to choose occupations that maximize their lifetime earnings (Blaug, 1976; Boskin, 1974). This would allow students to select early-career occupations with higher salaries, nonpecuniary benefits, or a combination of the two. Thus, students with additional undergraduate debt would be more likely to pursue a high-salary occupation.

Scholars also posit that students will make decisions based on their risk aversion with regard to debt (Burdman, 2005; Field, 2009). Risk aversion would align with human

capital theory on predicting early-career occupation. Students who are averse to risk around debt would be more likely to pursue a high-salary occupation. However, risk aversion diverges from the traditional interpretation of behavior by human capital theory for postbaccalaureate educational enrollment. Students would react to increased undergraduate debt load by lowering their aspirations for or choosing not to enroll in postbaccalaureate study, instead entering the labor force more quickly in order to begin repayment of loans. 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; Cunningham & Santiago, 2008; Perna, 2000). This is often posited as owing to structural income and wealth inequalities (Oliver & Shapiro, 1997), cultural aversion to debt, or familial lack of or negative experience with borrowing more generally (Burdman, 2005, Cunningham & Santiago, 2008). Therefore, students from groups that are underrepresented in higher education could react more strongly to the increasing reliance on student debt for college funding.

Methods

I employed a mixed-methods approach in my dissertation. I investigated research question 1 (To what extent does undergraduate student loan debt affect postbaccalaureate educational aspirations, educational enrollment, and early-career occupational choice?) using instrumental variables estimation on two different samples: a national sample of first-time postsecondary students and a national sample of bachelor's degree recipients. Due to the previously discussed complex, and potentially endogenous, relationship between debt and postbaccalaureate decision-making, I used changes in tuition and fees

over a student's undergraduate career as an excluded instrument (interacted with parental education) to estimate undergraduate debt's causal effect. I investigated research question 2 (How do underrepresented students conceptualize undergraduate debt and their repayment options? How does this change closer to time of repayment?) using semi-structured interviews with six recent graduates of a historically Black college or university (HBCU) who borrowed at some point in their undergraduate career and were required to complete federal exit counseling.

Results

The quantitative results align with findings from prior causal research on undergraduate debt's effects (Malcom & Dowd, 2012; Rothstein & Rouse, 2011; Zhang, 2013). Larger changes in tuition and fees are associated with larger amounts of undergraduate debt. Larger amounts of undergraduate debt lead to changes in postbaccalaureate decision-making. This supports the conceptual framework as a theory of behavior for students' postbaccalaureate decision-making. I find that a \$10,000 increase in total undergraduate debt does not appear to induce a change in students' aspirations, decreases the likelihood of students enrolling in graduate school by 3–4%, and increases the average annual salary of students by \$1,550 in 2009 and \$3,410 in 2012. A \$10,000 increase in federal undergraduate debt does not appear to induce a change in students' aspirations, decreases the likelihood of students enrolling in graduate school by 5%, and increases the average annual salary of students by \$2,100 in 2009 and \$4,620 in 2012.

For the qualitative results, I find that, for the six students with whom I spoke, the relationship between undergraduate debt and postbaccalaureate decision-making might be partially explained by the themes of timing and structure of information, family as a source

of knowledge, comfort with the amount borrowed, and the realities of postbaccalaureate decision-making. These results align with the few prior qualitative research studies on this topic. The six students in the sample reported not allowing undergraduate debt to affect their postbaccalaureate plans, similar to Murphy's (1994) work. However, four of the six students reported changing either their immediate plans after graduating or their long-term career plans in some part because of the amount they borrowed. These students also borrowed the highest amounts of cumulative debt of all the study participants. Students expressed more confidence in their ability to repay their undergraduate debt during their phase one interviews. This mirrors the high levels of confidence reported by the students in Fernandez and colleagues' (2015) research on federal exit counseling. However, as I hypothesize based on my conceptual framework, by the phase two interviews conducted approximately six months after graduation, students who had begun repayment reported more unease with their ability to repay their undergraduate debt. The results, while preliminary in nature because of the small sample size, suggest that following students past graduation is critical because the students' reported confidence or emotional state can change as repayment draws closer.

Contributions to Theory and Practice

The barrier of undergraduate debt could exacerbate the relatively stable trend of disproportionate graduate school attendance depending on students' race and income level (Carter, 1999; Malcom & Dowd, 2012; Mullen, Goyette & Soares, 2003; Sibulkin & 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 (Rothstein & Rouse, 2011). This is not necessarily a negative. Students responding to increased undergraduate debt by seeking an early-career occupation with a higher salary has likely positive effects both on the students' ability to repay and on their future utility. The concern about this is twofold. First, debt could induce students to select postbaccalaureate educational or occupational opportunities that run counter to their underlying preferences and abilities. If there is a distribution of underlying preferences and abilities for different majors, careers, and educational attainment, it could be a problem that undergraduate debt decreases students' ability to pursue their preferred postbaccalaureate life. Second, borrowing to finance undergraduate education is not randomly distributed among the population. Certain types of students (i.e., low-income, African American) borrow at higher rates and higher amounts than their peers do. Therefore, even if it is a rational choice to change postbaccalaureate behaviors based on the amount of undergraduate debt amassed, only certain students must face this particular reassessment.

The methodological contribution to the field is twofold. First, I add a new way to identify causal estimates from undergraduate debt by 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. The technique could be more widely applicable than the previous methods when investigating debt's impact. Second, I employ a mixed-methods analytical approach, allowing me 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.

Structure of the Dissertation

The structure of the dissertation is as follows. Chapter II is the review of the literature. In Chapter III, I outline the conceptual framework. Chapter IV presents the research methods and results for the quantitative research question. Chapter V covers the research methods and results for the qualitative research question. I end with Chapter VI, the conclusions and policy recommendations.

CHAPTER II

LITERATURE REVIEW

Prior research on the relationship between undergraduate loans and students' postbaccalaureate decision-making mainly focuses on educational and early-career occupation choices. I begin the review of the literature with a discussion of how college graduates choose to attend graduate school and to pursue certain early-career occupations. Next, I review the drivers and motivations for undergraduate debt. I follow with an overview of the research on the relationship between borrowing and graduate school aspirations, applications, and enrollment. Then, I examine research on the relationship between borrowing and early-career occupation choice. Next is a synopsis of how the relationship between undergraduate debt and these prior decisions differs for underrepresented students, specifically African American students and those attending HBCUs. I conclude the literature review with an overview of the qualitative research on undergraduate debt's influence on postbaccalaureate decision-making.

In quantitative research involving debt's causal effect, there is a fundamental issue of endogeneity (Cellini, 2008; Dynarski & Scott-Clayton, 2013). Using early-career occupation as an example, students could evaluate the amount of undergraduate debt they borrowed and then decide they will need to choose a higher-paying occupation after graduation in order to finance the debt. However, students could also go to college with a plan of entering a high-paying career field that will easily allow them to meet their loan payments each month. In this case, the choice of career would dictate how much a student is willing to borrow. Or, even worse from a statistical modeling perspective, the decision to

borrow undergraduate loans could be made near-simultaneously with the decision to pursue certain postbaccalaureate education or occupation decisions. With this possibility, debt would likely be an endogenous predictor. Prior causal research on undergraduate debt has either used pre-2000 data, which could be impractical for the current policy context post-Great Recession, or has studied a single institution/single area of study. I will fill this gap in the literature by estimating the causal effect of undergraduate debt on education and early-career occupational choice using a nationally representative sample of students from the past decade.

Qualitative research on undergraduate debt's influence on postbaccalaureate decision-making is scarce. A gap exists in the understanding of how students process their undergraduate debt, make meaning of debt burden, select repayment plans, and decide on postbaccalaureate education or occupation based on cumulative debt. I seek to fill this gap in our understanding of how students, particularly underrepresented students, conceptualize undergraduate debt and their repayment options.

Postbaccalaureate Decision-Making

To explain the relationship between undergraduate debt and postbaccalaureate education and early-career occupation decisions, I begin with a review of the literature on how college graduates make decisions for their postbaccalaureate life. Research on graduate school choice has found a mixture of individual and institutional characteristics associated with postbaccalaureate aspirations, application, and enrollment (e.g., English & Umbach, 2016; Heller, 2001; Millett, 2003; Mullen et al., 2003; Perna, 2004). For example, Mullen, Goyette, and Soares (2003) employed multinomial logistic regression to investigate the relationship between parental education attainment levels and enrollment in different

types of graduate degree programs: no enrollment, doctoral, professional, MBA, and master's. Using *Baccalaureate and Beyond (B&B): 93/97*, the authors found that gender, college admission test scores, selectivity of undergraduate institution, undergraduate GPA, college major, and, logically, students' graduate school aspirations all had a significant influence on the odds of a student enrolling in some type of postbaccalaureate education program as compared to their peers who did not enroll. The authors found limited evidence of the direct influence of parental education but strong support for the theory that parental education indirectly influences postbaccalaureate education decision-making. In the full regression models, the authors found evidence that an increase in parental education was associated with a 3.6% increase in the odds of students enrolling in master's programs. There was no evidence that parental education directly influenced enrollment in any of the other postbaccalaureate education degree programs. The authors argued that "the more socially prestigious the graduate occupation and the greater the amount of academic capital required for it, the more influence parental education has on matriculation into that program" (Mullen et al., 2003, p. 160–161). Following that logic, Mullen and colleagues posit that parental education actually had the largest influence on more "socially prestigious" program enrollment (doctoral and first professional) compared to less prestigious program enrollment (master's) due to the larger estimates for doctoral and first professional degree enrollment as compared to no enrollment (6.3% and 4.7% increase in the odds respectively). However, once the authors included measures of educational aspirations and career value (e.g., focus on financial gain) in that final model, those doctoral and first professional estimates lost statistical significance. The authors conclude that a particularly strong relationship between parental education and the

educational aspirations of students must exist in order to account for their results. Therefore, while there does not appear to be enough evidence to support the authors' supposition that "parental education has the strongest effect on enrollment in doctoral programs and the weakest on enrollment in master's programs" (p. 161), clear evidence exists that the relationship between individual and institutional characteristics and the decision to enroll in postbaccalaureate education changes depending on the type of program.

Most recently, English and Umbach (2016) added to this body of literature by creating a conceptual model of graduate school choice by analyzing the graduate school aspirations, applications, and enrollment of a nationally representative dataset of baccalaureate degree holders (B&B: 2000/2001). The authors based their model on Perna's (2006) model of how students choose to attend an undergraduate institution. This new model of graduate student choice melds the sociological theoretical concepts of social and cultural capital with economic concepts, such as human capital theory. The model has four layers that influence student decision-making: habitus, institutional context, graduate school context, and the macro social, economic, and policy context. This research contributes significantly by accounting for the clustered nature of the data (i.e., students nested within institutions) by using generalized hierarchical linear modeling and analyzing newer data as compared to other graduate school choice researchers (who generally used data from the early 1990s). English and Umbach (2016) found that a 1-point increase in undergraduate GPA was associated with .4%, .5%, and .7% increase in the odds of graduate school aspiration, application, and enrollment, respectively. Majoring in the humanities and social/behavioral sciences or math and life/physical sciences, as compared to business and

management, increased the odds of students aspiring to, applying to, and enrolling in graduate school. With all else being equal, African American students had 267%, 112%, and 53% higher odds of aspiring to, applying to, and enrolling in graduate school compared to their White peers. Parents' highest education primarily influenced applying to graduate school; students of parents with a bachelor's or master's degree had 32% or 47%, respectively, higher odds than peers whose parents held a high school diploma or less. Students attending Carnegie Classification other institutions had nearly 50% lower odds of aspiring to, applying to, and enrolling in graduate school compared to students attending Carnegie Classification doctoral institutions. Taken together, the results suggest that students with higher undergraduate GPAs, in certain majors, with parents with additional cultural or social capital (as evidenced by education level), and attending more research-intensive institutions were more likely to aspire to, apply to, and enroll in graduate school.

To be clear, aspiration to, application to, and enrollment in graduate school vary in terms of student effort. Scholars investigating the relationship between aspirations and behaviors, in this case application and enrollment, found mixed evidence (Glasman & Albarracin, 2006; Kraus, 1995). Aspirations or attitudes toward certain objects or behaviors do not consistently predict behaviors (Regan & Fazio, 1977). With that in mind, a large body of research, primarily conducted by psychologists, has investigated the situations in which attitudes do predict subsequent behaviors. Of primary interest to this work, scholars have found evidence that confidence in attitudes (Glasman & Albarracin, 2006) and direct experience with the object or behavior (Kraus, 1995) increased the predictive abilities of attitudes. Two students could express an interest in attaining a postbaccalaureate degree, but one student could have stronger confidence in her ability to

complete the degree and stronger direct experience with graduate school (e.g., if the student has a parent with a postbaccalaureate degree). Based on prior research, that student would be more likely to exhibit the behavior of interest (applying or enrolling in graduate school) even though the two students hold the same aspirations.

These types of moderators to the relationship between aspirations and behaviors complicate research with aspirations as an outcome. Aspirations may not vary greatly or may predict future behaviors weakly. This is particularly true when there is public pressure to report certain aspirations, such as obtaining a postbaccalaureate degree. This does not mean that researching aspirations is not practical or a contribution to the scholarly community. Throughout the world, a number of education policy interventions focus on changing aspirations of students (Chiapa, Garrido, & Prina, 2012; Dyce, Albold, & Long, 2013) in order to change the students' future behaviors. Research investigating how aspirations or attitudes change can be critical for developing education policy, particularly if one also studies behaviors. For example, if evidence suggests that an institutional experience does not change students' aspiration but does change behavior, policymakers might wish to focus on interventions that affect behavior, not aspiration. Research on aspirations or attitudes is meaningful; it is simply important to contextualize the results within the understanding of differences between self-reported aspirations and actual behaviors.

For postbaccalaureate early-career occupation selection, education scholars generally conduct research through the lens of Holland's theory of vocational personalities and work environments (Holland, 1985, 1997; Pike, 2006; Smart, Feldman, & Ethington, 2000). Holland's theory focuses on individuals, their environments, and how those

individuals interact with said environments (Holland, 1985). This allows researchers to assess the person-environment fit of the students. According to the theory, students select a major based on their interests and personality type, and that major socializes the students by rewarding certain behaviors and censuring others, which leads students to flourish if there is congruence between their personalities and their major environment (Pike, 2006; Smart et al., 2000). The six personality types are realistic, investigative, artistic, social, enterprising, and conventional (Holland, 1985). Applying theory to major selection, students would select majors that most align with their interests. If the major does not meet the students' expectations, the socialization process that occurs in the major will motivate students to select a different major. Once students have found a major (environment) that matches or closely aligns with their individual personalities (person), the students will have congruence and be more likely to report satisfaction and stronger learning outcomes in the classroom (four separate measures constructed from items on the National Survey of Student Engagement, based on four of the personality types: investigative, artistic, social, and enterprising; Pike, Smart, & Ethington, 2011). This process would take place again once a student selects an occupation after graduating from college. Holland's (1985) theory is a simplistic version of the way students make decisions about early-career occupation choices. Scholars have found evidence for differential occupation selection barriers, whether perceived or real, faced by certain student groups, such as women and racial/ethnic minorities (McWhirter, 1997). However, research focused on cross-group validation of Holland's theory in primary and secondary schools and higher education institutions reveals support for the theory's applicability in modeling vocational interests of different racial/ethnic groups and socioeconomic backgrounds (Fouad, 2007;

Nauta, 2010). Scholars have found suggestive evidence that this is the same for male and female students, though a minority of scholars found significant difference in vocational interest structures across gender (Fouad, 2007; Nauta, 2010). A significant body of research demonstrates that Holland's theory may not be applicable among individuals with non-American nationalities (Nauta, 2010). Thus, it is helpful to use Holland's (1985) theory to posit how students will approach early-career occupation choice, but there are student populations to whom this theory may not apply.

While there is generally consistent evidence of a link between college major and early-career occupation choice, this link strengthens as the occupation requires more major-specific skills or knowledge (Altonji, Arcidiacono, & Maurel, 2015). If students wish to maximize their postbaccalaureate earnings, there is evidence for a causal link between major choice and subsequent earnings, mediated by occupation selection. Evidence suggests that students working in occupations outside their undergraduate major field of study earn less than their peers whose occupations are more closely aligned with their major (Robst, 2007). Therefore, if maximizing salary is a primary anxiety, students are likely to focus on selecting majors that lead to certain early-career occupations. It is important to note that, while baccalaureate degree holders assess the salary a particular occupation could give them, they also focus on the occupation's nonpecuniary benefits. Additionally, there is likely heterogeneous prioritization of different pecuniary and nonpecuniary benefits, depending on demographics and cultural upbringing (Paulsen, 2001).

Typically, students attending highly selective or "prestigious" institutions report seeking high-salary and prestigious early-career occupations (e.g., finance, consulting,

technology-focused; Binder, Davis, & Bloom, 2016). In a sample of Harvard University and Stanford University undergraduates or recent graduates (less than three years from graduation), Binder et al. (2016) found that students wished to find occupations worthy of the institution they attended and the peers they attended with, while gaining financial stability and security for themselves. In interviews these students did allow that, once they are better established and have more financial security, they would like to switch occupations and focus more on work in the nonprofit and education sector.

Postbaccalaureate decision-making is driven by a combination of pre-college individual characteristics and in-college characteristics/experiences (which can be driven by the pre-college individual characteristics). Even after taking into consideration academic factors like college GPA and the research focus of the undergraduate institution, familial cultural and social capital still influence the education decision-making of recent graduates. Based on the most recent research on postbaccalaureate education choice, the critical point for graduates whose families have low cultural and social capital is likely at application time, though there is suggestive evidence that this also influences students when deciding to enroll. For early-career choice, there is a stronger emphasis in the literature on the personality of students and how students seek congruence between their personality and their environment (whether it is the environment while enrolled in college or once they have graduated). However, research shows that environmental barriers can potentially constrain students' ability to pursue a major or occupation that aligns with their personality. A potential barrier could be high amounts of undergraduate debt. Students could select occupations that will help them repay their debt, but the occupation would not align with their personality, which would lead to dissatisfaction and decreases in

productivity. Understanding the motivations and incentives for borrowing to finance undergraduate education helps us understand how additional debt affects postbaccalaureate decision-making. I fill this gap in the literature through my quantitative and qualitative research. Quantitatively, I examine the association between individual characteristics of students and their graduate school aspirations, enrollment, and early-career occupation salary. Qualitatively, I investigate the process by which students determine their postbaccalaureate plans and how this process changes over time.

Drivers and Motivations for Undergraduate Debt

Undergraduate debt is an area of higher education policy that has drawn intensive scholarly and practical interest. Since late 2011, American student loan debt has officially exceeded one trillion dollars, which has led to headlines such as 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). It can be difficult to understand why, with the overwhelmingly negative press on undergraduate borrowing and its effects, students still choose to borrow in order to finance their undergraduate education rather than seeking out other methods of payment or choosing not to enroll in higher education. Yet students do continue to borrow. Avery and Turner (2012) found that, in recent decades, the number of students using federal loans to finance their undergraduate careers has increased, though the average amount of debt per student has been relatively stable in constant dollars. This increase arises from both the larger number of students who are now enrolling in higher education and the higher

percentage of students pursuing an undergraduate education who rely on loans (Avery & Turner, 2012).

Reviewing the latest *Trends in Student Aid* from the College Board (2015) reveals a persistent relationship between the individual characteristics of students and borrowing rates. In 2011–2012, older students had the largest percentage of bachelor’s recipients with \$40,000 or more in cumulative undergraduate debt: 33% of those age 30–39 and 29% of those over the age of 40. This contrasted with students age 23 or younger. Only 11% of the younger students had \$40,000 or more in undergraduate debt. Students who filed as dependents had the highest percentage of graduates with no debt upon graduation (34%), while independents with and without dependents had the highest percentage of graduates with \$40,000 or more in debt (25% and 29%, respectively). There also appeared to be a positive relationship between time to degree and borrowing. Of students who reported earning a bachelor’s degree within four years, 36% had no debt and 10% had \$40,000 or more. Of students who took 10 years or longer, 24% have no debt and 31% have \$40,000 or more. A pattern emerged: as students took longer to earn a bachelor’s degree, they also were more likely to borrow more. Further, students who self-identified as African American had the highest percentage of reporting \$40,000 or more in debt (32%) and the lowest percentage of reporting no debt (14%). Thus, relying on simple descriptives, older, independent students who took longer than four years to complete a bachelor’s degree and self-identified as African American were more likely to carry high debt burdens. This is consistent with Houle’s (2013) multivariate analysis of individual predictors of borrowing using the National Longitudinal Study of Youth 1997. Ordinary least squares estimates showed parental socioeconomic status and race had a strong relationship with logged

student-reported undergraduate debt. Students from middle-income backgrounds who self-identified as African American were more likely to incur larger amounts of undergraduate debt. Students with at least one parent with a bachelor's degree or higher or who came from high-income backgrounds were more likely to borrow smaller amounts of undergraduate debt.

Evidence on institutional characteristics' relationship with undergraduate debt is mixed. Houle (2013) also found that private institutions and institutions with higher-than-average sticker price appeared to exacerbate the relationship between parental socioeconomic status and borrowing. Avery and Turner (2012) found that private not-for-profit four-year institutions had the highest percentage of undergraduate borrowing (as compared to public four- and two-year institutions; using Beginning Postsecondary Survey: 04/09). Recent trends support this conclusion: 20% of students attending private not-for-profit institutions had \$40,000 or more in cumulative undergraduate debt while only 12% of students attending public institutions carried the same debt load. Baum and O'Malley (2003) conducted a multivariate analysis of the trends in undergraduate debt levels and borrower attitudes over a 15-year period for borrowers in repayment on at least one federal student loan with Nellie Mae in 2002. They found that students who attended four-year private institutions borrowed larger amounts (only studying not-for-profit institutions). However, Monks' (2014) updated scholarship on not-for-profit four-year institutions found no relationship between control of an institution and average student debt. He analyzed the College Board's 2011 Annual Survey of Colleges and merged that data with financial aid figures from the National Association of State Student Grant Aid Programs. This difference could arise from a number of factors: Monks (2014) included

state grant aid measures; Baum and O'Malley's (2003) sample did not include any borrowers who defaulted on their student loans and was not nationally representative (while Monks' (2014) sample includes approximately 85% of all four-year degree-granting institutions); and Monks (2014) focused on the institution as the unit of analysis while Baum and O'Malley (2003) focused on the individual. It could be that, at the individual level, students attending private institutions borrowed higher amounts than their peers at public institutions but, on average, the amount of undergraduate debt was statistically indistinguishable between private and public not-for-profit institutions. It is difficult to form a clear picture, particularly as the Baum and O'Malley (2003) work was not nationally representative and the other cited research did not use a multivariate methodological approach.

Although he did not find a difference between public and private institutions in average student debt, Monks (2014) found evidence that the drivers of undergraduate debt do differ by control. All else being equal, borrowing at public institutions was driven by the amount of state grant aid, whether the institution was need-blind, the percentage of students with aid, limited-loan financial aid policy, four-year graduation rate, and selectivity (as measured by SAT median). Borrowing at private institutions was driven by cost of attendance, whether the institution meets the full need of a student, percentage of students with aid, no-loan financial aid policy, percentage of graduates in high-salary majors, and selectivity. Monks (2014) posits that more-selective institutions had lower average student debt because of the relationship between SAT scores and the income of students' families. There appeared to be a difference in the value of state grant aid and the sticker price of attending an institution for the different sectors. This makes sense, because

public institutions rely more on state grant aid to support undergraduate education and private institutions have higher cost of attendance on average. He also found that institutions that reported being need-blind in the admissions process had higher average debt loads. This is likely because these institutions attract more students from low-income backgrounds to apply and are better able to meet the students' financial need, which induces the students to attend that institution.

Combining the individual and institutional characteristics that are linked to an increase in undergraduate debt, it becomes clear that regression results without context are not enough. For example, in the prior section I discussed how, with all else equal, African American students are more likely than their White peers to aspire to, apply to, and enroll in graduate school. However, the reality is that all else is not equal. African American students are disproportionately older, more likely to be independent, more likely to have their own dependents, and on average take longer to complete a bachelor's (College Board, 2015). A sizable amount of research also demonstrates that African American students are less likely to attend selective institutions (e.g., Melguizo, 2008). Further differential effects of debt are discussed in the following section on Borrowing and Graduate School Aspirations, Applications, and Enrollment.

Students' age, dependency status, income background, parental education, ability to complete a degree in a shorter time (not intellectual ability), race/ethnicity, undergraduate institution selectivity and (potentially) institutional control all have an influence on how much they will borrow. Additional social and political structures within institutions and states can and do influence the debt burden experienced at different institutions. However, not enough research has examined the causal impact of these individual and institutional

characteristics on how much students will actually borrow. Prior research has focused on generally older data, with little ability to infer causality from the results. Therefore, scholars have a general understanding of the characteristics that influence borrowing amounts but less of causal mechanisms. Understanding the context of who borrows in the United States is a critical step in creating better comprehension of how debt affects students' actions. Borrowing is not a negligible activity. Borrowing to finance an undergraduate education has real potential consequences, including default and delaying certain life goals, such as graduate school, marriage, or buying a house. High payments and default on undergraduate debt have consequences and are of national interest if aversion to them deters students from making optimal postbaccalaureate decisions about postbaccalaureate education aspiration and enrollment and early-career occupation. The typical profile of a borrower shapes the discussion of how borrowing affects those students' lives. Little recent research exists on the effects of undergraduate debt on postbaccalaureate decision-making. I am focused on investigating how undergraduate debt affects postbaccalaureate education (graduate school aspirations, applications, and enrollment) and early-career occupation choice, though there are other postbaccalaureate decisions of equal interest both to the individual and the country.

Borrowing and Graduate School Aspirations, Applications, and Enrollment

Although not as widely researched as some areas of higher education, a substantial, if contradictory, body of research concerns the relationship between debt levels and graduate school aspirations, application, and enrollment. Researchers have reported a variety of findings, which range from negative effects of debt (Baum & Saunders, 1998; Baum & Schwartz, 1988; Choy & Gies, 1997; Fox, 1992; Heller, 2001; Malcom & Dowd,

2012; Millett, 2003; Weiler, 1994; Zhang, 2013) to neutral or insignificant/positive effects, grouped together because these effects would suggest that debt is not inhibiting students (Baird, 1973; Carter, 1999; Choy, 2000; COFHE, 1983; Ekstrom et al., 1991; English & Umbach, 2016; Kim & Eyermann, 2006; Murphy, 1994; Perna, 2004; Rothstein & Rouse, 2011; Sanford, 1980; Schapiro, O'Malley, & Litten, 1991; Weiler, 1991).

Scholars have posited that the reason undergraduate debt level has mixed findings of influence on graduate school enrollment in the extant literature is that debt levels could have an indirect effect on graduate school enrollment (Kim & Eyermann, 2006; Weiler, 1994). Graduate school aspirations would mediate this indirect effect. Educational aspirations influence academic achievement and graduate/first-time professional school enrollment (Allen, 1992; Astin, 1977; Epps, 1995; Hearn, 1987; Pascarella, 1984).² Aspirations can differ by the sector of higher education students attend (Brint & Karabel, 1989; Carter, 1999; Clark, 1960), students' race (Carter, 1999; Ekstrom et al., 1991), and students' socioeconomic status (Wapole, 2003). Prior aspirations, often operationalized as students' aspirations when entering college, are also the best predictor of later aspirations (Carter, 1999; Hearn, 1987; Heller, 2001; Millett, 2003; Pascarella, 1984). Therefore, debt level would influence graduate school aspirations, which influence enrollment behaviors (e.g., application, enrollment). Even with this potential mediating role, researchers who focused on debt's relationship with educational aspirations found mixed results (Carter, 1999; COFHE, 1983; Ekstrom et al., 1991; English & Umbach, 2016; Kim & Eyermann, 2006; Murphy, 1994; Rothstein & Rouse, 2011; Schapiro, O'Malley, & Litten, 1991).

² Due to the varying naming conventions of the extant literature, I will refer to graduate and first-time professional school interchangeably with graduate school or postbaccalaureate education.

It is important to note that, for all the research on debt's influence on graduate school aspirations and enrollment, there is a fundamental issue of endogeneity (Cellini, 2008). The amount of debt students borrow could be, 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/enrollment; changes in graduate school aspirations/enrollment would cause the changes in debt. Or, as previously mentioned, these two decisions could happen near simultaneously or jointly along with students' college major selection (Altonji, Blom, & Meghir, 2012). It becomes difficult to disentangle the direct effect of undergraduate debt on postbaccalaureate decisions. Therefore, debt would be an endogenous predictor.

Few researchers deal with the potential endogeneity in their debt measures (Malcom & Dowd, 2012; Rothstein & Rouse, 2011; Zhang, 2013). Rothstein and Rouse (2011) used administrative data from 1999–2006 from one institution that implemented a no-loan policy for all students receiving financial aid in 2001. Students attending after the policy changed were treated as if they would receive no loans as part of their undergraduate financial aid package. These students could be compared to students who never would have received need-based financial aid after 2001 in order to control for any temporal trends in the behaviors measured as outcome variables. Those students could also be compared to students who would have qualified for the no-loan program prior to 2001 because they should be similar to the treated students except that they were not given the opportunity to participate in the program because it had not been implemented yet. The authors created an analytical sample of cohorts of students who matriculated

before the no-loan policy was announced in order to ensure that students did not select to attend the anonymous institution specifically for the additional need-based financial aid.

The researchers created a simulated loan offer on each student by using administrative data. Using this simulated loan offer as an instrument for undergraduate debt, the authors employed instrumental variables estimation to investigate the causal effect of undergraduate debt on planning to attend graduate school (aspirations), planning to work directly after graduation, having a job, whether that job is in a high- or low-salary industry, and the salary of the early-career occupation (both in continuous dollar amount and an indicator of a salary above or below the 25th percentile). These models all included cohort-fixed effects in order to control for any cohort/temporal effects that were not controlled for by including the students who were not eligible for need-based financial aid. The authors also employed a difference-in-differences strategy, but I will discuss only the instrumental variables estimates because they are the most robust estimates. Rothstein and Rouse (2011) found that undergraduate debt had a nonstatistically significant, small, negative effect on graduate school aspirations. The authors did not find sufficient evidence that debt had an inhibiting impact on graduate school aspirations. I discuss the results of the occupation/work outcomes in the next section. While the estimation strategy was strong, it lacks generalizability because the authors studied just one institution, which is extremely selective and has a large endowment and a more privileged student body than the majority of other American institutions of higher learning.

Zhang (2013) used the B&B: 93/97 study to investigate the causal effect of undergraduate debt on a number of outcomes: graduate school attendance, graduate school program selection, early-career choice, and marriage and homeownership. Zhang

reduced the analytical sample to students who earned a baccalaureate degree from the 50 states and the District of Columbia. Like Rothstein and Rouse (2011), the author employed instrumental variables estimation to mitigate the potential endogeneity of undergraduate debt. His instruments were the percentage of gift aid relative to loans from the student's undergraduate institution and the percentage of students at said institution who received any form of financial aid. In order to make causal inferences, Zhang's (2013) instruments had to be relevant (able to predict the endogenous measure, in this case undergraduate debt) and exogenous (only influencing the outcome measure indirectly through the endogenous predictor). If there is a direct relationship between either of these instruments and the outcome variable, it would be difficult to make causal inferences based on Zhang's (2013) estimates. For example, if the amount of gift aid an institution can give a student, relative to the amount of loans, directly influences whether the student attends graduate school, this would violate the exogeneity assumption. This could occur if institutions with more robust opportunities for preparing students to attend graduate school are also more likely to have high gift-aid-to-loan ratios. Due to this likelihood, as well as the weak evidence that the instruments did not suffer from finite sample bias for private institutions, it is difficult to consider the relationships Zhang (2013) found to be causal.

With these caveats in mind, Zhang (2013) found that, for students attending public institutions, a \$1,000 increase in debt reduced the likelihood of attending graduate school by 2.7 percentage points (there was no consistent effect for students attending private institutions). This effect was concentrated in students attending doctoral, MBA, or first professional degree (e.g., medical or law school) programs. The early-career choice results are discussed in the next section. Zhang (2013) used older data (B&B: 93/97) and there are

serious threats to the exogeneity of his instruments. Also, there was no measure of whether any of these college graduates ever actually aspired to enter graduate school. If students who attended public institutions for their baccalaureate degrees were not as likely to aspire to graduate school, this finding would not be as critical a warning about the effects of undergraduate debt.

Malcom and Dowd (2012) investigated the effect of relative debt burden of STEM baccalaureate degree holders on graduate and professional school enrollment and whether that effect varied by students' race/ethnicity. The authors created a measure of each student's relative debt using the National Survey of Recent College Graduates (2003), a biennial nationally representative survey of individuals holding either a bachelor's or master's degree in a science, engineering, or health field from a United States institution (conducted by the National Science Foundation), Integrated Postsecondary Education Data System (IPEDS), and the Institute for College Access and Success student debt database. To create this measure, they divided the cumulative amount of debt a participant borrowed by the average amount of debt for that students' degree-granting institution. This allowed the authors to separate the analytical sample into three groups: heavy borrowers, typical borrowers, and individuals who never borrowed. If a student had attended a community college at some point in their educational career, this was taken into consideration for his/her placement into one of the three categories. While a useful measure, this calculation of debt burden is a noncontinuous measure of undergraduate debt. It assumes that there are three categories of debt use and that the delineations the authors make to separate the three groups are appropriate. The authors do not give a reason for choosing this operationalization of their debt measure. It was likely due to the conventional method of

estimating propensity scores, which necessitates a categorical measure of the endogenous predictor. It is generally accepted that undergraduate debt's effect is nonlinear (Dwyer et al., 2012; Hillman, 2015). Scholars generally agree that undergraduate debt has a likely positive effect on outcomes such as persistence or completion up to a certain amount of cumulative debt. Then, debt's positive effect likely decays as the negative effects of high debt loads manifest. Therefore, while I acknowledge the need for researchers to model undergraduate debt's relationship with outcomes in some nonlinear method, there is no evidence that it should be operationalized in this manner in order to create a proper model specification.

Malcom and Dowd (2012) matched individuals within their self-identified racial/ethnic group on their propensity to (a) borrow heavily compared to never borrowing and (b) be a typical borrower compared to a non-borrower using students' individual characteristics: gender, national origin, parental education, nontraditional student status, community college attendance, AA attainment, college GPA, and STEM major field (narrow kernel matching with a greater than 99% common support region). The authors then estimated the effect of relative borrowing on students' likelihood of enrolling in a master's, doctoral, or professional program within two years of earning a bachelor's degree. To make causal inferences using propensity score matching, some set of variables (X_i) must be found so that the assumption of ignorability can be upheld. Therefore, estimating causal effects relies heavily on the set of variables chosen for (X_i) and how the outcomes for the treated and comparison groups react when conditioned on (X_i). Without this assumption, selection bias could mean that one group (heavy, typical, or never borrow) could be more likely to systematically enroll in some type of

postbaccalaureate education degree program. The authors do include a useful set of covariates to predict borrowing behavior. It would have been useful to include measures of graduate school aspirations, control of undergraduate institution, selectivity/research focus of undergraduate institution, or the student's income background. It is the most robust set the authors could have used based on their data, but it does create potential difficulties in estimating causal effects. For example, if students attending research-intensive universities are more likely to be typical or heavy borrowers, and the authors find evidence of a positive relationship between enrollment and borrowing, this could actually be the relationship between attending a research-intensive institution and enrolling in graduate school (which is known to be positive; English & Umbach, 2016).

As noted previously, African American students were most likely to be heavy borrowers (along with White students). Latino students were most likely to be typical borrowers, and Asian students were most likely not to borrow at all. The authors estimated that typical borrowing had a negative effect on the likelihood of a student enrolling in graduate school compared to peers who did not borrow. Heavy borrowing had a negative effect on the same likelihood for White and Latino students compared to those who did not borrow. For African American and Asian students, there was no statistically significant effect of heavy borrowing on the likelihood of a student enrolling in graduate school. Although the authors used more recent data and estimate causal effects from propensity score matching, this research applied only to students earning STEM degrees, which is a minority of the overall college-going population (National Science Board, 2014).

Overall, there is weak evidence for increased undergraduate debt causing the average student to not apply to or enroll in postbaccalaureate education. There is stronger

evidence that increased undergraduate debt discourages STEM majors from enrolling in graduate programs. Previous research on debt's causal effect on postbaccalaureate education decision-making either used older, nationally representative data or newer, single-institution/single-major data, which may not be as relevant. New research is needed which analyzes the causal effects of debt for a representative sample of recent students eligible for federal financial aid. I endeavor to fill this gap. Even with this dearth of causal research, the literature base focused on postbaccalaureate education decision-making and debt is stronger than the literature focused on early-career choice.

Borrowing and Early-Career Occupation

Early-career occupations in low-salary or nonprofit industries can often lead to positive social externalities (Preston, 1989) and higher personal job satisfaction and nonpecuniary benefits even when controlling for salary (Benz, 2005). As previously mentioned, the public has expressed worry that, with more undergraduate debt, people will be less likely to make decisions that give them the most happiness/satisfaction or benefit society. A varied body of research on postbaccalaureate educational behavior exists (see above), but not enough research has investigated how undergraduate loans shape early-career occupational choice. The majority of research on educational debt and career choice has focused on graduate or first-professional-school debt. A large body of research has analyzed medical school students' career and specialty choices based on the amount of debt borrowed to finance their entire postsecondary education (Colquitt, Zeh, Killian, & Cultice, 1996; Grayson, Newton & Thompson, 2012; Kassebaum, Szenas, & Schuchert, 1996; Rosenblatt & Andrilla, 2005; Rosenthal, Marquette, & Diamond, 1996; Rosenthal et al., 1994; Spar, Pryor & Simon, 1993; Teitelbaum, Ehrlich, & Travis, 2009; Woodworth, Chang,

& Helmer, 2000). The results were mixed. Some researchers found that increased amounts of debt were associated with lowered likelihood of a student choosing a lower-paying specialty (e.g., primary care) and others found no statistically significant evidence of a relationship.

Scholars have conducted less research on law school debt and early-career occupational choice, but they have the advantage of causal results. Field (2009) analyzed a randomized control trial at New York University Law School, which randomly assigned some incoming students to receive a waiver for two thirds of the tuition that would become a loan if the student did not choose a public interest type of law; others received loans with income-contingent forgiveness based on the students' occupations after graduation (the loan would be forgiven if the student selected a public interest type position). The data came from administrative data, first-year entry surveys, third-year exit surveys, and work experience surveys completed biennially for up to six years after graduation. The results suggest that students assigned to the tuition waiver condition were induced to choose public interest law occupations at statistically significantly higher rates than the other students were. The regression results—controlling for individual characteristics, year of graduation, and lottery type—found a treatment effect of 19–20 percentage points. The author suggests that there could be a psychological or social cost for some students when they analyze their debt, which could influence the students to choose a higher-paying occupation after graduation. This is especially important because there was no guarantee that the loan forgiveness program would exist throughout the entire 10-year period the students would need in order to have their loans forgiven.

The little research done for undergraduate debt generally supports what Field (2009) found in law schools: an increase in debt correlates with a higher likelihood of selecting a higher-paying occupation (Baum & Saunders, 1998; Baum & Schwartz, 1988; Heller, 2001; Minicozzi, 2005; Rothstein & Rouse, 2011; Sanford, 1980; Zhang, 2013). The two causal studies find opposing results. Rothstein and Rouse (2011), discussed earlier, found that more undergraduate debt caused students to choose higher-paying early career occupations. As the simulated loan offer/undergraduate debt increased, students were less likely to hold a nonprofit/government/education job or any low-salary industry job. Students were also predicted to have higher observed salaries and less likely to have a salary below the 25th percentile. An increase of \$10,000 in undergraduate debt reduced the likelihood of a nonprofit/government/education job by 5–6 percentage points, increased the annual salary by \$2,000 on average, and reduced the likelihood of a salary below the 25th percentile by approximately 6 percentage points. The sample provided rich administrative data, but the results lack generalizability because the authors studied only one highly selective institution, with large endowments and a more privileged student body than the majority of other American institutions of higher learning institution (as mentioned previously). However, the authors posit that, because the sample students had families with higher incomes and higher early-career occupation salaries than national averages, undergraduate debt was less likely to have a strong effect on these students' postbaccalaureate decision-making (because of intra-family wealth sharing and higher utility from higher salaries). Based on those conjectures, Rothstein and Rouse (2011) believe that “debt effects should be *larger* for typical students than for [sample students]” (p. 161).

Zhang (2013), as discussed previously, conducted research on a nationally representative sample of baccalaureate degree holders. Using his instrumental variables of 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, he found no causal effect of debt on early-career choice both 1–2 years after graduation and 4–5 years after. This is contrary to what Rothstein and Rouse found. However, as discussed previously, his data were older (students earned their baccalaureate degree in 1993 and were followed until 1997), and there was not strong enough evidence that his instruments were exogenous.

Overall, there is strong evidence that an increase in debt causes students to choose higher-salary early-career occupations. While only one of the two causal studies investigating undergraduate debt find evidence supporting that supposition, the other simply finds statistically insignificant estimates (and there are methodological concerns about its ability to make causal claims). Couple that with the robust evidence from the professional school debt research, both causal and correlational, and there is clear evidence that an increase in undergraduate debt would likely inhibit students from pursuing low-salary early-career occupations. Previous research on undergraduate debt's causal effect on postbaccalaureate early-career occupation decision-making either used older, nationally representative data or newer, single-institution data, which may not be as relevant in the post-Great Recession context. New research is needed to analyze the causal effects of debt for a representative sample of recent students eligible for federal financial aid. I focus on filling this gap in the literature by estimating the effect of undergraduate debt on early-career occupation salary.

The majority of causal research on postbaccalaureate decision-making has focused on the average student, which can often obscure the experiences of different student groups. The differential effects of debt are an important part of understanding how debt could cause certain students—in this research, African American students—to react in different ways than their peers.

Differential Effects of Debt

Understanding the history of institutions critical to the education of African Americans in the United States, both historically and currently, creates an appropriate background for conceptualizing the differential effect of debt for African American students. A change ushered in with the Higher Education Act (HEA; 1965) was the creation of a new type of designation for postsecondary institutions. Title III of the HEA (1965) defines historically Black colleges and universities (HBCUs) as institutions founded before 1964 whose primary purpose was educating African Americans (Department of Education, 2015). Secretary of Education Arne Duncan once remarked, “We have over 7,000 institutions of higher education across the country, 106 of which are HBCUs. But in 2010, HBCUs still awarded a sixth of all bachelor degrees and professional degrees earned by African Americans in the U.S.” (Duncan, 2013). HBCUs enrolled 11% of African American students in higher education in 2012 although they make up only 3% of all U.S. institutions (Center for MSIs, 2014).

With the likely differential effects of undergraduate loans discussed in detail below (Baum & O’Malley, 2003; Burdman, 2005; Callender & Jackson, 2005; Cunningham & Santiago, 2008; Perna, 2000), I wish to further our understanding of the experiences of underrepresented students. Prior research has found that African American students were

more likely to aspire to graduate study if they attended an undergraduate institution with higher percentages of African American students (Carter, 1999). HBCUs are more likely to graduate African American students who go on to earn a doctorate, even after accounting for the number of African American students they enroll (Sibulkin & Butler, 2011).

Understanding the experiences of students attending these institutions is especially critical because research suggests that shifting higher education funding to loans instead of grants may disproportionately disadvantage underrepresented students, racial/ethnic minorities, and/or students from low-income backgrounds (Long & Riley, 2007). For example, of students who earned a bachelor's degree in 2011–2012, 30% had no debt and only 18% had \$40,000 or more in debt (College Board, 2015). However, African American students were under a larger undergraduate debt burden than the average bachelor's degree recipient. Of African American students, 14% had no debt and 32% had \$40,000 or more in debt (College Board, 2015). Solely focusing on the overall average would obscure the additional debt burden faced by African American students.

Recent research documents a student loan disadvantage for students attending HBCUs, regardless of race. Research from Texas and North Carolina found that students attending HBCUs had significantly higher delinquency and default rates than students attending Hispanic-serving institutions (HSIs) or predominantly White institutions (PWIs; Fletcher & Webster, 2010; Rust, 2009). Recent changes to Parent PLUS loan eligibility have also added to the unease surrounding differential influences of undergraduate loans. In 2011, President Obama and the Department of Education added additional criteria, such as unpaid debts in collection within the past five years, that could disqualify a family from receiving PLUS loans (Doubleday, 2013). This is generally seen as a response to fiscally

inappropriate access to debt after the Great Recession. Two recent empirical papers (Britton, 2015; Johnson, Bruch, & Gill, 2015), suggested that HBCUs were differentially affected by the change in PLUS loan eligibility compared to all non-HBCUs and predominantly Black institutions (those whose enrollment is at least 40% African American and 50% low-income or first-generation degree-seeking; Higher Education Act, 20 U.S.C. §§ 1059e). Their conclusions add credence to the idea that a general investigation into how students perceive undergraduate debt may not yield useful information because attending an HBCU might have a moderating influence on students' borrowing and decision-making behaviors.

Furthermore, African American students were more likely to borrow heavily to finance their baccalaureate degree (Heller, 2001; Houle, 2013; Malcom & Dowd, 2012) and more likely to aspire to enroll in postbaccalaureate education (Ekstrom et al., 1991). For example, debt burden—the ratio of monthly income to monthly repayment amount—is one measure of a student's ability to meet repayment requirements. In 1997, African American college graduates had 1.5 times greater risk of having a debt burden over 8%, declared the excessive cutoff by the federal government, than their White peers (Price, 2004). While approximately 24% of African American graduates held debt burden greater than 8%, only 21% of White graduates held an excessive debt burden.

Unfortunately, even African American students who aspired to a postbaccalaureate education when they entered college were less likely than their White peers to enroll in graduate school (Weiler, 1994). A combination of factors is thought to be the cause. Oliver and Shapiro's (1997) seminal work on the differences in wealth accumulation between African American and White families found severe structural inequalities. A large body of

research has focused on the persistent achievement gap between African American and White students in primary and secondary education (e.g., Jencks & Phillips, 2011). Researchers can generally agree that differences in class also create differences in the pre-collegiate achievement gap, but some also argue that “the black-white gap is partly the difference between the achievement of all lower-class and middle-class students, but there is an additional gap between black and white students even when the blacks and whites come from families with similar incomes” (Rothstein, 2004, p. 1). Using the National Assessment of Education Progress, researchers have been able to track a narrowing of the racial achievement gap until the late 1980s and 1990s, when the test score convergence stalled (Jencks & Phillips, 2011; Magnuson et al., 2008). From there, African American and White children improved at roughly the same rate in math but were mostly stagnant in reading achievement (Magnuson et al., 2008).

The previously discussed wealth disparities, in addition to disparities in adequate prenatal health and access to housing that is not located in areas with higher incidences of lead exposure, asthma rates, and the like, partially drove this gap in achievement (Rothstein, 2004). Even at similar levels of income, different racial/ethnic groups have different levels of achievement. Rothstein (2004) posits that this is because African American families are often poor longer, and they are more likely to give money to their family members who are also poor. This would result in even fewer material resources for poor African American families, which displays the complexities in understanding how students’ characteristics influence their likely level of academic achievement. Primary and secondary schooling itself reinforces these disparities, which drive differential performance of African American students. Minority and low-income students were less

likely to have high-quality teachers, in part because of teacher self-sorting (Clotfelter, Ladd, & Vigdor, 2010; Corcoran & Evans, 2008; Hanushek, Kain, & Rivkin, 2004; Lankford, Loeb, & Wyckoff, 2002). Less-advantaged students faced disproportionate exposure to low-quality teachers, and the gap in exposure between African American and White students has been growing over time (Corcoran & Evans, 2008). African American students encountered differential rates of discipline (e.g., suspension, expulsion; Gregory et al., 2010), and assignment to gifted programs, particularly when the assigning teacher was White (Grissom & Redding, 2016). Some evidence suggested that even African American students with high aspirations disproportionately chose not to enroll in postbaccalaureate education (although English & Umbach [2016] found increased odds of African American students applying and enrolling in graduate school, this did not translate to an actual increase in the number of students in programs).

This evidence contrasts with research on early-career occupation, which, while smaller, reflected a primarily negative effect of debt (Baum & Saunders, 1998; Baum & Schwartz, 1988; Field, 2009; Heller, 2001; Minicozzi, 2005; Rothstein & Rouse, 2011; Sanford, 1980; Zhang, 2013). As students increased their undergraduate debt, they were less likely to select careers in the public sector or in so-called low-salary industries. In particular, African American students were more likely to report that they changed their postbaccalaureate career plans due to their undergraduate debt (Baum & Saunders, 1998).

As outlined before, African American students have faced additional challenges both in financing higher education and in postbaccalaureate decision-making, particularly in education. These students were more likely than their peers were, particularly their White peers, to borrow, to borrow at higher rates, to have higher monthly debt burdens, and to

default on repayment. Evidence generally pointed to these students being less likely to enroll in postbaccalaureate education unless they were being compared to their peers, generally White students, who had the same amount of undergraduate debt, self-reported the same demographics, and attended similar institutions. The unfortunate reality is that African American students disproportionately come from low-income backgrounds, take longer to graduate, borrow more, and are less likely to come from families with abundant social and cultural capital. This means that, when equal conditions were not artificially created statistically, these students have faced larger hurdles to their postbaccalaureate decision-making. This could and likely does create a differential effect of undergraduate debt for African American students on their postbaccalaureate decision-making. My work fills a gap in the extant literature in two ways. First, I increase our understanding of the extent to which undergraduate debt affects the postbaccalaureate decision-making of African American students (through subpopulation analyses in the quantitative research). Second, by interviewing African American students attending an HBCU, I seek to understand how these students perceive their undergraduate debt and how they decide on postbaccalaureate education and occupation options. It is critical to understand how these students in particular make meaning around undergraduate debt due to the consistent evidence of their higher borrowing rates and amounts.

Qualitative Research on Undergraduate Debt

The majority of prior research on undergraduate debt and postbaccalaureate decision-making is quantitative. Although this can produce useful evidence of the effect of undergraduate loans, it does not help us understand how students make meaning of their undergraduate debt and how they perceive their postbaccalaureate options. There are

large gaps in our understanding of how students' perceptions of undergraduate student loans influence their behavior (Burdman, 2005; Cunningham & Santiago, 2008). Qualitative research on undergraduate debt and postbaccalaureate decision-making has primarily been published as doctoral dissertations. For example, Murphy (1994) conducted a mixed-methods dissertation. It incorporated focus groups, during the fall of 1991 and 1992 and the spring of 1992 and 1993 at a single private research university, with quantitative analyses using the sample of students who completed the 1986 third follow-up to High School and Beyond (HS&B). The focus groups included undergraduate students in their final year of study and first- or second-year graduate students. The main findings about graduate school aspirations from the focus groups were parental influence; importance of outside-school activities, from primary through higher education; primary and secondary school role models; the students' prior aspirations before entering their undergraduate program; collegiate academic success; and a labor market with few open positions.

In regard to undergraduate debt's influence, Murphy (1994) found a wide variety of responses. Some students needed to find employment immediately that would pay enough for the students to repay their loans. Others believed that the benefits of earning a postbaccalaureate degree outweighed the additional trepidation associated with more debt. However, the majority of students reported that they did not allow debt to "dictate what they chose to pursue after college" (Murphy, 1994, p. 97). These findings suggest that debt was not a large factor in forming graduate school aspirations, which supports the previous quantitative work. Although the qualitative portion of this study offers insight previously unseen in the undergraduate debt and graduate school aspirations literature, the student participants were wealthier, on average, than other students in the United

States and they attended a highly selective and prestigious institution. The nature of the sample makes it difficult to generalize the findings. Additionally, Murphy (1994) conducted this study more than 20 years ago. A more recent investigation of undergraduate debt's influence on postbaccalaureate decision-making is essential for creating policies more responsive to current students' needs.

The most updated qualitative research on undergraduate debt and postbaccalaureate decision-making or repayment comes from Fernandez and colleagues (2015). The authors conducted interviews with 38 students graduating from six institutions from different regions of the United States (three in Texas, two in the southeast, one in the Midwest) and sectors (three public 2-year, two private 4-year, one public 4-year) as they completed federally mandated exit counseling for the students' federal student loans. The authors found that students often reported high levels of confidence in themselves to repay their debt or in the system to help them find alternative means of repayment if necessary. This finding does not support the popular-press idea that students who have borrowed feel inhibited by their debt. While the study was timely and relevant, the researchers only spoke with students once. Thus, the study does not provide information on whether students' confidence in "the system" and their ability to repay their loans changes over time. Additionally, since the focus of the work was on evaluating exit counseling, in-depth questions about students' beliefs about their debt or postbaccalaureate futures were limited.

Overall, there is a dearth of qualitative research on undergraduate debt and postbaccalaureate decision-making. The research conducted so far generally suggests that students are confident that debt will not discourage them from reaching their preferred

postbaccalaureate goals and that they will be able to meet repayment conditions. There is still a gap in understanding how students conceptualize their undergraduate debt, make meaning of debt burden, select repayment plans, and whether and how cumulative debt influences postbaccalaureate education or occupational decisions. There is also a lack of understanding around how students' conceptions of undergraduate debt and repayment change over time, particularly in the time leading up to when students traditionally begin repayment. I seek to fill this gap in our understanding of how students, particularly underrepresented students, conceptualize undergraduate debt and their repayment options.

Conclusion

Prior research on the effects of undergraduate debt, both quantitative and qualitative, created the foundation for this work. Unfortunately, the causal research on undergraduate debt has either used pre-2000 data, which could be impractical for the current post-Great Recession policy context, or has focused on a single institution/single area of study. The qualitative work rarely investigated the specific influence of undergraduate debt on postbaccalaureate decision-making or the temporal nature of conceptions of debt and repayment. I fill this gap in the literature by estimating the causal effect of undergraduate debt on postbaccalaureate decision-making while expanding our understanding of how students, particularly underrepresented students, conceptualize undergraduate debt and their repayment options. In the next chapter, I outline the conceptual framework, which primarily relies on human capital theory from the discipline of economics.

CHAPTER III

CONCEPTUAL FRAMEWORK

I combine human capital theory and debt aversion to construct a conceptual model for how students respond to undergraduate debt. While prior research often views these theoretical perspectives in opposition, I explore how human capital theory and debt aversion can be viewed as complementary. To explain the conceptual framework, I first outline these two theoretical perspectives. Then I discuss caveats to their interpretation when applied to the relationship between undergraduate debt and postbaccalaureate decision-making. Next, I share the conceptual model and hypotheses for the effect of undergraduate debt. Finally, I give practical examples of the theories applied to undergraduate debt and postbaccalaureate decision-making.

Human Capital Theory

Human capital is the knowledge and skills that an individual or society hold that could be used to increase productivity (Paulsen, 2001). Scholars typically conceive investments in human capital as expenditures on health, formal or informal education, or activities that increase the capacity for productivity (Schultz, 1961). Human capital theory, the idea that both individuals and society benefit economically from investments in people, is often applied to research on education within economics (Sweetland, 1996).

In Becker's (1964) seminal work on internal rates of return on human capital investment, he outlined the implicit decision-making process for students when considering enrolling in higher education. Students must evaluate the costs of enrolling in college and the potential economic returns to the increase in their human capital by

acquiring new skills and knowledge (I discuss only economic returns in this section because these are the overwhelming majority of benefits discussed in relation to human capital theory). The costs are both direct (e.g., tuition and fees) and indirect (the foregone earnings the student could have earned with a high school diploma or GED alone). These costs might be offset if the student receives subsidies to attend higher education or works while enrolled. If a student receives a subsidy for higher education, such as a grant, the direct costs of enrolling decrease. Decreasing the net direct costs of higher education through subsidies is the primary focus of the United States' federal financial aid system. If a student works while enrolled in higher education, the amount of foregone earnings for the student decreases. With regard to benefits, investing in human capital leads to economic returns both to the individual, with increased lifetime earnings, and to society, with increased income at the local, state, regional, and national levels (Paulsen, 2001). Individual economic returns are often operationalized as the individual earnings differential between having a high school diploma and a baccalaureate degree (Paulsen, 2001; Sweetland, 1996).³

These benefits and costs should be evaluated at the present discounted value if possible (Paulsen, 2001). Earning \$1,000 today is not equal to earning \$1,000 dollars 5 years from now. Each person values future flows of cash, incoming and outgoing, differently. One person could be relatively *forward-thinking* and willing to forego present benefits for potentially larger ones in the future, which would indicate a lower discount rate. Another person could be *present-focused* and not willing to risk the essentially

³ This is for internal rate of return. The two other popular methods of measuring the private rate of return are either the average education differential (differential between the average person with a high school diploma and the average person with a baccalaureate degree) or the Mincerian earnings functions (Paulsen, 2001; Sweetland, 1996).

guaranteed benefit in the present for potential returns in the future, which would indicate a higher discount rate. If the *forward-thinking* person had a discount rate of 3%, she would value \$1,000 given to her in 5 years as approximately \$863 in the present day.⁴ If the *present-focused* person had a discount rate of 10%, she would value \$1,000 given to her in 5 years as approximately \$621 in the present day. This is why it is critical to factor in the present-value of future benefits and costs. Offering to give the first person \$1,000 in 5 years might induce different behavior than the same offer to the second. Once the present-value of future cash flows are taken into consideration, if the marginal benefit (additional benefit from a single-unit increase in education, normally operationalized as a year in college) is greater than the marginal cost (additional cost from a single-unit increase in education), human capital theory predicts that the student would choose to enroll in that additional year of higher education. The internal rate of return for a student is predicted to be higher if the earnings differential is larger, direct costs are lower, subsidies are higher, foregone earnings are lower, or the discount rate of the student is lower.

Human capital theory allows for adjustments for students who do not face the same challenges that the so-called traditional college student faces. The heterogeneous preferences and ability of each student affects both the supply and demand of higher education available to that student (Altonji, Blom, & Meghir, 2012). Demand for higher education can differ for students depending on their personal backgrounds and experiences (Paulsen, 2001). Students vary in the amount of ability they have, discrimination they face, quality of primary and secondary opportunities, and more. These differences can affect students' perceptions of how beneficial higher education would be

⁴ The equation for the calculation of present value of an amount of money is found in many economic texts, such as Paulsen (2001).

for them. Even when, on average, there is a high earnings differential between a high school graduate and a college graduate, certain groups of students may, correctly or incorrectly, assume that those benefits will not accrue to them (Paulsen, 2001). The supply of money to cover the direct costs of higher education also varies depending on the student. Credit markets do not treat all students or families the same, and often students from low-income backgrounds or those who are racial minorities have less access to financing options (Becker, 1975, 1993; Paulsen, 2001; Rothstein & Rouse, 2011). Need-based financial aid fills a critical gap in the supply for higher education because, without it, the costs would be so high that students could view their optimal amount of investment in higher education as less than is beneficial both to other types of students and to society (Paulsen, 2001).

Some scholars posit that the critical gap in the supply for higher education should not be filled by financial aid. Heckman and Carneiro (2003) argue that subsidies focused on early childhood education would reduce the gap in supply as the improvements in learning outcomes would exponentially improve the lives of younger students. In fact, they posit that, without drastic changes in early childhood education funding, “traditional policies” like tuition subsidies can do little to close gaps in the supply of higher education (in the paper specifically referring to college attendance). While focusing on early childhood education does have fiscal merit, it is difficult to see computationally that the investments in early childhood education would be the most efficient method of closing gaps in supply. For example, Dynarski and colleagues (2013) examined the effect of smaller class size in the first years of formal schooling on postsecondary outcomes. The authors found that being randomly assigned to a smaller class size in Tennessee increased the probability of attending college by 2.7 percentage points and of graduating by 1.6 percentage points, but

they also estimated that it would cost \$171,000 to induce a single student in the poorest third of schools to enroll in college. The authors calculated similar costs for other early childhood education programs: \$133,333 for Head Start, \$410,000 for the Abecedarian preschool experiment. However, when the authors calculated the costs of later-in-life interventions, they found smaller amounts: \$1,100 for the previously mentioned H&R Block FAFSA experiment (Bettinger et al., 2009), \$21,000 for the Social Security Student Benefit Program (grant to students whose parents died), and \$93,667 for Upward Bound. It is clear that, while investments in early childhood education are certainly useful, subsidies for higher education may be an effective and efficient way to close gaps in access to an undergraduate education.

Human capital theory has implications for postbaccalaureate decision-making. This theory is overwhelmingly used when discussing the choice to enroll in another year of primary and secondary schooling or an undergraduate degree program (Perna, 2000), but it logically applies to the choice to enroll in postbaccalaureate programs as well (Perna, 2004). As students near completion of their baccalaureate degree, they must decide whether they will try to enter the labor market or pursue further education. It follows that these students have many of the same anxieties that prospective undergraduate students do: Will attending graduate school pay me enough in the future to make up for the lost income? Will I not be able to get the type of job I want unless I attend graduate school? Students deciding whether to apply to graduate school must weigh these options and choose the individually optimal decision for them. Traditional interpretations of human capital theory predict that students would evaluate the amount of undergraduate loan debt they have borrowed and decide that the most rational way to repay the debt is to attend

graduate school to obtain a higher-earning occupation. This, however, depends on the anticipated rate of return the students have for their investment in graduate school. Additionally, undergraduate enrollment often increases during recessions and times when unemployment is high as students attempt to postpone labor market entry (Bedard & Herman, 2008; Fry, 2010; Murphy, 1994). If that assumption holds for enrollments to graduate school, the students might seek to attend graduate/professional school in order to wait out poor work opportunities (analysis sample for the quantitative portion of this study includes students who graduated during the beginning of the Great Recession).

With regard to early-career occupational choice, students implicitly weigh the benefits and costs of certain occupations in order to decide which occupation is the most optimal for them. The benefits in the case of occupational choice are generally expected lifetime earnings and nonpecuniary benefits (Boskin, 1974). The costs are the training required for the new occupation and the foregone potential lifetime earnings in other occupations. Under human capital theory, students are predicted to choose occupations that maximize the present value of potential lifetime earnings (Blaug, 1976; Boskin, 1974). Thus, students would select early-career occupations with higher salaries, better nonpecuniary benefits, or a combination of the two. Thus, students with additional undergraduate debt would be more likely to pursue a high-salary occupation.

Debt Aversion

Scholars posit that students make decisions based on their risk aversion with regard to debt (Burdman, 2005; Field, 2009). Debt aversion theory predicts that a student would either make decisions that do not require borrowing (not enrolling in higher education or transferring when more borrowing is required) or that lead to an extreme focus on

repayment of debt. Following this theory, students would react to increased undergraduate debt load by choosing to work in an occupation that returns a higher salary in order to repay loans quicker. Or students would react to increased debt load by lowering their aspirations for postbaccalaureate study and instead deciding to enter the labor force more quickly in order to begin repayment of loans. This theory does not have to be in competition with human capital theory. As noted previously, recent scholarship on the unstable nature of costs and benefits for students allows for debt aversion to predict students viewing education as less of a benefit or viewing the cost of additional education as exceptionally high (Altonji, Blom, & Meghir, 2012; Paulsen, 2001). In terms of differential effects, numerous scholars have found suggestive, though not conclusive, evidence that some student populations (e.g., racial ethnic/minorities, students from low-income backgrounds) can be risk-averse when confronted with undergraduate student loans (Burdman, 2005; Callender & Jackson, 2005; Cunningham & Santiago, 2008; Field, 2009; Perna, 2000). This is often posited as the result of structural income and wealth inequalities (Oliver & Shapiro, 1997), cultural aversion to debt, or familial lack of or negative experience with borrowing more generally (Burdman, 2005, Cunningham & Santiago, 2008). Based on prior research, students underrepresented in higher education could react more strongly to the increasing reliance on student debt for college funding. This would support Rothstein and Rouse's (2011) supposition that, potentially, all "college graduates are averse to holding debt or that they face constraints on their ability to borrow against future earnings" (p. 162). This aversion could push these students to search for higher-paying employment when previously the students had wished to enroll in postbaccalaureate education or choose an occupation with a smaller salary.

Caveats

Two types of repayment policies complicate these theories. Income-Based Repayment (IBR) plans allow students to pay a set portion of their income toward their *federal* loans instead of a flat payment based on the amount borrowed (U.S. Department of Education, 2014b). Still, approximately 14% of students in repayment on their Direct Loans in 2014 used IBR (College Board, 2014), which is a marginal portion of the population. Federal and state policies that allow for loan forgiveness generally rely on some low-salary/public service occupation requirement. For example, the federal Public Service Loan Forgiveness Program allows students who work full-time in public service occupations to forego repaying the remaining balance on any Direct Loans after making 120 payments on the debt. Like IBR, this policy could make it easier for students to manage high amounts of cumulative debt without needing a high-salary occupation. Based on prior research and the conceptual frameworks I apply, even with these types of repayment programs, students made postbaccalaureate decisions by responding to the cumulative amount of debt they borrowed.

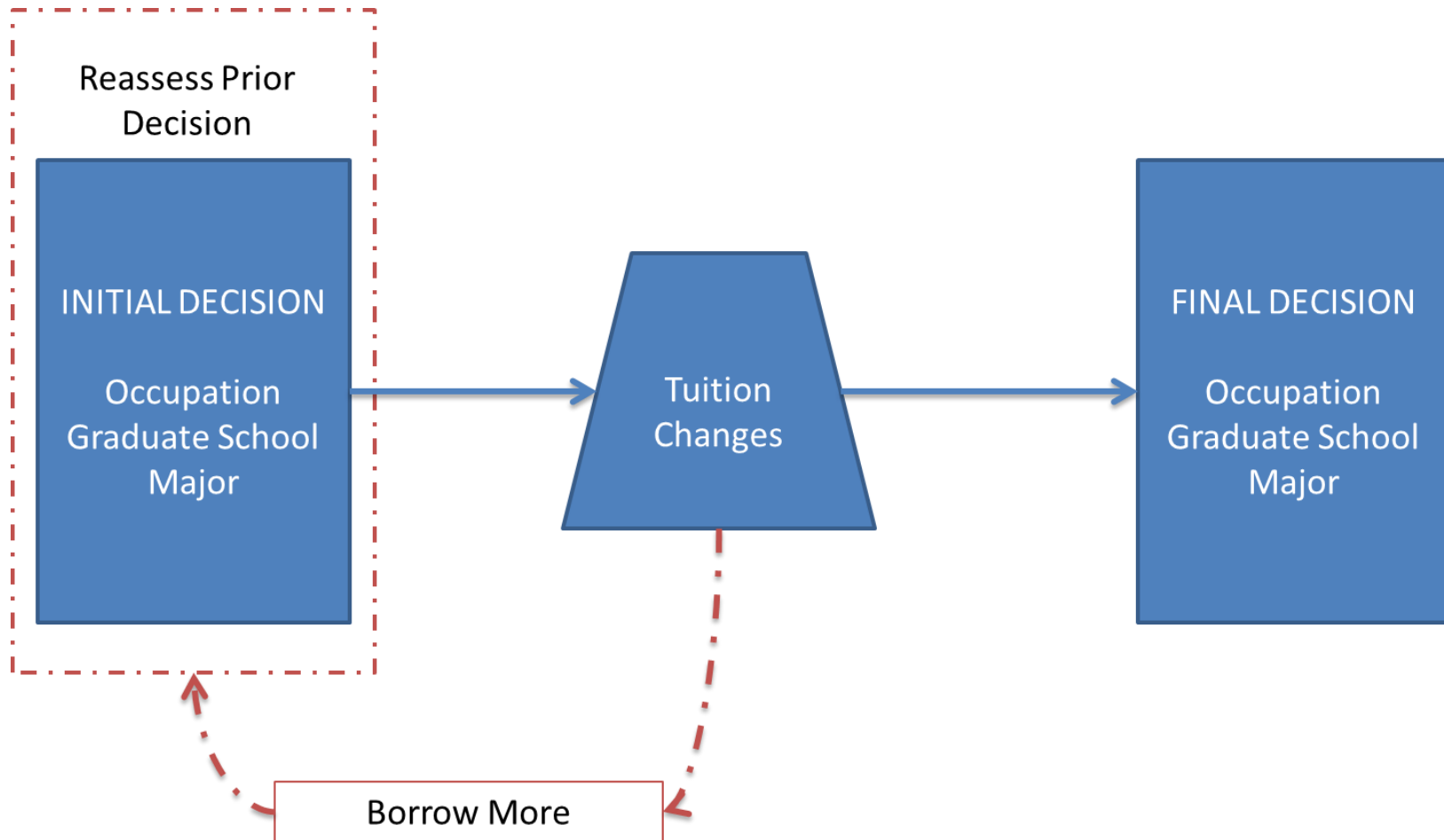
Conceptual Model and Hypotheses

A simpler way to think through the choices a student makes for additional schooling and then early-career occupation or graduate school is to focus on the sequential decisions each student makes (Altonji et al., 2012). Before enrolling in an undergraduate institution, a student chooses a major, an occupation, or enrolling in graduate school directly after graduating (initial decision). She decides on these alternatives nearly simultaneously and bases the decision on her underlying preferences and her abilities, as well as her uncertainty about those two factors (no student can truly know the extent of her ability or

preference for a certain occupation or postbaccalaureate degree; Altonji et al., 2012). While she is enrolled, tuition increases at that undergraduate institution. The student chooses to borrow or not to borrow in order to continue attending that institution. If the student does choose to borrow more, she must evaluate and reassess her prior decision about an occupation or attending graduate school. This reassessment can happen many times during a student's undergraduate career. My dissertation focuses on this reassessment decision: the choice of occupation or graduate school after a student has responded to tuition increases by borrowing an additional amount. The quantitative analyses focus on the local average treatment effect (LATE) of undergraduate debt: testing the extent to which undergraduate debt affects students' postbaccalaureate decision-making solely for students induced to borrow more because of tuition and fee changes. I study this reassessment at three time points: while students were in college, one year after graduation, and four years after graduation. The qualitative analyses focus on the process of reassessment students with undergraduate debt experience while making postbaccalaureate education and occupation decisions. See Figure for a visual explanation of these decision points.

I investigate how variation caused by exogenous shocks to the change in the price of attending different institutions induced certain students to borrow more to finance their undergraduate education. By doing this, I am able to analyze part of the causal effect of undergraduate debt on postbaccalaureate decision-making. In the models, I focus on the coefficients for the undergraduate debt measures. For the postbaccalaureate education models, if the coefficient on undergraduate debt is statistically significant and negative,

Figure. Conceptual Model.



debt had a negative effect on students' graduate school aspirations or enrollment behavior. If the coefficient on undergraduate debt is statistically significant and positive or statistically insignificant, but there is enough power to detect an effect, debt did not have an inhibiting effect on students' graduate aspirations or enrollment. For the postbaccalaureate early-career occupation models, if the coefficient on undergraduate debt is statistically significant and positive, debt had a positive effect on the early-career salary. If the coefficient on undergraduate debt is statistically significant and negative or statistically insignificant, and there is enough power to detect an effect, debt did not have an inhibiting effect on students' selecting occupations with lower salaries.

I have three hypotheses about debt's relationship with postbaccalaureate decision-making (for the quantitative work). First, I hypothesize that debt will have either a positive or statistically insignificant effect on graduate aspirations. Prior research has rarely found that debt could induce change in students aspiring to postbaccalaureate education (Rothstein & Rouse, 2011). Second, I hypothesize that debt will have a negative effect on graduate enrollment. As outlined in the literature review, educational aspirations and behaviors are not the same construct. Aspirations or attitudes toward certain objects or behaviors do not consistently predict behavior (Regan & Fazio, 1977). Moderators of the relationship between aspirations and debt, such as direct experience with the object or behavior (Kraus, 1995), can explain why aspirations may not vary greatly within the population or predict future behaviors weakly. Prior research, particularly Malcom and Dowd (2012), found suggestive evidence that increasing undergraduate debt would lead to students choosing not to enroll in postbaccalaureate education. This evidence differs from the research on aspirations, likely due to the weak predictive abilities of aspirations for

future behaviors. Malcom and Dowd's (2012) enrollment findings run counter to a traditional human capital theory prediction; however, I argue that students' risk aversion will make not enrolling in graduate school the most optimal decision from students' perspectives. Third, I hypothesize that debt will have a positive effect on early-career occupation salary. Extant literature and human capital theory predict that students will seek a higher salary when undergraduate debt increases in order to increase their utility.

To be clear, reassessment of prior postbaccalaureate decision-making is not inherently a negative behavior. For example, in examining the relationship between debt and early-career occupation salary, students' response to increased undergraduate debt by seeking an early-career occupation with a higher salary has likely positive effects both on the students' ability to repay and on their future utility. The potential apprehension about this reassessment is twofold. First, debt could induce students to select postbaccalaureate educational or occupational opportunities that are at odds with their underlying preferences and abilities. There is an unobserved distribution of underlying preferences and abilities for majors, careers, and educational attainment. Undergraduate debt may decrease students' ability to pursue their preferred postbaccalaureate life if they choose educational attainment levels or early-career occupations contrary to their underlying preferences and abilities. Second, borrowing to finance undergraduate education is not randomly distributed throughout the population. As outlined previously, certain types of students (i.e. low-income, African American) borrow at higher rates and higher amounts than do their peers. Therefore, even if it is a rational choice to change postbaccalaureate behaviors based on the amount of undergraduate debt amassed, only certain students must face this particular reassessment of prior postbaccalaureate decision-making.

Practical Examples

Here I provide examples of these theories applied to undergraduate debt and postbaccalaureate decision-making. First is an example for postbaccalaureate education. Two students enroll at Public State University (PSU). These students are both full-time, live on campus, have a mixture of grants and loans in their financial aid awards, and wish to attend a master's program after graduation. The COA at PSU is \$25,000 each year. After two years, PSU raises COA to \$32,000. Because of this \$7,000 increase, the students both borrow the additional amount in federal loans. Both students graduate after four years at PSU with \$15,000 in cumulative debt (average for bachelor's degree recipients; College Board, 2014). Student A is debt-averse/has a higher discount rate and, after graduation, chooses to forego graduate school and enter the labor market in order to begin repayment on the unanticipated amount of debt accumulated during her collegiate career. Student B realizes that, though she holds more debt than she had planned, the lifelong differential between holding a baccalaureate degree and a postbaccalaureate degree is large enough that she will easily be able to repay her undergraduate debt and still benefit from further education.

The second example concerns postbaccalaureate early-career occupational choice and uses the same two students without reference to their master's degree aspirations. Student A is debt averse/has a higher discount rate and chooses a high-salary occupation after graduation in order to begin repayment on the unanticipated amount of debt accumulated during her collegiate career. This is also a rational decision based on the student wishing to maximize her lifetime earnings. Student B realizes that, though she

holds more debt than she had planned, her underlying preferences and abilities make a low-salary occupation after graduation an attractive choice.

These examples show how the conceptual framework works in real-world scenarios. In the next chapter, I apply this conceptual framework to the quantitative analysis of research question 1: To what extent does undergraduate student loan debt affect postbaccalaureate educational aspirations, enrollment, and early-career occupational salary?

CHAPTER IV

INVESTIGATION 1: UNDERGRADUATE DEBT'S EFFECT ON POSTBACCALAUREATE EDUCATION AND EARLY-CAREER OCCUPATION CHOICE

My contribution to this body of research is to estimate the causal relationship between undergraduate debt and postbaccalaureate decision-making. Previous research on debt's relationship with postbaccalaureate decision-making either uses older, nationally representative data or newer, single-institution/single-field-of-study data. I use a new instrument—change in average tuition and fees—in order to investigate undergraduate debt's effects while filling in these gaps in the literature using newer, nationally representative data rich with financial aid and indebtedness measures. This instrument intuitively makes sense because changes in the cost of attending college should predict a change in the amount of undergraduate debt students borrow without directly affecting students' graduate school aspirations, enrollment behaviors, or early-career occupation salary. I focus on research question 1 for the quantitative analysis. For ease of interpretation, I separate that research question into three subquestions based on the outcome variable. The subquestions are: To what extent does undergraduate student loan debt affect postbaccalaureate

(A) educational aspirations?

(B) educational enrollment?

(C) early-career occupational salary?

In this chapter I outline the research methods first. I discuss the data, the variables, and how the variables are operationalized, and I end with model specifications. Then I report the results of the quantitative analyses. This includes summary statistics,

relationships among the key variables, the main regression analyses, subpopulation analyses, and robustness checks.

Research Methods

Data

I analyze two datasets from the U.S. Department of Education National Center for Education Statistics. I use the Beginning Postsecondary Students (BPS): 04/09 dataset for the analysis of the dependent variable postbaccalaureate education aspirations (research question 1.A) and the B&B 2007–2008 graduating cohort for the analysis of the dependent variables, postbaccalaureate education enrollment and early-career occupation choice (research questions 1.B and 1.C).

The BPS: 04/09 is a subsample of the base-year study of the National Postsecondary Student Aid Study (NPSAS: 04), a nationally representative survey of first-time postsecondary students conducted by the National Center for Education Statistics. NPSAS: 04 uses a two-stage design: Researchers select eligible institutions from the institutional sampling frame (constructed from IPEDS 2000–2001 to 2002–2003 data) and then choose students from those institutions. Selection requires eligible institutions to meet all criteria under Title IV of the Higher Education Act (20 U.S.C. §§ 1070–1099) for disbursing federal financial aid; eligible students must attend those institutions, be enrolled in the requisite academic program or course, and not be concurrently enrolled in high school or a GED program. A direct, unclustered sample of institutions is selected and, in order to analyze state policy measures, 12 states were oversampled from three higher education sectors (public 2-year, public 4-year, private not-for-profit 4-year). NPSAS: 04 samples 109,210 first-time beginning students via fixed-type sampling rates in order to maintain equal

probability of selection across institution type, but only 101,010 students are eligible once institutional records are verified. While NPSAS examines how students pay for college, BPS is a longitudinal dataset composed of information on students' background characteristics, persistence in and completion of postsecondary education programs, financing of college, transition to labor force, and changes over time in their aspirations, income, and other factors. For BPS: 04/09, students are initially surveyed at the end of their first academic year (2003–2004, first wave) and then invited to participate in follow-up surveys 2 years (2006, second wave) and 4 years later (2009, third wave). The final BPS: 04/09 dataset has 16,680 participants: any sample member eligible at the beginning of the study, alive during data collection, who has valid data to allow construction of his/her enrollment history. Response rate is 90% among sample members who are initially located in the batch-locating activities that create the base group from the NPSAS: 04. There are weights for three groups: study respondents at any point in data collection, panel respondents who completed all three phases, and sample members with transcript data (adjusted for nonresponse). I use the first and third waves of BPS: 04/09 to investigate graduate aspirations and debt.

The B&B: 08/12 is a subsample of NPSAS: 08. NPSAS: 08 samples students in a way similar to the methods described for NPSAS: 04. B&B: 08/12 focuses on a nationally representative sample of postsecondary students who earned a baccalaureate degree from a Title IV eligible institution between July 1, 2007 and June 30, 2008. The first follow-up occurred 1 year after earning the degree (2009) and the second follow-up occurred 3 years after that (2012). The surveys focus on postbaccalaureate education, debt and finances, and employment. The final B&B: 08/12 dataset has approximately 17,160 participants, which

include any sample member who participated in B&B: 08 and is still deemed eligible based on the B&B: 08/09 transcripts or interviews. The Department of Education obtained an 85% response rate. There are weights for three groups: panel weight to analyze NPSAS items with B&B: 08/12 items, panel weight to for all three waves, and panel weight for all three interviews and transcript data. I use all three waves to investigate the relationship of graduate school enrollment and early-career occupation salary with undergraduate debt.

I supplement each dataset with tuition and fee figures for the first postsecondary institution attended from IPEDS (surveys completed by all Title IV eligible postsecondary institutions in the United States) 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). For the aspirations dataset, I use figures from AY 2003–2004 to 2005–2006 (answering research question 1.A). For the enrollment and early-career choice dataset, I use figures from the entire approximate undergraduate enrollment for each student (answering research questions 1.B and 1.C).⁵ I further restrict the sample to U.S. citizens and resident aliens, since they are the only students eligible for federal financial aid, who attend not-for-profit institutions for which IPEDS codes could be located. This results in a sample size of approximately 9,000 for aspirations and 10,000 for enrollment and salary.

To measure the number of students who enroll in graduate school at some point, it would be useful to follow them for as long as possible after they earn their baccalaureate degree. That is not possible with the existing data constraints. Therefore, some students in

⁵ I created a variable for when students started postsecondary education based on the age the students reported they started postsecondary education. For any person whose starting year was before AY 1999–2000, I assigned them a starting year of AY 1999–2000. The earliest starting year was in the 1950s, but the 25th percentile was 2003. Additionally, the measure of tuition and fees is not recorded in IPEDS before 1999.

the sample count as not enrolling in graduate school during the time covered by the dataset but would eventually choose to enroll. Using the National Postsecondary Student Aid Study of 2007–2008, Choy and Cataldi (2011) found that, of students currently in graduate school, approximately 70% enrolled within 3–6 years of earning their baccalaureate degree in a master’s or doctoral program.⁶ Of students in first-professional degree programs, approximately 90% enrolled within 3–6 years of college graduation. Therefore, although B&B is not perfect, it allows me to observe students who enrolled in graduate school up to 4 years after earning their baccalaureate degree. This is likely to capture a substantial portion of students who enroll in graduate school.

Variables

There are three outcome variables of interest. The first outcome variable is graduate aspirations, which is operationalized as the highest degree ever expected three years after entering postsecondary education. This variable takes on a value of 1 if a student reports that his/her highest degree ever expected is any degree beyond a bachelor’s degree. It measures the attitudes of students and, as such, is not the same as actual behaviors students exhibited. As mentioned in the literature review, it is critical to differentiate the effects on aspirations and enrollment. The second outcome variable is graduate enrollment, which is operationalized as whether a student has enrolled in any type of postbaccalaureate education (measured at two time points: one year and four years after earning a baccalaureate degree). It measures actual student behavior. The third outcome variable is early-career occupation choice, which is operationalized as the annualized

⁶ This excludes students enrolled in doctoral programs in education. The authors removed those students from the overall averages as they are atypical and only 30% enroll in their program within 3–6 years of earning a baccalaureate degree.

salary of the student's primary occupation (measured at 1 year and 4 years after earning a baccalaureate degree). I log salary measures after adding 1 to them (to preserve the 0s, as the natural log of 1 is 0) in order to account for the multiplicative nature of salary increases.

Undergraduate debt is the endogenous variable of interest. I include both cumulative educational debt and cumulative federal educational debt as measures of total undergraduate debt for all models. The change in the average tuition and fees for each institution is the primary instrumental variable.⁷ I log these variables after adding 1 to them (again to preserve the 0s) in order to account for the likely multiplicative relationship between debt and change in average tuition and fees. This means that, for the salary outcome models (research question 1.C), I estimate the elasticity between early-career choice outcome and undergraduate debt. I include a measure of parents' education and an interaction between change in the average tuition and fees and parents' education in order to create an overidentified model (which allows me to test one of the primary assumptions of instrumental variables, discussed below). Parents' education in the aspirations models (research question 1.A) is mother's highest education (binary for education level of high school or higher) and in the enrollment and salary models (research questions 1.B and 1.C) is father's highest education (binary for education level of high school or higher). I made this choice because the respective measures of education provide the best identification for the sample.

⁷ In IPEDS, these variables for in-state students are tuition2 and fee2 (in-state average tuition for full-time undergraduates and in-state required fees for full-time undergraduates, respectively). For out-of-state students these are tuition3 and fee3 (out-of-state average tuition for full-time undergraduates and out-of-state required fees for full-time undergraduates, respectively).

Previous research emphasized the relationship between students' precollege characteristics (e.g., race/ethnicity, gender, socioeconomic status, high school performance) and their graduate school aspirations/enrollment. I operationalize precollege characteristics as age when starting postsecondary education, race/ethnicity (White, African American, Latino, Asian, other race),⁸ binary for gender, prior income (parents' income for dependent students or students' income for independent students), and college entrance examination score (SAT/ACT score). Many scholars found that the type of institutions students attend can influence students' graduate aspirations (e.g., Bowen & Bok, 1998). In contrast, Pascarella (1984) posited that institutional characteristics indirectly influenced graduate school aspirations because of their smaller effect estimates in the majority of models investigating the factors influencing graduate aspirations. I operationalize institutions' characteristics as binary for institutional control, binary for institutional level, initial average tuition and fees at first postsecondary institution, and institutional selectivity (most selective, selective, less selective, nonselective). Except for initial average tuition and fees and institutional selectivity, all these variables are measured in BPS: 04 or B&B: 08. Finally, I include measures of the individual after enrollment in postsecondary education: college GPA, marriage status, and whether the student has children. These variables are all measured as early as possible in students' careers: in BPS: 04 (except college GPA, which was measured in BPS: 06) or B&B: 08.

⁸ Other race is a combination of American Indian/Alaskan Native, Native Hawaiian/other Pacific Islander, other race, and more than one race due to small sample size.

Model Specification

Because of the potentially endogenous relationship between debt and postbaccalaureate decision-making, I implement instrumental variables (IV) estimation as an identification strategy to estimate causal effects. I use the changes in average tuition and fees at the institution the student attended their first year of postsecondary education interacted with parental education as an instrument for the change in student debt. Change in average tuition and fees could force students to borrow more because higher average tuition and fees would presumably lead students to rely on loans in order to finance their educations. However, change in average tuition and fees should not influence postbaccalaureate decision-making, except through the channel of undergraduate debt.

Students would be less likely to rely on loans to finance these changes if the increase in average tuition and fees was coupled with an increase in the amount of other types of aid available (e.g., grant aid). This did not appear to be the case, given that the maximum Pell grant was generally steady over the majority of students' undergraduate education in the sample: \$4,050 from AY 2003–2004 to AY 2006–2007, with a minor increase to \$4,310 in AY 2007–2008, the final year of undergraduate education for the second analysis of graduate school enrollment (U.S. Department of Education, 2015c). Although it is a cruder indicator, the amount of state need-based grant aid and institutional grants meeting need were also generally steady during the undergraduate education of the sample (Figures 26A, 31A, 31B of College Board, 2014). Therefore, it is likely that if the institution a student attends raises the average tuition and fees and the student chooses to continue attending that institution, the student will rely in some part on loans to cover the additional cost.

Students are not required to continue attending their first postsecondary institution. They could, in reaction to an increase in average tuition and fees, choose to transfer to a different institution or leave higher education altogether. Transferring is not necessarily a negative: Transfer students might be able to find a better fit at another institution and graduate with what they view as an appropriate amount of undergraduate debt. This scenario would mean that the coefficient of interest I estimate could be the lower bound because larger changes in average tuition and fees could be linked to a smaller amount of debt with transfer to a less expensive institution. Neither institutions, states, nor the federal government want the second option, leaving higher education with no degree or credential (Fain, 2014). In the model, these students would not have an increasing amount of undergraduate debt while the average tuition and fees were changing. Students in the sample choosing to leave college altogether could falsely result in estimates indicating that increases in average tuition and fees are not inhibiting students when in reality the increases caused the students to drop out of higher education. This is a concern only with research question 1.A, aspirations (questions 1.B and 1.C, enrollment and early-career choice, include only students who have earned a baccalaureate degree).

It would have been preferable to create an experimental design to test the research questions. However, it is both ethically and feasibly challenging to randomly assign students to different amounts of undergraduate debt in order to investigate how borrowing changes postbaccalaureate decision-making. Instead, I use the unsystematic assignment of tuition and fees changes throughout the United States, which are outside the control of students, to predict the portion of the causal relationship between undergraduate debt and

postbaccalaureate decision-making that is driven by students induced to borrow more by changes in tuition and fees (discussed below).

There are four assumptions of IV estimation that, once satisfied, allow the quantitative results of this work to be interpreted as credible estimates for the causal effect of undergraduate debt on graduate school aspirations, enrollment, and early-career occupation salary for students whose amount of undergraduate debt is influenced by the instruments, change in tuition and fees, parental education, and their interaction. This type of estimate is called a local average treatment effect (LATE; Imbens & Angrist, 1994). The four assumptions are independence, exclusion, relevance, and monotonicity (Angrist & Pischke, 2009; Imbens, 2014).

The *independence* assumption means the instruments must be distributed among the population of interest in a manner not related to the endogenous predictor (debt) or the potential outcomes (graduate school aspirations, enrollment, and early-career occupation salary). That the instrument can be considered good as randomly assigned makes it a strong assumption. Although it is easier to satisfy when estimating intent-to-treat effects from randomly assigned experiments, it is conventional to relax this assumption when using observational data (Imbens, 2014). The assumption can be relaxed to require that the instrument could be unconfounded assignment, conditioned on the other covariates. The instrument of changes in average tuition and fees satisfies this relaxed assumption because, conditioned on individual and institutional characteristics, changes in average tuition and fees at the first postsecondary institution attended conceivably occur in a quasi-random manner. It is plausible that this assumption is upheld.

The second assumption, the *exclusion* restriction, means the instruments can only affect the outcomes through the endogenous predictor; there is no plausible way for the instrument to influence the outcome directly. A potential threat is that graduate school admissions committees could view the increase in average tuition and fees as an increase in the quality of education students receive. If this were the case, an increase in average tuition and fees would directly influence the likelihood of students being admitted and ultimately enrolling in graduate school. This is not a plausible scenario, though, as graduate admissions committees normally view the rigor of coursework or opportunities for research at an undergraduate institution to be indicators of quality rather than the sticker price for attending. However, to control for this potential threat, I include a measure of selectivity of the undergraduate institution. High-salary occupation employers could view the increase in COA as an increase in the quality of education the students receive. If this were true, an increase in COA would directly influence the likelihood of students being offered high-salary occupations. This is not a plausible scenario, however, because potential employers normally view the general prestige at an undergraduate institution to be indicators of quality rather than the *changes* in the sticker price for attending. It also would not explain why a student chose to take the offered position. Still, the previously discussed measure of selectivity should control for this potential threat.

In addition, as students select which postsecondary institution they will attend, those who are more likely to aspire to or enroll in graduate school or select a low-salary occupation (e.g., highly motivated students) might enroll at institutions with higher changes in average tuition and fees. This would allow changes in average tuition and fees to have another pathway to affect the outcome variables. One would have to assume that

students can predict the amount of change in average tuition and fees that an institution will have over their undergraduate education. Students are generally not good predictors of how much undergraduate debt they will accumulate (Akers & Chingos, 2014; Andruska et al., 2014), which gives evidence that they are also not likely to be able to forecast the changes in average tuition and fees at their institution.

In states where tuition increased rapidly, there are two potential concerns: poor labor markets and apprehension about graduate school cost. Potentially poor labor markets lead to lower tax revenues, which reduces funding for higher education and increases college tuition. This is unlikely to be the case, however, as there is no discernible pattern between changes in tuition and fees and the state indicators of labor market health, such as unemployment rate. The direction of the relationship between undergraduate debt and the postbaccalaureate outcomes of interest can also provide evidence for this potential additional pathway between the endogenous predictor and the outcome. If the effects I find are reactions to poor labor markets, an increase in undergraduate debt should predict an increase in graduate school enrollment and a decrease in the early-career occupation salary. If the effects are the opposite of these directions, it is likely the exclusion restriction is upheld. I address this with the robustness checks outlined below.

For apprehension about graduate school cost, students might surmise that graduate school tuition will be very expensive based on the rapid increase in undergraduate tuition in their state. I would first have to assume that apprehension of rising costs of graduate education vary throughout the population of recent baccalaureate degree earners in relation to the changes in tuition at the students' institutions. Unless a student is borrowing more and analyzing the amount of money necessary to finance her college education, it is

unlikely that she would focus attention on the exact amount of increase in tuition and fees at her institution. There would be a general sense that tuition and fees have been increasing at colleges and universities, but students attending institutions with larger increases would not notice a distinct difference. This is tested further in the qualitative portion of this dissertation (Chapter V) and in the robustness checks below.

The third assumption, *relevance*, means the instruments must be predictive in the first stage models (when the endogenous predictor is regressed on the instruments and other covariates). If the instruments do not have significant predictive power, it is difficult to obtain unbiased and precise second stage estimates. This is testable and is shared in the results section of this chapter.

The final assumption, *monotonicity*, means the instruments' effect on the population of interest must be the same for all, though it allows that some may not be affected. For this work, I argue that large changes in average tuition and fees increase the amount of undergraduate debt students hold. If large changes in average tuition and fees caused students to decrease their amount of undergraduate debt, this work would violate this assumption. Due to this assumption, I focused only on the amount of undergraduate debt students borrowed, not the amount the students owed at any given time (because that would include the amount of undergraduate debt remaining after in-college payments). Students transferring to another institution and borrowing less or not borrowing at all would not decrease the amount of undergraduate debt borrowed. This is also true if students drop out of college in reaction to a change in average tuition and fees: the students still do not decrease the actual amount of undergraduate debt borrowed. For these reasons, violations of monotonicity are not possible.

In model 1, I investigate research question 1.A, debt's effect on postbaccalaureate education aspirations. Model 1 is as follows:

First stage

$$debt_{it} = \gamma_0 + Z\gamma_i + X_i\alpha + \varepsilon_i$$

Second stage

$$postbaccalaureate\ aspirations_{it} = \beta_0 + \beta_1 \widehat{debt}_{it} + X_i\delta + u_i$$

where $debt_{it}$ is the amount of undergraduate loans borrowed by 2008–2009 for student i ; Z represents a vector of the excluded instruments' change in average tuition and fees from 2003–2004 to 2008–2009, mother's education, and an interaction between the two for student i ; X_i represents a vector of individual and institutional covariates for student i including gender, race/ethnicity, prior income (quadratic), college entrance examination score, institutional selectivity, institutional control, institutional level, college GPA, marriage status, and the number of dependents a student has; and $postbaccalaureate\ aspirations_{it}$ is the highest degree expected to be earned in 2008–2009 (or the second wave) for each student i . I estimate this model with two measures of undergraduate debt, total and federal. For the second stage, I run a linear probability model (because the outcome variable is dichotomous).

For model 2, I investigate research question 1.B, debt's effect on postbaccalaureate education enrollment. Model 2 is as follows:

First stage

$$debt_{it-1} = \gamma_0 + Z\gamma_i + X_i\alpha + \varepsilon_i$$

Second stage

$$postbaccalaureate\ enrollment_{it} = \beta_0 + \beta_1 \widehat{debt}_{it-1} + X_i\delta + u_i$$

where $debt_{it-1}$ is the amount of undergraduate loans borrowed for the undergraduate career for student i ; Z represents a vector of the excluded instruments' change in average tuition and fees over the undergraduate career, father's education, and an interaction between the two for student i ; X_i represents a vector of individual and institutional covariates for student i including age at start of postsecondary education, gender, race/ethnicity, prior income (quadratic), college entrance examination score, undergraduate grade point average, marriage status, the number of dependents a student has, first institution selectivity, first institution control, and first institution level; and $postbaccalaureate\ enrollment_{it}$ is an indicator for graduate school enrollment for each student i (= 1 if student chose to enroll in graduate school). I estimate this model with two measures of undergraduate debt, total and federal, and at two time points for the outcome variable, enrollment in 2009 and 2012. For the second stage, I run a linear probability model (because the outcome variable is dichotomous).

For model 3, I investigate research question 1.C, debt's effect on postbaccalaureate early-career occupation salary. Model 3 is as follows:

First stage

$$debt_{it-1} = \gamma_0 + Z\gamma_i + X_i\alpha + \varepsilon_i$$

Second stage

$$postbaccalaureate\ salary_{it} = \beta_0 + \beta_1 \widehat{debt}_{it-1} + X_i\delta + u_i$$

where $debt_{it-1}$ is the amount of undergraduate loans borrowed for the undergraduate career for student i ; Z represents a vector of the excluded instruments' change in average tuition and fees over the undergraduate career, father's education, and an interaction between the two for student i ; X_i represents a vector of individual and institutional

covariates for student i including age at start of postsecondary education, gender, race/ethnicity, prior income (quadratic), college entrance examination score, undergraduate grade point average, marriage status, the number of dependents a student has, first institution selectivity, first institution control, and first institution level; and *postbaccalaureate salary*_{it} is the primary early-career occupation salary. I estimate model 3 with two measures of undergraduate debt, total and federal, and at two time points for the outcome variable, enrollment in 2009 and 2012.

To evaluate the hypotheses mentioned in the conceptual framework section, if β_1 is statistically significant and negative, debt would have a negative effect on the students' graduate aspirations or enrollment behavior. However, if β_1 is statistically significant and positive or statistically insignificant, but there is enough power to detect an effect, debt would not have an inhibiting effect on students' graduate aspirations or enrollment. For the early-career occupation choice model, if β_1 is statistically significant and positive, increases in undergraduate debt induce students to select early-career occupations with higher salaries. β_1 being statistically significant and negative or statistically insignificant would mean that increases in undergraduate debt do not inhibit students from selecting early-career occupations with lower salaries.

I model these relationships for subpopulations of student's race and prior income quartile. It would have been useful to include state-level characteristics in the primary model specifications to control for a variety of factors, such as the supply of graduate programs available to the student or the economic context for the labor market. Multiple factors complicate this. First, students can reside in one state but pursue postsecondary education in another, and little research has been done on which state influences a student

more for postbaccalaureate decision-making. It could be that one state influences a student more than another for all postbaccalaureate decision-making, or the state of legal residence influences graduate school decision-making while the post-college-enrollment state influences early-career occupation, or some other combination. Therefore, it is difficult even to select which state to assign to each student. Additionally, with regard to graduate school decision-making, there is a dearth of research on how distance influences the decisions to aspire to, apply to, or enroll in postbaccalaureate education. Even the latest research on graduate school choice (i.e., English & Umbach, 2016) includes state context only by controlling for whether students attended college in the same state as their legal residence. This was used as a proxy for social capital, following Perna (2004), and not to control for the state context of educational opportunities. The authors found no evidence supporting the notion that out-of-state students had larger or smaller odds of aspiring to, applying to, or enrolling in graduate school. Thus, prior research gives little guidance on which state's context provides the most appropriate control for understanding students' postbaccalaureate decision-making. For these reasons, I do not include state-level characteristics in the main specifications.

I conduct a robustness check using the main models, including state fixed effects for the two primary options of state contexts: state of legal residence (home state) and state post-college enrollment (post-college state). In the aspirations sample, home state is measured in the student's first year of postsecondary education and post-college state is the location of the first institution attended when the student enrolled (both measured in 2003–2004). In the enrollment and salary sample, home state is measured in the fall of the year the student earned a bachelor's degree (2007–2008). It would have been preferable to

have a measure of the state of legal residence from the first-year of postsecondary education for this sample, but the data do not include that information. The post-college state is measured as the state the student lived in during the first follow-up in 2009, one year after earning a bachelor's degree. Therefore, the post-college state measures are slightly different for the two samples, primarily due to the likelihood that the students in the enrollment and salary sample could have changed their residence during their baccalaureate career (though there is no way to know that using the data). These robustness checks give further evidence to the two state-related concerns with the exclusion restriction: poor labor markets and selective apprehension about graduate school costs.

In the results section of this chapter, I report several empirical tests of the excluded instruments. The first test is the Wu-Hausman test of endogeneity. The null hypothesis of this test is that ordinary least squares (OLS) and IV models produce statistically similar estimates. A p -value less than .05 allows the researcher to reject the null hypothesis; suggestive evidence that the predictor of interest (in my work, undergraduate debt) is statistically endogenous. This test is less reliable the smaller the sample size. As smaller sample size increases standard errors (because the formula for standard errors is heavily dependent on sample size), it is more difficult to detect a statistically significant difference between the OLS and IV models.

The next is the test of instrument relevance. Following Stock and Yogo (2005), there are two primary threats to instrument relevance. One is the amount of inflation in the conventional significance-level test of coefficient estimates (size). For example, I could calculate that a coefficient estimate is statistically significantly different from 0 if the p -

value for that estimates is .045 (conventional Wald test). With a weak instrument, the precision of the coefficient estimates and standard errors would be weak. Therefore, when I thought that coefficient had a p -value below .05, the conventional standard for statistical significance, it actually had a p -value below .10. To reach the conventionally optimal amount of inflation in size, the overidentified models must have a minimum eigenvalue F statistic (Shea's partial r^2) of at least 22.3 (Table 5.2, Stock & Yogo, 2005). I would then have confidence that, when I labeled an estimate as statistically significant at the .05 significance level, at most the inflation would be to the .10 significance level.

The other threat to instrument relevance is the amount of bias that is present in the OLS model and reduced by IV, or, put another way, the amount of bias present in the IV models relative to the amount of bias relative to OLS models. To reach the conventionally optimal 5% or less bias, the overidentified models must have a minimum eigenvalue F statistic (Shea's partial r^2) of at least 13.91 (Table 5.1, Stock & Yogo, 2005). In both cases, the null hypothesis of these tests is that the instruments are weak. Reaching those critical F -values allows the researcher to reject the null hypothesis, which is evidence that the instruments are strong. Minimum eigenvalue F statistics below either of these cutoffs do not automatically nullify the potential positives of IV estimation. It would solely increase concerns about the instrument relevance and decrease confidence in the reliability of the coefficient estimates and standard errors. These two tests give additional evidence for the relevance assumption: that the instruments have a sufficiently predictive relationship with the endogenous predictor.

The final test is the test of overidentifying restrictions (testing the previously discussed exclusion restriction). The null hypothesis for this test is that the instruments are

exogenous. At conventional levels, a Sargan statistic greater than .05 suggests that the instruments are not systematically related to the error term of the second stage model. That would be suggestive evidence that the instruments satisfy the exclusion assumption is upheld and there is no third channel between the instruments and the outcome variables.

Results

Summary Statistics

As previously summarized, postbaccalaureate decision-making varies by a number of individual and institutional characteristics. Tables 1, 2, and 3 show how students' individual and institutional characteristics vary according to students' postbaccalaureate educational aspirations, enrollment, and early-career occupation salary, respectively.

Using two-sample *t*-tests to detect differences, I find that students who aspired to a bachelor's degree or below do not statistically significantly differ from those who aspire to graduate degrees only when those students self-identify as African American, Latino, or other race (American Indian, Alaskan Native, more than one race, and other race). All other individual and institutional characteristics differ by aspirations. Students who self-identify as female, Asian, attending selective or most-selective institutions, or private institutions, or who aspire to graduate degrees when they entered postsecondary education, report graduate degree aspirations at higher rates. Students reporting higher proportions of graduate education aspirations also have higher prior incomes, SAT/ACT scores, and undergraduate GPAs, as well as fewer children. Notably, these students have, on average, approximately \$16,000 of undergraduate debt, \$10,000 of which is federal debt, whereas students with bachelor's or below aspirations have, on average, approximately \$12,000 of undergraduate debt, \$7,000 of which is federal debt. The students aspiring to attend

Table 1

T-Tests on Graduate School Aspirations

	Bachelor's or Below		Postbaccalaureate	
	Mean	SD	Mean	SD
Continuous Variables				
Cumulative Loans	11,862.44	16,921.10	16,134.27***	19,979.74
Cumulative Federal Loans	7,219.08	9,031.04	9,945.52***	10,564.86
Prior Income	65,378.72	52,103.81	78,252.96***	57,110.42
Entrance Examination (in SAT)	969.62	189.02	1,076.44***	196.90
College GPA	2.99	0.62	3.18***	0.53
Entering Tuition & Fees	7,058.22	6,952.81	11,095.48***	8,923.36
Dependents	0.05	0.28	0.02***	0.20
Indicator Variables				
Female	0.52	0.50	0.60**	0.49
Mother's Education	0.94	0.24	0.96***	0.20
Race				
White	0.74	0.44	0.72*	0.45
African American	0.10	0.30	0.10	0.29
Latino	0.09	0.28	0.08	0.27
Asian	0.03	0.18	0.06***	0.24
Other Race	0.05	0.21	0.05	0.22
Selectivity				
Nonselective	0.46	0.50	0.20***	0.40
Less Selective	0.06	0.25	0.05*	0.23
Selective	0.41	0.49	0.55***	0.50
Most Selective	0.07	0.25	0.20***	0.40
Private Control	0.23	0.42	0.39***	0.49
2-Yr or Less Institution	0.43	0.49	0.17***	0.38
Married	0.01	0.12	0.01***	0.08
Entering Graduate School Aspirations	0.52	0.50	0.81***	0.39

Note: Bachelor's or Below columns are means/proportions for students aspiring to a bachelor's degree. Postbaccalaureate columns are means/proportions for students aspiring to a postbaccalaureate degree. Two sample *t*-tests were run; significance of difference recorded in the Postbaccalaureate Mean column. * = $p < 0.05$; ** = $p < .01$; *** = $p < .001$.

Table 2

T-Tests on Graduate School Enrollment

	No Enrollment		Enrollment	
	Mean	SD	Mean	SD
Continuous Variables				
Cumulative Loans	18,605.96	18,952.77	17,295.30**	18,792.37
Cumulative Federal Loans	12,528.36	10,948.70	11,627.61***	10,774.47
Age	18.12	0.75	18.04***	0.70
Prior Income	66,973.15	62,438.42	69,832.28*	63,556.70
Entrance Examination (in SAT)	1,079.07	174.46	1,119.34***	183.69
College GPA	3.26	0.47	3.41***	0.41
Entering Tuition & Fees	10,245.32	8,697.69	11,783.08***	9,479.97
Dependents	0.07	0.35	0.07	0.33
Indicator Variables				
Female	0.56	0.50	0.62***	0.49
Father's Education	0.95	0.21	0.95	0.23
Race				
White	0.80	0.40	0.75***	0.43
African American	0.05	0.22	0.08***	0.27
Latino	0.06	0.25	0.07	0.26
Asian	0.05	0.22	0.06*	0.24
Other Race	0.03	0.18	0.03	0.18
Selectivity				
Nonselective	0.20	0.40	0.16***	0.37
Less Selective	0.06	0.24	0.05	0.23
Selective	0.60	0.49	0.59	0.49
Most Selective	0.14	0.34	0.19***	0.39
Private Control	0.32	0.47	0.39***	0.49
2-Yr or Less Institution	0.16	0.37	0.13***	0.34
Married	0.10	0.30	0.08**	0.27
Entering Graduate School Aspirations	0.68	0.47	0.93***	0.26

Note: No Enrollment columns are means/proportions for students who did not enroll in graduate school in 2012. Enrollment columns are means/proportions for students who did enroll in graduate school in 2012. Two sample *t*-tests were run; significance of difference recorded in the Enrollment Mean column. * = $p < 0.05$; ** = $p < .01$; *** = $p < .001$.

Table 3

T-Tests on Salary

	Low Salary		High Salary	
	Mean	SD	Mean	SD
Continuous Variables				
Cumulative Loans	17,845.79	18,143.92	18,281.20	19,627.46
Cumulative Federal Loans	12,358.32	10,958.93	11,948.90 ⁺	10,807.51
Age	18.07	0.69	18.10*	0.77
Prior Income	66,780.20	60,658.99	69,553.23*	65,097.35
Entrance Examination (in SAT)	1,082.10	182.69	1,109.60***	175.02
College GPA	3.32	0.46	3.33	0.45
Entering Tuition & Fees	10,745.58	8,912.27	11,022.29	9,209.06
Dependents	0.06	0.31	0.08	0.37
Indicator Variables				
Female	0.67	0.47	0.50***	0.50
Father's Education	0.95	0.21	0.95	0.22
Race				
White	0.78	0.41	0.78	0.41
African American	0.08	0.26	0.05***	0.22
Latino	0.06	0.24	0.07 ⁺	0.26
Asian	0.05	0.21	0.06***	0.25
Other Race	0.04	0.19	0.03	0.18
Selectivity				
Nonselective	0.19	0.39	0.18 ⁺	0.38
Less Selective	0.06	0.25	0.05*	0.22
Selective	0.61	0.49	0.58*	0.49
Most Selective	0.13	0.34	0.19***	0.39
Private Control	0.36	0.48	0.34	0.47
2-Yr or Less Institution	0.16	0.36	0.14 ⁺	0.35
Married	0.08	0.28	0.09	0.29

Note: Low Salary columns are means/proportions for students with a salary at or below the 50th percentile of salaries in 2012 (\$39,000). High Salary columns are means/proportions for students with a salary above the 50th percentile of salaries in 2012. Two sample *t*-tests were run; significance of difference recorded in the High Salary Mean column. ⁺ = $p < 0.10$; * = $p < 0.05$; ** = $p < .01$; *** = $p < .001$.

postbaccalaureate education owe more, which is consistent with the idea that students with more undergraduate debt are not automatically deciding that some type of graduate education is not a viable option. Students who aspire to attain a postbaccalaureate degree might be borrowing more in order to achieve that goal (see Table A1 for the unconditioned sample means).

Students reporting enrollment in graduate school in 2012 at higher rates are those who self-identify as female, African American, or Asian and attend most-selective or private institutions. Similar to graduate aspirations, these students also have higher prior incomes, SAT/ACT scores, and undergraduate GPAs. They are also younger on average when they started postsecondary education (though only by .08 of a year). However, the relationship between debt and postbaccalaureate education decision-making has now switched. Students who enroll in graduate school by 2012 have only \$17,000 in undergraduate debt, \$12,000 of which is federal, while students who do not enroll borrow \$19,000, \$13,000 of which is federal. Students who enroll in graduate school do not hold as much debt as their peers who do not enroll (see Table A2 for the unconditioned sample means). This could mean that the relationship between undergraduate debt and aspirations differs from the relationship with enrollment. This could be partly due to the previously discussed differences between attitudes and behaviors.

Students who report a high-salary (split at the 50th percentile, approximately \$39,000) in 2012 are less likely to be female or African American and more likely to attend most selective institutions. These students are slightly older and have higher prior incomes when they started college and higher SAT/ACT scores. Interestingly, these students do not differ from their peers in borrowing behaviors at conventionally significant levels (see

Table A2 for the unconditioned sample means). Taking these summary statistics together, students who aspire to graduate school, enroll in graduate school, and earn higher salaries are generally more privileged, especially with higher prior incomes, SAT/ACT scores, and attending most-selective institutions. Female and African American students are both more likely to enroll in graduate school and less likely to have high salaries after graduating from college. The relationship with undergraduate debt is less clear across the three outcome measures. To investigate the relationship between debt and the three outcomes, I first explore how borrowing varies by individual and institutional characteristics.

Murphy (1994) found that students with greater academic ability who attended more-selective institutions borrowed at higher rates. The raw averages in my two samples tell a more complex story. For the aspirations sample, if greater academic ability is measured by SAT/ACT score, students with the greatest academic ability (score greater than the 75th percentile) borrow the second-least in cumulative loans and the least in federal loans. Students above the 75th percentile of SAT/ACT score and above (greater than 1180) borrow \$14,000, \$9,000 of which is federal. Students between the 50th and 75th (greater than 1040 and up to and including 1180) borrow \$15,000, \$9,000 of which is federal, and those between the 25th and 50th (greater than 910 and up to and including 1040) borrow \$16,000, \$10,000 federal. For the enrollment and salary sample, students with the highest SAT/ACT scores borrow the least, both in cumulative loans and federal loans. Students above the 75th percentile (greater than 1220) borrow \$16,000, \$10,000 of which is federal. Students in the lowest quartile (25th percentile, below and including 970) borrow the most, approximately \$20,000, \$12,000 of which is federal.

For the aspirations sample, students who attend most-selective institutions borrow an average of \$15,000 in cumulative loans (\$8,000 federal), and students attending selective and less-selective institutions actually borrow the most: \$17,000 (\$10,000 federal) and \$17,000 (\$12,000 federal), respectively. This might be linked to the abundant financial aid available at the most-selective institutions, which allows students from low-income backgrounds to rely less on loans to finance their educations (Rothstein & Rouse, 2011). Students who attended nonselective institutions borrow an average of \$10,000 (\$7,000 federal). Similar to SAT/ACT scores, for the enrollment and salary sample, students who attend the most-selective institutions borrow the least (\$16,000, \$10,000 federal). Students who attend nonselective and selective institutions borrow approximately \$18,000 (\$12,000–\$13,000 federal), while those attending less-selective institutions borrow the most (\$20,000, \$14,000 federal).

For the aspirations sample, students with a prior income less than or equal to the 25th percentile (less than \$35,000) borrow approximately \$15,000 (\$10,000 federal), while students with prior incomes greater than the 75th percentile (greater than \$98,000) borrow approximately \$11,400 (\$6,000). For the enrollment and salary sample, students with a prior income of less than or equal to \$22,000 (25th percentile) borrow \$19,000 (\$15,000 federal), whereas students with the highest prior incomes (greater than \$99,000) borrow only \$15,000 (\$8,000 federal). It makes sense that the students with higher prior income amounts would have had more disposable resources—particularly given that federal loans are means-tested—but these summary statistics reinforce the finding that students with lower prior income are borrowing more, in raw averages, rather than paying for their education strictly through grants.

Following Malcom and Dowd (2012) and others, I find that African American students borrow the most, regardless of whether the sample is first-time attendees in postsecondary education (aspirations sample) or bachelor's degree earners (enrollment and salary sample). These students borrow \$17,000 (\$13,000 federal) in the aspirations sample and \$23,000 (\$18,000 federal) in the enrollment and salary sample.

It is important to note the taste for borrowing within the analytical sample. Before the Ensuring Continued Access to Student Loans Act of 2008, dependent students could borrow up to \$23,000 during their undergraduate career in federal subsidized and unsubsidized loans (FinAid, 2016). Independent students were allowed an aggregate borrowing limit of \$46,000. Within the aspirations sample, students borrow, on average, 39% of the aggregate borrowing maximum. Students who report graduate school aspirations borrow a statistically significantly larger percentage of the maximum (43% versus 31%). Within the enrollment and salary sample, students borrow, on average, 45% of the aggregate borrowing maximum. In contrast to graduate school aspirations, students who report enrolling in graduate school in 2009 and 2012 borrow a smaller percentage of the maximum than their contemporary peers who did not enroll, though not at conventionally statistically significant levels (43–44% versus 45%). Students who report a high salary in both 2009 and 2012 borrow a statistically significantly smaller percentage of the maximum than their contemporary peers who report a low salary (43% versus 46%). Therefore, on average, students borrow less than half the maximum aggregate amount allowed for federal borrowing. There is suggestive evidence that students who aspire to graduate school or who report a low salary borrow a larger percentage of the maximum amount. With these borrowing relationships in mind, I turn to analyzing the relationships

among the measures: debt, change in tuition and fees, and postbaccalaureate decision-making.

Relationships among Key Variables

A critical prerequisite for the use of IV is strong relationships between debt, the instruments (change in tuition and fees, interacting with parent's education), and the outcomes (graduate school aspirations, graduate school enrollment, and early-career occupation salary). Table 4 shows the proportion of students who aspire to graduate school by percentiles of undergraduate debt. A clear pattern holds for both cumulative total and federal loans. Students with larger amounts of debt are also more likely to aspire to graduate school. This relationship reflects the simple means discussed in the prior section and suggests a relationship between undergraduate debt and the outcomes of interest. Table 5 shows the proportion of students who aspire to graduate school by percentiles of the change in tuition and fees and the interaction between that change and parental education. A similar pattern is found: Students with larger changes in tuition and fees are students who aspire to graduate school at higher rates (there is less variation in graduate school aspirations for the children of parents with less than a high school diploma). Tables 6 and 7 show the average amount of cumulative debt—total loans and federal loans, respectively—over percentiles of the instruments. Again, students with larger changes in tuition and fees borrow higher amounts of debt. This suggests a relationship between the instruments and the endogenous predictor, debt, which is critical because the strength of the relationship between the instruments and the endogenous predictor dictates both the reliability of the later significance tests and the amount of bias I can account for by modeling with IV. Table 8 shows correlations between total cumulative loans, total federal

Table 4

Mean of Graduate School Aspirations by Debt Percentiles, Conditioned on Having Debt

Percentile of Debt	Loan		Federal Loan	
	Mean	SD	Mean	SD
No Debt	0.65	0.48	0.65	0.48
Less Than and including 25th	0.61	0.49	0.61	0.49
Between 25th and 50th (including 50th)	0.67	0.47	0.66	0.48
Between 50th and 75th (including 75th)	0.73	0.44	0.77	0.42
Greater than 75th	0.77	0.42	0.76	0.43

Note: Each cell shows the likelihood of aspiring to earn a postbaccalaureate degree in 2009 for that subset of borrowers.

Table 5

Mean of Graduate School Aspirations by Instruments' Percentiles

Percentile of Instrument	Change in Tuition & Fees		Interaction with HS and Above		Interaction with below HS	
	Mean	SD	Mean	SD	Mean	SD
Less than and including 25th	0.49	0.50	0.51	0.50	0.67	0.47
Between 25th and 50th (including 50th)	0.64	0.48	0.65	0.48	0.47	0.50
Between 50th and 75th (including 75th)	0.72	0.45	0.73	0.45	0.66	0.47
Greater than 75th	0.80	0.40	0.81	0.39	0.66	0.48

Note: Interaction between Change in Tuition & Fees and mother's education level (HS = high school). Each cell shows the likelihood of aspiring to earn a postbaccalaureate degree in 2009 for students whose tuition and fees increased by the stated percentile.

Table 6

Mean of Undergraduate Debt (Loan) by Instruments' Percentiles

Percentile of Instrument	Change in Tuition & Fees		Interaction with HS and Higher		Interaction with HS or Below	
	Mean	SD	Mean	SD	Mean	SD
Less than and including 25th	9,873.47	14,898.00	10,618.96	15,413.00	14,672.74	19,180.91
Between 25th and 50th (including 50th)	12,644.16	15,960.10	12,562.25	15,794.49	9,641.324	13,199.19
Between 50th and 75th (including 75th)	15,980.49	18,298.02	16,385.65	18,946.61	16,948.52	17,676.78
Greater than 75th	20,335.18	24,295.46	20,202.53	24,291.51	20,353.50	18,800.95

Note: Interaction is change in tuition and fees with mother's education (HS = high school). Each cell is the average amount of debt for students whose tuition and fees changed by the stated percentile.

Table 7

Mean of Federal Undergraduate Debt (Federal Loan) by Instruments' Percentiles

Percentile of Instrument	Change in Tuition & Fees		Interaction with HS and Higher		Interaction with HS or Below	
	Mean	SD	Mean	SD	Mean	SD
Less than and including 25th	6,457.258	8,868.406	7,007.503	9,369.989	8,974.502	10,114.1
Between 25th and 50th (including 50th)	8,566.762	10,086.55	8,479.243	9,952.385	6,896.448	9,482.979
Between 50th and 75th (including 75th)	10,437.96	10,595.61	10,464.06	10,493.4	12,388.2	11,677.69
Greater than 75th	10,677.68	10,431.19	10,630.99	10,465.3	12,815.66	11,537.66

Note: Interaction is change in tuition and fees interacted with mother's education (HS = high school). Each cell shows the average amount of debt for students whose tuition and fees changed by the stated percentile.

Table 8

Correlations among Key Variables for Aspirations Sample

	Loan	Federal Loan	Graduate School Aspirations	Change in Tuition and Fees	Parent's Education
Loan	1				
Federal Loan	0.68	1			
Graduate School Aspirations	0.11	0.13	1		
Change in Tuition and Fees	0.20	0.14	0.22	1	
Parent's Education	0.02	0.001	0.05	0.09	1

Note: Pearson's correlations.

loans, graduate school aspirations, change in tuition and fees, and parent's education. These relationships are generally replicated.

Focusing on graduate school enrollment, Table 9 shows the proportion of students who enroll in graduate school by percentiles of undergraduate debt. Graduate school enrollment appears to have the opposite relationship with debt. Students with higher amounts of undergraduate debt enroll in graduate school at slightly lower rates, which supports the earlier summary statistics. Table 10 shows the proportion of students who enroll in graduate school in 2009 by percentiles of the instruments. Table 11 shows the same relationship for enrollment in 2012. The relationship generally follows the same pattern as the one between enrollment and debt, though students with changes in tuition and fees above the 75th percentile consistently enroll at high rates. This indicates a nonlinear relationship between changes in tuition and fees and graduate school enrollment. Tables 12 and 13 show the average amount of cumulative debt—total loans and federal loans, respectively—over percentiles of the instruments. Students with larger changes in tuition and fees borrow more to finance their undergraduate education. Table 14 shows correlations between total cumulative loans, total federal loans, graduate school enrollment in 2009 and 2012, early-career occupation salary in 2009 and 2012, change in tuition and fees, and parental education. These relationships are generally replicated.

Table 15 reflects the relationship between early-career occupation salary and undergraduate debt. There is not as clear a linear pattern between salary and debt; for this and other previously stated reasons, I log salary and debt. Once I transform these variables, students with higher amounts of debt also have higher salaries. Tables 16 and 17 show that

Table 9

Mean of Graduate School Enrollment by Debt Percentiles, Conditioned on Having Debt

Percentile of Debt	Loan, 2009		Loan, 2012		Federal Loan, 2009		Federal Loan, 2012	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD
No debt	0.31	0.46	0.44	0.50	0.31	0.46	0.44	0.50
Less than and including 25th	0.30	0.46	0.43	0.50	0.30	0.46	0.43	0.50
Between 25th and 50th (including 50th)	0.29	0.46	0.41	0.49	0.28	0.45	0.42	0.49
Between 50th and 75th (including 75th)	0.23	0.42	0.40	0.49	0.25	0.43	0.40	0.49
Greater than 75th	0.27	0.44	0.38	0.49	0.26	0.44	0.38	0.49

Note: Each cell shows the likelihood of enrolling in graduate school for that subset of borrowers (measured in the year included in column title).

Table 10

Mean of Graduate School Enrollment by Instruments' Percentiles for 2009

Percentile of Instrument	Change in Tuition & Fees		Interaction with HS and Above		Interaction with below HS	
	Mean	SD	Mean	SD	Mean	SD
Less than and including 25th	0.31	0.46	0.30	0.46	0.28	0.45
Between 25th and 50th (including 50th)	0.26	0.44	0.27	0.44	0.29	0.45
Between 50th and 75th (including 75th)	0.27	0.44	0.27	0.44	0.22	0.42
Greater than 75th	0.29	0.45	0.29	0.45	0.32	0.47

Note: Interaction is change in tuition and fees with father's education (HS = high school). Each cell shows the likelihood of enrolling in graduate school for students whose tuition and fees changed by the stated percentile (enrollment measured in 2009).

Table 11

Mean of Graduate School Enrollment by Instruments' Percentiles for 2012

Percentile of Instrument	Change in Tuition & Fees		Interaction with HS and Above		Interaction with below HS	
	Mean	SD	Mean	SD	Mean	SD
Less than and including 25th	0.43	0.49	0.42	0.49	0.41	0.49
Between 25th and 50th (including 50th)	0.39	0.49	0.39	0.49	0.46	0.50
Between 50th and 75th (including 75th)	0.41	0.49	0.41	0.49	0.39	0.49
Greater than 75th	0.44	0.50	0.44	0.50	0.44	0.50

Note: Interaction is change in tuition and fees interacted with father's education (HS = high school). Each cell shows the likelihood of enrolling in graduate school for students whose tuition and fees changed by the stated percentile (enrollment measured in 2012).

Table 12

Mean of Undergraduate Debt (Loan) by Instruments' Percentiles

Percentile of Instrument	Change in Tuition & Fees		Interaction with HS and Higher		Interaction with HS or Below	
	Mean	SD	Mean	SD	Mean	SD
Less than and including 25th	14,411.41	15,968.97	15,331.11	16,516.74	17,915.24	18,923.51
Between 25th and 50th (including 50th)	14,805.29	15,924.62	14,829.8	15,964.91	16,519.6	14,346.66
Between 50th and 75th (including 75th)	20,046.19	18,475.41	19,807.1	18,365.37	22,720.92	18,069.78
Greater than 75th	22,987.12	22,950.08	22,938.59	23,200.11	26,264.74	19,441.54

Note: Interaction is change in tuition and fees with father's education. Each cell shows the average amount of debt for students whose tuition and fees changed by the stated percentile.

Table 13

Mean of Federal Undergraduate Debt (Federal Loan) by Instruments' Percentiles

Percentile of Instrument	Change in Tuition & Fees		Interaction with HS and Higher		Interaction with HS or Below	
	Mean	SD	Mean	SD	Mean	SD
Less than and including 25th	10,247.81	10,069.45	10,836.34	10,441.1	12,022.61	10,825.22
Between 25th and 50th (including 50th)	10,859.25	10,615.75	10,850.41	10,626.14	12,854.34	10,731.19
Between 50th and 75th (including 75th)	13,639.08	11,174.00	13,484.16	11,073.03	16,471.13	12,491.95
Greater than 75th	13,874.00	11,167.66	13,761.1	11,120.3	17,260	11,881.59

Note: Interaction is change in tuition and fees with father's education. Each cell shows the average amount of debt for students whose tuition and fees changed by the stated percentile.

Table 14

Correlations among Key Variables for Graduate School Enrollment and Salary Sample

	Loan	Federal Loan	Enroll 2009	Enroll 2012	Salary 2009	Salary 2012	Change in Tuition and Fees	Parent's Education
Loan	1							
Federal Loan	0.70	1						
Enroll 2009	-0.03	-0.03	1					
Enroll 2012	-0.03	-0.04	0.63	1				
Salary 2009	0.01	-0.01	-0.25	-0.20	1			
Salary 2012	-0.003	-0.04	-0.05	-0.10	0.51	1		
Change in Tuition and Fees	0.19	0.15	-0.02	0.005	0.06	0.04	1	
Parent's Education	-0.02	-0.04	0.004	-0.001	-0.005	-0.004	0.03	1

Note: Pearson's correlations.

Table 15

Mean of Early-Career Occupation Salary by Debt Percentiles, Conditioned on Having Debt

Percentile of Debt	Loan, 2009		Loan, 2012		Federal Loan, 2009		Federal Loan, 2012	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD
No debt	31,321.46	19,096.57	42,945.49	29,330.38	31,564.86	19,142.45	43,024.15	29,909.10
Less than and including 25th	31,322.62	18,512.86	42,942.31	29,501.05	31,368.11	18,364.90	42,864.25	29,101.75
Between 25th and 50th (including 50th)	29,291.45	16,273.89	40,368.45	24,109.38	29,915.76	17,221.46	40,781.72	23,789.59
Between 50th and 75th (including 75th)	31,404.39	17,507.01	40,084.18	22,841.35	29,899.15	16,150.62	39,863.14	23,444.16
Greater than 75th	31,305.35	16,664.53	41,853.77	24,727.62	31,897.20	17,017.14	41,315.59	24,712.35

Note: Each cell is the average salary of that subset of borrowers (measured in the year included in column title).

Table 16

Mean of Early-Career Occupation Salary by Instruments' Percentiles in 2009

Percentile of Instrument	Change in Tuition & Fees		Interaction with HS and Above		Interaction with below HS	
	Mean	SD	Mean	SD	Mean	SD
Less than and including 25th	29,831.08	17,104.85	30,043.25	17,323.74	30,918.68	17,615.87
Between 25th and 50th (including 50th)	31,214.39	18,497.32	31,367.75	18,412.83	31,323.84	19,072.16
Between 50th and 75th (including 75th)	30,902.01	16,785.96	30,836.56	16,749.07	32,020.21	16,832.29
Greater than 75th	31,876.13	17,964.82	31,801.88	17,960.3	32,321.9	16,775.41

Note: Interaction is change in tuition and fees interacted with father's education (HS = high school). Each cell shows the average salary for students whose tuition and fees changed by the stated percentile (enrollment measured in 2009)

Table 17

Mean of Early-Career Occupation Salary by Instruments' Percentiles in 2012

Percentile of Instrument	Change in Tuition & Fees		Interaction with HS and Above		Interaction with below HS	
	Mean	SD	Mean	SD	Mean	SD
Less than and including 25th	40,931.3	26,611.69	41,027.86	26,457.74	41,670.11	26,578.95
Between 25th and 50th (including 50th)	41,743.47	24,897.74	41,998.21	24,943.50	44,453.86	27,210.94
Between 50th and 75th (including 75th)	41,079.47	26,959.27	40,984.42	27,141.32	42,204.18	26,221.07
Greater than 75th	43,203.08	27,724.98	43,129.66	27,679.76	43,854.85	26,520.29

Note: Interaction is change in tuition and fees with father's education (HS = high school). Each cell shows the average salary for students whose tuition and fees changed by the stated percentile (enrollment measured in 2012).

students with larger changes in tuition and fees also generally have higher salaries (refer to Tables 12 and 13 for the relationship between the debt and the instruments).

Overall, these estimates reveal that all the debt measures are related to the outcome measures and instruments. The naïve relationships reflect that debt has a positive relationship with aspirations and salary but a negative relationship with enrollment. The previously discussed potential endogeneity in measures of debt make it difficult to draw causal inferences from these results. For causal estimates, I turn to the main analyses.

Main Analyses

All the estimates from the IV models are LATE (as previously discussed). This means that the estimates apply only to students for whom changes in the instruments (i.e., changes in tuition and fees interacted with parental education) induce them to borrow more. For the tests of the assumptions of IV, I model the two-stage least squares models without robust standard errors and then conduct the tests. Then I estimate the IV models with robust standard errors, and those are the standard errors reported in all tables.

Research question 1.A is, To what extent does undergraduate student loan debt affect postbaccalaureate educational aspirations? Table 18 shows the OLS models for graduate school aspirations (full model in Table A3). The measures for cumulative loans and federal loans both have an extremely small, statistically significant association with graduate school aspirations. Holding individual and institutional characteristics constant, a 1% increase in undergraduate loans predicts a 0.4% increase in graduate school aspirations. A 1% increase in undergraduate federal loans predicts a 0.5% increase in graduate school aspirations. A \$10,000 increase from the average amount of total loans predicts a 0.2% increase in graduate school aspirations. The same increase in the average

Table 18

Results of OLS, Dependent Variable: Graduate School Aspirations

	Loan	Federal Loan
Cumulative Loans (Log)	0.004*** (0.001)	0.005*** (0.001)
Covariates Included	X	X
Observations	8880	8880

Note: Covariates included in the models: gender, race/ethnicity, family or student income prior to postsecondary education, college entrance examination score, institutional selectivity, institutional control, institutional level, college GPA, marriage status, and the number of dependents a student has. The primary covariate of interest in the models is cumulative loans borrowed from 2003–2004 to 2008–2009 (loan) and cumulative federal loans borrowed over the same period (federal loan). Standard errors in parentheses. *** = $p < .001$. Observations are rounded due to NCES guidelines.

amount of federal loans would predict a 0.4% increase. This means that, practically, undergraduate debt has little influence on graduate school aspirations, once individual and institutional characteristics were controlled. However, due to debt's potential endogeneity, it would be more appropriate to estimate debt's relationship with graduate school aspirations by exploiting the exogenous variation in change in tuition and fees.

Table 19 shows the results from the IV models (full reduced form, first stage, and second stage models in Tables A4–A6). In both models, debt has a small, negative, statistically insignificant relationship with graduate school aspirations. There is not sufficient evidence to conclude that this finding is more than a spurious result of this particular sample. In addition, the Wu-Hausman statistic is not statistically significant (p -values of 0.165 and 0.176 for loans and federal loans, respectively). I cannot reject the null hypothesis that the OLS and the IV models produce statistically similar estimates.

The minimum eigenvalue is not large enough to allay concerns about the strength of the instruments either in size or bias (9.53 and 9.49 for loans and federal loans, respectively). I cannot reject the null hypothesis that the instruments are weak at the optimal level (at most 5% relative bias and size inflation to 0.10 significance level). However, I could reject the null hypothesis that the instruments are weak at the next critical value level (at most 10% relative bias [critical F -value 9.08] and size inflation to 0.15 significance level). Therefore, while not optimally strong, there is evidence of marginally strong instruments. This would create doubt about the point estimates for coefficients and their statistical significance (though the coefficient on debt, primary coefficient of interest, is statistically insignificant). The Sargan statistic's p -values are above conventional levels (0.697 and 0.659, respectively), so I failing to reject the null hypothesis

Table 19

Results of Two-Stage Least Squares, Dependent Variable: Graduate School Aspirations

	Loan	Federal Loan
First Stage		
Change in Average Tuition and Fees	0.88*** (0.16)	0.83*** (0.16)
Mother's Education	4.71*** (1.19)	4.36*** (1.16)
Change in Average Tuition and Fees * Mother's Education	-0.64*** (0.16)	-0.58*** (0.16)
Second Stage		
Cumulative Loans (Log)	-0.02 (0.02)	-0.02 (0.02)
Covariates Included	X	X
Observations	8880	8880
Wu-Hausman (<i>p</i> -value)	1.93 (0.165)	1.83 (0.176)
Minimum eigenvalue	9.53	9.49
<i>F</i> -bias crit, <i>F</i> -size crit	13.91, 22.3	13.91, 22.3
Sargan (<i>p</i> -value)	0.72 (0.697)	0.83 (0.659)

Note: Excluded instruments: change in average tuition and fees, mother's education, and change in average tuition and fees interacted with mother's education. Covariates included in the models: gender, race/ethnicity, family or student income prior to postsecondary education, college entrance examination score, institutional selectivity, institutional control, institutional level, college GPA, marriage status, and the number of dependents a student has. The primary covariate of interest in the models is cumulative loans borrowed from 2003–2004 to 2008–2009 (loan) and cumulative federal loans borrowed over the same period (federal loan). Standard errors in parentheses. *** = $p < .001$. Observations are rounded due to NCES guidelines.

that the instruments are exogenous and not systematically related to the second stage error term. In general, this leads me to prefer the OLS estimates, which still estimate a practically small influence of debt on graduate school aspirations. Therefore, in answer to research question 1.A, I find no evidence that larger amounts of debt inhibit students from aspiring to attend graduate school.

Research question 1.B is, To what extent does undergraduate student loan debt affect postbaccalaureate educational enrollment? Similar to graduate school aspirations, the OLS models for graduate school enrollment reveal a small influence of undergraduate debt on graduate school enrollment (Table 20, full model in Table A7). In 2009, increasing either loans or federal loans by 1% predicts a 0.4% decrease in graduate school enrollment. By 2012, this relationship attenuates but only to 0.3%. All the models show a small, negative, statistically insignificant relationship between undergraduate debt and graduate school enrollment. The IV models give a clearer picture (Table 21, full reduced form, first stage, and second stage models in Tables A8–A10). A 1% increase in cumulative loans causes a 7% decrease in the likelihood of a student enrolling in graduate school in 2009 and an 8% decrease for all other models, holding individual and institutional characteristics constant.

Wu-Hausman statistics all reject the null hypothesis that OLS and IV models produce statistically similar estimates, while the smallest minimum eigenvalue F is 33.91, which rejects the null hypothesis of weak instruments. At most, there is 5% inflation in the relative bias and increase in size of the Wald statistic significance level to .10. Also, the models' Sargan statistics are all statistically insignificant, therefore failing to reject the null hypothesis that the instruments are exogenous. Based on these tests, the results are

Table 20

Results of OLS, Dependent Variable: Graduate School Enrollment

	Loan		Federal Loan	
	2009	2012	2009	2012
Cumulative Loans (Log)	-0.004*** (0.001)	-0.003** (0.001)	-0.004*** (0.001)	-0.003** (0.001)
Covariates Included	X	X	X	X
Observations	9820	9820	9820	9820

Note: Covariates included in the models: age at start of postsecondary education, gender, race/ethnicity, family or student income prior to graduation, college entrance examination score, undergraduate grade point average, marriage status, the number of dependents a student has, first institution selectivity, first institution control, and first institution level. The primary covariate of interest in the models is cumulative loans borrowed during the postsecondary career (loan) and cumulative federal loans borrowed over the same period (federal loan). Standard errors in parentheses. ** = $p < .01$; *** = $p < .001$. Observations are rounded due to NCES guidelines.

Table 21

Results of Two-Stage Least Squares, Dependent Variable: Graduate School Enrollment

	Loan		Federal Loan	
	2009	2012	2009	2012
First Stage				
Change in Average Tuition and Fees	0.84*** (0.13)	0.84*** (0.13)	0.78*** (0.13)	0.78*** (0.13)
Father's Education	2.55** (0.96)	2.55** (0.96)	2.19* (0.96)	2.19* (0.96)
Change in Average Tuition and Fees * Father's Education	-0.38** (0.13)	-0.38** (0.13)	-0.33* (0.13)	-0.33* (0.13)
Second Stage				
Cumulative Loans (Log)	-0.07*** (0.01)	-0.08*** (0.01)	-0.08*** (0.01)	-0.08*** (0.01)
Covariates Included	X	X	X	X
Observations	9820	9820	9820	9820
Wu-Hausman (<i>p</i> -value)	43.31 (0.000)	47.99 (0.000)	44.68 (0.000)	48.56 (0.000)
Minimum eigenvalue	37.18	37.182	33.91	33.91
<i>F</i> -bias crit, <i>F</i> -size crit	13.91, 22.3	13.91, 22.3	13.91, 22.3	13.91, 22.3
Sargan (<i>p</i> -value)	3.90 (0.142)	2.23 (0.329)	3.19 (0.203)	1.75 (0.416)

Note: Excluded instrument: change in average tuition and fees, father's education, and change in average tuition and fees interacted with father's education. Covariates included in the models: age at start of postsecondary education, gender, race/ethnicity, family or student income prior to graduation, college entrance examination score, undergraduate grade point average, marriage status, the number of dependents a student has, first institution selectivity, first institution control, and first institution level. The primary covariate of interest in the models is cumulative loans borrowed during the postsecondary career (loan) and cumulative federal loans borrowed over the same period (federal loan). Standard errors in parentheses. * = $p < 0.05$; ** = $p < .01$; *** = $p < .001$. Observations are rounded due to NCES guidelines.

consistent with the assumption that undergraduate debt is endogenous, the instruments are sufficiently strong and relevant, and the instruments satisfy the exclusion restriction. Therefore, the estimate for undergraduate debt satisfies the assumptions of LATE.

The average amount of debt is \$18,000 in loans and \$12,000 in federal loans, which means a 1% increase would be \$180 and \$120, respectively. Twenty-eight percent of students enroll in graduate school by 2009 and the standard deviation is 45%. The number of students enrolling increases to 42% by 2012, with a standard deviation of 49%. That means an increase of \$180 in cumulative loans and \$120 in federal loans cause a decrease in enrollment of approximately 0.002 of a standard deviation in both 2009 and 2012. Imagining these effects for a more standard change in debt is illuminating. A \$10,000 increase in total loans would cause a 3% and 4% decrease in graduate school enrollment in 2009 and 2012, respectively. A \$10,000 increase in federal loans would cause a 5% decrease in graduate school enrollment in both years. Therefore, in answer to research question 1.B, I find evidence that increased undergraduate debt decreases the likelihood of recent bachelor's degree earners enrolling in graduate school.

Research question 1.C is, To what extent does undergraduate student loan debt affect postbaccalaureate early-career occupation salary? The OLS models for early-career occupation salary result in small, statistically insignificant estimates (Table 22, full model in Table A11). The IV models give stronger evidence on the relationship between debt and early-career salary (Table 23, full reduced form, first stage, and second stage models in Tables A12–A14). In 2009, a 1% increase in total loans or federal loans causes a 0.1% and 0.11% increase in salary, respectively. In 2012, this relationship strengthens and a 1% increase causes a 0.18% increase in salary for both types of loans.

Table 22

Results of OLS, Dependent Variable: Salary

	Loan		Federal Loan	
	2009	2012	2009	2012
Cumulative Loans (Log)	0.003 (0.002)	0.010 ⁺ (0.005)	0.001 (0.002)	0.009 ⁺ (0.005)
Covariates Included	X	X	X	X
Observations	8030	8030	8030	8030

Note: Covariates included in the models: age at start of postsecondary education, gender, race/ethnicity, family or student income prior to graduation, college entrance examination score, undergraduate grade point average, marriage status, the number of dependents a student has, first institution selectivity, first institution control, and first institution level. The primary covariate of interest in the models is cumulative loans borrowed during the postsecondary career (loan) and cumulative federal loans borrowed over the same period (federal loan). Standard errors in parentheses. + = $p < 0.10$. Observations are rounded due to NCES guidelines.

Table 23

Results of Two-Stage Least Squares, Dependent Variable: Salary

	Loan		Federal Loan	
	2009	2012	2009	2012
First Stage				
Change in Average Tuition and Fees	0.83*** (0.16)	0.83*** (0.16)	0.77*** (0.16)	0.77*** (0.16)
Father's Education	2.70* (1.19)	2.70* (1.19)	2.39* (1.19)	2.39* (1.19)
Change in Average Tuition and Fees * Father's Education	-0.40* (0.16)	-0.40* (0.16)	-0.35* (0.16)	-0.35* (0.16)
Second Stage				
Cumulative Loans (Log)	0.10*** (0.02)	0.18* (0.08)	0.11*** (0.03)	0.18* (0.08)
Covariates Included	X	X	X	X
Observations	8030	8030	8030	8030
Wu-Hausman (<i>p</i> -value)	28.96 (0.000)	9.220 (0.002)	30.60 (0.000)	9.13 (0.003)
Minimum eigenvalue	26.27	26.27	24.07	24.07
<i>F</i> -bias crit, <i>F</i> -size crit	13.91, 22.3	13.91, 22.3	13.91, 22.3	13.91, 22.3
Sargan (<i>p</i> -value)	3.04 (0.219)	1.01 (0.604)	2.44 (0.295)	1.16 (0.561)

Note: Excluded instrument: change in average tuition and fees, father's education, and change in average tuition and fees interacted with father's education. Covariates included in the models: age at start of postsecondary education, gender, race/ethnicity, family or student income prior to graduation, college entrance examination score, undergraduate grade point average, marriage status, the number of dependents a student has, first institution selectivity, first institution control, and first institution level. The primary covariate of interest in the models is cumulative loans borrowed during the postsecondary career (loan) and cumulative federal loans borrowed over the same period (federal loan). Standard errors in parentheses. * = $p < 0.05$; *** = $p < .001$. Observations are rounded due to NCES guidelines.

Wu-Hausman statistics are all statistically significant, thus rejecting the null hypothesis that OLS and IV models produce statistically similar estimates. The smallest minimum eigenvalue is 24.07, and with the previously mentioned critical values, I reject the null hypothesis of weak instruments. The Sargan statistics are all statistically insignificant, which again fails to reject the null hypothesis that the instruments are exogenous. Based on these tests, the results are consistent with the assumption that undergraduate debt is endogenous, the instruments are sufficiently strong and relevant, and the instruments satisfy the exclusion restriction. Therefore, the estimate for undergraduate debt satisfies the assumptions of LATE.

The average amount of salary in 2009 is \$31,000 and in 2012 is \$42,000, which means the increases of approximately 0.1% and 0.18% for the average student are \$30 and \$80. Therefore, an increase of \$180 in cumulative loans or \$120 in federal loans (1% increase) causes an increase in salary of \$30 in 2009 and \$80 in 2012. These are relatively small amounts, but for students who have larger changes in the amount of debt, they could be practically significant. A \$10,000 increase in total loans causes an increase in salary of \$1,550 (5% increase) in 2009 and of \$3,410 (11% increase) in 2012. A \$10,000 increase in federal loans causes an increase in salary of \$2,100 (5% increase) in 2009 and of \$4,620 (11% increase) in 2012. These figures could both be practically significant for students. For total loans, these changes correspond to 0.09 and 0.13 of a standard deviation change in 2009 and 2012, respectively. For federal loans, these changes correspond to 0.12 and 0.17 of a standard deviation change in 2009 and 2012, respectively. Therefore, in answer to research question 1.C, I find evidence that increased undergraduate debt increases recent bachelor's degree earners' early-career occupation salaries.

The prior estimates from the IV models are applicable to only a certain type of student. The interaction between change in tuition and fees with parental education (which is particularly critical to test that the instruments do not have a direct effect on the outcomes of interest) complicates the interpretation. To investigate how robust the estimates are without the additional treatment effect restrictions, I also model the relationship between debt and postbaccalaureate decision-making using just identified models with change in tuition and fees as the sole instrument (full reduced form, first stage, and second stage models in Tables A15–23). The estimates are qualitatively similar to the overidentified models in estimate size, direction, and significance. Similar to the overidentified models, the aspirations model is not as efficient as an OLS model would have been, and the enrollment and salary models uphold the assumptions of instrument relevance and exclusion.

Subpopulation Analyses

I conduct the same analyses for race/ethnicity and income subpopulations. The primary racial comparison of interest for this work is between White and African American students because both the prior research and the summary statistics previously outlined show that African American students generally hold higher amounts of undergraduate debt. I present estimates for models run for students who self-identified as White, African American, Latino, Asian, and other race in Tables A24–A83 (these include full OLS, reduced form, first stage, and second stage models for all race/ethnicity subpopulation analyses).

For graduate school aspirations, African American students have marginally statistically significant estimates. There is suggestive evidence that a 1% increase in total or federal loans caused a 5% decrease in graduate school aspirations. Unlike the full

sample, Wu-Hausman statistics for the African American students' models are all statistically significant, therefore rejecting the null hypothesis that OLS and IV models would produce statistically similar estimates. The minimum eigenvalues are not large enough to allay worries about the strength of the instruments either in size or in bias (10.21 and 9.19 for loans and federal loans, respectively). I cannot reject the null hypothesis that the instruments are weak at the optimal level (at most 5% relative bias and size inflation to 0.10 significance level). However, I could reject the null hypothesis that the instruments are weak at the next critical value level (at most 10% relative bias [critical F -value 9.08] and size inflation to 0.15 significance level). Therefore, there is evidence of marginally strong instruments, though it is not optimally strong. This creates doubt about the point estimate bias of the coefficient estimates and their statistical significance. The Sargan statistic's p -values are above conventional levels, which fails to reject the null hypothesis that the instruments are exogenous and the instruments are not systematically related to the second stage error term. The full sample estimates for graduate school aspirations are generally positive in OLS models with a small, statistically insignificant, and negative IV second stage estimate for debt's effect. That negative IV second stage estimate appears to be driven primarily by African American students and partially by Asian and other race students. The estimates from the Asian and other race subpopulation models are statistically insignificant, with weak instrument relevance (potentially due to the smaller sample size).

For both graduate school enrollment and early-career occupation salary, the models for White students show generally relevant instruments that uphold the exclusion restriction. I predict that a 1% increase in total loans would cause an 11% decrease in

graduate school enrollment. For federal loans, it would cause a 12% decrease. I predict that a 1% increase in either total or federal loans would cause a 0.12–0.14% increase in salary in 2009, climbing to 0.22–0.24% in 2012. The models for African American students have generally weak instruments (small minimum eigenvalues), likely due, in part, to the smaller sample size. Therefore, while the estimates are similar in sign (negative with enrollment and positive with salary), none of the coefficient estimates are statistically significant. With the instrument relevance issues, the African American models do not yield credible causal estimates.

Focusing on prior income, I present the estimates for students from low-income to high-income backgrounds in Tables A84–A131 (includes full OLS, reduced form, first stage, and second stage models for all income subpopulation analyses). The instrument relevance for both low- and high-income students is weak for graduate school aspirations models. The estimates are all small, statistically insignificant, and negative. Due to the instrument relevance issues, these are not credible causal estimates. For graduate school enrollment and salary, low-income student models show strong evidence for causal estimates (Wu-Hausman statistics statistically significant; smallest minimum eigenvalue of approximately 21 or 14; Sargan statistically insignificant). A 1% increase in either total or federal undergraduate debt caused a 5% decrease in graduate school enrollment in 2009 and a 4% decrease in 2012. There is marginal evidence as well that a 1% increase in either measure of debt caused a 0.05% increase in salary in 2009 (at the 0.10 significance level).

Prior research and summary statistics from this work suggest that the students in the middle of the prior income distribution might be the most affected by undergraduate debt. The aspirations models have weak instrument relevance. Except for graduate school

enrollment for mid- to low-income students, instrument relevance and exogeneity is inconsistent, which leads me to question the credibility of the estimates from those models. For mid- to low-income students, a 1% increase in undergraduate debt caused an 8–9% decrease in graduate school enrollment.

These subpopulation analyses point to low-income and mid- to low-income students as the primary drivers of the full sample relationships. However, due to sample size limitations for the race/ethnicity subpopulation analyses, it is difficult to exclude the possibility that race/ethnicity also moderates the relationship between undergraduate debt and postbaccalaureate decision-making.

Robustness Check

As discussed in the methods section, the capacity of different states to provide graduate school education or early-career occupation opportunities or differential rates of changes in tuition and fees based on revenues could influence the estimates.

I present the graduate school aspirations state specification results in Tables A132–A135. The first two columns present estimates with home state fixed effects and the second two columns present estimates with post-college enrollment state fixed effects. All primary estimates are qualitatively similar (in direction and magnitude), but the IV models now produce statistically different estimates from OLS (Wu-Hausman statistic is statistically significant) and continue to provide evidence that the instruments are exogenous and not systematically related to the second stage error term (Sargan statistics' p -values remain above conventional levels of .05).

Tables A136–A143 show the graduate school enrollment state specification results. For both the home state and post-college state specifications, the estimates are all

qualitatively similar. The IV models produce statistically different estimates from OLS (Wu-Hausman statistic is statistically significant), sufficiently strong instruments (minimum eigenvalues greater than 22.3), and support instrument exogeneity (Sargan statistics' p -values above .05).

Tables A144–A151 show the early-career occupation state specification results. For both the home state and post-college state specifications, the estimates are all qualitatively similar. The IV models produce similarly credible causal estimates, except for the relative size critical value (lowest minimum eigenvalue obtained is 19.66).

Overall, regardless of controlling for home or post-college enrollment state characteristics, the main analysis relationships hold: Increasing undergraduate debt decreases graduate school enrollment and increases early-career occupation salary.

Conclusion

I find no evidence that larger amounts of debt inhibit students from *aspiring* to attend graduate school, but I do find evidence that increased undergraduate debt decreases the likelihood of recent bachelor's degree earners enrolling in graduate school and increases their early-career occupation salaries. Due to the generalizability restrictions of the methods, these findings apply solely to recent bachelor's degree earners for whom changes in tuition and fees induce changes in borrowing behaviors. This generalizability restriction contextualizes the policy and practice relevance of these findings (discussed in the final chapter). In the next chapter, I apply the previously outlined conceptual framework to the qualitative analysis of research question 2: How do underrepresented students conceptualize undergraduate debt and their repayment options, and how does this change closer to time of repayment?

CHAPTER V

INVESTIGATION 2: A CASE STUDY OF UNDERGRADUATE DEBT, REPAYMENT PLANS, AND POSTBACCALAUREATE DECISION-MAKING

The Higher Education Act (HEA) of 1965 originally targeted the neediest students for student financial aid (Dynarski & Scott-Clayton, 2013). Over time, with new laws such as the Middle Income Assistance Act (1978) and the reauthorization of the HEA in 1992, which created non-means-tested loans (Stafford unsubsidized loan), the scope and complexity of aid programs has grown. This expansion resulted in 60% of college graduates from public and private not-for-profit institutions in AY 2012–2013 graduating with debt (College Board, 2014), which left a majority of college graduates in the unfortunate position of assessing how to repay their undergraduate student loans. The year 2011 saw the highest cohort default rate on federal student loans in more than 15 years (College Board, 2012). Furthermore, 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 (U.S.D.O.E. National Center for Education Statistics, 2013). These potential adverse effects appear to affect minority students disproportionately. For example, debt burden is one measure of a student's ability to meet repayment requirements. Approximately 24% of African American graduates held debt burden greater than 8%, whereas 21% of White graduates held an excessive debt burden (Price, 2004). This raw difference is significant, but smaller than might be anticipated. Controlling for individual and institutional characteristics, African American college graduates in 1997 had a 1.5 times greater risk than their White peers of having a debt burden over 8%, which was declared the excessive cutoff by the federal government (Price, 2004).

Research illuminating the influence of undergraduate debt on postbaccalaureate decision-making and how underrepresented students create their belief structures about undergraduate debt and postbaccalaureate options could aid in explicating why these students do not appear to make the same choices as their peers. Even when controlling for graduate school aspirations, African American students are less likely to enroll in graduate school and more likely to report a change in their postbaccalaureate career plans due to their undergraduate debt (Baum & Saunders, 1998; Weiler, 1994). These students are more likely than their peers, particularly White peers, to borrow; to borrow at higher rates; to have higher monthly debt burdens; and to default on repayment. Evidence generally points to these students being less likely to enroll in postbaccalaureate education unless they are compared to their peers (generally White students) who are at the same amount of undergraduate debt, self-report the same demographics, and attend similar institutions. African American students disproportionately come from low-income backgrounds, take longer to graduate, borrow more, and are less likely to come from families with abundant social and cultural capital. This means that, without artificially created statistically equal conditions, these students face larger hurdles to their postbaccalaureate decision-making. Research question 2 asks:

How do underrepresented students conceptualize undergraduate debt and their repayment options? How does this change closer to time of repayment?

My goal for this study is to gather and analyze evidence that could clarify the nuanced relationship between human capital theory and loan/debt aversion and how this relationship changes over time (part of the reassessment cycle mentioned in my conceptual framework). As a refresher, I posit that before college enrollment, students select a major

and choose postbaccalaureate plans, such as to enter an occupation or to attain a postbaccalaureate degree directly after graduating. While they are in college, their tuition increases. Students choose to borrow or not to borrow in order to continue attending the initial institution. If students do choose to borrow the additional amount, they must evaluate and reassess their prior decision of an occupation or attending graduate school. This reassessment can happen several times during the students' undergraduate career. The analysis in this chapter focuses on the process of reassessment students with undergraduate debt experience while making postbaccalaureate education and occupation decisions.

It is difficult to disentangle the processes that produce quantitative evidence on this topic. Understanding undergraduate debt's effect requires understanding why students react to an increase in cumulative loan amounts by choosing not to enroll in graduate school or choosing higher-salary early-career occupations. Qualitative data provides the potential for deeper clarification of the processes students use to make postbaccalaureate decisions and for further refinement of my conceptual framework, particularly with regard to how the reassessment process occurs.

In this chapter, I outline the research methods first. I discuss the participants, sampling strategy, data sources, data analysis methods, and my background as a researcher. I follow this by sharing the results of the qualitative interviews. This includes the emergent themes of timing and structure of information, family as a source of knowledge, comfort with amount borrowed, and postbaccalaureate decision-making. I end the results section with a discussion of the connections between qualitative and quantitative results and conclusions.

Research Methods

Participants

I interviewed six undergraduate students who held federal undergraduate loans and graduated from an HBCU. The institution the students graduated from, referred to as Southern University (SU), is located in the southern region of the United States. SU is a small, private institution. At the end of AY 2014–2015, approximately 60 students who borrowed federal undergraduate loans graduated. Of those students, 80% were female and the average cumulative amount borrowed was almost \$23,000 in combined Federal Direct Subsidized and Unsubsidized loans. In the closest comparison year (2013–2014), approximately 64% of all U.S. college graduates from private not-for-profit institutions borrowed to finance their undergraduate education (College Board, 2015). On average, private not-for-profit college graduates in the same year who used undergraduate loans to finance their undergraduate education borrowed \$30,200 (College Board, 2015). Therefore, SU follows national trends on the number of students who borrow, though the cumulative amount is smaller than the national average.

Sampling

A member of the Office of Financial Aid sent out my recruitment email for this study to all students who had completed or would be completing repayment counseling on their federal student loans (see Appendix B, Item B1). Those students then had the opportunity to contact me if interested in participating in the study. I employed this purposive sampling method due to the highly sensitive nature of the information about the students. SU was unable to grant me access to financial aid data on its students, which would have allowed me to sample students randomly or to contact all students directly. Unfortunately, this also

meant that I could not stratify the sample based on gender or the cumulative amount of loans borrowed by the students. Thus, the sample comprises five women who were presumably eager to discuss their undergraduate debt (10% response rate). To increase the sample size, I asked students after completing their interview if they knew of anyone else who would be a good fit for the research study (snowball sampling). This produced one additional participant, who brought the total up to six.

Data Sources

I used both document/artifact analysis and semi-structured interviews with these recent graduates of SU. The document analysis included close reading of the United States Department of Education website and publicly available financial aid documentation from SU. I analyzed both the Department of Education's Financial Aid website (U.S. Department of Education, 2015b) and the Federal Student Aid website (a more user-friendly version, U.S. Department of Education, 2015a). I analyzed approximately 40 documents on the student loan process in the United States and the options for students to repay those loans (see Table 24).

I conducted semi-structured one-on-one telephone interviews with recent SU graduates. As recommended by Yin (2003), I developed interview protocols based on the conceptual framework and review of the literature (see Appendix B, Items B2 and B3). The focus of the interviews was how students conceptualize undergraduate debt and their repayment options. I interviewed participants at two different points in time, referred to as phase one

Table 24

Artifacts Analyzed

Southern University	Source	
Descriptions of types of aid	Website	[Confidential]
Entrance and exit counseling	Website	[Confidential]
Financial aid summary checklist	Website	[Confidential]
Handbook on financial aid	Paper	
Key financial aid terms	Website	[Confidential]
U.S. Department of Education		
Aid for military families website	Website	https://studentaid.ed.gov/sa/types/grants-scholarships/military
Basic eligibility criteria website	Website	https://studentaid.ed.gov/sa/eligibility/basic-criteria
Basics for students	Paper	https://studentaid.ed.gov/sa/sites/default/files/direct-loan-basics-students.pdf
Be a responsible borrower: Plan ahead and graduate with less debt	Paper	https://studentaid.ed.gov/sa/sites/default/files/responsible-borrower.pdf
Choose a career school carefully	Paper	https://studentaid.ed.gov/sa/sites/default/files/choose-school.pdf
Comparing federal and private student loans graphic	Paper	https://studentaid.ed.gov/sa/sites/default/files/federal-vs-private-loans-graphic.png
Deferment and forbearance website	Website	https://studentaid.ed.gov/sa/repay-loans/deferment-forbearance
Don't get scammed on your way to college!	Paper	https://studentaid.ed.gov/sa/sites/default/files/dont-get-scammed.pdf
Entrance counseling module	Website	https://studentloans.gov/myDirectLoan/entranceCounseling.action?execution=e2s1
Exit counseling module	Website	https://studentloans.gov/myDirectLoan/exitCounseling.action?execution=e5s1
Federal student aid and identity theft	Paper	https://studentaid.ed.gov/sa/sites/default/files/student-aid-and-identity-theft.pdf
Federal student loan programs	Paper	https://studentaid.ed.gov/sa/sites/default/files/federal-

		loan-programs.pdf
Federal student loans	Website	https://studentloans.gov/myDirectLoan/index.action
Federal Student Loans: Direct PLUS loan basics for parents	Paper	https://studentaid.ed.gov/sa/sites/default/files/direct-loan-basics-parents.pdf
Financial awareness counseling module	Website	https://studentloans.gov/myDirectLoan/financialAwarenessCounseling.action?execution=e3s1
Forgiveness, cancellation, and discharge website	Website	https://studentaid.ed.gov/sa/repay-loans/forgiveness-cancellation
Getting a federal student loan graphic	Paper	https://studentaid.ed.gov/sa/sites/default/files/get-loan.png
Glossary	Website	https://studentloans.gov/myDirectLoan/glossary.action
How to repay your loans website	Website	https://studentaid.ed.gov/sa/repay-loans
Income-driven repayment plans for federal student loans	Paper	https://studentaid.ed.gov/sa/sites/default/files/income-driven-repayment.pdf
Interest rates and fees website	Website	https://studentaid.ed.gov/sa/types/loans/interest-rates
Loans overview website	Website	https://studentaid.ed.gov/sa/types/loans
Non-U.S. citizens website	Website	https://studentaid.ed.gov/sa/eligibility/non-us-citizens
Peace Corps and repayment of your federal student loans	Paper	https://studentaid.ed.gov/sa/sites/default/files/peace-corps-and-loan-repayment_1.pdf
Public service loan forgiveness program	Paper	https://studentaid.ed.gov/sa/sites/default/files/public-service-loan-forgiveness.pdf
Repaying your loans	Paper	https://studentaid.ed.gov/sa/sites/default/files/repaying-your-loans.pdf
Repayment calculator	Website	https://studentloans.gov/myDirectLoan/mobile/repayment/repaymentEstimator.action
Trouble making your federal student loan payments? Graphic	Paper	https://studentaid.ed.gov/sa/sites/default/files/trouble-paying-graphic.png
Understanding default website	Website	https://studentaid.ed.gov/sa/repay-loans/default
When it's time to repay graphic	Paper	https://studentaid.ed.gov/sa/sites/default/files/repayment-plans-graphic.png
Why get a federal student loan?	Paper	https://studentaid.ed.gov/sa/sites/default/files/why-get-fed-loan.pdf

Consumer Financial Protection Bureau		
Repay student debt	Website	http://www.consumerfinance.gov/paying-for-college/repay-student-debt/#Question-1:federal
Federal Trade Commission		
Student loans	Paper	https://www.consumer.ftc.gov/articles/pdf-0048-student-loans.pdf

and phase two. As these interviews were semi-structured, I allowed participants to deviate from the protocol if interesting and relevant information emerged. In phase one, I interviewed students during the summer directly after the students graduated in 2015. Participants received a \$25 gift card as compensation. In phase two, I interviewed each student again at least 6 months after graduation, closer to the time when the students must make repayment decisions with the federal government. Participants received a \$15 gift card for participating in the second interview. This follow-up interview was critical because research shows that students generally cannot correctly estimate the dollar amount of student loans they have borrowed while still enrolled (Akers & Chingos, 2014; Andruska et al., 2014). During these interviews, I wrote field notes for each student. After each interview, audio recordings were transcribed verbatim. Phase one interviews lasted approximately 1 hour and phase two interviews lasted approximately 30 minutes. The Vanderbilt University and SU Institutional Review Boards approved this research.

Data Analysis Methods

Once the interviews were transcribed, I used NVivo 11 software to analyze the data in an iterative process. First, I read the full transcripts and expanded on the field notes written while I interviewed the students. These field notes included methodological notes and theoretical notes on emerging themes. From there, I read the transcripts again and coded them for broad categories influenced by the previously created methodological and theoretical notes. In the pilot study of the interview protocol, general categories such as “amount of debt as a moderator,” “family,” and “comfort with debt” emerged, and so I expected these themes to be present in the actual interviews. At this point, I wrote memos summarizing the emerging themes in each interview. I sent the memos to the participants

to give them the opportunity to correct any of the interpretations (member check-ins; Lincoln & Guba, 1985). None of the participants responded. During this entire analytical process, I discussed the emerging themes and field notes with a peer debriefer to get a second opinion on the analysis and to make sure I was acknowledging and attempting to minimize my personal biases in interpreting participants' statements. Once I had coded all the transcripts for the macro concepts and more granular facets, I analyzed the coding on all the transcripts in order to code for themes across students.

Background of Researcher

I am a doctoral candidate who is dedicated to studying how loans affect college students. I have previously worked as an assistant dean of admissions in charge of low-income and first-generation college students and as a financial aid liaison for a selective institution in the southeastern United States. This practical experience led to a deep understanding of the student financial aid process, particularly loans and the effects they can have on students' postbaccalaureate decision-making. I gained this experience at a selective public institution in the same region of the country as SU. I acknowledge that the financial aid priorities might have been different for the two institutions, but the manner of packaging students' financial aid awards were similar (based on informal conversations with staff in SU's financial aid office).

Limitations

The qualitative portion of this dissertation has a small number of participants, primarily because of two issues. First, in order to gain permission from an institution to participate in this research, I had to allow the Office of Financial Aid to contact the population of students completing exit counseling and graduating that year. Although this

could have made students take the email more seriously, it also limited the number of times potential participants were contacted about participating in the study. It would have been useful to be able to contact students directly about participation in this research. Second, the timing of the first email to students, April 2015, was likely an extremely busy time as students prepared for graduation and/or moving away from college. The Office of Financial Aid sent follow-up emails after graduation in order to mitigate this. If I had been able to participate in SU's loan counseling session and meet with students, I believe I would have a larger sample. In future work building on this study, I plan to attend at least one on-campus event that will allow me to build rapport with and increase the participation rates in future research.

Having several sources of data for triangulation would have been advantageous. As previously mentioned, SU could not give me actual cumulative loan amounts for each student, so I could not verify the figures students reported to me in our interviews. Future research will also involve interviews with stakeholders in counseling students on loan repayment and students not attending HBCUs (as contrast cases). This, in addition to more interviews with students at more institutions, should create a more robust compilation of data about perceptions of undergraduate student loan debt and its influences on the future decision-making of underrepresented students.

Results

I conducted interviews with six recent SU graduates. I use pseudonyms to protect participants' confidentiality in the results that follow. Table 25 gives a brief overview of each student from SU.

Table 25

Information about Participating Students

Pseudonym	Amount of Debt Phase One	Amount of Debt Phase Two
Amanda	\$10,000–\$19,999	\$10,000–\$19,999
Sandra	\$10,000–\$19,999	\$30,000–\$39,999
Jocelyn	\$50,000+	\$50,000+
Annie	<\$2,500	\$10,000–\$19,999
Nicole	\$20,000–\$29,999	\$20,000–\$29,999
Cecelia	\$50,000+	\$50,000+

Graduates borrowed a combination of Direct Loans, subsidized and unsubsidized, from the federal government. At least three of these graduates had parents who also borrowed PLUS loans. The students were 21–22 years old when they graduated from SU. All the graduates self-identified as African American, Black, or Black American and reported majoring in either social sciences or humanities fields.

The primary themes I found with regard to undergraduate debt and postbaccalaureate decision-making were timing and structure of information, family as a source of knowledge, comfort/discomfort with the amount borrowed, and realities of postbaccalaureate decision-making. Based on the conceptual framework, I expected that timing and structure of information on undergraduate borrowing and repayment would be critical to students' conceptions of undergraduate debt and postbaccalaureate decision-making. Though I never directly asked about families in the interview protocols, students consistently pointed to their families as primary sources of knowledge about

undergraduate debt and repayment. This aligns with the general emphasis in prior research on parents' transfer of knowledge and financial and cultural capital to their children, which influences children's decision-making (Houle, 2013). I directly probed students about their comfort with the amount borrowed and the realities of postbaccalaureate decision-making; therefore, it is not surprising that students provided information on these topics.

Timing and Structure of Information

SU students directly reported that the sources they consulted for information on loan repayment were federal exit counseling (all six), friends (four), family (two), federal government websites (two), loan servicers (one), and job recruiters (one). During the phase one interviews, students reported finding the federally mandated exit counseling useful in preparing them for understanding their monthly repayment. Exit counseling involved students completing an internet module created by the federal government that covers how students can repay their federal student loans. The module outlined the cumulative amount the student owed (including interest) as well as the monthly payment based on the student's repayment options. Students were required to complete exit counseling in order to obtain their degree or their transcript from SU. To be clear, students would often refer to federal exit counseling as "the pie chart" or "the website where I found out how much I have to pay." Only twice during all the interviews, both phase one and phase two, did students actually refer to exit counseling by name. Annie, who reported borrowing less than \$2,500 during the phase one interview, said, "I recently completed the exit counseling for the loan, so that was most recently what really helped me, you know, concretely set pay, schedule the pay in the amount that I'm comfortable with." She, and

three other students, said the exit counseling put her debt in perspective and helped her to conceptualize the amount she owed. This benefit of exit counseling was sometimes overshadowed by its timing during the undergraduate's career. SU students emphasized that the timing of counseling on borrowing and repayment of their undergraduate debt was critical.

The federal government mandates entrance counseling when students begin their postsecondary studies if the students are borrowing federal loans. The next time students are mandated to participate in financial counseling is when they are graduating and therefore exiting the institution. During both phase one and phase two interviews, no graduates had any recollection of income-based repayment plans (even though I brought them up at the end of phase one interviews); they discussed deferring loans only in relation to a relative or friend who had previously done so. It is not surprising then that five of the six graduates did not find the federally mandated exit counseling to be enough preparation. Amanda, who reported borrowing between \$10,000 and \$19,999, discussed the issues with the timing of exit counseling in her phase one interview.

I had the freshman introductory blah blah blah, here's the loans. I don't recall them saying my loans would start accumulating [interest]. There's no follow-up during sophomore or junior year. I heard during the final semester from an underclassman...They know that you're not interested [as a] freshman so they don't spend as much time on the introductory mandatory entrance counseling...Moving forward, I hope that the financial aid office is a little more proactive in reaching out to students and making sure to reach out to students to make sure they are given correct and complete information regarding their loans. A lot of what you hear about loans in college is hearsay and unless you sit down with someone from financial aid it's hearsay.

While it is likely that the entrance counseling did include interest rate accumulation for unsubsidized loans, Amanda reported having no knowledge of this accumulation until she completed exit counseling. She said, "Had I known I was going to start accumulating

interest while I was in school I would've used the money to pay it off." She also emphasized that the financial aid office should be more proactive in contacting students to share information about financial aid. Students did have the ability to contact financial aid administrators at any time to arrange a meeting to discuss their undergraduate debt. However, five of the six participants indicated that they did not know there was a deficit in their understanding of their debt and repayment, which made it unlikely that they would have approached an administrator. Unease with the timing of information delivery was common. Sandra, who reported borrowing between \$10,000 and \$19,999, discussed a session SU held for graduating seniors about financial aid.

Me: Did [SU] do anything?

Sandra: They did but it was not helpful. It was during graduation season, a couple of weeks before graduation, people were trying to graduate and had exams so no one went. Even though in my head I was like "Oh it's important I should go" ...send me emails at the end of the semester it seems like you don't care and if you don't care, why should I care?

Sandra's quote highlights a sentiment about the SU loan programming shared by the other five graduates. They perceived the timing of both the federally mandated exit counseling and the SU-specific loan discussion as being too late to affect actual borrowing behaviors. During the phase one interviews, Annie was the only SU graduate who mentioned feeling more secure in making decisions about repayment based on the federal exit counseling. She also reported the smallest amount of undergraduate debt (less than \$2,500). When I questioned students about their experiences with federal exit counseling, the five who were dissatisfied all discussed wishing they had a better understanding of how much they were borrowing each year. The intention of federal exit counseling is not to notify students of cumulative debt amounts at the end of each academic year (U.S. Department of Education, 2016); its intention is to prepare students for entering

repayment once they leave higher education. Thus, it appeared that part of the dissatisfaction with exit counseling stemmed from a lack of information on topics that exit counseling was never intended to affect.

The conceptual framework posits that students can reassess their postbaccalaureate decision-making based on the amount of undergraduate debt they hold in an iterative process throughout the undergraduate career. My findings suggest that students may not reassess based on undergraduate debt until they exit higher education. None of the students reported noticing SU's changes in tuition (over the students' undergraduate careers, the average tuition and fees increased by approximately \$1,400). This could explain in part why it is difficult to find variation in graduate school aspirations while students are in college (as shown in the quantitative results); the peak time to reassess would not have arrived yet. If students truly do not have a clear understanding of the amount of undergraduate debt they hold from year to year, it would be difficult for this amount to influence their future decision-making.

Family as a Source of Knowledge

SU students often reported consulting with family members as a source of knowledge about debt and repayment. (In the Timing and Structure of Information section, I was referring to students' answer to the question, "What sources have you consulted about loan repayment?" whereas this section discusses all instances of student mentions of family). Sandra reported that she had learned from a family member that a student could defer payment on her undergraduate loans if she enrolled in a postbaccalaureate education program. She said, "I didn't know that you could defer your school loans. I found that out from [my sibling]." There was an emphasis on family as a resource for information as well

as emotional support. While this reliance was expected based on prior research, the overwhelming focus on the family was not. Despite the fact that the words *family* and *parent* were not used in my research protocol questions, students used these words more than 60 times during the interviews. I did probe once students began to discuss their families and it became clear their families were a central area of support for participating students, with friends/peers being a close second (based on the number of mentions). All students readily reported using their families either directly, as sources of advice on how to navigate the financial aid system, or indirectly, by informing how the students conceptualized debt and the extent to which they were comfortable with it (which ranged from complete comfort to anxiety and fear). For example, Amanda said that her parents were constantly hiding from student loan creditors.

Me: Can you tell me more about what you meant by dodging Sallie Mae?

Amanda: My parents [are] still paying back their student loans from when they were in school. Mom is unemployed so she kind of avoids those letters and those phone calls.

Other graduates reinforced this discomfort, speaking of family members “not moving out [of parents’ homes] yet because they’re saving up to pay back their loans.” In fact, Nicole, who owed between \$20,000 and \$29,999, said she would rather work full-time while attending graduate school full-time.

Nicole: I just don’t like the concept of knowing that I owe somebody so the sooner I can pay them back or make a dent in paying it back [the better]. Debt I just uhh I don’t like the sound of that, I don’t like the word. So any of the free time I had I would like to work to pay back something.

Me: Why do you think you feel that way?

Nicole: Maybe upbringing? My parents taught me [to] try not to owe somebody

Nicole appeared anxious to repay her undergraduate debt and reported wanting to do so as quickly as possible. She reported not being willing to put her loans into

forbearance while enrolled in graduate school because of the interest that would continue accruing. She also reported that she had absorbed these feelings of anxiety around debt from her parents, who repeatedly emphasized that debt is not a good thing. It did not appear that her parents had a great deal of experience with debt, however, as the only debt she could think of that they might have had was an auto loan. During her phase two interview, when she had begun repayment, Nicole said that she was “pretty nonchalant” about repaying her student loans. She did not get accepted to graduate school and decided to work while taking a year off from school, which allowed her to meet her monthly payments in the “good old-fashioned way,” as she called it.

At the other end of the spectrum, Annie reported that the amount she was borrowing did not concern her.

Me: How do you feel about that amount [you borrowed]?

Annie: The [less than \$2,500] doesn't overwhelm me but my parents are paying back the larger portion. Not too concerned...You know my mom and I discussed getting [me] getting a part-time job...my mom said "No your job right now is to be a student."

Annie reported not feeling anxious during our phase one interview because her parents would be repaying the majority of her undergraduate debt. She went further during her phase two interview, saying, “It's kind of [my parents'] gift to me...I figured I would just work and pay off my portion of my debt and my parents help me pay off my portion of my loans.”

The conceptual framework posits that students might reassess their postbaccalaureate decision-making after borrowing additional undergraduate debt. From the interviews, it appeared that the process of reassessment might partially rely on the knowledge and understanding of debt and repayment these students had learned from

their families. The students with more knowledge were able to reassess and find ways to continue pursuing their interests. Participants with less knowledge appeared to reassess and make different education and occupation decisions than they had discussed in the phase one interviews. This could mean that new ways of introducing students to knowledge about debt and its consequences for their lives might mitigate information asymmetries present in students' understanding of debt.

Comfort with Amount Borrowed

The SU graduates expressed a range of feelings, from mild discomfort with the amount they had borrowed to more severe apprehension. Where a graduate fell on this continuum generally corresponded to the amount borrowed, with those borrowing more than \$20,000 tending to express more discomfort. The two graduates with less than \$20,000 in debt often expressed more comfort with the amount they borrowed (I include Annie here because, even though she changed her reported amount between phase one and phase two, both amounts were less than \$20,000). These graduates shared sentiments like this: "I'm kinda still in that indifferent [space]" (Amanda).

The three students who borrowed more than \$20,000 tended to express surprise at the final amount borrowed (Sandra is counted separately because her reported amount changed substantially between interviews). Jocelyn conveyed her amazement during her phase one interview at the amount of money she had borrowed to finance her undergraduate education.

Me: And how do you feel about the amount you borrowed?

Jocelyn: It was a shock to me. I was expecting around \$30,000 when we did the exit counseling...

Me: Did someone talk about that amount with you while you were at [SU]?

Jocelyn: No I just always checked [the website] but I guess I forgot to include the Perkins loan [when checking]. Me and my friends just looked through [the website],

no one ever sat down and talked to us about loans...I would get emails from only one service loan not all of them that would also be a factor too

Jocelyn did not seem to have a clear understanding of how much she had borrowed until her exit counseling. She took personal responsibility for overlooking some of her loans when totaling her debt, but failing to recall all one's debt might be one reason students said they would have benefited from more proactive interactions with the financial aid office. As mentioned previously, students could initiate meetings with financial aid administrators but rarely took the opportunity to do so. With students typically meeting with the financial aid office only at the beginning and end of their undergraduate careers, it is understandable that they could continue to miscalculate their total debt (Fernandez et al., 2015). This is particularly true because the entrance counseling occurs during orientation, "when students aren't paying as much attention" (Jocelyn).

Still, it appears that exit counseling is playing at least one critical role: making sure that soon-to-be graduates know the final amount borrowed and the approximate monthly repayment. Two of the SU graduates reported different total amounts of debt at the two interviews. One of those students is Sandra. Sandra discussed her feelings on the amount of debt she had accumulated in her first interview: "as compared to [my family member] and what [the family member] has to pay back, I'm appreciative of the amount I borrowed." These sentiments changed once she had a clearer understanding of the amount she borrowed and the amount of her monthly repayment (in phase one she reported \$10,000-\$19,999 of debt but \$30,000-\$39,999 during phase two). In the second interview, she said that the amount she borrowed was "worthwhile only because I did get a [scholarship], so I'm better off than other people...With that being said, I'm still surprised at how much I owe back... [that amount is] a little bit ridiculous."

All the SU students reported that the amount they borrowed was worthwhile. They considered their undergraduate education “an investment in yourself” (Jocelyn). Four of the SU graduates reported career interests that required postbaccalaureate education: foreign service officer, dentist, school counselor, and medical doctor. Cecelia explained how she rationalized the amount of undergraduate debt she held.

Me: So do you feel that it was worthwhile to borrow this amount of money?

Cecelia: Well, because of this career path that I’m on, I do, but I feel like if the career path that I’m on wasn’t my – you know like [if I wanted to] be a teacher or something, I don’t feel like it would be worth that type of money, because that’s probably a teacher’s salary in one year, you know?

Me: So can you explain that a little bit more?

Cecelia: ...if I don’t have any other – you know any other means of borrowing it, then I – you know to get my education, I think you know in the end, [professionals in the career field I am interested in] kind of – it’s always worth it for them, you know that amount of money, and just kind of the amount of schooling that they put in and then you know you can pay it back faster and you know sooner – you know faster or sooner or whatever.

Cecelia suggested that, if she had planned on a less lucrative career, she would not be comfortable with the amount of undergraduate debt she held.

Students’ reported comfort with debt may influence their reassessment process for postbaccalaureate decision-making. As students borrowed more and evaluated the possibilities for their lives after college, those who had reported being more comfortable with debt were also continuing to pursue their original interests and preferences.

Postbaccalaureate Decision-Making

SU graduates had varying post-college plans. Four students planned to start careers that required postbaccalaureate education, but all six students reported plans to enroll in some type of graduate school, first professional degree, or certificate program. Annie and Amanda said their undergraduate debt had no effect on their decisions after graduating. Annie attributed her ability to continue with the same postbaccalaureate plans, regardless

of the amount she borrowed, to her knowledge that “education doesn’t stop after undergrad, so I’ve been preparing for... the amount I will owe after [my postbaccalaureate degree].” Amanda echoed these thoughts.

The goal has always been to make – to impact change. It’s just the way that I went about it has varied. And so in doing so, I never – I didn’t really consider my loans that much because I figured I would be able to find a way, somehow, to find a program or to find a job that would forgive my loans or allow me to continue my education at no additional cost so that my loans wouldn't increase. So that you know with the educational backing, my pay scale and pay rate would increase, thus enabling me to make consistent payments and larger payments towards loans. Though it’s never been a real issue, per se. I’ve always considered it but it’s never been “Okay, well, I better do this so that I can make sure that I pay my loans.” It’s been, “This is what I want to do.”

Amanda reported perceiving that, regardless of the postbaccalaureate education or occupation she chose, she would always be increasing her salary, which would allow her to make her payments. It is interesting that both Annie and Amanda had the lowest amounts of cumulative debt. Also, Annie reported familial support beyond that of her peers (parents willing to repay all her undergraduate debt), which could have increased her confidence in her ability to meet repayment responsibilities regardless of postbaccalaureate decisions.

Four of the students reported a change in behavior between phase one and phase two interviews. Cecelia said that her debt “encouraged [her] even more to know that [she] had this much debt, [so she] got to go out to the finish line in order to be able to pay it back.” She said her debt motivated her to continue her education so she could obtain a higher-salary occupation in order to repay her undergraduate debt. She also stated that the debt made her take time off before starting postbaccalaureate education. Cecelia had performed poorly in one of the undergraduate courses necessary for admittance to the postbaccalaureate program she preferred. She planned to wait to enroll in the program of her choice until she could take the course again. When I asked if she would have retaken

the course while still enrolled without the amount of debt she had, she replied, "Probably, yes. I'm definitely sure, yeah." Both Jocelyn and Nicole planned to work while pursuing postbaccalaureate degrees in order to reduce the amount of debt they held, even though they would have had opportunities to defer repayment.

Although three students changed their immediate plans after graduating from college, only Sandra changed her long-term career goals. Sandra still planned to attend graduate school, but in her second interview she reported placing certain restrictions on any postbaccalaureate education.

Sandra: 'Cause even if I'm working I still want to continue my education but being financially stable is way more important...I've also been thinking about doing an online master's program...my friend told me how much she has to borrow [to attend graduate school] and I'm like "Whoa!"

Me: If you did not have any undergraduate debt, what would your plans have been after graduating?

Sandra: ...I wouldn't feel so pressured to like decide, "OK, I did want to go to an on-campus [master's]," but now I'm like 99% sure I'm not going to be on a campus again.

Sandra's description of how she adjusted her plans for her education, and therefore her long-term career, tell an interesting story. During the first interview, she spoke of pursuing a career requiring a professional degree (e.g., JD, MD) after taking a year's break. However, once she experienced the academic break and began repaying her debt, she reported having changed her mind and decided to focus on financial stability. This does not preclude her attending graduate school at some point in the future, but her focus on financial stability drove her to report only considering online degree programs.

In addition to the primary focus areas of postbaccalaureate education and occupation, one student said that debt influenced her thoughts about starting a family. Jocelyn, who repeatedly expressed anxiety about the amount of undergraduate debt she

held, spoke of the ways debt has influenced her decision-making beyond education or occupation.

Jocelyn: Thought about getting a job to pay off the loans and once that's done I would pursue my passion. Think about if I want to have family all that stuff...

Me: How would this affect you having a family?

Jocelyn: At one point in time I was a person who wanted to get married debt-free but now I don't think it's realistic because I've taken on more debt.

Me: Why get married debt-free?

Jocelyn: I just feel like that's a lot of baggage to take in, to ask your spouse to help pay [over \$50,000] in debt as you all become one.

Jocelyn reported feeling that it was inappropriate to have her romantic partner share responsibility for her educational debt. During her second interview, she described previously only wishing to marry once she had repaid her debt but, by our second interview, she had begun to feel that was no longer feasible. She expressed feeling hesitant to embark on marriage with the amount of her outstanding debt. Jocelyn's reasoning could partly explain what lies behind the phenomenon of the millennial generation marrying at a later age, which scholars and the popular press have noted (White, 2015).

These examples align with the suppositions of the conceptual framework. Student participants reported beginning higher education with an idea of their early-career occupation and the education required for it and for their long-term career goals. This decision is made jointly with how much the students would borrow to finance higher education. Once the amount of debt they had accumulated became real to the students, they reported reassessing their previous occupation and postbaccalaureate education plans.

Conclusion

The quantitative results support the conceptual framework as well as the role undergraduate debt plays in the reassessment of postbaccalaureate decision-making. The qualitative results provide weak evidence, due to sample size, in support of my framework.

These results suggest that the relationship between undergraduate debt and postbaccalaureate decision-making might be partially explained by the timing and structure of information, family as a source of knowledge, comfort with the amount borrowed, and the realities of postbaccalaureate decision-making. The sample consists solely of students who earned a bachelor's degree, which constrains the policy and practice implications of the results. In the next chapter, I relate the qualitative and quantitative results and the implications of this work.

CHAPTER VI

CONCLUSION

The results of this research expand our general understanding of how undergraduate loans influence and potentially constrain students' postbaccalaureate decision-making. My dissertation adds to the body of evidence by answering the following research questions:

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

In this chapter, I discuss the results of the quantitative and qualitative investigations. I then analyze the policy and practical implications of the results. I end with the future research needed based on an understanding of the prior literature and my own work.

Discussion of Quantitative and Qualitative Results

My conceptual framework relies on viewing postbaccalaureate decision-making as a series of sequential decisions (Altonji et al., 2012). Before enrolling in an undergraduate institution, a student chooses a major and either an occupation or decides to attend graduate school directly after graduating (initial decision). She makes these decisions almost simultaneously and bases them on her underlying preferences, abilities, and uncertainty about those two factors (no student can truly know the extent of her ability or preference for a certain occupation or postbaccalaureate degree; Altonji et al., 2012). While the student is enrolled, tuition increases at that undergraduate institution. She chooses to borrow or not to borrow in order to continue attending that institution. If the student does

choose to borrow the additional amount, she must evaluate and reassess her prior decision of occupation or graduate school. This reassessment can happen multiple times throughout the undergraduate career. I focus on this reassessment decision: the choice of occupation or attending graduate school after a student has responded to tuition increases by borrowing an additional amount. This is not a test of the conceptual framework; I merely use my conceptual framework as a guide for the theory of action of student borrowers.

The quantitative results align with the findings of prior causal research on undergraduate debt's effects (Malcom & Dowd, 2012; Rothstein & Rouse, 2011; Zhang, 2013). Larger changes in tuition and fees are associated with larger amounts of undergraduate debt. Greater undergraduate debt leads to changes in postbaccalaureate decision-making. This supports the conceptual framework as a theory of behavior for students' postbaccalaureate decision-making. I find no evidence that larger amounts of debt inhibit students from aspiring to attend graduate school. Increased undergraduate debt decreases the likelihood of recent bachelor's degree earners enrolling in graduate school and increases their early-career occupation salaries. This research contributes to the field because I produce causal estimates of the effect of undergraduate debt for a recent national sample. According to my conceptual framework, tuition and fee changes do induce certain students to borrow more, which leads those students to reassess their postbaccalaureate decisions. My findings support all my hypotheses. A \$10,000 increase in total undergraduate debt: does not appear to induce a change in students' aspirations; decreases the likelihood of students enrolling in graduate school by 3–4%; and, increases the average annual salary of students by \$1,550 in 2009 and \$3,410 in 2012. A \$10,000 increase in federal undergraduate debt: does not appear to induce a change in students'

aspirations; decreased the likelihood of students enrolling in graduate school by 5%; and, increases the average annual salary of students by \$2,100 in 2009 and \$4,620 in 2012.

My aspirations results mirror those of Rothstein and Rouse (2011). The enrollment estimates are smaller than Zhang's (2013) 2.7-percentage-point reduction in the likelihood of graduate school enrollment for every \$1,000 debt increase for students attending public institutions. However, this disparity could result from differences in our modeling strategies: the variation used to predict undergraduate debt, the Great Recession's effect on my sample, and the modeling of the relationship between debt and outcome variables (Zhang used a linear measure of debt). Prior research emphasized that students often seek shelter in graduate school in order to wait out poor labor market opportunities. The estimates could be smaller partly because more students sought enrollment in graduate school to wait for better employment opportunities. My graduate school enrollment estimates are also smaller than Malcom and Dowd's (2012) estimates, but again, the variation used is different and the authors modeled debt as a categorical variable with three values (no borrowing, typical borrowing, and heavy borrowing). My early-career occupation salary findings generally support Rothstein and Rouse's (2011) findings. Rothstein and Rouse (2011) found that an increase of \$10,000 in debt increased the annual salary of graduates by \$2,000 on average. My estimates for average annual salary increase one year after graduate are approximately \$2,000. Rothstein and Rouse (2011) obtained early-career occupation information from student exit surveys that the anonymous institution's career services office conducted the week before students graduated. Therefore, the authors' estimates are most comparable to the findings for 2009. The estimates from 2012 show that the relationship between undergraduate borrowing and

early-career occupation salary has strengthened since 2009 (though this could be due to students selecting higher-salary occupations directly after graduating, which allows students to increase their salary at a higher rate). I investigate the relationship between postbaccalaureate decision-making and two types of undergraduate borrowing: total debt and federal debt. It is logical for students who incur large amounts of federal debt to react more strongly to the cumulative amount since federal debt is means-tested. This is a consistent finding because higher amounts of federal borrowing cause greater reductions in graduate school enrollment and higher average salaries.

The qualitative results align in some ways with the few prior qualitative research studies on this topic. The six students in the sample initially reported not allowing undergraduate debt to affect their postbaccalaureate plans, similar to Murphy's (1994) work. However, four of the six students later reported changing either their immediate plans after graduating or their long-term career plan in some part because of the amount they had borrowed; these students also carried the highest cumulative debt loads. Students expressed more confidence in their ability to repay their undergraduate debt during their phase one interviews. This finding mirrors the high levels of confidence reported by the students in Fernandez and colleagues' (2015) research on federal loan exit counseling. However, as I hypothesize based on the conceptual framework, by the time of the phase two interviews, four students who had begun repayment reported more anxiety about their ability to repay their undergraduate debt. The results, while preliminary in nature due to the small sample size, suggest that following students past graduation is key because the students' reported confidence or emotional state appears to change as repayment draws closer.

My qualitative results can inform our thinking about students' conceptualizations of undergraduate debt and how they reassess their postbaccalaureate plans. Future research, discussed below, could test the conceptual framework to find out whether the pilot results are more widespread. Although I found evidence of timing and structure of information, family as a source of knowledge, comfort with the amount borrowed, and the realities of postbaccalaureate decision-making supporting the framework, gaps remain in our understanding of how students internalize the borrowing of larger amounts. Particularly with the small sample size, it is inappropriate to draw conclusions about the behaviors and perceptions of HBCU bachelor's degree earners. These results provide a first glimpse into the decision-making process among a small group of students in this population.

With both quantitative and qualitative results in mind, I contribute to the field of education policy in three ways. One is identifying causal estimates from undergraduate debt by instrumenting with changes in cost of tuition and fees. This technique could be used in multiple scenarios as long as the change in tuition has no outside effect on the outcome variable. The second way my results contribute to education policy is suggestive evidence from the qualitative study on the importance of following students beyond graduation to investigate how undergraduate debt continues to influence their perceptions and decision-making. It may be more complicated to reach this population, but students' reported beliefs and behaviors seemed to shift drastically as they began repayment.

The third contribution is the creation of my conceptual framework and the evidence supporting or adding nuance to our understanding of human capital. The conceptual framework outline how students make postbaccalaureate decisions, particularly for graduate school enrollment and early-career occupation salary. My results support the

notion that increased costs associated with undergraduate education does, (at least partially) drive the amount of undergraduate debt students hold. This in turn may result in a reassessment of prior plans for graduate school and early-career occupation. I found less evidence for the reassessment of graduate school aspirations (likely because, in part, the reassessment primarily occurs after leaving college and because social desirability might affect self-reported aspirations). With regard to human capital theory, students reacting to larger amounts of undergraduate debt by increasing their annual salaries follows the general premise of maximization of lifetime utility. Contrary to traditional conceptions of human capital theory, I do not find evidence that students enroll in graduate school in order to maximize their lifetime utility by attaining entry to a higher-paying career. The increased costs of enrolling in graduate school, whether due to the actual cost of postbaccalaureate education or the foregone earnings, might prohibit certain students from enrolling. Researchers can overlook this nuanced perspective of human capital theory if they view students as rational actors, forgetting that both the pure costs of more education and the discount rate of future earnings create optimal decisions different from the traditional expectation. With these contributions noted, I turn to implications for policy and practice.

Implications for Policy and Practice

Cumulative undergraduate debt, both total and federal borrowing, affects students' postbaccalaureate decision-making. This creates two primary areas of interest for policymakers and policy intermediary organizations: rising costs of attending higher education and undergraduate debt burdens.

First, the amount that colleges charge students does directly affect their borrowing, which directly affects their decisions after graduating from college. The National Conference of State Legislatures posits that the primary reasons for recent increases in tuition are the Great Recession's depletion of state higher education appropriations and the increasing enrollments in higher education institutions, which are partly due to the increase in the earnings premium for a college degree compared to a high school diploma or its equivalent (Weeden, 2015). Although it is popular to equate a decrease in state appropriations with a corresponding increase in tuition, evidence suggests this is not the case. The relationship between state appropriations and tuition setting is not linear and is generally influenced by the ideological positions of state policy makers and each state's demographics (Doyle, 2012). Still, in response to increases in tuition, states have proposed varying tuition policies: limitations on annual tuition increases, linking tuition with institutional performance, tuition stabilization fund, tuition freezes, tuition tax credits and deductions, guaranteed or fixed tuition, linking tuition with financial aid, and nonresident enrollment increases (Weeden, 2015). Limitations on annual tuition increases and tuition freezes represent some of the more popular options considered by state higher education policymakers. According to a study by the California Legislative Analyst's Office, tuition freezes bring additional challenges because institutions swiftly increase tuition after freezes (Taylor, 2014). Therefore, tuition freezes decrease borrowing for some students only to rapidly increase it for others. Less research exists on limiting annual tuition increases and how institutions might react. Researchers continue to investigate outcomes of tuition policies, but controlling the price of an undergraduate education is imperative for

keeping optimal postbaccalaureate decision-making unaffected by undergraduate borrowing.

Second, reliance on undergraduate student loans to finance college is at an all-time high. From a policy perspective, it becomes critical to either decrease the amount students are expected to borrow or to decrease the negative effects from borrowing large amounts of undergraduate debt. The federal government can increase the maximum Pell award or increase the expected family contributions that qualify for subsidized Direct Loans. While there is some evidence that increasing federal financial aid creates a chain reaction wherein institutions raise tuition (Cellini & Goldin, 2012), it is just one of many factors that induce changes in the costs of college. Unless there is clear evidence that increasing Pell awards causes an increase in tuition and fees so large that the undergraduate loan burden would remain the same, increasing federal grant aid becomes an attractive solution to the effects of high undergraduate debt burden.

Responsibility for decreasing the amount students borrow lies with the state as well as institutions. State policymakers can create additional grant aid for students to deter borrowing to finance attending higher education. Tennessee is a pioneer in this movement. In 2014, the Tennessee legislature passed the Tennessee Promise Scholarship Act, which provides tuition-free community college for high school graduates with a certain GPA (Kelderman, 2014; NPR, 2014). The state used excess funds from the state lottery reserve to finance the new program. This is one example of how state policy can mitigate the amount students borrow for their undergraduate education. Additionally, institutions determine how institutionally funded financial aid, often called tuition discounts, are disbursed to students. Evidence suggests that institutions with unfunded tuition discounts

less than approximately 13% can generate net tuition revenue (Hillman, 2012). However, on average, most institutions appear to provide tuition discounts to all students instead of targeting students with less ability to finance postsecondary education (Heller, 2008).

There is room for institutions to provide tuition discounts to targeted student groups, such as students from low-income backgrounds, which would reduce the amount they borrow for higher education.

Providing better information on repayment plans during students' undergraduate careers could decrease the negative effects of larger cumulative undergraduate debt. As students gain greater understanding of their options for managing debt repayment, there could be a lessening of the potentially negative effect of undergraduate debt on graduate school enrollment and early-career occupation salary. As previously mentioned, federally mandated loan counseling occurs when students enter and exit higher education. This might not give many students enough information to make them cognizant of the amount of undergraduate debt they have accumulated. It could be useful to mandate institutional loan counseling in the spring of each year a student is enrolled in an undergraduate degree program. From my limited qualitative results, I find that students responded best to knowing the total amount of debt accumulated and the monthly repayment amount. If a larger qualitative study can replicate these preliminary findings, it might be useful for institutions to require students to complete a simple module that shows them their cumulative debt and approximate monthly repayment amount. A federal policy coupled with additional practical support would be required. Financial aid offices could also be more proactive around loan counseling, particularly when students have accumulated 90 credits (which is 30 credits away from the minimum to earn a bachelor's degree). This

would be more difficult for commuter than residential institutions due to the latter's ease of access to the student population. However, if the federal government mandated a "continual counseling" session to take place once a student reaches 90 credits, the institution could couple this with a counseling workshop or event held by the financial aid office. Because financial aid offices are understaffed and facing resource shortages (NASFAA, 2016), it would be useful to couple a mandate for additional counseling with additional funds or the streamlining of financial aid staffers' other responsibilities. If that is not feasible, experimenting with low-cost methods of delivering accurate and timely information on undergraduate borrowing, such as an interactive website, would be advantageous. By creating more opportunities for students to understand how much they have borrowed and how this will affect them in the future, we could create borrowers who understand better how to prepare themselves for their postbaccalaureate lives. The financial aid office component of this may be crucial because there is potential for perverse incentives if we further educate students on the amount of debt borrowed without including information on how students can manage their debt. Students could feel that the cumulative amount of undergraduate debt is too much and so they might be better off dropping out of college and starting to work to begin repayment. Early and frequent education about the ways to manage undergraduate debt repayment is critical in order to begin lessening the negative effects of undergraduate debt.

All these implications focus on lessening the amount of risk students associate with pursuing a college degree. For example, one reason to provide these options for financing higher education is that it would allow students to assess less risk in certain postbaccalaureate decisions when comparing the costs and benefits. This is particularly

critical when framing the issue of undergraduate debt burden for policymakers. Debt is not an inherently bad thing; however, certain student populations can view debt as prohibitive to entering certain occupations or attending graduate school. Therefore, for some students the costs of these postbaccalaureate decisions would be much higher than they are assumed to be for the average student. When policymakers seek to learn about the effects of undergraduate debt or the potential reasons for lower levels of graduate school attainment, it is imperative to understand how students assess and understand the risks and costs involved.

Future Research

To help our country create a strong and diverse labor force, additional research is needed into both the causal effects of undergraduate debt on postbaccalaureate decision-making and the perceptions and beliefs that drive those decisions. Subpopulation analyses of the negative effects of undergraduate debt would increase our understanding of which students debt affects most. The subpopulation analyses suggest that African American and middle-income students drive significant portions of this effect, but the models do not produce credible causal estimates. I plan to use my causal inference method (tuition and fees as an instrument for undergraduate debt) to investigate whether these effects differ for public and private institutions. Also, there are multiple ways to conceptualize graduate school enrollment and early-career occupation choice. For graduate school, I plan to estimate the effect of undergraduate debt separately on enrollment into master's and doctoral programs. For early-career occupation, I plan to estimate the effect of undergraduate debt on an indicator of low salary (below the 25th percentile of annual salaries), an indicator for nonprofit occupations, an indicator for occupational prestige, and

a survey item on satisfaction with occupation salary. The occupational prestige investigation would also be able to aid in add to our understanding of the extent to which occupational choice is stratified by income and racial/ethnic groups. The results from these additional quantitative analyses would increase our understanding of whether and how this effect changes based on the subpopulation or the way that graduate school or early-career occupation are defined.

For the qualitative research, I plan to use the dissertation results as a pilot for a full-scale qualitative investigation of how underrepresented students conceptualize undergraduate debt and their repayment options. As prior research and my own work show, African American students borrow at higher rates and accumulate greater amounts of both total and federal undergraduate debt. However, little is known about how these students think about their borrowing, repayment options, and postbaccalaureate decision-making. I plan to conduct interviews at a number of other HBCUs, with African American students and with their White peers as contrast cases. I also plan to conduct interviews with African American and White students attending non-MSIs similar in institutional profile to HBCUs. By integrating the suggestions I listed in the limitations section of Chapter V (e.g., attending loan counseling workshops the institution holds), I hope to increase participation rates. This will give me a larger sample size, which will increase the trustworthiness and credibility of the results (Lincoln & Guba, 1985).

With regard to the policy and practice implications, additional research on state tuition policy and loan counseling would be useful for discerning the most optimal policy and practice changes. With multiple states enacting different types of tuition policies, there are natural experiments that are already occurring throughout the United States which

could be studied. At present, it is not clear what type of tuition policy would be best for curtailing undergraduate debt burden in the long term. In addition, we need improved understanding of which parts of loan counseling are useful to students and how to increase the frequency with which students discuss or receive formal and accurate information about how much they are borrowing. The preliminary qualitative results suggest that sample students do not begin to seriously plan for repayment of their undergraduate loans until the repayment time draws near. If that is true broadly, more research into ways to make loan counseling more effective and salient could be helpful.

Concluding Thoughts

This dissertation contributes both a new instrumental variable and a new conceptual framework for understanding how undergraduate debt affects postbaccalaureate decision-making. Increased undergraduate debt, whether total or federal, reduces the likelihood of students enrolling in graduate school and increases students' average annual salary in early-career occupations. This is not inherently a bad thing. However, if students make decisions contrary to their underlying preferences and abilities because of their debt, disparities in educational attainment and low-salary occupations, such as teaching, may persist.

APPENDIX A

INVESTIGATION 1 TABLES

Table A1

<i>Summary Statistics for Graduate Education Aspirations Data</i>		
	Mean	SD
Key Variables		
Cumulative Loans	14,705.03	19,116.87
Cumulative Federal Loans	9,033.33	10,158.99
Change in Tuition & Fees	3,434.71	2,968.83
Graduate School Aspirations	0.67	0.47
Continuous Variables		
Prior Income	73,945.59	55,814.30
Entrance Examination (in SAT)	1,040.70	200.72
College GPA	3.11	0.57
Entering Tuition & Fees	9,744.73	8,531.23
Dependents	0.03	0.23
Indicator Variables		
Female	0.57	0.49
Mother's Education	0.95	0.21
Race		
White	0.72	0.45
African American	0.10	0.30
Latino	0.08	0.27
Asian	0.05	0.22
Other Race	0.05	0.21
Selectivity		
Nonselective	0.29	0.45
Less Selective	0.06	0.23
Selective	0.50	0.50
Most Selective	0.15	0.36
Private Control	0.34	0.47
2-Yr or Less Institution	0.26	0.44
Married	0.01	0.10
Entering Graduate School Aspirations	0.71	0.45

Table A2

Summary Statistics for Graduate School Enrollment and Early-Career Occupation Data

	Mean	SD
Key Variables		
Cumulative Loans	18,062.30	18,896.27
Cumulative Federal Loans	12,154.73	10,885.15
Change in Tuition & Fees	2,087.49	1,737.14
Graduate Enrollment 2009	0.28	0.45
Graduate Enrollment 2012	0.41	0.49
Salary 2009	30,955.22	17,612.87
Salary 2012	41,738.93	26,579.64
Continuous Variables		
Age	18.09	0.73
Prior Income	68,159.11	62,916.52
Entrance Examination (in SAT)	1,095.77	179.43
College GPA	3.32	0.45
Entering Tuition & Fees	10,883.18	9,061.56
Dependents	0.07	0.34
Indicator Variables		
Female	0.59	0.49
Father's Education	0.95	0.22
Race		
White	0.78	0.41
African American	0.06	0.24
Latino	0.07	0.25
Asian	0.06	0.23
Other Race	0.03	0.18
Selectivity		
Nonselective	0.18	0.39
Less Selective	0.06	0.24
Selective	0.60	0.49
Most Selective	0.16	0.37
Private Control	0.35	0.48
2-Yr or Less Institution	0.15	0.36
Married	0.09	0.28
Entering Graduate School Aspirations	0.78	0.41

Table A3

Results of OLS, Dependent Variable: Graduate School Aspirations (Full Model)

	Loan	Federal Loan
Cumulative Loans Borrowed 2009 (Log)	0.004***	0.005***
	(0.001)	(0.001)
Female	0.07***	0.07***
	(0.01)	(0.01)
Race/Ethnicity (Reference: White)		
African American	0.15***	0.15***
	(0.02)	(0.02)
Latino	0.09***	0.09***
	(0.02)	(0.02)
Asian	0.12***	0.12***
	(0.02)	(0.02)
Other Race	0.06**	0.06**
	(0.02)	(0.02)
Prior Income	0.00***	0.00***
	(0.00)	(0.00)
Prior Income * Prior Income	-0.00**	-0.00**
	(0.00)	(0.00)
Entrance Examination (in SAT)	0.00***	0.00***
	(0.00)	(0.00)
Institutional Selectivity (Reference: Nonselective)		
Less Selective	0.01	0.01
	(0.03)	(0.03)
Selective	0.09**	0.09**
	(0.03)	(0.03)
Most Selective	0.11***	0.11***
	(0.03)	(0.03)
Private Control	-0.02	-0.02
	(0.02)	(0.02)
2-Year or Less	-0.12***	-0.12***
	(0.03)	(0.03)
College GPA	0.08***	0.08***
	(0.01)	(0.01)
Entering Tuition & Fees	0.00*	0.00*
	(0.00)	(0.00)
Married	0.01	0.00
	(0.06)	(0.06)
Dependents	-0.03	-0.03
	(0.02)	(0.02)
Constant	-0.10*	-0.10*

	(0.05)	(0.05)
Observations	8880	8880

Note: The primary covariate of interest in the models is cumulative loans borrowed from 2003–2004 to 2008–2009 (loan) and cumulative federal loans borrowed over the same period (federal loan). Standard errors in parentheses. * = $p < 0.05$; ** = $p < .01$; *** = $p < .001$. Observations are rounded due to NCES guidelines.

Table A4

Results of OLS Reduced Form, Dependent Variable: Graduate School Aspirations (Full Model)

	Loan	Federal Loan
Change in Average Tuition and Fees	-0.02	-0.02
	(0.02)	(0.02)
Mother's Education	0.01	0.01
	(0.02)	(0.02)
Change in Average Tuition and Fees * Mother's Education	-0.08	-0.08
	(0.14)	(0.14)
Female	0.07***	0.07***
	(0.01)	(0.01)
Race/Ethnicity (Reference: White)		
African American	0.15***	0.15***
	(0.02)	(0.02)
Latino	0.09***	0.09***
	(0.02)	(0.02)
Asian	0.12***	0.12***
	(0.02)	(0.02)
Other Race	0.06**	0.06**
	(0.02)	(0.02)
Prior Income	0.00***	0.00***
	(0.00)	(0.00)
Prior Income * Prior Income	-0.00**	-0.00**
	(0.00)	(0.00)
Entrance Examination (in SAT)	0.00***	0.00***
	(0.00)	(0.00)
Institutional Selectivity (Reference: Nonselective)		
Less Selective	0.02	0.02
	(0.03)	(0.03)
Selective	0.09**	0.09**
	(0.03)	(0.03)
Most Selective	0.10***	0.10***
	(0.03)	(0.03)
Private Control	-0.01	-0.01
	(0.02)	(0.02)
2-Year or Less	-0.13***	-0.13***
	(0.03)	(0.03)
College GPA	0.08***	0.08***
	(0.01)	(0.01)
Entering Tuition & Fees	0.00*	0.00*

	(0.00)	(0.00)
Married	0.00	0.00
	(0.06)	(0.06)
Dependents	-0.03	-0.03
	(0.02)	(0.02)
Constant	0.06	0.06
	(0.15)	(0.15)
<hr/>		
Observations	8880	8880

Note: Reduced form equation for the IV model of undergraduate debt's effect on graduate aspirations; standard errors in parentheses. * = $p < 0.05$; ** = $p < .01$; *** = $p < .001$. Observations are rounded due to NCES guidelines.

Table A5

*Results of Two-Stage Least Squares, Dependent Variable: Graduate School Aspirations
First Stage (Full Model)*

	Loan	Federal Loan
Change in Average Tuition and Fees	0.88***	0.83***
	(0.16)	(0.16)
Mother's Education	4.71***	4.36***
	(1.19)	(1.16)
Change in Average Tuition and Fees * Mother's Education	-0.64***	-0.58***
	(0.16)	(0.16)
Female	0.11	0.10
	(0.10)	(0.09)
Race/Ethnicity (Reference: White)		
African American	1.06***	1.12***
	(0.15)	(0.16)
Latino	-0.17	-0.20
	(0.18)	(0.17)
Asian	-0.92***	-0.91***
	(0.23)	(0.22)
Other Race	-0.28	-0.17
	(0.22)	(0.21)
Prior Income	-0.00***	-0.00***
	(0.00)	(0.00)
Prior Income * Prior Income	0.00*	0.00**
	(0.00)	(0.00)
Entrance Examination (in SAT)	-0.00**	-0.00**
	(0.00)	(0.00)
Institutional Selectivity (Reference: Nonselective)		
Less Selective	0.30	0.41
	(0.28)	(0.29)
Selective	0.01	0.16
	(0.24)	(0.24)
Most Selective	-1.19***	-1.07***
	(0.29)	(0.29)
Private Control	0.50**	0.69***
	(0.19)	(0.19)
2-Year or Less	-1.13***	-1.11***
	(0.25)	(0.25)
College GPA	-0.38***	-0.30***
	(0.09)	(0.09)

Entering Tuition & Fees	0.00** (0.00)	0.00* (0.00)
Married	-0.24 (0.58)	-0.02 (0.56)
Dependents	-0.50* (0.22)	-0.62** (0.22)
Constant	3.13* (1.26)	2.67* (1.23)
Observations	8880	8880
Wu-Hausman (<i>p</i> -value)	1.93 (0.165)	1.83 (0.176)
Minimum eigenvalue	9.53	9.49
<i>F</i> -bias crit, <i>F</i> -size crit	13.91, 22.3	13.91, 22.3
Sargan (<i>p</i> -value)	0.72 (0.697)	0.83 (0.659)

Note: Excluded instruments: change in average tuition and fees, mother's education, and change in average tuition and fees interacted with mother's education. Standard errors in parentheses. * = $p < 0.05$; ** = $p < .01$; *** = $p < .001$. Observations are rounded due to NCES guidelines.

Table A6

*Results of Two-Stage Least Squares, Dependent Variable: Graduate School Aspirations
Second Stage (Full Model)*

	Loan	Federal Loan
Cumulative Loans (Log)	-0.02	-0.02
	(0.02)	(0.02)
Female	0.08***	0.08***
	(0.01)	(0.01)
Race/Ethnicity (Reference: White)		
African American	0.18***	0.18***
	(0.03)	(0.03)
Latino	0.08***	0.08***
	(0.02)	(0.02)
Asian	0.09***	0.10***
	(0.03)	(0.03)
Other Race	0.06*	0.06*
	(0.02)	(0.02)
Prior Income	0.00	0.00
	(0.00)	(0.00)
Prior Income * Prior Income	-0.00+	-0.00+
	(0.00)	(0.00)
Entrance Examination (in SAT)	0.00***	0.00***
	(0.00)	(0.00)
Institutional Selectivity (Reference: Nonselective)		
Less Selective	0.02	0.02
	(0.03)	(0.03)
Selective	0.09**	0.09***
	(0.03)	(0.03)
Most Selective	0.08*	0.08*
	(0.04)	(0.04)
Private Control	-0.00	0.00
	(0.02)	(0.03)
2-Year or Less	-0.16***	-0.15***
	(0.04)	(0.04)
College GPA	0.07***	0.07***
	(0.01)	(0.01)
Entering Tuition & Fees	0.00**	0.00**
	(0.00)	(0.00)
Married	-0.00	0.00
	(0.06)	(0.06)
Dependents	-0.04	-0.04
	(0.03)	(0.03)

Constant	0.14 (0.20)	0.12 (0.19)
Observations	8880	8880
Wu-Hausman (<i>p</i> -value)	1.93 (0.165)	1.83 (0.176)
Minimum eigenvalue	9.53	9.49
<i>F</i> -bias crit, <i>F</i> -size crit	13.91, 22.3	13.91, 22.3
Sargan (<i>p</i> -value)	0.72 (0.697)	0.83 (0.659)

Note: Excluded instrument: change in average tuition and fees, mother's education, and change in average tuition and fees interacted with mother's education. Standard errors in parentheses. + = $p < 0.10$; * = $p < 0.05$; ** = $p < .01$; *** = $p < .001$. Observations are rounded due to NCES guidelines.

Table A7

Results of OLS, Dependent Variable: Graduate School Enrollment (Full Model)

	Loan		Federal Loan	
	2009	2012	2009	2012
Cumulative Loans Borrowed 2009 (Log)	-0.004***	-0.003**	-0.004***	-0.003**
	(0.001)	(0.001)	(0.001)	(0.001)
Age	-0.02***	-0.02***	-0.02***	-0.02***
	(0.01)	(0.01)	(0.01)	(0.01)
Female	0.01	0.02*	0.01	0.02*
	(0.01)	(0.01)	(0.01)	(0.01)
Race/Ethnicity (Reference: White)				
African American	0.14***	0.20***	0.14***	0.20***
	(0.02)	(0.02)	(0.02)	(0.02)
Latino	0.04*	0.07***	0.04*	0.07***
	(0.02)	(0.02)	(0.02)	(0.02)
Asian	0.06**	0.09***	0.06**	0.09***
	(0.02)	(0.02)	(0.02)	(0.02)
Other Race	0.03	0.04	0.03	0.04
	(0.03)	(0.03)	(0.03)	(0.03)
Prior Income	-0.00	0.00	-0.00	0.00
	(0.00)	(0.00)	(0.00)	(0.00)
Prior Income * Prior Income	0.00	-0.00	0.00	-0.00
	(0.00)	(0.00)	(0.00)	(0.00)
Entrance Examination (in SAT)	0.00***	0.00***	0.00***	0.00***
	(0.00)	(0.00)	(0.00)	(0.00)
Institutional Selectivity (Reference: Nonselective)				
Less Selective	0.00	-0.02	0.00	-0.02
	(0.03)	(0.03)	(0.03)	(0.03)
Selective	0.05+	0.02	0.04+	0.02
	(0.03)	(0.03)	(0.03)	(0.03)
Most Selective	0.07**	0.08*	0.07**	0.08*
	(0.03)	(0.03)	(0.03)	(0.03)
Private Control	0.05*	0.03	0.05*	0.03
	(0.02)	(0.02)	(0.02)	(0.02)
2-Year or Less	-0.01	0.00	-0.01	0.00

	(0.03)	(0.03)	(0.03)	(0.03)
College GPA	0.17***	0.20***	0.17***	0.20***
	(0.01)	(0.01)	(0.01)	(0.01)
Entering Tuition & Fees	-0.00*	0.00	-0.00*	0.00
	(0.00)	(0.00)	(0.00)	(0.00)
Married	-0.06***	-0.07***	-0.06***	-0.07***
	(0.02)	(0.02)	(0.02)	(0.02)
Dependents	0.01	0.03+	0.01	0.03+
	(0.01)	(0.02)	(0.01)	(0.02)
Constant	-0.05	-0.08	-0.05	-0.08
	(0.13)	(0.13)	(0.13)	(0.13)
Observations	9820	9820	9820	9820

Note: Standard errors in parentheses. + = $p < 0.10$; * = $p < 0.05$; ** = $p < .01$; *** = $p < .001$. Observations are rounded due to NCES guidelines.

Table A8

Results of OLS Reduced Form, Dependent Variable: Graduate School Enrollment (Full Model)

	Loan		Federal Loan	
	2009	2012	2009	2012
Change in Average Tuition and Fees	-0.04**	-0.04**	-0.04**	-0.04**
	(0.01)	(0.01)	(0.01)	(0.01)
Father's Education	0.04	-0.02	0.04	-0.02
	(0.10)	(0.11)	(0.10)	(0.11)
Change in Average Tuition and Fees * Father's Education	-0.00	0.00	-0.00	0.00
	(0.01)	(0.02)	(0.01)	(0.02)
Age	-0.03***	-0.03***	-0.03***	-0.03***
	(0.01)	(0.01)	(0.01)	(0.01)
Female	0.00	0.02+	0.00	0.02+
	(0.01)	(0.01)	(0.01)	(0.01)
Race/Ethnicity (Reference: White)				
African American	0.13***	0.19***	0.13***	0.19***
	(0.02)	(0.02)	(0.02)	(0.02)
Latino	0.04*	0.06**	0.04*	0.06**
	(0.02)	(0.02)	(0.02)	(0.02)
Asian	0.06**	0.08***	0.06**	0.08***
	(0.02)	(0.02)	(0.02)	(0.02)
Other Race	0.03	0.04	0.03	0.04
	(0.03)	(0.03)	(0.03)	(0.03)
Prior Income	-0.00	0.00	-0.00	0.00
	(0.00)	(0.00)	(0.00)	(0.00)
Prior Income * Prior Income	0.00	-0.00	0.00	-0.00
	(0.00)	(0.00)	(0.00)	(0.00)
Entrance Examination (in SAT)	0.00***	0.00***	0.00***	0.00***
	(0.00)	(0.00)	(0.00)	(0.00)
Institutional Selectivity (Reference: Nonselective)				
Less Selective	0.00	-0.02	0.00	-0.02
	(0.03)	(0.03)	(0.03)	(0.03)
Selective	0.05+	0.03	0.05+	0.03
	(0.02)	(0.03)	(0.02)	(0.03)

Most Selective	0.08** (0.03)	0.08** (0.03)	0.08** (0.03)	0.08** (0.03)
Private Control	0.06** (0.02)	0.04* (0.02)	0.06** (0.02)	0.04* (0.02)
2-Year or Less	-0.04 (0.03)	-0.02 (0.03)	-0.04 (0.03)	-0.02 (0.03)
College GPA	0.17*** (0.01)	0.20*** (0.01)	0.17*** (0.01)	0.20*** (0.01)
Entering Tuition & Fees	-0.00 (0.00)	0.00* (0.00)	-0.00 (0.00)	0.00* (0.00)
Married	-0.06** (0.02)	-0.07*** (0.02)	-0.06** (0.02)	-0.07*** (0.02)
Dependents	0.01 (0.01)	0.03* (0.02)	0.01 (0.01)	0.03* (0.02)
Constant	0.23 (0.16)	0.28+ (0.17)	0.23 (0.16)	0.28+ (0.17)
Observations	9820	9820	9820	9820

Note: Reduced form model of the IV model for undergraduate debt's effect on graduate school enrollment. Standard errors in parentheses. + = $p < 0.10$; * = $p < 0.05$; ** = $p < .01$; *** = $p < .001$. Observations are rounded due to NCES guidelines.

Table A9

*Results of Two-Stage Least Squares, Dependent Variable: Graduate School Enrollment
First Stage Full Model*

	Loan		Federal Loan	
	2009	2012	2009	2012
Change in Average Tuition and Fees	0.84***	0.84***	0.78***	0.78***
	(0.13)	(0.13)	(0.13)	(0.13)
Father's Education	2.55**	2.55**	2.19*	2.19*
	(0.96)	(0.96)	(0.96)	(0.96)
Change in Average Tuition and Fees * Father's Education	-0.38**	-0.38**	-0.33*	-0.33*
	(0.13)	(0.13)	(0.13)	(0.13)
Age	0.05	0.05	0.04	0.04
	(0.06)	(0.06)	(0.06)	(0.06)
Female	0.22*	0.22*	0.22*	0.22*
	(0.09)	(0.09)	(0.09)	(0.09)
Race/Ethnicity (Reference: White)				
African American	0.43**	0.43**	0.45**	0.45**
	(0.16)	(0.16)	(0.17)	(0.17)
Latino	-0.20	-0.20	-0.37*	-0.37*
	(0.17)	(0.17)	(0.18)	(0.18)
Asian	-0.92***	-0.92***	-0.94***	-0.94***
	(0.19)	(0.19)	(0.18)	(0.18)
Other Race	-0.11	-0.11	-0.23	-0.23
	(0.24)	(0.24)	(0.24)	(0.24)
Prior Income	-0.00***	-0.00***	-0.00***	-0.00***
	(0.00)	(0.00)	(0.00)	(0.00)
Prior Income * Prior Income	0.00**	0.00**	0.00***	0.00***
	(0.00)	(0.00)	(0.00)	(0.00)
Entrance Examination (in SAT)	-0.00***	-0.00***	-0.00***	-0.00***
	(0.00)	(0.00)	(0.00)	(0.00)
Institutional Selectivity (Reference: Nonselective)				
Less Selective	0.47	0.47	0.46	0.46
	(0.30)	(0.30)	(0.30)	(0.30)
Selective	0.36	0.36	0.33	0.33
	(0.24)	(0.24)	(0.25)	(0.25)
Most Selective	-0.46+	-0.46+	-0.53+	-0.53+

	(0.28)	(0.28)	(0.28)	(0.28)
Private Control	0.02	0.02	-0.04	-0.04
	(0.19)	(0.19)	(0.18)	(0.18)
2-Year or Less	1.08***	1.08***	0.97***	0.97***
	(0.26)	(0.26)	(0.27)	(0.27)
College GPA	-0.45***	-0.45***	-0.35***	-0.35***
	(0.10)	(0.10)	(0.10)	(0.10)
Entering Tuition & Fees	0.00**	0.00***	0.00**	0.00**
	(0.00)	(0.00)	(0.00)	(0.00)
Married	-0.61***	-0.61***	-0.68***	-0.68***
	(0.17)	(0.17)	(0.17)	(0.17)
Dependents	0.30*	0.30*	0.33**	0.33**
	(0.12)	(0.12)	(0.13)	(0.13)
Constant	4.33**	4.33**	4.22**	4.22**
	(1.49)	(1.49)	(1.51)	(1.51)
Observations	9820	9820	9820	9820
Wu-Hausman (<i>p</i> -value)	43.31 (0.000)	47.99 (0.000)	44.68 (0.000)	48.56 (0.000)
Minimum eigenvalue	37.18	37.182	33.91	33.91
<i>F</i> -bias crit, <i>F</i> -size crit	13.91, 22.3	13.91, 22.3	13.91, 22.3	13.91, 22.3
Sargan (<i>p</i> -value)	3.90 (0.142)	2.23 (0.329)	3.19 (0.203)	1.75 (0.416)

Note: Excluded instruments: change in average tuition and fees, father's education, and change in average tuition and fees interacted with father's education. Standard errors in parentheses. + = $p < 0.10$; * = $p < 0.05$; ** = $p < .01$; *** = $p < .001$. Observations are rounded due to NCES guidelines.

Table A10

*Results of Two-Stage Least Squares, Dependent Variable: Graduate School Enrollment
Second Stage Full Model*

	Loan		Federal Loan	
	2009	2012	2009	2012
Cumulative Loans (Log)	-0.07*** (0.01)	-0.08*** (0.01)	-0.08*** (0.01)	-0.08*** (0.01)
Age	-0.02** (0.01)	-0.02** (0.01)	-0.02** (0.01)	-0.02** (0.01)
Female	0.02+ (0.01)	0.04** (0.01)	0.02+ (0.01)	0.04** (0.01)
Race/Ethnicity (Reference: White)				
African American	0.16*** (0.02)	0.22*** (0.02)	0.16*** (0.02)	0.23*** (0.03)
Latino	0.02 (0.02)	0.05* (0.02)	0.01 (0.02)	0.03 (0.02)
Asian	-0.01 (0.03)	0.01 (0.03)	-0.01 (0.03)	0.00 (0.03)
Other Race	0.02 (0.03)	0.03 (0.03)	0.01 (0.03)	0.02 (0.03)
Prior Income	-0.00*** (0.00)	-0.00*** (0.00)	-0.00*** (0.00)	-0.00*** (0.00)
Prior Income * Prior Income	0.00* (0.00)	0.00 (0.00)	0.00** (0.00)	0.00+ (0.00)
Entrance Examination (in SAT)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)
Institutional Selectivity (Reference: Nonselective)				
Less Selective	0.04 (0.04)	0.02 (0.04)	0.04 (0.04)	0.02 (0.04)
Selective	0.07* (0.03)	0.06 (0.04)	0.07* (0.03)	0.06 (0.04)
Most Selective	0.04 (0.04)	0.04 (0.04)	0.04 (0.04)	0.04 (0.04)
Private Control	0.06* (0.02)	0.04+ (0.02)	0.05* (0.02)	0.04 (0.02)
2-Year or Less	0.04 (0.04)	0.06 (0.04)	0.04 (0.04)	0.06 (0.04)
College GPA	0.14*** (0.01)	0.16*** (0.02)	0.14*** (0.01)	0.17*** (0.02)

Entering Tuition & Fees	0.00 (0.00)	0.00*** (0.00)	0.00 (0.00)	0.00*** (0.00)
Married	-0.10*** (0.02)	-0.11*** (0.02)	-0.11*** (0.02)	-0.12*** (0.03)
Dependents	0.03* (0.02)	0.06** (0.02)	0.04* (0.02)	0.06** (0.02)
Constant	0.71*** (0.21)	0.75*** (0.21)	0.71*** (0.21)	0.75*** (0.22)
Observations	9820	9820	9820	9820
Wu-Hausman (<i>p</i> -value)	43.31 (0.000)	47.99 (0.000)	44.68 (0.000)	48.56 (0.000)
Minimum eigenvalue	37.18	37.182	33.91	33.91
<i>F</i> -bias crit, <i>F</i> -size crit	13.91, 22.3	13.91, 22.3	13.91, 22.3	13.91, 22.3
Sargan (<i>p</i> -value)	3.90 (0.142)	2.23 (0.329)	3.19 (0.203)	1.75 (0.416)

Note: Excluded instruments: change in average tuition and fees, father's education, and change in average tuition and fees interacted with father's education. Standard errors in parentheses. + = $p < 0.10$; * = $p < 0.05$; ** = $p < .01$; *** = $p < .001$. Observations are rounded due to NCES guidelines.

Table A11

Results of OLS, Dependent Variable: Salary (Full Model)

	Loan		Federal Loan	
	2009	2012	2009	2012
Cumulative Loans Borrowed 2009 (Log)	0.003	0.010⁺	0.001	0.009⁺
	(0.002)	(0.005)	(0.002)	(0.005)
Age	0.01 (0.01)	-0.04 (0.04)	0.01 (0.01)	-0.04 (0.04)
Female	-0.19*** (0.02)	-0.26*** (0.05)	-0.19*** (0.02)	-0.26*** (0.05)
Race/Ethnicity (Reference: White)				
African American	-0.06 ⁺ (0.03)	-0.50*** (0.13)	-0.06 ⁺ (0.03)	-0.50*** (0.13)
Latino	0.02 (0.03)	-0.18 (0.11)	0.02 (0.03)	-0.18 (0.11)
Asian	0.02 (0.04)	-0.48*** (0.14)	0.02 (0.04)	-0.48*** (0.14)
Other Race	-0.02 (0.04)	-0.11 (0.12)	-0.03 (0.04)	-0.11 (0.12)
Prior Income	-0.00 (0.00)	-0.00 (0.00)	-0.00 (0.00)	-0.00 (0.00)
Prior Income * Prior Income	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)
Entrance Examination (in SAT)	-0.00 (0.00)	0.00*** (0.00)	-0.00 (0.00)	0.00*** (0.00)
Institutional Selectivity (Reference: Nonselective)				
Less Selective	-0.02 (0.05)	0.18 (0.16)	-0.02 (0.05)	0.18 (0.16)
Selective	-0.03 (0.04)	0.04 (0.14)	-0.03 (0.04)	0.04 (0.14)
Most Selective	0.09* (0.05)	0.18 (0.15)	0.09* (0.05)	0.18 (0.15)
Private Control	-0.08** (0.03)	-0.08 (0.09)	-0.08** (0.03)	-0.08 (0.09)
2-Year or Less	-0.04	-0.04	-0.04	-0.04

	(0.04)	(0.15)	(0.04)	(0.15)
College GPA	-0.01	0.00	-0.01	-0.00
	(0.02)	(0.05)	(0.02)	(0.05)
Entering Tuition & Fees	0.00	-0.00	0.00	-0.00
	(0.00)	(0.00)	(0.00)	(0.00)
Married	0.10***	0.07	0.10***	0.07
	(0.03)	(0.08)	(0.03)	(0.08)
Dependents	0.06*	0.04	0.06*	0.04
	(0.02)	(0.08)	(0.02)	(0.08)
Constant	10.16***	10.04***	10.18***	10.06***
	(0.22)	(0.83)	(0.22)	(0.83)
Observations	8030	8030	8030	8030

Note: Standard errors in parentheses. + = $p < 0.10$; * = $p < 0.05$; ** = $p < .01$; *** = $p < .001$.
Observations are rounded due to NCES guidelines.

Table A12

Results of OLS Reduced Form, Dependent Variable: Salary (Full Model)

	Loan		Federal Loan	
	2009	2012	2009	2012
Change in Average Tuition and Fees	1,271.66*	1,390.70	1,271.66*	1,390.70
	(587.57)	(1,004.87)	(587.57)	(1,004.87)
Father's Education	31.29	-1,041.51	31.29	-1,041.51
	(602.50)	(1,021.86)	(602.50)	(1,021.86)
Change in Average Tuition and Fees * Father's Education	-606.66	5,963.83	-606.66	5,963.83
	(4,316.96)	(7,270.90)	(4,316.96)	(7,270.90)
Age	344.79	287.37	344.79	287.37
	(289.12)	(464.32)	(289.12)	(464.32)
Female	-6,264.99***	-10,201.01***	-6,264.99***	-10,201.01***
	(421.85)	(643.05)	(421.85)	(643.05)
Race/Ethnicity (Reference: White)				
African American	-490.43	-1,982.22+	-490.43	-1,982.22+
	(785.24)	(1,143.88)	(785.24)	(1,143.88)
Latino	1,319.59+	1,471.21	1,319.59+	1,471.21
	(794.22)	(1,198.50)	(794.22)	(1,198.50)
Asian	2,620.27*	3,368.56*	2,620.27*	3,368.56*
	(1,020.87)	(1,607.12)	(1,020.87)	(1,607.12)
Other Race	615.27	-1,577.67	615.27	-1,577.67
	(1,337.01)	(1,573.44)	(1,337.01)	(1,573.44)
Prior Income	-0.00	-0.02	-0.00	-0.02
	(0.01)	(0.02)	(0.01)	(0.02)
Prior Income * Prior Income	0.00	0.00+	0.00	0.00+
	(0.00)	(0.00)	(0.00)	(0.00)
Entrance Examination (in SAT)	0.95	8.08***	0.95	8.08***
	(1.29)	(1.99)	(1.29)	(1.99)
Institutional Selectivity (Reference: Nonselective)				
Less Selective	-1,127.09	-624.78	-1,127.09	-624.78
	(1,202.47)	(1,657.22)	(1,202.47)	(1,657.22)
Selective	-985.19	-453.53	-985.19	-453.53
	(1,017.50)	(1,435.71)	(1,017.50)	(1,435.71)

Most Selective	3,358.94** (1,200.57)	4,381.61** (1,694.57)	3,358.94** (1,200.57)	4,381.61** (1,694.57)
Private Control	-2,886.06*** (839.90)	-4,844.73*** (1,221.03)	-2,886.06*** (839.90)	-4,844.73*** (1,221.03)
2-Year or Less	-334.92 (1,106.79)	-251.94 (1,563.63)	-334.92 (1,106.79)	-251.94 (1,563.63)
College GPA	1,131.56** (430.36)	1,626.80* (648.40)	1,131.56** (430.36)	1,626.80* (648.40)
Entering Tuition & Fees	-0.02 (0.05)	0.16* (0.08)	-0.02 (0.05)	0.16* (0.08)
Married	2,416.00** (735.40)	2,262.39* (1,084.79)	2,416.00** (735.40)	2,262.39* (1,084.79)
Dependents	1,629.00** (630.82)	2,075.56 (1,423.27)	1,629.00** (630.82)	2,075.56 (1,423.27)
Constant	15,587.27* (7,254.99)	18,979.25 (11,597.25)	15,587.27* (7,254.99)	18,979.25 (11,597.25)
Observations	8030	8030	8030	8030

Note: Reduced form model of the IV model for undergraduate debt's effect on early-career occupation salary. Standard errors in parentheses. + = $p < 0.10$; * = $p < 0.05$; ** = $p < .01$; *** = $p < .001$. Observations are rounded due to NCES guidelines.

Table A13

Results of Two-Stage Least Squares, Dependent Variable: Salary
First Stage Full Model

	Loan		Federal Loan	
	2009	2012	2009	2012
Change in Average Tuition and Fees	0.83***	0.83***	0.77***	0.77***
	(0.16)	(0.16)	(0.16)	(0.16)
Father's Education	2.70*	2.70*	2.39*	2.39*
	(1.19)	(1.19)	(1.19)	(1.19)
Change in Average tuition and Fees * Father's education	-0.40*	-0.40*	-0.35*	-0.35*
	(0.16)	(0.16)	(0.16)	(0.16)
Age	0.04	0.04	0.04	0.04
	(0.06)	(0.06)	(0.07)	(0.07)
Female	0.25*	0.25*	0.27**	0.27**
	(0.10)	(0.10)	(0.10)	(0.10)
Race/Ethnicity (Reference: White)				
African American	0.50**	0.50**	0.52**	0.52**
	(0.18)	(0.18)	(0.19)	(0.19)
Latino	-0.04	-0.04	-0.23	-0.23
	(0.19)	(0.19)	(0.20)	(0.20)
Asian	-0.87***	-0.87***	-0.90***	-0.90***
	(0.22)	(0.22)	(0.22)	(0.22)
Other Race	-0.14	-0.14	-0.21	-0.21
	(0.26)	(0.26)	(0.26)	(0.26)
Prior Income	-0.00***	-0.00***	-0.00***	-0.00***
	(0.00)	(0.00)	(0.00)	(0.00)
Prior Income * Prior Income	0.00**	0.00**	0.00***	0.00***
	(0.00)	(0.00)	(0.00)	(0.00)
Entrance Examination (in SAT)	-0.00***	-0.00***	-0.00***	-0.00***
	(0.00)	(0.00)	(0.00)	(0.00)
Institutional Selectivity (Reference: Nonselective)				
Less Selective	0.68*	0.68*	0.65*	0.65*
	(0.32)	(0.32)	(0.32)	(0.32)
Selective	0.49+	0.49+	0.46+	0.46+
	(0.27)	(0.27)	(0.27)	(0.27)
Most Selective	-0.36	-0.36	-0.43	-0.43

	(0.30)	(0.30)	(0.31)	(0.31)
Private Control	0.04	0.04	0.01	0.01
	(0.21)	(0.21)	(0.21)	(0.21)
2-Year or Less	1.17***	1.17***	1.06***	1.06***
	(0.29)	(0.29)	(0.29)	(0.29)
College GPA	-0.42***	-0.42***	-0.32**	-0.32**
	(0.11)	(0.11)	(0.11)	(0.11)
Entering Tuition & Fees	0.00***	0.00***	0.00***	0.00***
	0.00***	0.00***	0.00***	0.00***
Married	-0.54**	-0.54**	-0.56**	-0.56**
	(0.18)	(0.18)	(0.19)	(0.19)
Dependents	0.27 ⁺	0.27 ⁺	0.28*	0.28*
	(0.14)	(0.14)	(0.14)	(0.14)
Constant	4.24*	4.24*	3.95*	3.95*
	(1.77)	(1.77)	(1.79)	(1.79)
Observations	8030	8030	8030	8030
Wu-Hausman (<i>p</i> -value)	28.96 (0.000)	9.220 (0.002)	30.60 (0.000)	9.13 (0.003)
Minimum eigenvalue	26.27	26.27	24.07	24.07
<i>F</i> -bias crit, <i>F</i> -size crit	13.91, 22.3	13.91, 22.3	13.91, 22.3	13.91, 22.3
Sargan (<i>p</i> -value)	3.04 (0.219)	1.01 (0.604)	2.44 (0.295)	1.16 (0.561)

Note: Excluded instruments: change in average tuition and fees, father's education, and change in average tuition and fees interacted with father's education. Standard errors in parentheses. ⁺ = $p < 0.10$; * = $p < 0.05$; ** = $p < .01$; *** = $p < .001$. Observations are rounded due to NCES guidelines.

Table A14

Results of Two-Stage Least Squares, Dependent Variable: Salary
Second Stage Full Model

	Loan		Federal Loan	
	2009	2012	2009	2012
Cumulative Loans (Log)	0.10*** (0.02)	0.18* (0.08)	0.11*** (0.03)	0.18* (0.08)
Age	0.01 (0.01)	-0.04 (0.04)	0.01 (0.01)	-0.04 (0.04)
Female	-0.22*** (0.02)	-0.30*** (0.05)	-0.22*** (0.02)	-0.30*** (0.05)
Race/Ethnicity (Reference: White)				
African American	-0.10** (0.04)	-0.57*** (0.14)	-0.11** (0.04)	-0.58*** (0.14)
Latino	0.03 (0.04)	-0.17 (0.12)	0.05 (0.04)	-0.13 (0.12)
Asian	0.12* (0.05)	-0.32+ (0.16)	0.13* (0.05)	-0.30+ (0.17)
Other Race	-0.00 (0.05)	-0.07 (0.13)	0.00 (0.05)	-0.06 (0.14)
Prior Income	0.00*** (0.00)	0.00+ (0.00)	0.00*** (0.00)	0.00+ (0.00)
Prior Income * Prior Income	-0.00 (0.00)	-0.00 (0.00)	-0.00 (0.00)	-0.00 (0.00)
Entrance Examination (in SAT)	0.00 (0.00)	0.00*** (0.00)	0.00 (0.00)	0.00*** (0.00)
Institutional Selectivity (Reference: Nonselective)				
Less Selective	-0.09 (0.06)	0.06 (0.18)	-0.09 (0.06)	0.06 (0.18)
Selective	-0.09+ (0.05)	-0.06 (0.15)	-0.09+ (0.05)	-0.05 (0.15)
Most Selective	0.13* (0.06)	0.24 (0.16)	0.14* (0.06)	0.25 (0.17)
Private Control	-0.10** (0.04)	-0.10 (0.10)	-0.10* (0.04)	-0.10 (0.10)
2-Year or Less	-0.13* (0.06)	-0.19 (0.17)	-0.12* (0.06)	-0.18 (0.17)
College GPA	0.04+ (0.02)	0.08 (0.07)	0.03 (0.02)	0.07 (0.06)

Entering Tuition & Fees	-0.00*	-0.00*	-0.00+	-0.00*
	(0.00)	(0.00)	(0.00)	(0.00)
Married	0.15***	0.16	0.16***	0.16+
	(0.04)	(0.10)	(0.04)	(0.10)
Dependents	0.02	-0.02	0.02	-0.02
	(0.03)	(0.09)	(0.03)	(0.09)
Constant	9.06***	8.21***	9.08***	8.27***
	(0.37)	(1.22)	(0.37)	(1.21)
Observations	8030	8030	8030	8030
Wu-Hausman (<i>p</i> -value)	28.96 (0.000)	9.220 (0.002)	30.60 (0.000)	9.13 (0.003)
Minimum eigenvalue	26.27	26.27	24.07	24.07
<i>F</i> -bias crit, <i>F</i> -size crit	13.91, 22.3	13.91, 22.3	13.91, 22.3	13.91, 22.3
Sargan (<i>p</i> -value)	3.04 (0.219)	1.01 (0.604)	2.44 (0.295)	1.16 (0.561)

Note: Excluded instruments: change in average tuition and fees, father's education, and change in average tuition and fees interacted with father's education. Standard errors in parentheses. + = $p < 0.10$; * = $p < 0.05$; ** = $p < .01$; *** = $p < .001$. Observations are rounded due to NCES guidelines.

Table A15

Results of OLS Reduced Form (Just Identified), Dependent Variable: Graduate School Aspirations

	Loan	Federal Loan
Change in Average Tuition and Fees	-0.01	-0.01
	(0.01)	(0.01)
Female	0.07***	0.07***
	(0.01)	(0.01)
Race/Ethnicity (Reference: White)		
African American	0.15***	0.15***
	(0.02)	(0.02)
Latino	0.09***	0.09***
	(0.02)	(0.02)
Asian	0.12***	0.12***
	(0.02)	(0.02)
Other Race	0.06**	0.06**
	(0.02)	(0.02)
Mother's Education	0.02	0.02
	(0.02)	(0.02)
Prior Income	0.00***	0.00***
	(0.00)	(0.00)
Prior Income * Prior Income	-0.00**	-0.00**
	(0.00)	(0.00)
Entrance Examination (in SAT)	0.00***	0.00***
	(0.00)	(0.00)
Institutional Selectivity (Reference: Nonselective)		
Less Selective	0.02	0.02
	(0.03)	(0.03)
Selective	0.09***	0.09***
	(0.03)	(0.03)
Most Selective	0.10***	0.10***
	(0.03)	(0.03)
Private Control	-0.01	-0.01
	(0.02)	(0.02)
2-Year or Less	-0.13***	-0.13***
	(0.03)	(0.03)
College GPA	0.08***	0.08***
	(0.01)	(0.01)
Entering Tuition & Fees	0.00**	0.00**
	(0.00)	(0.00)

Married	0.00 (0.06)	0.00 (0.06)
Dependents	-0.03 (0.02)	-0.03 (0.02)
Constant	-0.02 (0.07)	-0.02 (0.07)
Observations	8880	8880

Note: Standard errors in parentheses. + = $p < 0.10$; * = $p < 0.05$; ** = $p < .01$; *** = $p < .001$.
Observations are rounded due to NCES guidelines.

Table A16

*Results of Two-Stage Least Squares, Dependent Variable: Graduate School Aspirations.
First Stage Full Model, Just Identified*

	Loan	Federal Loan
Change in Average Tuition and Fees	0.30***	0.30***
	(0.08)	(0.08)
Female	0.12 (0.10)	0.11 (0.09)
Race/Ethnicity (Reference: White)		
African American	1.05*** (0.15)	1.12*** (0.16)
Latino	-0.19 (0.18)	-0.22 (0.17)
Asian	-0.90*** (0.23)	-0.90*** (0.22)
Other Race	-0.28 (0.22)	-0.17 (0.21)
Mother's Education	0.17 (0.22)	0.25 (0.22)
Prior Income	-0.00*** (0.00)	-0.00*** (0.00)
Prior Income * Prior Income	0.00* (0.00)	0.00** (0.00)
Entrance Examination (in SAT)	-0.00** (0.00)	-0.00** (0.00)
Institutional Selectivity (Reference: Nonselective)		
Less Selective	0.31 (0.28)	0.42 (0.29)
Selective	-0.01 (0.24)	0.14 (0.24)
Most Selective	-1.21*** (0.29)	-1.08*** (0.29)
Private Control	0.51** (0.19)	0.69*** (0.19)
2-Year or Less	-1.14*** (0.25)	-1.12*** (0.25)
College GPA	-0.37*** (0.09)	-0.30*** (0.09)
Entering Tuition & Fees	0.00** (0.00)	0.00+ (0.00)

Married	-0.30 (0.58)	-0.07 (0.56)
Dependents	-0.52* (0.22)	-0.63** (0.22)
Constant	7.30*** (0.73)	6.47*** (0.71)
Observations	8880	8880
Wu-Hausman (<i>p</i> -value)	1.52 (0.217)	1.57 (0.211)
Minimum eigenvalue	15.46	16.74
<i>F</i> -size crit	16.38	16.38

Note: Excluded instrument: change in average tuition and fees. Standard errors in parentheses. + = $p < 0.10$; * = $p < 0.05$; ** = $p < .01$; *** = $p < .001$. Observations are rounded due to NCES guidelines.

Table A17

*Results of Two-Stage Least Squares, Dependent Variable: Graduate School Aspirations
Second Stage Full Model, Just Identified*

	Loan	Federal Loan
Cumulative Loans (Log)	-0.03	-0.03
	(0.03)	(0.03)
Female	0.08***	0.08***
	(0.01)	(0.01)
Race/Ethnicity (Reference: White)		
African American	0.18***	0.18***
	(0.03)	(0.03)
Latino	0.08***	0.08***
	(0.02)	(0.02)
Asian	0.09***	0.09**
	(0.03)	(0.03)
Other Race	0.06*	0.06*
	(0.02)	(0.02)
Mother's Education	0.02	0.02
	(0.03)	(0.03)
Prior Income	0.00	0.00
	(0.00)	(0.00)
Prior Income * Prior Income	-0.00	-0.00
	(0.00)	(0.00)
Entrance Examination (in SAT)	0.00***	0.00***
	(0.00)	(0.00)
Institutional Selectivity (Reference: Nonselective)		
Less Selective	0.02	0.02
	(0.04)	(0.04)
Selective	0.09**	0.09***
	(0.03)	(0.03)
Most Selective	0.07	0.08 ⁺
	(0.05)	(0.04)
Private Control	0.00	0.01
	(0.03)	(0.03)
2-Year or Less	-0.16***	-0.16***
	(0.05)	(0.05)
College GPA	0.07***	0.07***
	(0.01)	(0.01)
Entering Tuition & Fees	0.00*	0.00*
	(0.00)	(0.00)
Married	-0.01	0.00

	(0.06)	(0.06)
Dependents	-0.04	-0.05
	(0.03)	(0.03)
Constant	0.18	0.15
	(0.26)	(0.23)
Observations	8880	8880
Wu-Hausman (<i>p</i> -value)	1.52 (0.217)	1.57 (0.211)
Minimum eigenvalue	15.46	16.74
<i>F</i> -size crit	16.38	16.38

Note: Excluded instrument: change in average tuition and fees. Standard errors in parentheses. + = $p < 0.10$; * = $p < 0.05$; ** = $p < .01$; *** = $p < .001$. Observations are rounded due to NCES guidelines.

Table A18

Results of OLS Reduced Form (Just Identified), Dependent Variable: Graduate School Enrollment

	Loan		Federal Loan	
	2009	2012	2009	2012
Change in Average Tuition and Fees	-0.04***	-0.04***	-0.04***	-0.04***
	(0.01)	(0.01)	(0.01)	(0.01)
Age	-0.03***	-0.03***	-0.03***	-0.03***
	(0.01)	(0.01)	(0.01)	(0.01)
Female	0.00	0.02 ⁺	0.00	0.02 ⁺
	(0.01)	(0.01)	(0.01)	(0.01)
Race/Ethnicity (Reference: White)				
African American	0.13***	0.19***	0.13***	0.19***
	(0.02)	(0.02)	(0.02)	(0.02)
Latino	0.04 [*]	0.06**	0.04 [*]	0.06**
	(0.02)	(0.02)	(0.02)	(0.02)
Asian	0.06**	0.08***	0.06**	0.08***
	(0.02)	(0.02)	(0.02)	(0.02)
Other Race	0.03	0.04	0.03	0.04
	(0.03)	(0.03)	(0.03)	(0.03)
Father's Education	0.03	0.00	0.03	0.00
	(0.02)	(0.02)	(0.02)	(0.02)
Prior Income	-0.00	0.00	-0.00	0.00
	(0.00)	(0.00)	(0.00)	(0.00)
Prior Income * Prior Income	0.00	-0.00	0.00	-0.00
	(0.00)	(0.00)	(0.00)	(0.00)
Entrance Examination (in SAT)	0.00***	0.00***	0.00***	0.00***
	(0.00)	(0.00)	(0.00)	(0.00)
Institutional Selectivity (Reference: Nonselective)				
Less Selective	0.00	-0.02	0.00	-0.02
	(0.03)	(0.03)	(0.03)	(0.03)
Selective	0.05 ⁺	0.03	0.05 ⁺	0.03
	(0.02)	(0.03)	(0.02)	(0.03)
Most Selective	0.08**	0.08 [*]	0.08**	0.08 [*]
	(0.03)	(0.03)	(0.03)	(0.03)
Private Control	0.06**	0.04 [*]	0.06**	0.04 [*]
	(0.02)	(0.02)	(0.02)	(0.02)
2-Year or Less	-0.04	-0.02	-0.04	-0.02

	(0.03)	(0.03)	(0.03)	(0.03)
College GPA	0.17***	0.20***	0.17***	0.20***
	(0.01)	(0.01)	(0.01)	(0.01)
Entering Tuition & Fees	-0.00	0.00*	-0.00	0.00*
	(0.00)	(0.00)	(0.00)	(0.00)
Married	-0.06**	-0.07***	-0.06**	-0.07***
	(0.02)	(0.02)	(0.02)	(0.02)
Dependents	0.01	0.03*	0.01	0.03*
	(0.01)	(0.02)	(0.01)	(0.02)
Constant	0.24+	0.27+	0.24+	0.27+
	(0.14)	(0.14)	(0.14)	(0.14)
Observations	9820	9820	9820	9820

Note: Standard errors in parentheses. + = $p < 0.10$; * = $p < 0.05$; ** = $p < .01$; *** = $p < .001$.
Observations are rounded due to NCES guidelines.

Table A19

*Results of Two-Stage Least Squares, Dependent Variable: Graduate School Enrollment
First Stage Full Model, Just Identified*

	Loan		Federal Loan	
	2009	2012	2009	2012
Change in Average Tuition and Fees	0.50***	0.50***	0.48***	0.48***
	(0.05)	(0.05)	(0.05)	(0.05)
Age	0.05	0.05	0.04	0.04
	(0.06)	(0.06)	(0.06)	(0.06)
Female	0.22*	0.22*	0.23*	0.23*
	(0.09)	(0.09)	(0.09)	(0.09)
Race/Ethnicity (Reference: White)				
African American	0.43**	0.43**	0.45**	0.45**
	(0.16)	(0.16)	(0.17)	(0.17)
Latino	-0.20	-0.20	-0.37*	-0.37*
	(0.17)	(0.17)	(0.18)	(0.18)
Asian	-0.93***	-0.93***	-0.95***	-0.95***
	(0.19)	(0.19)	(0.18)	(0.18)
Other Race	-0.11	-0.11	-0.23	-0.23
	(0.24)	(0.24)	(0.24)	(0.24)
Father's Education	-0.05	-0.05	-0.07	-0.07
	(0.19)	(0.19)	(0.19)	(0.19)
Prior Income	-0.00***	-0.00***	-0.00***	-0.00***
	(0.00)	(0.00)	(0.00)	(0.00)
Prior Income * Prior Income	0.00**	0.00**	0.00***	0.00***
	(0.00)	(0.00)	(0.00)	(0.00)
Entrance Examination (in SAT)	-0.00***	-0.00***	-0.00***	-0.00***
	(0.00)	(0.00)	(0.00)	(0.00)
Institutional Selectivity (Reference: Nonselective)				
Less Selective	0.48	0.48	0.47	0.47
	(0.29)	(0.29)	(0.30)	(0.30)
Selective	0.36	0.36	0.34	0.34
	(0.24)	(0.24)	(0.25)	(0.25)
Most Selective	-0.45	-0.45	-0.53+	-0.53+
	(0.28)	(0.28)	(0.28)	(0.28)
Private Control	0.01	0.01	-0.05	-0.05
	(0.19)	(0.19)	(0.18)	(0.18)
2-Year or Less	1.09***	1.09***	0.98***	0.98***

	(0.26)	(0.26)	(0.27)	(0.27)
College GPA	-0.45***	-0.45***	-0.35***	-0.35***
	(0.10)	(0.10)	(0.10)	(0.10)
Entering Tuition & Fees	0.00***	0.00***	0.00***	0.00***
	(0.00)	(0.00)	(0.00)	(0.00)
Married	-0.62***	-0.62***	-0.68***	-0.68***
	(0.17)	(0.17)	(0.17)	(0.17)
Dependents	0.30*	0.30*	0.33**	0.33**
	(0.12)	(0.12)	(0.13)	(0.13)
Constant	6.66***	6.66***	6.24***	6.24***
	(1.24)	(1.24)	(1.26)	(1.26)
Observations	9820	9820	9820	9820
Wu-Hausman (<i>p</i> -value)	47.89 (0.000)	51.04 (0.000)	48.44 (0.000)	51.01 (0.000)
Minimum eigenvalue	103.41	103.41	95.65	95.65
<i>F</i> -bias crit, <i>F</i> -size crit	16.38	16.38	16.38	16.38

Note: Excluded instrument: change in average tuition and fees. Standard errors in parentheses. + = $p < 0.10$; * = $p < 0.05$; ** = $p < .01$; *** = $p < .001$. Observations are rounded due to NCES guidelines.

Table A20

*Results of Two-Stage Least Squares, Dependent Variable: Graduate School Enrollment
Second Stage Full Model, Just Identified*

	Loan		Federal Loan	
	2009	2012	2009	2012
Cumulative Loans (Log)	-0.08*** (0.01)	-0.08*** (0.01)	-0.08*** (0.01)	-0.09*** (0.01)
Age	-0.02** (0.01)	-0.02** (0.01)	-0.02** (0.01)	-0.02** (0.01)
Female	0.02+ (0.01)	0.04** (0.01)	0.02+ (0.01)	0.04** (0.01)
Race/ethnicity (Reference: White)				
African American	0.16*** (0.02)	0.22*** (0.02)	0.16*** (0.02)	0.23*** (0.03)
Latino	0.03 (0.02)	0.05+ (0.02)	0.01 (0.02)	0.03 (0.03)
Asian	-0.01 (0.03)	0.00 (0.03)	-0.02 (0.03)	-0.00 (0.03)
Other Race	0.02 (0.03)	0.03 (0.03)	0.01 (0.03)	0.02 (0.03)
Father's Education	0.02 (0.03)	-0.00 (0.03)	0.02 (0.03)	-0.01 (0.03)
Prior Income	-0.00*** (0.00)	-0.00*** (0.00)	-0.00*** (0.00)	-0.00*** (0.00)
Prior Income * Prior Income	0.00* (0.00)	0.00 (0.00)	0.00** (0.00)	0.00* (0.00)
Entrance Examination (in SAT)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)
Institutional Selectivity (Reference: Nonselective)				
Less Selective	0.04 (0.04)	0.02 (0.04)	0.04 (0.04)	0.02 (0.04)
Selective	0.08* (0.03)	0.06 (0.04)	0.08* (0.03)	0.06 (0.04)
Most Selective	0.04 (0.04)	0.04 (0.04)	0.03 (0.04)	0.03 (0.04)
Private Control	0.06* (0.02)	0.04+ (0.02)	0.05* (0.02)	0.04 (0.02)
2-Year or Less	0.05 (0.04)	0.07+ (0.04)	0.04 (0.04)	0.06 (0.04)

College GPA	0.13*** (0.01)	0.16*** (0.02)	0.14*** (0.01)	0.17*** (0.02)
Entering Tuition & Fees	0.00+ (0.00)	0.00*** (0.00)	0.00 (0.00)	0.00*** (0.00)
Married	-0.10*** (0.02)	-0.12*** (0.02)	-0.11*** (0.02)	-0.12*** (0.03)
Dependents	0.04* (0.02)	0.06** (0.02)	0.04* (0.02)	0.06** (0.02)
Constant	0.76*** (0.22)	0.81*** (0.22)	0.75*** (0.22)	0.80*** (0.22)
Observations	9820	9820	9820	9820
Wu-Hausman (<i>p</i> -value)	47.89 (0.000)	51.04 (0.000)	48.44 (0.000)	51.01 (0.000)
Minimum eigenvalue	103.41	103.41	95.65	95.65
<i>F</i> -size crit	16.38	16.38	16.38	16.38

Note: Excluded instrument: change in average tuition and fees. Standard errors in parentheses. + = $p < 0.10$; * = $p < 0.05$; ** = $p < .01$; *** = $p < .001$. Observations are rounded due to NCES guidelines.

Table A21

Results of OLS Reduced Form (Just Identified), Dependent Variable: Salary

	Loan		Federal Loan	
	2009	2012	2009	2012
Change in Average Tuition and Fees	1,300.02***	446.68	1,300.02***	446.68
	(225.72)	(360.13)	(225.72)	(360.13)
Age	344.80 (289.09)	287.09 (464.44)	344.80 (289.09)	287.09 (464.44)
Female	-6,265.19*** (421.87)	-10,194.60*** (643.06)	-6,265.19*** (421.87)	-10,194.60*** (643.06)
Race/Ethnicity (Reference: White)				
African American	-490.12 (785.23)	-1,992.56+ (1,143.27)	-490.12 (785.23)	-1,992.56+ (1,143.27)
Latino	1,319.23+ (794.32)	1,483.05 (1,198.96)	1,319.23+ (794.32)	1,483.05 (1,198.96)
Asian	2,621.91* (1,019.20)	3,313.95* (1,606.54)	2,621.91* (1,019.20)	3,313.95* (1,606.54)
Other Race	615.07 (1,336.91)	-1,570.83 (1,573.15)	615.07 (1,336.91)	-1,570.83 (1,573.15)
Father's Education	-388.98 (875.06)	-1,281.66 (1,319.99)	-388.98 (875.06)	-1,281.66 (1,319.99)
Prior Income	-0.00 (0.01)	-0.02 (0.02)	-0.00 (0.01)	-0.02 (0.02)
Prior Income * Prior Income	0.00 (0.00)	0.00+ (0.00)	0.00 (0.00)	0.00+ (0.00)
Entrance Examination (in SAT)	0.95 (1.29)	8.10*** (1.99)	0.95 (1.29)	8.10*** (1.99)
Institutional Selectivity (Reference: Nonselective)				
Less Selective	-1,128.36 (1,202.84)	-582.44 (1,656.10)	-1,128.36 (1,202.84)	-582.44 (1,656.10)
Selective	-985.63 (1,017.71)	-438.83 (1,435.09)	-985.63 (1,017.71)	-438.83 (1,435.09)
Most Selective	3,358.26** (1,200.89)	4,404.22** (1,693.58)	3,358.26** (1,200.89)	4,404.22** (1,693.58)
Private Control	-2,885.10*** (839.32)	-4,876.73*** (1,220.26)	-2,885.10*** (839.32)	-4,876.73*** (1,220.26)
2-Year or Less	-335.87 (1,107.34)	-220.33 (1,563.53)	-335.87 (1,107.34)	-220.33 (1,563.53)

College GPA	1,131.89** (430.35)	1,615.66* (648.23)	1,131.89** (430.35)	1,615.66* (648.23)
Entering Tuition & Fees	-0.02 (0.05)	0.16* (0.08)	-0.02 (0.05)	0.16* (0.08)
Married	2,416.63** (735.35)	2,241.62* (1,083.84)	2,416.63** (735.35)	2,241.62* (1,083.84)
Dependents	1,628.73** (630.84)	2,084.67 (1,422.89)	1,628.73** (630.84)	2,084.67 (1,422.89)
Constant	15,389.96* (6,132.85)	25,546.42** (9,579.34)	15,389.96* (6,132.85)	25,546.42** (9,579.34)
Observations	8030	8030	8030	8030

Note: Standard errors in parentheses. + = $p < 0.10$; * = $p < 0.05$; ** = $p < .01$; *** = $p < .001$.
Observations are rounded due to NCES guidelines.

Table A22

*Results of Two-Stage Least Squares, Dependent Variable: Salary
First Stage Full Model, Just Identified*

	Loan		Federal Loan	
	2009	2012	2009	2012
Change in Average Tuition and Fees	0.47***	0.47***	0.45***	0.45***
	(0.06)	(0.06)	(0.06)	(0.06)
Age	0.04 (0.06)	0.04 (0.06)	0.04 (0.07)	0.04 (0.07)
Female	0.26** (0.10)	0.26** (0.10)	0.27** (0.10)	0.27** (0.10)
Race/Ethnicity (Reference: White)				
African American	0.49** (0.18)	0.49** (0.18)	0.52** (0.19)	0.52** (0.19)
Latino	-0.03 (0.19)	-0.03 (0.19)	-0.22 (0.20)	-0.22 (0.20)
Asian	-0.89*** (0.22)	-0.89*** (0.22)	-0.92*** (0.22)	-0.92*** (0.22)
Other Race	-0.14 (0.26)	-0.14 (0.26)	-0.20 (0.26)	-0.20 (0.26)
Father's Education	-0.11 (0.20)	-0.11 (0.20)	-0.07 (0.21)	-0.07 (0.21)
Prior Income	-0.00*** (0.00)	-0.00*** (0.00)	-0.00*** (0.00)	-0.00*** (0.00)
Prior Income * Prior Income	0.00** (0.00)	0.00** (0.00)	0.00*** (0.00)	0.00*** (0.00)
Entrance Examination (in SAT)	-0.00*** (0.00)	-0.00*** (0.00)	-0.00*** (0.00)	-0.00*** (0.00)
Institutional Selectivity (Reference: Nonselective)				
Less Selective	0.69* (0.32)	0.69* (0.32)	0.66* (0.32)	0.66* (0.32)
Selective	0.49+ (0.26)	0.49+ (0.26)	0.46+ (0.27)	0.46+ (0.27)
Most Selective	-0.35 (0.30)	-0.35 (0.30)	-0.42 (0.31)	-0.42 (0.31)
Private Control	0.03 (0.21)	0.03 (0.21)	0.00 (0.20)	0.00 (0.20)
2-Year or Less	1.18***	1.18***	1.07***	1.07***

	(0.29)	(0.29)	(0.29)	(0.29)
College GPA	-0.43***	-0.43***	-0.33**	-0.33**
	(0.11)	(0.11)	(0.11)	(0.11)
Entering Tuition & Fees	0.00***	0.00***	0.00***	0.00***
	(0.00)	(0.00)	(0.00)	(0.00)
Married	-0.54**	-0.54**	-0.56**	-0.56**
	(0.18)	(0.18)	(0.19)	(0.19)
Dependents	0.27*	0.27*	0.28*	0.28*
	(0.14)	(0.14)	(0.14)	(0.14)
Constant	6.78***	6.78***	6.18***	6.18***
	(1.41)	(1.41)	(1.43)	(1.43)
Observations	8030	8030	8030	8030
Wu-Hausman (<i>p</i> -value)	32.71 (0.000)	6.70 (0.010)	33.68 (0.000)	6.76 (0.009)
Minimum eigenvalue	71.89	71.89	66.92	66.92
<i>F</i> -size crit	16.38	16.38	16.38	16.38

Note: Excluded instrument: change in average tuition and fees. Standard errors in parentheses. + = $p < 0.10$; * = $p < 0.05$; ** = $p < .01$; *** = $p < .001$. Observations are rounded due to NCES guidelines.

Table A23

Results of Two-Stage Least Squares, Dependent Variable: Salary
Second Stage Full Model, Just Identified

	Loan		Federal Loan	
	2009	2012	2009	2012
Cumulative Loans (Log)	0.11*** (0.03)	0.16* (0.07)	0.12*** (0.03)	0.16* (0.08)
Age	0.01 (0.01)	-0.04 (0.04)	0.01 (0.01)	-0.04 (0.04)
Female	-0.22*** (0.02)	-0.29*** (0.05)	-0.22*** (0.02)	-0.30*** (0.05)
Race/Ethnicity (Reference: White)				
African American	-0.11** (0.04)	-0.56*** (0.14)	-0.11** (0.04)	-0.57*** (0.14)
Latino	0.03 (0.04)	-0.17 (0.12)	0.05 (0.04)	-0.14 (0.12)
Asian	0.13* (0.05)	-0.33* (0.17)	0.14* (0.05)	-0.32+ (0.17)
Other Race	-0.00 (0.05)	-0.08 (0.13)	0.01 (0.05)	-0.07 (0.13)
Father's Education	0.02 (0.05)	0.01 (0.14)	0.02 (0.05)	0.01 (0.14)
Prior Income	0.00*** (0.00)	0.00+ (0.00)	0.00*** (0.00)	0.00+ (0.00)
Prior Income * Prior Income	-0.00 (0.00)	-0.00 (0.00)	-0.00 (0.00)	-0.00 (0.00)
Entrance Examination (in SAT)	0.00+ (0.00)	0.00*** (0.00)	0.00 (0.00)	0.00*** (0.00)
Institutional Selectivity (Reference: Nonselective)				
Less Selective	-0.10 (0.06)	0.07 (0.17)	-0.10 (0.06)	0.07 (0.18)
Selective	-0.09+ (0.05)	-0.05 (0.15)	-0.09+ (0.05)	-0.04 (0.15)
Most Selective	0.13* (0.06)	0.23 (0.16)	0.14* (0.06)	0.24 (0.16)
Private Control	-0.10** (0.04)	-0.10 (0.10)	-0.10* (0.04)	-0.10 (0.10)
2-Year or Less	-0.14* (0.06)	-0.18 (0.17)	-0.13* (0.06)	-0.17 (0.16)

College GPA	0.05 ⁺ (0.02)	0.07 (0.06)	0.04 (0.02)	0.06 (0.06)
Entering Tuition & Fees	-0.00* (0.00)	-0.00* (0.00)	-0.00* (0.00)	-0.00* (0.00)
Married	0.16*** (0.04)	0.15 (0.09)	0.16*** (0.04)	0.15 (0.10)
Dependents	0.02 (0.03)	-0.01 (0.09)	0.01 (0.03)	-0.02 (0.09)
Constant	8.92*** (0.38)	8.39*** (1.22)	8.96*** (0.39)	8.46*** (1.20)
Observations	8030	8030	8030	8030
Wu-Hausman (<i>p</i> -value)	32.71 (0.000)	6.70 (0.010)	33.68 (0.000)	6.76 (0.009)
Minimum eigenvalue	71.89	71.89	66.92	66.92
<i>F</i> -size crit	16.38	16.38	16.38	16.38

Note: Excluded instrument: change in average tuition and fees. Standard errors in parentheses. ⁺ = $p < 0.10$; * = $p < 0.05$; ** = $p < .01$; *** = $p < .001$. Observations are rounded due to NCES guidelines.

Table A24

Results of OLS, Dependent Variable: Graduate School Aspirations (Full Model)
Subpopulation: White

	Loan	Federal Loan
Cumulative Loans Borrowed 2009 (Log)	0.004**	0.004**
	(0.00)	(0.00)
Female	0.068***	0.068***
	(0.01)	(0.01)
Prior Income	0.000***	0.000***
	(0.00)	(0.00)
Prior Income * Prior Income	-0.000***	-0.000***
	(0.00)	(0.00)
Entrance Examination (in SAT)	0.000***	0.000***
	(0.00)	(0.00)
Institutional Selectivity (Reference: Nonselective)		
Less Selective	0.032	0.032
	(0.04)	(0.04)
Selective	0.099**	0.098**
	(0.03)	(0.03)
Most Selective	0.129***	0.129***
	(0.04)	(0.04)
Private Control	-0.000	-0.001
	(0.02)	(0.02)
2-Year or Less	-0.106**	-0.106**
	(0.03)	(0.03)
College GPA	0.095***	0.095***
	(0.01)	(0.01)
Entering Tuition & Fees	0.000+	0.000+
	(0.00)	(0.00)
Married	0.013	0.013
	(0.07)	(0.07)
Dependents	-0.118***	-0.119***
	(0.03)	(0.03)
Constant	-0.217***	-0.215***
	(0.05)	(0.05)
Observations	6410	6410

Note: The primary covariate of interest in the models is cumulative loans borrowed from 2003–2004 to 2008–2009 (loan) and cumulative federal loans borrowed over the same period (federal loan). Models run solely for students self-identifying as White. Standard errors in parentheses. + = $p < 0.10$; * = $p < 0.05$; ** = $p < .01$; *** = $p < .001$. Observations are rounded due to NCES guidelines.

Table A25

*Results of OLS Reduced Form, Dependent Variable: Graduate School Aspirations (Full Model);
Subpopulation: White*

	Loan	Federal Loan
Change in Average Tuition and Fees	-0.01	-0.01
	(0.04)	(0.04)
Mother's Education	0.00	0.00
	(0.30)	(0.30)
Change in Average Tuition and Fees * Mother's Education	0.01	0.01
	(0.04)	(0.04)
Female	0.07***	0.07***
	(0.01)	(0.01)
Prior Income	0.00***	0.00***
	(0.00)	(0.00)
Prior Income * Prior Income	-0.00**	-0.00**
	(0.00)	(0.00)
Entrance Examination (in SAT)	0.00***	0.00***
	(0.00)	(0.00)
Institutional Selectivity (Reference: Nonselective)		
Less Selective	0.03	0.03
	(0.04)	(0.04)
Selective	0.10**	0.10**
	(0.03)	(0.03)
Most Selective	0.12***	0.12***
	(0.04)	(0.04)
Private Control	0.00	0.00
	(0.02)	(0.02)
2-Year or Less	-0.11**	-0.11**
	(0.03)	(0.03)
College GPA	0.09***	0.09***
	(0.01)	(0.01)
Entering Tuition & Fees	0.00+	0.00+
	(0.00)	(0.00)
Married	0.02	0.02
	(0.07)	(0.07)
Dependents	-0.12***	-0.12***
	(0.03)	(0.03)
Constant	-0.20	-0.20
	(0.30)	(0.30)
Observations	6410	6410

Note: Reduced form equation for the IV model of undergraduate debt's effect on graduate school aspirations. Models run solely for students self-identifying as White. Standard errors in parentheses. + = $p < 0.10$; * = $p < 0.05$; ** = $p < .01$; *** = $p < .001$. Observations are rounded due to NCES guidelines.

Table A26

*Results of Two-Stage Least Squares, Dependent Variable: Graduate School Aspirations
First Stage Full Model; Subpopulation: White*

	Loan	Federal Loan
Change in Average Tuition and Fees	0.14	0.12
	(0.39)	(0.38)
Mother's Education	1.12	0.79
	(2.87)	(2.78)
Change in Average Tuition and Fees * Mother's Education	-0.11	-0.06
	(0.38)	(0.37)
Female	0.14	0.13
	(0.12)	(0.11)
Prior Income	-0.00***	-0.00***
	(0.00)	(0.00)
Prior Income * Prior Income	0.00**	0.00***
	(0.00)	(0.00)
Entrance Examination (in SAT)	-0.00**	-0.00*
	(0.00)	(0.00)
Institutional Selectivity (Reference: Nonselective)		
Less Selective	0.14	0.22
	(0.36)	(0.36)
Selective	-0.19	-0.01
	(0.28)	(0.28)
Most Selective	-1.49***	-1.37***
	(0.34)	(0.35)
Private Control	0.50*	0.69**
	(0.23)	(0.22)
2-Year or Less	-1.22***	-1.19***
	(0.30)	(0.30)
College GPA	-0.39***	-0.29**
	(0.11)	(0.10)
Entering Tuition & Fees	0.00***	0.00**
	(0.00)	(0.00)
Married	0.23	0.14
	(0.76)	(0.73)
Dependents	-1.05**	-0.97**
	(0.38)	(0.37)
Constant	8.68**	7.98**
	(2.95)	(2.86)
Observations	6410	6410

Wu-Hausman (p -value)	2.75 (0.097)	2.53 (0.112)
Minimum eigenvalue	0.29	0.32
F -bias crit, F -size crit	13.91, 22.3	13.91, 22.3
Sargan (p -value)	0.16 (0.923)	0.25 (0.883)

Note: Excluded instruments: change in average tuition and fees, mother's education, and change in average tuition and fees interacted with mother's education. Models run solely for students self-identifying as White. Standard errors in parentheses. + = $p < 0.10$; * = $p < 0.05$; ** = $p < .01$; *** = $p < .001$. Observations are rounded due to NCES guidelines.

Table A27

*Results of Two-Stage Least Squares, Dependent Variable: Graduate School Aspirations
Second Stage Full Model; Subpopulation: White.*

	Loan	Federal Loan
Cumulative Loans (Log)	0.18	0.17
	(0.21)	(0.19)
Female	0.05	0.05
	(0.04)	(0.03)
Prior Income	0.00	0.00
	(0.00)	(0.00)
Prior Income * Prior Income	-0.00	-0.00
	(0.00)	(0.00)
Entrance Examination (in SAT)	0.00*	0.00**
	(0.00)	(0.00)
Institutional Selectivity (Reference: Nonselective)		
Less Selective	0.01	-0.01
	(0.08)	(0.09)
Selective	0.13+	0.10+
	(0.07)	(0.06)
Most Selective	0.39	0.35
	(0.32)	(0.27)
Private Control	-0.09	-0.12
	(0.12)	(0.15)
2-Year or Less	0.11	0.09
	(0.27)	(0.25)
College GPA	0.16+	0.14*
	(0.09)	(0.06)
Entering Tuition & Fees	-0.00	-0.00
	(0.00)	(0.00)
Married	-0.02	-0.01
	(0.15)	(0.14)
Dependents	0.06	0.04
	(0.23)	(0.20)
Constant	-1.95	-1.69
	(2.11)	(1.78)
Observations	6410	6410
Wu-Hausman (<i>p</i> -value)	2.75 (0.097)	2.53 (0.112)
Minimum eigenvalue	0.29	0.32
<i>F</i> -bias crit, <i>F</i> -size crit	13.91, 22.3	13.91, 22.3
Sargan (<i>p</i> -value)	0.16 (0.923)	0.25 (0.883)

Note: Excluded instruments: change in average tuition and fees, mother's education, and change in average tuition and fees interacted with mother's education. Models run solely

for students self-identifying as White. Standard errors in parentheses. + = $p < 0.10$; * = $p < 0.05$; ** = $p < .01$; *** = $p < .001$. Observations are rounded due to NCES guidelines.

Table A28

Results of OLS, Dependent Variable: Graduate School Aspirations (Full Model)
Subpopulation: African American

	Loan	Federal Loan
Cumulative Loans Borrowed 2009 (Log)	0.008***	0.008***
	(0.00)	(0.00)
Female	0.110***	0.108***
	(0.03)	(0.03)
Prior Income	0.000	0.000
	(0.00)	(0.00)
Prior Income * Prior Income	-0.000	-0.000
	(0.00)	(0.00)
Entrance Examination (in SAT)	0.000	0.000
	(0.00)	(0.00)
Institutional Selectivity (Reference: Nonselective)		
Less Selective	-0.009	-0.012
	(0.09)	(0.09)
Selective	0.070	0.066
	(0.09)	(0.09)
Most Selective	0.133	0.130
	(0.10)	(0.10)
Private Control	-0.005	-0.008
	(0.06)	(0.06)
2-Year or Less	-0.167 ⁺	-0.169 ⁺
	(0.09)	(0.09)
College GPA	0.005	0.005
	(0.03)	(0.03)
Entering Tuition & Fees	0.000	0.000
	(0.00)	(0.00)
Married	0.212	0.208
	(0.15)	(0.15)
Dependents	0.024	0.026
	(0.04)	(0.04)
Constant	0.424**	0.432**
	(0.14)	(0.14)
Observations	860	860

Note: The primary covariate of interest in the models is cumulative loans borrowed from 2003–2004 to 2008–2009 (loan) and cumulative federal loans borrowed over the same period (federal loan). Models run solely for students self-identifying as African American. Standard errors in parentheses. ⁺ = $p < 0.10$; * = $p < 0.05$; ** = $p < .01$; *** = $p < .001$. Observations are rounded due to NCES guidelines.

Table A29

Results of OLS Reduced Form, Dependent Variable: Graduate School Aspirations (Full Model)
Subpopulation: African American

	Loan	Federal Loan
Change in Average Tuition and Fees	0.01	0.01
	(0.06)	(0.06)
Mother's Education	0.44	0.44
	(0.40)	(0.40)
Change in Average Tuition and fees * Mother's Education	-0.06	-0.06
	(0.06)	(0.06)
Female	0.11**	0.11**
	(0.03)	(0.03)
Prior Income	0.00	0.00
	(0.00)	(0.00)
Prior Income * Prior Income	-0.00	-0.00
	(0.00)	(0.00)
Entrance Examination (in SAT)	0.00	0.00
	(0.00)	(0.00)
Institutional Selectivity (Reference: Nonselective)		
Less Selective	0.01	0.01
	(0.10)	(0.10)
Selective	0.10	0.10
	(0.09)	(0.09)
Most Selective	0.16	0.16
	(0.10)	(0.10)
Private Control	0.01	0.01
	(0.06)	(0.06)
2-Year or Less	-0.21*	-0.21*
	(0.09)	(0.09)
College GPA	0.00	0.00
	(0.03)	(0.03)
Entering Tuition & Fees	0.00+	0.00+
	(0.00)	(0.00)
Married	0.19	0.19
	(0.15)	(0.15)
Dependents	0.03	0.03
	(0.04)	(0.04)
Constant	0.43	0.43
	(0.44)	(0.44)
Observations	860	860

Note: Reduced form equation for the IV model of undergraduate debt's effect on graduate school aspirations. Models run solely for students self-identifying as African American. Standard errors in parentheses. + = $p < 0.10$; * = $p < 0.05$; ** = $p < .01$; *** = $p < .001$. Observations are rounded due to NCES guidelines.

Table A30

*Results of Two-Stage Least Squares, Dependent Variable: Graduate School Aspirations
First Stage Full Model; Subpopulation: African American*

	Loan	Federal Loan
Change in Average Tuition and Fees	0.58⁺	0.60
	(0.33)	(0.43)
Mother's Education	-3.73	-3.46
	(2.35)	(3.00)
Change in Average Tuition and Fees * Mother's Education	0.39	0.42
	(0.31)	(0.41)
Female	-0.09	0.12
	(0.26)	(0.27)
Prior Income	-0.00	-0.00
	(0.00)	(0.00)
Prior Income * Prior Income	-0.00*	-0.00*
	(0.00)	(0.00)
Entrance Examination (in SAT)	-0.00	-0.00
	(0.00)	(0.00)
Institutional Selectivity (Reference: Nonselective)		
Less Selective	1.09	1.48 ⁺
	(0.75)	(0.80)
Selective	1.30 ⁺	1.81*
	(0.74)	(0.78)
Most Selective	0.66	1.07
	(0.89)	(0.92)
Private Control	-0.48	-0.07
	(0.48)	(0.50)
2-Year or Less	-0.21	0.06
	(0.76)	(0.80)
College GPA	-0.23	-0.25
	(0.23)	(0.23)
Entering Tuition & Fees	-0.00	-0.00
	(0.00)	(0.00)
Married	-2.28	-1.82
	(1.83)	(1.82)
Dependents	0.33	0.11
	(0.34)	(0.38)
Constant	5.58*	4.43
	(2.77)	(3.28)
Observations	860	860

Wu-Hausman (p -value)	6.06 (0.014)	6.48 (0.011)
Minimum eigenvalue	10.21	9.19
F -bias crit, F -size crit	13.91, 22.3	13.91, 22.3
Sargan (p -value)	0.95 (0.622)	0.55 (0.759)

Note: Excluded instruments: change in average tuition and fees, mother's education, and change in average tuition and fees interacted with mother's education. Models run solely for students self-identifying as African American. Standard errors in parentheses. + = $p < 0.10$; * = $p < 0.05$; ** = $p < .01$; *** = $p < .001$. Observations are rounded due to NCES guidelines.

Table A31

*Results of Two-Stage Least Squares, Dependent Variable: Graduate School Aspirations
Second Stage Full Model; Subpopulation: African American*

	Loan	Federal Loan
Cumulative Loans (Log)	-0.05⁺ (0.03)	-0.05⁺ (0.03)
Female	0.10** (0.04)	0.11** (0.04)
Prior Income	0.00 (0.00)	0.00 (0.00)
Prior Income * Prior Income	-0.00 (0.00)	-0.00 (0.00)
Entrance Examination (in SAT)	0.00 (0.00)	0.00 (0.00)
Institutional Selectivity (Reference: Nonselective)		
Less Selective	0.07 (0.11)	0.09 (0.12)
Selective	0.16 (0.10)	0.19 ⁺ (0.11)
Most Selective	0.18 (0.11)	0.21 ⁺ (0.12)
Private Control	-0.01 (0.06)	0.01 (0.07)
2-Year or Less	-0.21* (0.10)	-0.21 ⁺ (0.11)
College GPA	-0.01 (0.03)	-0.01 (0.03)
Entering Tuition & Fees	0.00 (0.00)	0.00 (0.00)
Married	0.08 (0.20)	0.09 (0.20)
Dependents	0.04 (0.04)	0.03 (0.05)
Constant	0.90** (0.28)	0.90** (0.28)
Observations	860	860
Wu-Hausman (<i>p</i> -value)	6.06 (0.014)	6.48 (0.011)
Minimum eigenvalue	10.21	9.19
<i>F</i> -bias crit, <i>F</i> -size crit	13.91, 22.3	13.91, 22.3
Sargan (<i>p</i> -value)	0.95 (0.622)	0.55 (0.759)

Note: Excluded instruments: change in average tuition and fees, mother's education, and

change in average tuition and fees interacted with mother's education. Models run solely for students self-identifying as African American. Standard errors in parentheses. + = $p < 0.10$; * = $p < 0.05$; ** = $p < .01$; *** = $p < .001$. Observations are rounded due to NCES guidelines.

Table A32

*Results of OLS, Dependent Variable: Graduate School Aspirations (Full Model)
Subpopulation: Latino*

	Loan	Federal Loan
Cumulative Loans Borrowed 2009 (Log)	0.009***	0.012***
	(0.00)	(0.00)
Female	0.050 (0.04)	0.051 (0.04)
Prior Income	-0.000 (0.00)	-0.000 (0.00)
Prior Income * Prior Income	0.000 (0.00)	0.000 (0.00)
Entrance Examination (in SAT)	0.000** (0.00)	0.000** (0.00)
Institutional Selectivity (Reference: Nonselective)		
Less Selective	-0.080 (0.09)	-0.080 (0.09)
Selective	0.014 (0.07)	0.015 (0.07)
Most Selective	-0.008 (0.09)	-0.001 (0.09)
Private Control	-0.173* (0.07)	-0.178* (0.07)
2-Year or Less	-0.173* (0.08)	-0.161* (0.08)
College GPA	0.035 (0.03)	0.037 (0.03)
Entering Tuition & Fees	0.000 (0.00)	0.000 (0.00)
Married	0.022 (0.13)	0.011 (0.12)
Dependents	-0.011 (0.06)	-0.006 (0.06)
Constant	0.229 (0.16)	0.199 (0.16)
Observations	730	730

Note: The primary covariate of interest in the models is cumulative loans borrowed from 2003–2004 to 2008–2009 (loan) and cumulative federal loans borrowed over the same period (federal loan). Models run solely for students self-identifying as Latino. Standard errors in parentheses. + = $p < 0.10$; * = $p < 0.05$; ** = $p < .01$; *** = $p < .001$. Observations are rounded due to NCES guidelines.

Table A33

Results of OLS Reduced Form, Dependent Variable: Graduate School Aspirations (Full model)
Subpopulation: Latino

	Loan	Federal Loan
Change in Average Tuition and Fees	0.02	0.02
	(0.03)	(0.03)
Mother's Education	0.24	0.24
	(0.21)	(0.21)
Change in Average Tuition and Fees * Mother's Education	-0.04	-0.04
	(0.03)	(0.03)
Female	0.05	0.05
	(0.04)	(0.04)
Prior Income	-0.00	-0.00
	(0.00)	(0.00)
Prior Income * Prior Income	0.00	0.00
	(0.00)	(0.00)
Entrance Examination (in SAT)	0.00**	0.00**
	(0.00)	(0.00)
Institutional Selectivity (Reference: Nonselective)		
Less Selective	-0.08	-0.08
	(0.10)	(0.10)
Selective	0.02	0.02
	(0.08)	(0.08)
Most Selective	-0.02	-0.02
	(0.09)	(0.09)
Private Control	-0.17*	-0.17*
	(0.08)	(0.08)
2-Year or Less	-0.20*	-0.20*
	(0.08)	(0.08)
College GPA	0.03	0.03
	(0.03)	(0.03)
Entering Tuition & Fees	0.00+	0.00+
	(0.00)	(0.00)
Married	0.03	0.03
	(0.12)	(0.12)
Dependents	-0.01	-0.01
	(0.06)	(0.06)
Constant	0.15	0.15
	(0.25)	(0.25)
Observations	730	730

Note: Reduced form equation for the IV model of undergraduate debt's effect on graduate aspirations. Models run solely for students self-identifying as Latino. Standard errors in parentheses. + = $p < 0.10$; * = $p < 0.05$; ** = $p < .01$; *** = $p < .001$. Observations are rounded due to NCES guidelines.

Table A34

*Results of Two-Stage Least Squares, Dependent Variable: Graduate School Aspirations
First Stage Full Model; Subpopulation: Latino*

	Loan	Federal Loan
Change in Average Tuition and Fees	0.92***	0.81**
	(0.26)	(0.25)
Mother's Education	5.58**	5.04**
	(1.86)	(1.80)
Change in Average Tuition and Fees * Mother's Education	-0.72**	-0.65*
	(0.26)	(0.26)
Female	-0.29	-0.35
	(0.33)	(0.32)
Prior Income	0.00	0.00
	(0.00)	(0.00)
Prior Income * Prior Income	-0.00 ⁺	-0.00*
	(0.00)	(0.00)
Entrance Examination (in SAT)	-0.00	-0.00
	(0.00)	(0.00)
Institutional Selectivity (Reference: Nonselective)		
Less Selective	0.50	0.31
	(0.80)	(0.82)
Selective	0.15	-0.05
	(0.68)	(0.71)
Most Selective	-0.85	-1.21
	(0.92)	(0.93)
Private Control	0.93	1.13
	(0.75)	(0.73)
2-Year or Less	-2.02**	-2.40**
	(0.71)	(0.74)
College GPA	-0.29	-0.39
	(0.33)	(0.32)
Entering Tuition & Fees	0.00	0.00
	(0.00)	(0.00)
Married	0.51	1.37
	(1.15)	(1.15)
Dependents	-0.14	-0.54
	(0.53)	(0.49)
Constant	2.35	3.30
	(2.26)	(2.21)

Observations	730	730
Wu-Hausman (<i>p</i> -value)	0.10 (0.748)	0.06 (0.805)
Minimum eigenvalue	4.66	3.83
<i>F</i> -bias crit, <i>F</i> -size crit	13.91, 22.3	13.91, 22.3
Sargan (<i>p</i> -value)	1.32 (0.518)	1.34 (0.512)

Note: Excluded instruments: change in average tuition and fees, mother's education, and change in average tuition and fees interacted with mother's education. Models run solely for students self-identifying as Latino. Standard errors in parentheses. + = $p < 0.10$; * = $p < 0.05$; ** = $p < .01$; *** = $p < .001$. Observations are rounded due to NCES guidelines.

Table A35

*Results of Two-Stage Least Squares, Dependent Variable: Graduate School Aspirations
Second Stage Full Model; Subpopulation: Latino*

	Loan	Federal Loan
Cumulative Loans (Log)	0.02	0.02
	(0.03)	(0.03)
Female	0.05	0.05
	(0.04)	(0.04)
Prior Income	-0.00	-0.00
	(0.00)	(0.00)
Prior Income * Prior Income	0.00	0.00
	(0.00)	(0.00)
Entrance Examination (in SAT)	0.00**	0.00**
	(0.00)	(0.00)
Institutional Selectivity (Reference: Nonselective)		
Less Selective	-0.09	-0.08
	(0.10)	(0.09)
Selective	0.01	0.02
	(0.07)	(0.07)
Most Selective	0.00	0.01
	(0.10)	(0.10)
Private Control	-0.18*	-0.19*
	(0.08)	(0.08)
2-Year or Less	-0.15	-0.14
	(0.11)	(0.12)
College GPA	0.04	0.04
	(0.03)	(0.03)
Entering Tuition & Fees	0.00	0.00
	(0.00)	(0.00)
Married	0.02	0.00
	(0.12)	(0.13)
Dependents	-0.01	-0.00
	(0.06)	(0.06)
Constant	0.15	0.13
	(0.31)	(0.34)
Observations	730	730
Wu-Hausman (<i>p</i> -value)	0.10 (0.748)	0.06 (0.805)
Minimum eigenvalue	4.66	3.83
<i>F</i> -bias crit, <i>F</i> -size crit	13.91, 22.3	13.91, 22.3
Sargan (<i>p</i> -value)	1.32 (0.518)	1.34 (0.512)

Note: Excluded instruments: change in average tuition and fees, mother's education, and

change in average tuition and fees interacted with mother's education. Models run solely for students self-identifying as Latino. Standard errors in parentheses. + = $p < 0.10$; * = $p < 0.05$; ** = $p < .01$; *** = $p < .001$. Observations are rounded due to NCES guidelines.

Table A36

*Results of OLS, Dependent Variable: Graduate School Aspirations (Full Model)
Subpopulation: Asian*

	Loan	Federal Loan
Cumulative Loans Borrowed 2009 (Log)	0.001	0.002
	(0.00)	(0.00)
Female	0.031 (0.04)	0.032 (0.04)
Prior Income	-0.000 (0.00)	-0.000 (0.00)
Prior Income * Prior Income	0.000 (0.00)	0.000 (0.00)
Entrance Examination (in SAT)	0.000 (0.00)	0.000 (0.00)
Institutional Selectivity (Reference: Nonselective)		
Less Selective	-0.080 (0.18)	-0.082 (0.18)
Selective	-0.054 (0.14)	-0.056 (0.14)
Most Selective	-0.105 (0.15)	-0.107 (0.15)
Private Control	-0.218* (0.10)	-0.219* (0.10)
2-Year or Less	-0.220 (0.14)	-0.221 (0.14)
College GPA	0.080+ (0.05)	0.080+ (0.05)
Entering Tuition & Fees	0.000+ (0.00)	0.000+ (0.00)
Married	-0.003 (0.21)	-0.002 (0.21)
Dependents	0.017 (0.04)	0.017 (0.04)
Constant	0.356* (0.18)	0.353* (0.18)
Observations	440	440

Note: The primary covariate of interest in the models is cumulative loans borrowed from 2003–2004 to 2008–2009 (loan) and cumulative federal loans borrowed over the same period (federal loan). Models run solely for students self-identifying as Asian. Standard errors in parentheses. + = $p < 0.10$; * = $p < 0.05$; ** = $p < .01$; *** = $p < .001$. Observations are rounded due to NCES guidelines.

Table A37

Results of OLS Reduced Form, Dependent Variable: Graduate School Aspirations (Full Model)
Subpopulation: Asian

	Loan	Federal Loan
Change in Average Tuition and Fees	-0.07	-0.07
	(0.05)	(0.05)
Mother's Education	-0.39	-0.39
	(0.38)	(0.38)
Change in Average Tuition and Fees * Mother's Education	0.06	0.06
	(0.05)	(0.05)
Female	0.04	0.04
	(0.04)	(0.04)
Prior Income	-0.00	-0.00
	(0.00)	(0.00)
Prior Income * Prior Income	0.00	0.00
	(0.00)	(0.00)
Entrance Examination (in SAT)	0.00	0.00
	(0.00)	(0.00)
Institutional Selectivity (Reference: Nonselective)		
Less Selective	-0.10	-0.10
	(0.18)	(0.18)
Selective	-0.06	-0.06
	(0.14)	(0.14)
Most Selective	-0.12	-0.12
	(0.15)	(0.15)
Private Control	-0.20*	-0.20*
	(0.10)	(0.10)
2-Year or Less	-0.25+	-0.25+
	(0.14)	(0.14)
College GPA	0.08+	0.08+
	(0.05)	(0.05)
Entering Tuition & Fees	0.00	0.00
	(0.00)	(0.00)
Married	-0.01	-0.01
	(0.21)	(0.21)
Dependents	0.03	0.03
	(0.05)	(0.05)
Constant	0.81+	0.81+
	(0.42)	(0.42)
Observations	440	440

Note: Reduced form equation for the IV model of undergraduate debt's effect on graduate aspirations. Models run solely for students self-identifying as Asian. Standard errors in parentheses. + = $p < 0.10$; * = $p < 0.05$; ** = $p < .01$; *** = $p < .001$. Observations are rounded due to NCES guidelines.

Table A38

*Results of Two-Stage Least Squares, Dependent Variable: Graduate School Aspirations
First Stage Full Model; Subpopulation: Asian*

	Loan	Federal Loan
Change in Average Tuition and Fees	1.35**	1.22**
	(0.46)	(0.44)
Mother's Education	4.19	4.31
	(3.41)	(3.26)
Change in Average Tuition and Fees * Mother's Education	-0.71	-0.74+
	(0.47)	(0.45)
Female	0.28	0.04
	(0.46)	(0.44)
Prior Income	-0.00**	-0.00**
	(0.00)	(0.00)
Prior Income * Prior Income	0.00+	0.00+
	(0.00)	(0.00)
Entrance Examination (in SAT)	0.00	-0.00
	(0.00)	(0.00)
Institutional Selectivity (Reference: Nonselective)		
Less Selective	-0.46	0.81
	(1.90)	(1.80)
Selective	0.24	1.10
	(1.44)	(1.36)
Most Selective	-0.59	0.57
	(1.55)	(1.47)
Private Control	2.31*	2.21*
	(1.02)	(0.99)
2-Year or Less	0.40	1.24
	(1.43)	(1.34)
College GPA	-0.71	-0.48
	(0.44)	(0.43)
Entering Tuition & Fees	-0.00	-0.00
	(0.00)	(0.00)
Married	-2.87	-2.38
	(2.25)	(2.22)
Dependents	-1.17*	-1.01*
	(0.45)	(0.46)
Constant	-1.07	-1.31
	(3.98)	(3.76)

Observations	440	440
Wu-Hausman (<i>p</i> -value)	2.31 (0.136)	2.93 (0.088)
Minimum eigenvalue	3.41	2.99
<i>F</i> -bias crit, <i>F</i> -size crit	13.91, 22.3	13.91, 22.3
Sargan (<i>p</i> -value)	1.54 (0.462)	0.95 (0.623)

Note: Excluded instruments: change in average tuition and fees, mother's education, and change in average tuition and fees interacted with mother's education. Models run solely for students self-identifying as Asian. Standard errors in parentheses. + = $p < 0.10$; * = $p < 0.05$; ** = $p < .01$; *** = $p < .001$. Observations are rounded due to NCES guidelines.

Table A39

*Results of Two-Stage Least Squares, Dependent Variable: Graduate School Aspirations
Second Stage Full Model; Subpopulation: Asian*

	Loan	Federal Loan
Cumulative Loans (Log)	-0.04 (0.03)	-0.05 (0.04)
Female	0.05 (0.04)	0.04 (0.04)
Prior Income	-0.00 (0.00)	-0.00 (0.00)
Prior Income * Prior Income	0.00 (0.00)	0.00 (0.00)
Entrance Examination (in SAT)	0.00 (0.00)	0.00 (0.00)
Institutional Selectivity (Reference: Nonselective)		
Less Selective	-0.07 (0.18)	-0.02 (0.19)
Selective	-0.02 (0.12)	0.02 (0.13)
Most Selective	-0.11 (0.14)	-0.07 (0.13)
Private Control	-0.12 (0.13)	-0.10 (0.14)
2-Year or Less	-0.23 ⁺ (0.13)	-0.19 (0.13)
College GPA	0.05 (0.05)	0.06 (0.05)
Entering Tuition & Fees	0.00 (0.00)	0.00 (0.00)
Married	-0.12 (0.16)	-0.12 (0.15)
Dependents	-0.02 (0.04)	-0.02 (0.04)
Constant	0.67* (0.30)	0.69* (0.30)
Observations	440	440
Wu-Hausman (<i>p</i> -value)	2.31 (0.136)	2.93 (0.088)
Minimum eigenvalue	3.41	2.99
<i>F</i> -bias crit, <i>F</i> -size crit	13.91, 22.3	13.91, 22.3
Sargan (<i>p</i> -value)	1.54 (0.462)	0.95 (0.623)

Note: Excluded instruments: change in average tuition and fees, mother's education, and

change in average tuition and fees interacted with mother's education. Models run solely for students self-identifying as Asian. Standard errors in parentheses. + = $p < 0.10$; * = $p < 0.05$; ** = $p < .01$; *** = $p < .001$. Observations are rounded due to NCES guidelines.

Table A40

*Results of OLS, Dependent Variable: Graduate School Aspirations (Full Model)
Subpopulation: Other Race*

	Loan	Federal Loan
Cumulative Loans Borrowed 2009 (Log)	0.011*	0.011*
	(0.00)	(0.01)
Female	0.166***	0.168***
	(0.04)	(0.04)
Prior Income	0.000	0.000
	(0.00)	(0.00)
Prior Income * Prior Income	0.000	0.000
	(0.00)	(0.00)
Entrance Examination (in SAT)	0.000**	0.000**
	(0.00)	(0.00)
Institutional Selectivity (Reference: Nonselective)		
Less Selective	0.128	0.129
	(0.15)	(0.15)
Selective	0.222 ⁺	0.225 ⁺
	(0.13)	(0.13)
Most Selective	0.276 ⁺	0.278 ⁺
	(0.15)	(0.15)
Private Control	0.040	0.042
	(0.09)	(0.09)
2-Year or Less	0.061	0.060
	(0.13)	(0.13)
College GPA	0.001	0.000
	(0.04)	(0.04)
Entering Tuition & Fees	-0.000	-0.000
	(0.00)	(0.00)
Married	-0.609***	-0.614***
	(0.10)	(0.10)
Dependents	0.033	0.034
	(0.10)	(0.10)
Constant	-0.102	-0.094
	(0.21)	(0.21)
Observations	430	430

Note: The primary covariate of interest in the models is cumulative loans borrowed from 2003–2004 to 2008–2009 (loan) and cumulative federal loans borrowed over the same period (federal loan). Models run solely for students self-identifying as American Indian/Alaskan Native, Native Hawaiian/other Pacific Islander, other, or more than one race. Standard errors in parentheses. ⁺ = $p < 0.10$; * = $p < 0.05$; ** = $p < .01$; *** = $p < .001$.

Observations are rounded due to NCES guidelines.

Table A41

Results of OLS Reduced Form, Dependent Variable: Graduate School Aspirations (Full Model)
Subpopulation: Other Race

	Loan	Federal Loan
Change in Average Tuition and Fees	-0.16*	-0.16*
	(0.08)	(0.08)
Mother's Education	-1.20*	-1.20*
	(0.53)	(0.53)
Change in Average Tuition and Fees * Mother's Education	0.14+	0.14+
	(0.08)	(0.08)
Female	0.16***	0.16***
	(0.04)	(0.04)
Prior Income	0.00	0.00
	(0.00)	(0.00)
Prior Income * Prior Income	0.00	0.00
	(0.00)	(0.00)
Entrance Examination (in SAT)	0.00**	0.00**
	(0.00)	(0.00)
Institutional Selectivity (Reference: Nonselective)		
Less Selective	0.15	0.15
	(0.15)	(0.15)
Selective	0.23+	0.23+
	(0.13)	(0.13)
Most Selective	0.26+	0.26+
	(0.15)	(0.15)
Private Control	0.08	0.08
	(0.09)	(0.09)
2-Year or Less	0.02	0.02
	(0.14)	(0.14)
College GPA	-0.00	-0.00
	(0.04)	(0.04)
Entering Tuition & Fees	-0.00	-0.00
	(0.00)	(0.00)
Married	-0.55***	-0.55***
	(0.10)	(0.10)
Dependents	0.03	0.03
	(0.11)	(0.11)
Constant	1.25*	1.25*
	(0.56)	(0.56)
Observations	430	430

Note: Reduced form equation for the IV model of undergraduate debt's effect on graduate aspirations. Models run solely for students self-identifying as American Indian/Alaskan Native, Native Hawaiian/other Pacific Islander, other, or more than one race. Standard errors in parentheses. + = $p < 0.10$; * = $p < 0.05$; ** = $p < .01$; *** = $p < .001$. Observations are rounded due to NCES guidelines.

Table A42

*Results of Two-Stage Least Squares, Dependent Variable: Graduate School Aspirations
First Stage Full Model; Subpopulation: Other Race*

	Loan	Federal Loan
Change in Average Tuition and Fees	0.60	0.43
	(0.79)	(0.78)
Mother's Education	3.26	1.14
	(5.74)	(5.62)
Change in Average Tuition and Fees * Mother's Education	-0.43	-0.12
	(0.75)	(0.74)
Female	0.63	0.42
	(0.44)	(0.43)
Prior Income	-0.00**	-0.00***
	(0.00)	(0.00)
Prior Income * Prior Income	0.00	0.00
	(0.00)	(0.00)
Entrance Examination (in SAT)	-0.00	-0.00
	(0.00)	(0.00)
Institutional Selectivity (Reference: Nonselective)		
Less Selective	1.22	1.14
	(1.49)	(1.48)
Selective	0.72	0.47
	(1.40)	(1.38)
Most Selective	-0.84	-0.95
	(1.59)	(1.56)
Private Control	2.21*	1.97*
	(0.91)	(0.92)
2-Year or Less	-1.22***	-1.19***
	(0.30)	(0.30)
College GPA	-0.23	-0.14
	(0.40)	(0.39)
Entering Tuition & Fees	-0.00	-0.00
	(0.00)	(0.00)
Married	2.94***	3.45***
	(0.88)	(0.87)
Dependents	-0.24	-0.38
	(0.89)	(0.86)
Constant	3.66	4.15
	(6.27)	(6.17)

Observations	430	430
Wu-Hausman (<i>p</i> -value)	4.97 (0.026)	3.08 (0.080)
Minimum eigenvalue	0.21	0.32
<i>F</i> -bias crit, <i>F</i> -size crit	13.91, 22.3	13.91, 22.3
Sargan (<i>p</i> -value)	0.33 (0.846)	1.15 (0.562)

Note: Excluded instruments: change in average tuition and fees, mother's education, and change in average tuition and fees interacted with mother's education. Models run solely for students self-identifying as American Indian/Alaskan Native, Native Hawaiian/other Pacific Islander, other, or more than one race. Standard errors in parentheses. + = $p < 0.10$; * = $p < 0.05$; ** = $p < .01$; *** = $p < .001$. Observations are rounded due to NCES guidelines.

Table A43

*Results of Two-Stage Least Squares, Dependent Variable: Graduate School Aspirations
Second Stage Full Model; Subpopulation: Other Race*

	Loan	Federal Loan
Cumulative Loans (Log)	-0.26 (0.36)	-0.17 (0.22)
Female	0.33 (0.24)	0.24* (0.12)
Prior Income	-0.00 (0.00)	-0.00 (0.00)
Prior Income * Prior Income	0.00 (0.00)	0.00 (0.00)
Entrance Examination (in SAT)	0.00 (0.00)	0.00 (0.00)
Institutional Selectivity (Reference: Nonselective)		
Less Selective	0.46 (0.65)	0.34 (0.43)
Selective	0.42 (0.52)	0.31 (0.34)
Most Selective	0.03 (0.60)	0.10 (0.43)
Private Control	0.67 (0.86)	0.41 (0.50)
2-Year or Less	-0.37 (0.74)	-0.21 (0.47)
College GPA	-0.06 (0.14)	-0.03 (0.09)
Entering Tuition & Fees	-0.00 (0.00)	-0.00 (0.00)
Married	0.22 (1.12)	0.02 (0.80)
Dependents	-0.03 (0.25)	-0.04 (0.19)
Constant	2.13 (3.00)	1.25 (1.70)
Observations	430	430
Wu-Hausman (<i>p</i> -value)	4.97 (0.026)	3.08 (0.080)
Minimum eigenvalue	0.21	0.32
<i>F</i> -bias crit, <i>F</i> -size crit	13.91, 22.3	13.91, 22.3
Sargan (<i>p</i> -value)	0.33 (0.846)	1.15 (0.562)

Note: Excluded instruments: change in average tuition and fees, mother's education, and

change in average tuition and fees interacted with mother's education. Models run solely for students self-identifying as American Indian/Alaskan Native, Native Hawaiian/other Pacific Islander, other, or more than one race. Standard errors in parentheses. + = $p < 0.10$; * = $p < 0.05$; ** = $p < .01$; *** = $p < .001$. Observations are rounded due to NCES guidelines.

Table A44

Results of OLS, Dependent Variable: Graduate School Enrollment (Full Model)
Subpopulation: White

	Loan		Federal Loan	
	2009	2012	2009	2012
Cumulative Loans Borrowed 2009 (Log)	-0.004***	-0.003**	-0.004***	-0.003**
	(0.00)	(0.00)	(0.00)	(0.00)
Age	-0.018*	-0.020*	-0.018*	-0.020*
	(0.01)	(0.01)	(0.01)	(0.01)
Female	0.005	0.020+	0.005	0.020+
	(0.01)	(0.01)	(0.01)	(0.01)
Prior Income	-0.000	0.000	-0.000	0.000
	(0.00)	(0.00)	(0.00)	(0.00)
Prior Income * Prior Income	0.000	-0.000	0.000	-0.000
	(0.00)	(0.00)	(0.00)	(0.00)
Entrance Examination (in SAT)	0.000***	0.000***	0.000***	0.000***
	(0.00)	(0.00)	(0.00)	(0.00)
Institutional Selectivity (Reference: Nonselective)				
Less Selective	-0.005	-0.040	-0.005	-0.040
	(0.04)	(0.04)	(0.04)	(0.04)
Selective	0.065*	0.040	0.065*	0.040
	(0.03)	(0.03)	(0.03)	(0.03)
Most Selective	0.096**	0.098**	0.095**	0.097**
	(0.03)	(0.04)	(0.03)	(0.04)
Private Control	0.042+	0.021	0.041+	0.020
	(0.02)	(0.02)	(0.02)	(0.02)
2-Year or Less	0.010	0.024	0.009	0.023
	(0.03)	(0.03)	(0.03)	(0.03)
College GPA	0.163***	0.198***	0.163***	0.198***
	(0.01)	(0.01)	(0.01)	(0.01)
Entering Tuition & Fees	-0.000*	0.000	-0.000*	0.000
	(0.00)	(0.00)	(0.00)	(0.00)
Married	-0.059**	-0.060**	-0.059**	-0.060**
	(0.02)	(0.02)	(0.02)	(0.02)
Dependents	-0.025	-0.012	-0.025	-0.011
	(0.02)	(0.02)	(0.02)	(0.02)
Constant	-0.101	-0.146	-0.105	-0.147
	(0.15)	(0.16)	(0.15)	(0.16)

Observations	7490	7490	7490	7490
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Note: Models run solely for students self-identifying as White. Standard errors in parentheses. + = $p < 0.10$; * = $p < 0.05$; ** = $p < .01$; *** = $p < .001$. Observations are rounded due to NCES guidelines.

Table A45

Results of OLS Reduced Form, Dependent Variable: Graduate School Enrollment (Full Model)
Subpopulation: White

	Loan		Federal Loan	
	2009	2012	2009	2012
Change in Average Tuition and Fees	-0.05⁺	-0.06[*]	-0.05⁺	-0.06[*]
	(0.03)	(0.03)	(0.03)	(0.03)
Father's Education	-0.01	-0.15	-0.01	-0.15
	(0.20)	(0.22)	(0.20)	(0.22)
Change in Average Tuition and Fees * Father's Education	0.01	0.01	0.01	0.01
	(0.03)	(0.03)	(0.03)	(0.03)
Age	-0.02 ^{**}	-0.02 ^{**}	-0.02 ^{**}	-0.02 ^{**}
	(0.01)	(0.01)	(0.01)	(0.01)
Female	0.00	0.02	0.00	0.02
	(0.01)	(0.01)	(0.01)	(0.01)
Prior Income	-0.00	0.00	-0.00	0.00
	(0.00)	(0.00)	(0.00)	(0.00)
Prior Income * Prior Income	0.00	-0.00	0.00	-0.00
	(0.00)	(0.00)	(0.00)	(0.00)
Entrance Examination (in SAT)	0.00 ^{***}	0.00 ^{***}	0.00 ^{***}	0.00 ^{***}
	(0.00)	(0.00)	(0.00)	(0.00)
Institutional Selectivity (Reference: Nonselective)				
Less Selective	-0.01	-0.04	-0.01	-0.04
	(0.04)	(0.04)	(0.04)	(0.04)
Selective	0.07 [*]	0.05	0.07 [*]	0.05
	(0.03)	(0.03)	(0.03)	(0.03)
Most Selective	0.10 ^{**}	0.10 ^{**}	0.10 ^{**}	0.10 ^{**}
	(0.03)	(0.04)	(0.03)	(0.04)
Private Control	0.05 [*]	0.03	0.05 [*]	0.03
	(0.02)	(0.02)	(0.02)	(0.02)
2-Year or Less	-0.02	-0.01	-0.02	-0.01
	(0.03)	(0.03)	(0.03)	(0.03)
College GPA	0.16 ^{***}	0.19 ^{***}	0.16 ^{***}	0.19 ^{***}
	(0.01)	(0.01)	(0.01)	(0.01)
Entering Tuition & Fees	-0.00	0.00 ^{**}	-0.00	0.00 ^{**}

	(0.00)	(0.00)	(0.00)	(0.00)
Married	-0.05*	-0.05*	-0.05*	-0.05*
	(0.02)	(0.02)	(0.02)	(0.02)
Dependents	-0.02	-0.01	-0.02	-0.01
	(0.02)	(0.02)	(0.02)	(0.02)
Constant	0.27	0.41	0.27	0.41
	(0.26)	(0.28)	(0.26)	(0.28)
Observations	7490	7490	7490	7490

Note: Reduced form model of the IV model for undergraduate debt's effect on graduate school enrollment. Models run solely for students self-identifying as White. Standard errors in parentheses. + = $p < 0.10$; * = $p < 0.05$; ** = $p < .01$; *** = $p < .001$. Observations are rounded due to NCES guidelines.

Table A46

*Results of Two-Stage Least Squares, Dependent Variable: Graduate School Enrollment
First Stage Full Model; Subpopulation: White*

	Loan		Federal Loan	
	2009	2012	2009	2012
Change in Average Tuition and Fees	0.47⁺	0.47⁺	0.45⁺	0.45⁺
	(0.25)	(0.25)	(0.25)	(0.25)
Father's Education	0.14	0.14	0.26	0.26
	(1.80)	(1.80)	(1.83)	(1.83)
Change in Average Tuition and Fees * Father's Education	-0.08	-0.08	-0.08	-0.08
	(0.25)	(0.25)	(0.25)	(0.25)
Age	-0.01	-0.01	-0.03	-0.03
	(0.07)	(0.07)	(0.07)	(0.07)
Female	0.20 ⁺	0.20 ⁺	0.18 ⁺	0.18 ⁺
	(0.10)	(0.10)	(0.10)	(0.10)
Prior Income	-0.00 ^{***}	-0.00 ^{***}	-0.00 ^{***}	-0.00 ^{***}
	(0.00)	(0.00)	(0.00)	(0.00)
Prior Income * Prior Income	0.00 ^{**}	0.00 ^{**}	0.00 ^{***}	0.00 ^{***}
	(0.00)	(0.00)	(0.00)	(0.00)
Entrance Examination (in SAT)	-0.00 ^{***}	-0.00 ^{***}	-0.00 ^{***}	-0.00 ^{***}
	(0.00)	(0.00)	(0.00)	(0.00)
Institutional Selectivity (Reference: Nonselective)				
Less Selective	0.67 ⁺	0.67 ⁺	0.67 ⁺	0.67 ⁺
	(0.35)	(0.35)	(0.35)	(0.35)
Selective	0.36	0.36	0.21	0.21
	(0.28)	(0.28)	(0.28)	(0.28)
Most Selective	-0.62 [*]	-0.62 [*]	-0.82 ^{**}	-0.82 ^{**}
	(0.31)	(0.31)	(0.31)	(0.31)
Private Control	0.05	0.05	-0.04	-0.04
	(0.21)	(0.21)	(0.21)	(0.21)
2-Year or Less	1.09 ^{***}	1.09 ^{***}	0.89 ^{**}	0.89 ^{**}
	(0.30)	(0.30)	(0.30)	(0.30)
College GPA	-0.36 ^{**}	-0.36 ^{**}	-0.29 [*]	-0.29 [*]
	(0.12)	(0.12)	(0.12)	(0.12)
Entering Tuition & Fees	0.00 ^{***}	0.00 ^{***}	0.00 ^{***}	0.00 ^{***}
	(0.00)	(0.00)	(0.00)	(0.00)
Married	-0.86 ^{***}	-0.86 ^{***}	-0.86 ^{***}	-0.86 ^{***}

	(0.19)	(0.19)	(0.19)	(0.19)
Dependents	0.58***	0.58***	0.64***	0.64***
	(0.16)	(0.16)	(0.17)	(0.17)
Constant	8.37***	8.37***	7.88***	7.88***
	(2.31)	(2.31)	(2.34)	(2.34)
Observations	7490	7490	7490	7490
Wu-Hausman (<i>p</i> -value)	43.52 (0.000)	44.26 (0.000)	43.93 (0.000)	45.08 (0.000)
Minimum eigenvalue	14.92	14.92	12.85	12.85
<i>F</i> -bias crit, <i>F</i> -size crit	13.91, 22.3	13.91, 22.3	13.91, 22.3	13.91, 22.3
Sargan (<i>p</i> -value)	0.07 (0.965)	3.32 (0.190)	0.03 (0.984)	2.72 (0.257)

Note: Excluded instruments: change in average tuition and fees, father's education, and change in average tuition and fees interacted with father's education. Models run solely for students self-identifying as White. Standard errors in parentheses. + = $p < 0.10$; * = $p < 0.05$; ** = $p < .01$; *** = $p < .001$. Observations are rounded due to NCES guidelines.

Table A47

*Results of Two-Stage Least Squares, Dependent Variable: Graduate School Enrollment
Second Stage Full Model; Subpopulation: White*

	Loan		Federal Loan	
	2009	2012	2009	2012
Cumulative Loans (Log)	-0.11*** (0.02)	-0.11*** (0.02)	-0.12*** (0.03)	-0.12*** (0.03)
Age	-0.02* (0.01)	-0.03* (0.01)	-0.03* (0.01)	-0.03* (0.01)
Female	0.02 (0.02)	0.04* (0.02)	0.02 (0.02)	0.04* (0.02)
Prior Income	-0.00** (0.00)	-0.00** (0.00)	-0.00** (0.00)	-0.00** (0.00)
Prior Income * Prior Income	0.00** (0.00)	0.00* (0.00)	0.00** (0.00)	0.00* (0.00)
Entrance Examination (in SAT)	-0.00 (0.00)	-0.00 (0.00)	-0.00 (0.00)	-0.00 (0.00)
Institutional Selectivity (Reference: Nonselective)				
Less Selective	0.07 (0.05)	0.04 (0.06)	0.07 (0.06)	0.04 (0.06)
Selective	0.11* (0.04)	0.09+ (0.05)	0.09* (0.04)	0.07 (0.05)
Most Selective	0.03 (0.05)	0.03 (0.05)	0.00 (0.05)	-0.00 (0.06)
Private Control	0.06+ (0.03)	0.04 (0.03)	0.05 (0.03)	0.03 (0.03)
2-Year or Less	0.10* (0.05)	0.12* (0.05)	0.09+ (0.05)	0.11+ (0.06)
College GPA	0.12*** (0.02)	0.15*** (0.02)	0.12*** (0.02)	0.16*** (0.02)
Entering Tuition & Fees	0.00* (0.00)	0.00** (0.00)	0.00* (0.00)	0.00*** (0.00)
Married	-0.14*** (0.03)	-0.15*** (0.04)	-0.15*** (0.04)	-0.16*** (0.04)
Dependents	0.04 (0.03)	0.06* (0.03)	0.05+ (0.03)	0.07* (0.03)
Constant	1.18*** (0.35)	1.22*** (0.37)	1.22** (0.37)	1.26** (0.39)
Observations	7490	7490	7490	7490
Wu-Hausman (<i>p</i> -value)	43.52 (0.000)	44.26 (0.000)	43.93 (0.000)	45.08 (0.000)

Minimum eigenvalue	14.92	14.92	12.85	12.85
<i>F</i> -bias crit, <i>F</i> -size crit	13.91, 22.3	13.91, 22.3	13.91, 22.3	13.91, 22.3
Sargan (<i>p</i> -value)	0.07 (0.965)	3.32 (0.190)	0.03 (0.984)	2.72 (0.257)

Note: Excluded instruments: change in average tuition and fees, father's education, and change in average tuition and fees interacted with father's education. Models run solely for students self-identifying as White. Standard errors in parentheses. + = $p < 0.10$; * = $p < 0.05$; ** = $p < .01$; *** = $p < .001$. Observations are rounded due to NCES guidelines.

Table A48

Results of OLS, Dependent Variable: Graduate School Enrollment (Full Model)
Subpopulation: African American

	Loan		Federal Loan	
	2009	2012	2009	2012
Cumulative Loans Borrowed 2009 (Log)	0.004	0.001	0.003	0.003
	(0.00)	(0.01)	(0.00)	(0.00)
Age	-0.008 (0.02)	-0.025 (0.02)	-0.008 (0.02)	-0.025 (0.02)
Female	-0.005 (0.04)	0.044 (0.04)	-0.005 (0.04)	0.042 (0.04)
Prior Income	-0.000 (0.00)	-0.000 (0.00)	-0.000 (0.00)	-0.000 (0.00)
Prior Income * Prior Income	-0.000 (0.00)	0.000 (0.00)	-0.000 (0.00)	0.000 (0.00)
Entrance Examination (in SAT)	0.000 (0.00)	0.000 (0.00)	0.000 (0.00)	0.000 (0.00)
Institutional Selectivity (Reference: Nonselective)				
Less Selective	-0.108 (0.11)	0.018 (0.10)	-0.106 (0.11)	0.018 (0.10)
Selective	-0.145 (0.10)	-0.026 (0.10)	-0.144 (0.10)	-0.027 (0.09)
Most Selective	0.022 (0.12)	0.111 (0.12)	0.023 (0.12)	0.111 (0.12)
Private Control	0.076 (0.08)	0.146* (0.07)	0.076 (0.08)	0.146+ (0.07)
2-Year or Less	-0.198+ (0.11)	-0.111 (0.11)	-0.197+ (0.11)	-0.109 (0.11)
College GPA	0.205*** (0.04)	0.192*** (0.05)	0.204*** (0.04)	0.194*** (0.05)
Entering Tuition & Fees	-0.000 (0.00)	-0.000 (0.00)	-0.000 (0.00)	-0.000 (0.00)
Married	0.085 (0.10)	-0.051 (0.10)	0.086 (0.10)	-0.052 (0.10)
Dependents	-0.008 (0.03)	0.053 (0.03)	-0.008 (0.03)	0.052 (0.03)
Constant	-0.043 (0.41)	0.209 (0.41)	-0.028 (0.41)	0.183 (0.40)
Observations	660	660	660	660

Note: Models run solely for students self-identifying as African American. Standard errors in parentheses. + = $p < 0.10$; * = $p < 0.05$; ** = $p < .01$; *** = $p < .001$. Observations are rounded due to NCES guidelines.

Table A49

Results of OLS Reduced Form, Dependent Variable: Graduate School Enrollment (Full Model)
Subpopulation: African American

	Loan		Federal Loan	
	2009	2012	2009	2012
Change in Average Tuition and Fees	-0.06⁺	-0.04	-0.06⁺	-0.04
	(0.03)	(0.05)	(0.03)	(0.05)
Father's Education	-0.24	-0.19	-0.24	-0.19
	(0.27)	(0.37)	(0.27)	(0.37)
Change in Average Tuition and Fees * Father's Education	0.04	0.03	0.04	0.03
	(0.04)	(0.05)	(0.04)	(0.05)
Age	-0.01	-0.03	-0.01	-0.03
	(0.02)	(0.02)	(0.02)	(0.02)
Female	-0.00	0.04	-0.00	0.04
	(0.04)	(0.04)	(0.04)	(0.04)
Prior Income	-0.00	-0.00	-0.00	-0.00
	(0.00)	(0.00)	(0.00)	(0.00)
Prior Income * Prior Income	-0.00	0.00	-0.00	0.00
	(0.00)	(0.00)	(0.00)	(0.00)
Entrance Examination (in SAT)	0.00	0.00	0.00	0.00
	(0.00)	(0.00)	(0.00)	(0.00)
Institutional Selectivity (Reference: Nonselective)				
Less Selective	-0.08	0.04	-0.08	0.04
	(0.11)	(0.11)	(0.11)	(0.11)
Selective	-0.11	-0.00	-0.11	-0.00
	(0.10)	(0.10)	(0.10)	(0.10)
Most Selective	0.05	0.13	0.05	0.13
	(0.12)	(0.12)	(0.12)	(0.12)
Private Control	0.07	0.14 ⁺	0.07	0.14 ⁺
	(0.08)	(0.08)	(0.08)	(0.08)
2-Year or Less	-0.20 ⁺	-0.11	-0.20 ⁺	-0.11
	(0.11)	(0.11)	(0.11)	(0.11)
College GPA	0.20 ^{***}	0.19 ^{***}	0.20 ^{***}	0.19 ^{***}
	(0.04)	(0.05)	(0.04)	(0.05)
Entering Tuition & Fees	-0.00	-0.00	-0.00	-0.00

	(0.00)	(0.00)	(0.00)	(0.00)
Married	0.10	-0.04	0.10	-0.04
	(0.10)	(0.10)	(0.10)	(0.10)
Dependents	0.00	0.06 ⁺	0.00	0.06 ⁺
	(0.03)	(0.03)	(0.03)	(0.03)
Constant	0.44	0.54	0.44	0.54
	(0.46)	(0.54)	(0.46)	(0.54)
Observations	660	660	660	660

Note: Reduced form model of the IV model for undergraduate debt's effect on graduate school enrollment. Models run solely for students self-identifying as African American. Standard errors in parentheses. ⁺ = $p < 0.10$; * = $p < 0.05$; ** = $p < .01$; *** = $p < .001$. Observations are rounded due to NCES guidelines.

Table A50

*Results of Two-Stage Least Squares, Dependent Variable: Graduate School Enrollment
First Stage Full Model; Subpopulation: African American*

	Loan		Federal Loan	
	2009	2012	2009	2012
Change in Average Tuition and Fees	1.01*	1.01*	0.93*	0.93*
	(0.44)	(0.44)	(0.43)	(0.43)
Father's Education	2.71	2.71	2.01	2.01
	(3.27)	(3.27)	(3.15)	(3.15)
Change in Average Tuition and Fees * Father's Education	-0.42	-0.42	-0.32	-0.32
	(0.45)	(0.45)	(0.43)	(0.43)
Age	0.14	0.14	0.19	0.19
	(0.13)	(0.13)	(0.13)	(0.13)
Female	0.62 ⁺	0.62 ⁺	0.63 ⁺	0.63 ⁺
	(0.32)	(0.32)	(0.33)	(0.33)
Prior Income	-0.00	-0.00	-0.00	-0.00
	(0.00)	(0.00)	(0.00)	(0.00)
Prior Income * Prior Income	-0.00	-0.00	0.00	0.00
	(0.00)	(0.00)	(0.00)	(0.00)
Entrance Examination (in SAT)	-0.00**	-0.00**	-0.00***	-0.00***
	(0.00)	(0.00)	(0.00)	(0.00)
Institutional Selectivity (Reference: Nonselective)				
Less Selective	0.06	0.06	-0.38	-0.38
	(0.77)	(0.77)	(0.77)	(0.77)
Selective	-0.09	-0.09	-0.19	-0.19
	(0.73)	(0.73)	(0.72)	(0.72)
Most Selective	-0.00	-0.00	-0.17	-0.17
	(0.89)	(0.89)	(0.88)	(0.88)
Private Control	0.08	0.08	0.12	0.12
	(0.54)	(0.54)	(0.59)	(0.59)
2-Year or Less	-0.24	-0.24	-0.78	-0.78
	(0.85)	(0.85)	(0.84)	(0.84)
College GPA	-1.08***	-1.08***	-0.99**	-0.99**
	(0.31)	(0.31)	(0.32)	(0.32)
Entering Tuition & Fees	-0.00	-0.00	-0.00	-0.00
	(0.00)	(0.00)	(0.00)	(0.00)
Married	0.53	0.53	0.39	0.39

	(0.55)	(0.55)	(0.62)	(0.62)
Dependents	-0.08	-0.08	-0.02	-0.02
	(0.20)	(0.20)	(0.21)	(0.21)
Constant	4.86	4.86	5.18	5.18
	(4.33)	(4.33)	(4.29)	(4.29)
Observations	660	660	660	660
Wu-Hausman (<i>p</i> -value)	3.56 (0.060)	1.65 (0.200)	3.27 (0.071)	1.79 (0.182)
Minimum eigenvalue	7.45	7.45	6.83	6.83
<i>F</i> -bias crit, <i>F</i> -size crit	13.91, 22.3	13.91, 22.3	13.91, 22.3	13.91, 22.3
Sargan (<i>p</i> -value)	0.30 (0.862)	0.08 (0.960)	0.39 (0.822)	0.131 (0.936)

Note: Excluded instruments: change in average tuition and fees, father's education, and change in average tuition and fees interacted with father's education. Models run solely for students self-identifying as African American. Standard errors in parentheses. + = $p < 0.10$; * = $p < 0.05$; ** = $p < .01$; *** = $p < .001$. Observations are rounded due to NCES guidelines.

Table A51

*Results of Two-Stage Least Squares, Dependent Variable: Graduate School Enrollment
Second Stage Full Model; Subpopulation: African American*

	Loan		Federal Loan	
	2009	2012	2009	2012
Cumulative Loans (Log)	-0.05 (0.03)	-0.04 (0.03)	-0.05 (0.03)	-0.04 (0.03)
Age	-0.00 (0.02)	-0.02 (0.02)	-0.00 (0.02)	-0.02 (0.02)
Female	0.03 (0.05)	0.07 (0.05)	0.03 (0.05)	0.06 (0.05)
Prior Income	-0.00 (0.00)	-0.00 (0.00)	-0.00 (0.00)	-0.00 (0.00)
Prior Income * Prior Income	-0.00 (0.00)	0.00 (0.00)	-0.00 (0.00)	0.00 (0.00)
Entrance Examination (in SAT)	-0.00 (0.00)	0.00 (0.00)	-0.00 (0.00)	0.00 (0.00)
Institutional Selectivity (Reference: Nonselective)				
Less Selective	-0.07 (0.12)	0.04 (0.11)	-0.09 (0.11)	0.03 (0.11)
Selective	-0.12 (0.11)	-0.01 (0.10)	-0.12 (0.11)	-0.01 (0.10)
Most Selective	0.04 (0.13)	0.13 (0.12)	0.03 (0.13)	0.12 (0.12)
Private Control	0.08 (0.08)	0.15* (0.08)	0.08 (0.08)	0.15+ (0.08)
2-Year or Less	-0.21+ (0.12)	-0.12 (0.11)	-0.24* (0.12)	-0.14 (0.11)
College GPA	0.15** (0.06)	0.15** (0.06)	0.15** (0.05)	0.15** (0.06)
Entering Tuition & Fees	-0.00 (0.00)	-0.00 (0.00)	-0.00 (0.00)	-0.00 (0.00)
Married	0.13 (0.10)	-0.02 (0.10)	0.12 (0.10)	-0.03 (0.09)
Dependents	-0.00 (0.03)	0.06 (0.03)	0.00 (0.03)	0.06+ (0.03)
Constant	0.61 (0.59)	0.66 (0.55)	0.59 (0.60)	0.65 (0.56)
Observations	660	660	660	660
Wu-Hausman (<i>p</i> -value)	3.56 (0.060)	1.65 (0.200)	3.27 (0.071)	1.79 (0.182)

Minimum eigenvalue	7.45	7.45	6.83	6.83
<i>F</i> -bias crit, <i>F</i> -size crit	13.91, 22.3	13.91, 22.3	13.91, 22.3	13.91, 22.3
Sargan (<i>p</i> -value)	0.30 (0.862)	0.08 (0.960)	0.39 (0.822)	0.131 (0.936)

Note: Excluded instrument: change in average tuition and fees, father's education, and change in average tuition and fees interacted with father's education. Models run solely for students self-identifying as African American. Standard errors in parentheses. + = $p < 0.10$; * = $p < 0.05$; ** = $p < .01$; *** = $p < .001$. Observations are rounded due to NCES guidelines.

Table A52

Results of OLS, Dependent Variable: Graduate School Enrollment (Full Model)
Subpopulation: Latino

	Loan		Federal Loan	
	2009	2012	2009	2012
Cumulative Loans Borrowed 2009 (Log)	-0.001	-0.001	0.001	-0.003
	(0.00)	(0.00)	(0.00)	(0.00)
Age	-0.042 (0.03)	-0.060* (0.02)	-0.042+ (0.03)	-0.060* (0.02)
Female	-0.005 (0.04)	0.004 (0.04)	-0.005 (0.04)	0.005 (0.04)
Prior Income	0.000 (0.00)	0.000 (0.00)	0.000 (0.00)	0.000 (0.00)
Prior Income * Prior Income	0.000 (0.00)	-0.000 (0.00)	0.000 (0.00)	-0.000 (0.00)
Entrance Examination (in SAT)	0.000* (0.00)	0.000 (0.00)	0.000* (0.00)	0.000 (0.00)
Institutional Selectivity (Reference: Nonselective)				
Less Selective	0.039 (0.09)	-0.070 (0.11)	0.041 (0.09)	-0.071 (0.11)
Selective	0.060 (0.08)	-0.070 (0.09)	0.058 (0.08)	-0.067 (0.09)
Most Selective	0.057 (0.09)	-0.047 (0.11)	0.057 (0.09)	-0.046 (0.11)
Private Control	0.215* (0.09)	0.120 (0.09)	0.215* (0.09)	0.120 (0.10)
2-Year or Less	-0.021 (0.08)	-0.110 (0.10)	-0.023 (0.08)	-0.108 (0.10)
College GPA	0.181*** (0.04)	0.233*** (0.05)	0.183*** (0.04)	0.232*** (0.05)
Entering Tuition & Fees	-0.000+ (0.00)	-0.000 (0.00)	-0.000* (0.00)	-0.000 (0.00)
Married	-0.079 (0.06)	-0.076 (0.07)	-0.080 (0.06)	-0.077 (0.07)
Dependents	0.098* (0.05)	0.115* (0.05)	0.098* (0.05)	0.115* (0.05)
Constant	0.199 (0.51)	0.615 (0.46)	0.173 (0.51)	0.631 (0.47)
Observations	680	680	680	680

Note: Models run solely for students self-identifying as Latino. Standard errors in parentheses. + = $p < 0.10$; * = $p < 0.05$; ** = $p < .01$; *** = $p < .001$. Observations are rounded due to NCES guidelines.

Table A53

Results of OLS Reduced Form, Dependent Variable: Graduate School Enrollment (Full Model)
Subpopulation: Latino

	Loan		Federal Loan	
	2009	2012	2009	2012
Change in Average Tuition and Fees	0.00	-0.01	0.00	-0.01
	(0.03)	(0.03)	(0.03)	(0.03)
Father's Education	0.22	0.05	0.22	0.05
	(0.23)	(0.23)	(0.23)	(0.23)
Change in Average Tuition and Fees * Father's Education	-0.03	0.00	-0.03	0.00
	(0.03)	(0.03)	(0.03)	(0.03)
Age	-0.04 ⁺	-0.06 ^{**}	-0.04 ⁺	-0.06 ^{**}
	(0.03)	(0.02)	(0.03)	(0.02)
Female	-0.00	0.00	-0.00	0.00
	(0.04)	(0.04)	(0.04)	(0.04)
Prior Income	-0.00	-0.00	-0.00	-0.00
	(0.00)	(0.00)	(0.00)	(0.00)
Prior Income * Prior Income	0.00	-0.00	0.00	-0.00
	(0.00)	(0.00)	(0.00)	(0.00)
Entrance Examination (in SAT)	0.00 [*]	0.00	0.00 [*]	0.00
	(0.00)	(0.00)	(0.00)	(0.00)
Institutional Selectivity (Reference: Nonselective)				
Less Selective	0.04	-0.07	0.04	-0.07
	(0.09)	(0.11)	(0.09)	(0.11)
Selective	0.05	-0.07	0.05	-0.07
	(0.08)	(0.09)	(0.08)	(0.09)
Most Selective	0.05	-0.04	0.05	-0.04
	(0.10)	(0.11)	(0.10)	(0.11)
Private Control	0.23 [*]	0.12	0.23 [*]	0.12
	(0.10)	(0.10)	(0.10)	(0.10)
2-Year or Less	-0.04	-0.12	-0.04	-0.12
	(0.08)	(0.10)	(0.08)	(0.10)
College GPA	0.18 ^{***}	0.23 ^{***}	0.18 ^{***}	0.23 ^{***}
	(0.04)	(0.05)	(0.04)	(0.05)
Entering Tuition & Fees	-0.00 ⁺	-0.00	-0.00 ⁺	-0.00
	(0.00)	(0.00)	(0.00)	(0.00)
Married	-0.07	-0.08	-0.07	-0.08

	(0.06)	(0.07)	(0.06)	(0.07)
Dependents	0.10*	0.12*	0.10*	0.12*
	(0.05)	(0.05)	(0.05)	(0.05)
Constant	0.20	0.70	0.20	0.70
	(0.56)	(0.52)	(0.56)	(0.52)
Observations	680	680	680	680

Note: Reduced form model of the IV model for undergraduate debt's effect on graduate school enrollment. Models run solely for students self-identifying as Latino. Standard errors in parentheses. + = $p < 0.10$; * = $p < 0.05$; ** = $p < .01$; *** = $p < .001$. Observations are rounded due to NCES guidelines.

Table A54

*Results of Two-Stage Least Squares, Dependent Variable: Graduate School Enrollment
First Stage Full Model; Subpopulation: Latino*

	Loan		Federal Loan	
	2009	2012	2009	2012
Change in Average Tuition and Fees	0.87*	0.87*	0.90**	0.90**
	(0.34)	(0.34)	(0.34)	(0.34)
Father's Education	2.91	2.91	1.76	1.76
	(2.44)	(2.44)	(2.43)	(2.43)
Change in Average Tuition and Fees * Father's Education	-0.36	-0.36	-0.18	-0.18
	(0.34)	(0.34)	(0.34)	(0.34)
Age	0.08	0.08	-0.01	-0.01
	(0.23)	(0.23)	(0.24)	(0.24)
Female	0.08	0.08	0.34	0.34
	(0.34)	(0.34)	(0.35)	(0.35)
Prior Income	-0.00*	-0.00*	-0.00*	-0.00*
	(0.00)	(0.00)	(0.00)	(0.00)
Prior Income * Prior Income	0.00	0.00	0.00	0.00
	(0.00)	(0.00)	(0.00)	(0.00)
Entrance Examination (in SAT)	-0.00	-0.00	-0.00	-0.00
	(0.00)	(0.00)	(0.00)	(0.00)
Institutional Selectivity (Reference: Nonselective)				
Less Selective	-1.17	-1.17	-0.67	-0.67
	(1.01)	(1.01)	(1.13)	(1.13)
Selective	0.39	0.39	1.46	1.46
	(0.85)	(0.85)	(0.96)	(0.96)
Most Selective	-0.59	-0.59	0.55	0.55
	(0.98)	(0.98)	(1.09)	(1.09)
Private Control	-0.54	-0.54	-0.44	-0.44
	(0.75)	(0.75)	(0.78)	(0.78)
2-Year or Less	0.80	0.80	1.85+	1.85+
	(0.89)	(0.89)	(1.00)	(1.00)
College GPA	-0.80+	-0.80+	-0.57	-0.57
	(0.43)	(0.43)	(0.43)	(0.43)
Entering Tuition & Fees	0.00	0.00	0.00	0.00
	(0.00)	(0.00)	(0.00)	(0.00)
Married	0.78	0.78	0.10	0.10

	(0.56)	(0.56)	(0.63)	(0.63)
Dependents	-0.09	-0.09	-0.38	-0.38
	(0.39)	(0.39)	(0.43)	(0.43)
Constant	3.97	3.97	3.45	3.45
	(5.06)	(5.06)	(5.15)	(5.15)
Observations	680	680	680	680
Wu-Hausman (<i>p</i> -value)	0.27 (0.603)	0.02 (0.882)	0.73 (0.394)	0.01 (0.928)
Minimum eigenvalue	5.11	5.11	7.12	7.12
<i>F</i> -bias crit, <i>F</i> -size crit	13.91, 22.3	13.91, 22.3	13.91, 22.3	13.91, 22.3
Sargan (<i>p</i> -value)	1.80 (0.406)	1.47 (0.480)	1.47 (0.480)	1.46 (0.482)

Note: Excluded instruments: change in average tuition and fees, father's education, and change in average tuition and fees interacted with father's education. Models run solely for students self-identifying as Latino. Standard errors in parentheses. + = $p < 0.10$; * = $p < 0.05$; ** = $p < .01$; *** = $p < .001$. Observations are rounded due to NCES guidelines.

Table A55

*Results of Two-Stage Least Squares, Dependent Variable: Graduate School Enrollment
Second Stage Full Model; Subpopulations: Latino*

	Loan		Federal Loan	
	2009	2012	2009	2012
Cumulative Loans (Log)	-0.02	-0.01	-0.02	-0.01
	(0.03)	(0.03)	(0.03)	(0.02)
Age	-0.04	-0.06*	-0.04	-0.06**
	(0.03)	(0.02)	(0.03)	(0.02)
Female	-0.00	0.00	0.00	0.01
	(0.04)	(0.04)	(0.04)	(0.04)
Prior Income	-0.00	0.00	-0.00	0.00
	(0.00)	(0.00)	(0.00)	(0.00)
Prior Income * Prior Income	0.00	-0.00	0.00	-0.00
	(0.00)	(0.00)	(0.00)	(0.00)
Entrance Examination (in SAT)	0.00*	0.00	0.00*	0.00
	(0.00)	(0.00)	(0.00)	(0.00)
Institutional Selectivity (Reference: Nonselective)				
Less Selective	0.02	-0.08	0.03	-0.07
	(0.10)	(0.11)	(0.10)	(0.11)
Selective	0.06	-0.07	0.08	-0.06
	(0.08)	(0.09)	(0.09)	(0.10)
Most Selective	0.04	-0.05	0.06	-0.05
	(0.10)	(0.11)	(0.10)	(0.11)
Private Control	0.21*	0.12	0.22*	0.12
	(0.10)	(0.09)	(0.10)	(0.09)
2-Year or Less	-0.02	-0.11	-0.00	-0.11
	(0.08)	(0.10)	(0.09)	(0.10)
College GPA	0.17**	0.23***	0.17***	0.23***
	(0.05)	(0.06)	(0.05)	(0.05)
Entering Tuition & Fees	-0.00	-0.00	-0.00+	-0.00
	(0.00)	(0.00)	(0.00)	(0.00)
Married	-0.07	-0.07	-0.08	-0.08
	(0.07)	(0.07)	(0.06)	(0.07)
Dependents	0.10*	0.12*	0.09+	0.11*
	(0.05)	(0.05)	(0.05)	(0.05)
Constant	0.36	0.66	0.39	0.66
	(0.62)	(0.55)	(0.59)	(0.52)
Observations	680	680	680	680
Wu-Hausman (<i>p</i> -value)	0.27 (0.603)	0.02 (0.882)	0.73 (0.394)	0.01 (0.928)

Minimum eigenvalue	5.11	5.11	7.12	7.12
<i>F</i> -bias crit, <i>F</i> -size crit	13.91, 22.3	13.91, 22.3	13.91, 22.3	13.91, 22.3
Sargan (<i>p</i> -value)	1.80 (0.406)	1.47 (0.480)	1.47 (0.480)	1.46 (0.482)

Note: Excluded instruments: change in average tuition and fees, father's education, and change in average tuition and fees interacted with father's education. Models run solely for students self-identifying as Latino. Standard errors in parentheses. + = $p < 0.10$; * = $p < 0.05$; ** = $p < .01$; *** = $p < .001$. Observations are rounded due to NCES guidelines.

Table A56

Results of OLS, Dependent Variable: Graduate School Enrollment (Full model)
Subpopulation: Asian

	Loan		Federal Loan	
	2009	2012	2009	2012
Cumulative Loans Borrowed 2009 (Log)	-0.004	-0.005	-0.005	-0.007
	(0.00)	(0.00)	(0.00)	(0.00)
Age	-0.064**	-0.025	-0.065**	-0.026
	(0.02)	(0.03)	(0.02)	(0.03)
Female	0.048	0.103**	0.048	0.102**
	(0.04)	(0.04)	(0.04)	(0.04)
Prior Income	-0.000	-0.000	-0.000	-0.000
	(0.00)	(0.00)	(0.00)	(0.00)
Prior Income * Prior Income	0.000	-0.000	0.000	0.000
	(0.00)	(0.00)	(0.00)	(0.00)
Entrance Examination (in SAT)	0.000+	0.000*	0.000+	0.000*
	(0.00)	(0.00)	(0.00)	(0.00)
Institutional Selectivity (Reference: Nonselective)				
Less Selective	-0.036	-0.241	-0.035	-0.239
	(0.17)	(0.19)	(0.17)	(0.19)
Selective	-0.014	-0.068	-0.014	-0.066
	(0.13)	(0.15)	(0.13)	(0.15)
Most Selective	0.003	-0.039	0.004	-0.037
	(0.13)	(0.15)	(0.13)	(0.15)
Private Control	0.043	0.015	0.043	0.017
	(0.10)	(0.11)	(0.10)	(0.11)
2-Year or Less	-0.059	-0.049	-0.058	-0.048
	(0.13)	(0.15)	(0.13)	(0.15)
College GPA	0.243***	0.260***	0.244***	0.260***
	(0.05)	(0.05)	(0.05)	(0.05)
Entering Tuition & Fees	-0.000	-0.000	-0.000	-0.000
	(0.00)	(0.00)	(0.00)	(0.00)
Married	-0.070	-0.107	-0.069	-0.105
	(0.10)	(0.10)	(0.10)	(0.10)
Dependents	0.026	0.035	0.026	0.035
	(0.08)	(0.09)	(0.09)	(0.09)
Constant	0.502	-0.144	0.508	-0.128
	(0.52)	(0.52)	(0.52)	(0.53)
Observations	660	660	660	660

Note: Models run solely for students self-identifying as Asian. Standard errors in parentheses. + = $p < 0.10$; * = $p < 0.05$; ** = $p < .01$; *** = $p < .001$. Observations are rounded due to NCES guidelines.

Table A57

Results of OLS Reduced Form, Dependent Variable: Graduate School Enrollment (Full Model)
Subpopulation: Asian

	Loan		Federal Loan	
	2009	2012	2009	2012
Change in Average Tuition and Fees	-0.05⁺	-0.05[*]	-0.05⁺	-0.05[*]
	(0.03)	(0.02)	(0.03)	(0.02)
Father's Education	-0.12	0.08	-0.12	0.08
	(0.20)	(0.20)	(0.20)	(0.20)
Change in Average Tuition and Fees * Father's Education	0.03	-0.00	0.03	-0.00
	(0.03)	(0.03)	(0.03)	(0.03)
Age	-0.07 ^{**}	-0.03	-0.07 ^{**}	-0.03
	(0.02)	(0.03)	(0.02)	(0.03)
Female	0.04	0.10 [*]	0.04	0.10 [*]
	(0.04)	(0.04)	(0.04)	(0.04)
Prior Income	-0.00	-0.00	-0.00	-0.00
	(0.00)	(0.00)	(0.00)	(0.00)
Prior Income * Prior Income	0.00	0.00	0.00	0.00
	(0.00)	(0.00)	(0.00)	(0.00)
Entrance Examination (in SAT)	0.00 ⁺	0.00 [*]	0.00 ⁺	0.00 [*]
	(0.00)	(0.00)	(0.00)	(0.00)
Institutional Selectivity (Reference: Nonselective)				
Less Selective	-0.02	-0.24	-0.02	-0.24
	(0.17)	(0.18)	(0.17)	(0.18)
Selective	-0.00	-0.06	-0.00	-0.06
	(0.12)	(0.14)	(0.12)	(0.14)
Most Selective	0.01	-0.04	0.01	-0.04
	(0.13)	(0.14)	(0.13)	(0.14)
Private Control	0.05	0.04	0.05	0.04
	(0.10)	(0.11)	(0.10)	(0.11)
2-Year or Less	-0.07	-0.10	-0.07	-0.10
	(0.13)	(0.14)	(0.13)	(0.14)
College GPA	0.24 ^{***}	0.26 ^{***}	0.24 ^{***}	0.26 ^{***}
	(0.05)	(0.05)	(0.05)	(0.05)
Entering Tuition & Fees	-0.00	0.00	-0.00	0.00
	(0.00)	(0.00)	(0.00)	(0.00)
Married	-0.09	-0.14	-0.09	-0.14

	(0.10)	(0.10)	(0.10)	(0.10)
Dependents	0.06	0.07	0.06	0.07
	(0.09)	(0.08)	(0.09)	(0.08)
Constant	0.80	0.20	0.80	0.20
	(0.55)	(0.56)	(0.55)	(0.56)
Observations	660	660	660	660

Note: Reduced form model of the IV model for undergraduate debt's effect on graduate school enrollment. Models run solely for students self-identifying as Asian. Standard errors in parentheses. + = $p < 0.10$; * = $p < 0.05$; ** = $p < .01$; *** = $p < .001$. Observations are rounded due to NCES guidelines.

Table A58

*Results of Two-Stage Least Squares, Dependent Variable: Graduate School Enrollment
First Stage Full Model; Subpopulations: Asian*

	Loan		Federal Loan	
	2009	2012	2009	2012
Change in Average Tuition and Fees	1.03***	1.03***	1.03***	1.03***
	(0.18)	(0.18)	(0.18)	(0.18)
Father's Education	1.29	1.29	0.66	0.66
	(1.82)	(1.82)	(1.77)	(1.77)
Change in Average Tuition and Fees * Father's Education	-0.24	-0.24	-0.18	-0.18
	(0.25)	(0.25)	(0.24)	(0.24)
Age	0.07	0.07	0.02	0.02
	(0.25)	(0.25)	(0.25)	(0.25)
Female	-0.13	-0.13	-0.20	-0.20
	(0.35)	(0.35)	(0.34)	(0.34)
Prior Income	-0.00**	-0.00**	-0.00***	-0.00***
	(0.00)	(0.00)	(0.00)	(0.00)
Prior Income * Prior Income	0.00	0.00	0.00	0.00
	(0.00)	(0.00)	(0.00)	(0.00)
Entrance Examination (in SAT)	-0.00	-0.00	-0.00	-0.00
	(0.00)	(0.00)	(0.00)	(0.00)
Institutional Selectivity (Reference: Nonselective)				
Less Selective	0.39	0.39	0.57	0.57
	(2.11)	(2.11)	(2.04)	(2.04)
Selective	1.43	1.43	1.32	1.32
	(1.75)	(1.75)	(1.67)	(1.67)
Most Selective	1.85	1.85	1.76	1.76
	(1.79)	(1.79)	(1.70)	(1.70)
Private Control	1.74+	1.74+	1.54	1.54
	(0.96)	(0.96)	(0.94)	(0.94)
2-Year or Less	2.36	2.36	2.29	2.29
	(1.82)	(1.82)	(1.74)	(1.74)
College GPA	-0.79+	-0.79+	-0.54	-0.54
	(0.44)	(0.44)	(0.44)	(0.44)
Entering Tuition & Fees	-0.00	-0.00	-0.00	-0.00
	(0.00)	(0.00)	(0.00)	(0.00)
Married	0.92	0.92	1.07	1.07

	(1.01)	(1.01)	(0.98)	(0.98)
Dependents	-1.26	-1.26	-1.18	-1.18
	(1.12)	(1.12)	(1.09)	(1.09)
Constant	1.12	1.12	1.42	1.42
	(5.83)	(5.83)	(5.73)	(5.73)
Observations	660	660	660	660
Wu-Hausman (<i>p</i> -value)	2.61 (0.107)	6.57 (0.011)	2.65 (0.104)	6.49 (0.011)
Minimum eigenvalue	9.84	9.84	10.66	10.66
<i>F</i> -bias crit, <i>F</i> -size crit	13.91, 22.3	13.91, 22.3	13.91, 22.3	13.91, 22.3
Sargan (<i>p</i> -value)	1.11 (0.575)	0.62 (0.735)	0.97 (0.614)	0.33 (0.850)

Note: Excluded instruments: change in average tuition and fees, father's education, and change in average tuition and fees interacted with father's education. Models run solely for students self-identifying as Asian. Standard errors in parentheses. + = $p < 0.10$; * = $p < 0.05$; ** = $p < .01$; *** = $p < .001$. Observations are rounded due to NCES guidelines.

Table A59

*Results of Two-Stage Least Squares, Dependent Variable: Graduate School Enrollment
Second Stage Full Model; Subpopulation: Asian*

	Loan		Federal Loan	
	2009	2012	2009	2012
Cumulative Loans (Log)	-0.04⁺ (0.02)	-0.06^{**} (0.02)	-0.04⁺ (0.02)	-0.05^{**} (0.02)
Age	-0.06 [*] (0.03)	-0.03 (0.03)	-0.07 [*] (0.03)	-0.03 (0.03)
Female	0.04 (0.04)	0.09 [*] (0.04)	0.04 (0.04)	0.09 [*] (0.04)
Prior Income	-0.00 (0.00)	-0.00 (0.00)	-0.00 (0.00)	-0.00 (0.00)
Prior Income * Prior Income	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)
Entrance Examination (in SAT)	0.00 (0.00)	0.00 ⁺ (0.00)	0.00 (0.00)	0.00 ⁺ (0.00)
Institutional Selectivity (Reference: Nonselective)				
Less Selective	-0.02 (0.19)	-0.22 (0.25)	-0.02 (0.19)	-0.21 (0.25)
Selective	0.04 (0.15)	0.01 (0.21)	0.03 (0.15)	0.01 (0.20)
Most Selective	0.07 (0.16)	0.06 (0.21)	0.06 (0.16)	0.06 (0.21)
Private Control	0.12 (0.11)	0.13 (0.12)	0.11 (0.11)	0.12 (0.12)
2-Year or Less	-0.00 (0.15)	0.04 (0.21)	-0.01 (0.15)	0.04 (0.21)
College GPA	0.21 ^{***} (0.05)	0.21 ^{***} (0.06)	0.22 ^{***} (0.05)	0.23 ^{***} (0.05)
Entering Tuition & Fees	-0.00 (0.00)	-0.00 (0.00)	-0.00 (0.00)	-0.00 (0.00)
Married	-0.06 (0.10)	-0.08 (0.12)	-0.05 (0.10)	-0.08 (0.12)
Dependents	0.01 (0.11)	0.00 (0.13)	0.01 (0.11)	0.01 (0.13)
Constant	0.80 (0.62)	0.33 (0.62)	0.81 (0.61)	0.34 (0.62)
Observations	660	660	660	660
Wu-Hausman (<i>p</i> -value)	2.61 (0.107)	6.57 (0.011)	2.65 (0.104)	6.49 (0.011)

Minimum eigenvalue	9.84	9.84	10.66	10.66
<i>F</i> -bias crit, <i>F</i> -size crit	13.91, 22.3	13.91, 22.3	13.91, 22.3	13.91, 22.3
Sargan (<i>p</i> -value)	1.11 (0.575)	0.62 (0.735)	0.97 (0.614)	0.33 (0.850)

Note: Excluded instruments: change in average tuition and fees, father's education, and change in average tuition and fees interacted with father's education. Models run solely for students self-identifying as Asian. Standard errors in parentheses. + = $p < 0.10$; * = $p < 0.05$; ** = $p < .01$; *** = $p < .001$. Observations are rounded due to NCES guidelines.

Table A60

Results of OLS, Dependent Variable: Graduate School Enrollment (Full Model)
Subpopulation: Other Race

	Loan		Federal Loan	
	2009	2012	2009	2012
Cumulative Loans Borrowed 2009 (Log)	-0.016*	-0.015*	-0.012+	-0.014*
	(0.01)	(0.01)	(0.01)	(0.01)
Age	-0.033 (0.02)	-0.013 (0.03)	-0.034 (0.02)	-0.014 (0.03)
Female	0.031 (0.05)	-0.059 (0.06)	0.032 (0.05)	-0.058 (0.06)
Prior Income	0.000 (0.00)	0.000 (0.00)	0.000 (0.00)	0.000 (0.00)
Prior Income * Prior Income	-0.000 (0.00)	-0.000 (0.00)	-0.000 (0.00)	-0.000 (0.00)
Entrance Examination (in SAT)	0.000 (0.00)	0.000 (0.00)	0.000 (0.00)	0.000 (0.00)
Institutional Selectivity (Reference: Nonselective)				
Less Selective	0.134 (0.22)	0.166 (0.22)	0.132 (0.23)	0.176 (0.23)
Selective	0.121 (0.18)	0.082 (0.18)	0.124 (0.18)	0.094 (0.18)
Most Selective	-0.001 (0.19)	0.099 (0.19)	0.002 (0.19)	0.105 (0.20)
Private Control	-0.014 (0.11)	-0.105 (0.11)	-0.016 (0.11)	-0.109 (0.11)
2-Year or Less	0.064 (0.19)	0.092 (0.19)	0.061 (0.19)	0.099 (0.20)
College GPA	0.155* (0.06)	0.203** (0.06)	0.161** (0.06)	0.208** (0.06)
Entering Tuition & Fees	-0.000 (0.00)	0.000 (0.00)	-0.000 (0.00)	0.000 (0.00)
Married	-0.200* (0.08)	-0.228* (0.10)	-0.194* (0.08)	-0.226* (0.10)
Dependents	0.197** (0.06)	0.197** (0.06)	0.195** (0.06)	0.196** (0.06)
Constant	0.102 (0.47)	-0.219 (0.58)	0.087 (0.47)	-0.241 (0.58)
Observations	330	330	330	330

Note: Models run solely for students self-identifying as American Indian/Alaskan Native, Native Hawaiian/other Pacific Islander, other, or more than one race. Standard errors in parentheses. + = $p < 0.10$; * = $p < 0.05$; ** = $p < .01$; *** = $p < .001$. Observations are rounded due to NCES guidelines.

Table A61

Results of OLS Reduced Form, Dependent Variable: Graduate School Enrollment (Full Model)
Subpopulation: Other Race

	Loan		Federal Loan	
	2009	2012	2009	2012
Change in Average Tuition and Fees	-0.08	-0.11	-0.08	-0.11
	(0.06)	(0.07)	(0.06)	(0.07)
Father's Education	-0.45	-0.72	-0.45	-0.72
	(0.44)	(0.45)	(0.44)	(0.45)
Change in Average Tuition and Fees * Father's Education	0.02	0.08	0.02	0.08
	(0.06)	(0.07)	(0.06)	(0.07)
Age	-0.04*	-0.02	-0.04*	-0.02
	(0.02)	(0.03)	(0.02)	(0.03)
Female	0.01	-0.08	0.01	-0.08
	(0.05)	(0.06)	(0.05)	(0.06)
Prior Income	0.00+	0.00	0.00+	0.00
	(0.00)	(0.00)	(0.00)	(0.00)
Prior Income * Prior Income	-0.00	-0.00	-0.00	-0.00
	(0.00)	(0.00)	(0.00)	(0.00)
Entrance Examination (in SAT)	0.00+	0.00	0.00+	0.00
	(0.00)	(0.00)	(0.00)	(0.00)
Institutional Selectivity (Reference: Nonselective)				
Less Selective	0.07	0.10	0.07	0.10
	(0.22)	(0.23)	(0.22)	(0.23)
Selective	0.09	0.04	0.09	0.04
	(0.18)	(0.18)	(0.18)	(0.18)
Most Selective	-0.03	0.07	-0.03	0.07
	(0.19)	(0.20)	(0.19)	(0.20)
Private Control	0.03	-0.08	0.03	-0.08
	(0.11)	(0.11)	(0.11)	(0.11)
2-Year or Less	-0.08	-0.02	-0.08	-0.02
	(0.19)	(0.20)	(0.19)	(0.20)
College GPA	0.16**	0.21***	0.16**	0.21***
	(0.06)	(0.06)	(0.06)	(0.06)
Entering Tuition & Fees	-0.00	0.00	-0.00	0.00
	(0.00)	(0.00)	(0.00)	(0.00)
Married	-0.17*	-0.21*	-0.17*	-0.21*

Dependents	(0.09) 0.23***	(0.10) 0.21**	(0.09) 0.23***	(0.10) 0.21**
Constant	(0.06) 1.04+	(0.07) 0.73	(0.06) 1.04+	(0.07) 0.73
Observations	(0.62) 330	(0.73) 330	(0.62) 330	(0.73) 330

Note: Reduced form model of the IV model for undergraduate debt's effect on graduate school enrollment. Models run solely for students self-identifying as American Indian/Alaskan Native, Native Hawaiian/other Pacific Islander, other, or more than one race. Standard errors in parentheses. + = $p < 0.10$; * = $p < 0.05$; ** = $p < .01$; *** = $p < .001$. Observations are rounded due to NCES guidelines.

Table A62

*Results of Two-Stage Least Squares, Dependent Variable: Graduate School Enrollment
First Stage Full Model; Subpopulation: Other Race*

	Loan		Federal Loan	
	2009	2012	2009	2012
Change in Average Tuition and Fees	1.23⁺	1.23⁺	1.09⁺	1.09⁺
	(0.64)	(0.64)	(0.63)	(0.63)
Father's Education	3.61	3.61	3.60	3.60
	(4.72)	(4.72)	(4.63)	(4.63)
Change in Average Tuition and Fees * Father's Education	-0.38	-0.38	-0.43	-0.43
	(0.64)	(0.64)	(0.63)	(0.63)
Age	0.49	0.49	0.60	0.60
	(0.49)	(0.49)	(0.49)	(0.49)
Female	0.20 ⁺	0.20 ⁺	0.18 ⁺	0.18 ⁺
	(0.10)	(0.10)	(0.10)	(0.10)
Prior Income	-0.00 [*]	-0.00 [*]	-0.00 ^{***}	-0.00 ^{***}
	(0.00)	(0.00)	(0.00)	(0.00)
Prior Income * Prior Income	0.00	0.00	0.00 [*]	0.00 [*]
	(0.00)	(0.00)	(0.00)	(0.00)
Entrance Examination (in SAT)	-0.00	-0.00	-0.00	-0.00
	(0.00)	(0.00)	(0.00)	(0.00)
Institutional Selectivity (Reference: Nonselective)				
Less Selective	3.88 ⁺	3.88 ⁺	4.58 [*]	4.58 [*]
	(2.00)	(2.00)	(2.07)	(2.07)
Selective	2.48	2.48	3.38 ⁺	3.38 ⁺
	(1.84)	(1.84)	(1.85)	(1.85)
Most Selective	0.84	0.84	1.11	1.11
	(1.99)	(1.99)	(1.98)	(1.98)
Private Control	-0.94	-0.94	-1.06	-1.06
	(1.05)	(1.05)	(1.03)	(1.03)
2-Year or Less	4.29 [*]	4.29 [*]	4.62 [*]	4.62 [*]
	(1.91)	(1.91)	(1.95)	(1.95)
College GPA	-0.50	-0.50	-0.19	-0.19
	(0.59)	(0.59)	(0.57)	(0.57)
Entering Tuition & Fees	0.00	0.00	0.00 ⁺	0.00 ⁺
	(0.00)	(0.00)	(0.00)	(0.00)
Married	-1.49	-1.49	-1.40	-1.40

	(1.07)	(1.07)	(1.09)	(1.09)
Dependents	0.20	0.20	0.26	0.26
	(0.59)	(0.59)	(0.58)	(0.58)
Constant	-11.08 ⁺	-11.08 ⁺	-11.17 ⁺	-11.17 ⁺
	(6.44)	(6.44)	(6.59)	(6.59)
Observations	330	330	330	330
Wu-Hausman (<i>p</i> -value)	5.50 (0.020)	1.26 (0.262)	5.79 (0.017)	1.49 (0.223)
Minimum eigenvalue	4.18	4.18	2.56	2.56
<i>F</i> -bias crit, <i>F</i> -size crit	13.91, 22.3	13.91, 22.3	13.91, 22.3	13.91, 22.3
Sargan (<i>p</i> -value)	2.07 (0.356)	1.44 (0.487)	2.05 (0.359)	1.34 (0.512)

Note: Excluded instruments: change in average tuition and fees, father's education, and change in average tuition and fees interacted with father's education. Models run solely for students self-identifying as American Indian/Alaskan Native, Native Hawaiian/other Pacific Islander, other, or more than one race. Standard errors in parentheses. ⁺ = $p < 0.10$; * = $p < 0.05$; ** = $p < .01$; *** = $p < .001$. Observations are rounded due to NCES guidelines.

Table A63

*Results of Two-Stage Least Squares, Dependent Variable: Graduate School Enrollment
Second Stage Full Model; Subpopulation: Other Race*

	Loan		Federal Loan	
	2009	2012	2009	2012
Cumulative Loans (Log)	-0.09** (0.03)	-0.05 (0.03)	-0.11* (0.04)	-0.06 (0.04)
Age	-0.00 (0.03)	0.00 (0.03)	0.01 (0.04)	0.01 (0.04)
Female	0.06 (0.06)	-0.05 (0.06)	0.08 (0.07)	-0.03 (0.06)
Prior Income	-0.00 (0.00)	-0.00 (0.00)	-0.00 (0.00)	-0.00 (0.00)
Prior Income * Prior Income	-0.00 (0.00)	-0.00 (0.00)	0.00 (0.00)	0.00 (0.00)
Entrance Examination (in SAT)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)
Institutional Selectivity (Reference: Nonselective)				
Less Selective	0.37 (0.29)	0.29 (0.24)	0.52 (0.36)	0.38 (0.29)
Selective	0.27 (0.25)	0.16 (0.20)	0.42 (0.31)	0.25 (0.24)
Most Selective	0.01 (0.25)	0.11 (0.20)	0.06 (0.30)	0.13 (0.23)
Private Control	-0.05 (0.12)	-0.12 (0.11)	-0.08 (0.14)	-0.14 (0.12)
2-Year or Less	0.26 (0.27)	0.19 (0.22)	0.38 (0.33)	0.27 (0.26)
College GPA	0.12 (0.08)	0.19** (0.07)	0.14+ (0.08)	0.20** (0.07)
Entering Tuition & Fees	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)
Married	-0.30* (0.12)	-0.28* (0.11)	-0.32* (0.15)	-0.29* (0.12)
Dependents	0.24** (0.07)	0.22** (0.07)	0.25** (0.08)	0.22** (0.07)
Constant	0.03 (0.60)	-0.26 (0.59)	-0.16 (0.70)	-0.37 (0.65)
Observations	330	330	330	330
Wu-Hausman (<i>p</i> -value)	5.50 (0.020)	1.26 (0.262)	5.79 (0.017)	1.49 (0.223)

Minimum eigenvalue	4.18	4.18	2.56	2.56
<i>F</i> -bias crit, <i>F</i> -size crit	13.91, 22.3	13.91, 22.3	13.91, 22.3	13.91, 22.3
Sargan (<i>p</i> -value)	2.07 (0.356)	1.44 (0.487)	2.05 (0.359)	1.34 (0.512)

Note: Excluded instrument: change in average tuition and fees, father's education, and change in average tuition and fees interacted with father's education. Models run solely for students self-identifying as American Indian/Alaskan Native, Native Hawaiian/other Pacific Islander, other, or more than one race. Standard errors in parentheses. + = $p < 0.10$; * = $p < 0.05$; ** = $p < .01$; *** = $p < .001$. Observations are rounded due to NCES guidelines.

Table A64

*Results of OLS, Dependent Variable: Salary (Full Model)**Subpopulation: White*

	Loan		Federal Loan	
	2009	2012	2009	2012
Cumulative Loans Borrowed 2009 (Log)	0.003	0.012*	0.001	0.010+
	(0.00)	(0.01)	(0.00)	(0.01)
Age	0.013	-0.005	0.013	-0.005
	(0.01)	(0.04)	(0.01)	(0.04)
Female	-0.204***	-0.249***	-0.204***	-0.248***
	(0.02)	(0.05)	(0.02)	(0.05)
Prior Income	-0.000	-0.000	-0.000	-0.000
	(0.00)	(0.00)	(0.00)	(0.00)
Prior Income * Prior Income	0.000	0.000	0.000	0.000
	(0.00)	(0.00)	(0.00)	(0.00)
Entrance Examination (in SAT)	-0.000*	0.001***	-0.000*	0.001***
	(0.00)	(0.00)	(0.00)	(0.00)
Institutional Selectivity (Reference: Nonselective)				
Less Selective	0.012	0.181	0.013	0.183
	(0.06)	(0.16)	(0.06)	(0.16)
Selective	-0.026	0.052	-0.025	0.054
	(0.05)	(0.14)	(0.05)	(0.14)
Most Selective	0.120*	0.163	0.120*	0.164
	(0.05)	(0.15)	(0.05)	(0.16)
Private Control	-0.084*	0.018	-0.084*	0.019
	(0.04)	(0.10)	(0.04)	(0.10)
2-Year or Less	-0.018	0.014	-0.016	0.018
	(0.05)	(0.15)	(0.05)	(0.15)
College GPA	-0.016	-0.005	-0.017	-0.007
	(0.02)	(0.05)	(0.02)	(0.05)
Entering Tuition & Fees	0.000	-0.000	0.000	-0.000
	(0.00)	(0.00)	(0.00)	(0.00)
Married	0.099**	0.095	0.098**	0.094
	(0.03)	(0.08)	(0.03)	(0.08)
Dependents	0.038	-0.024	0.039	-0.023
	(0.03)	(0.08)	(0.03)	(0.08)
Constant	10.202***	9.730***	10.221***	9.762***
	(0.24)	(0.87)	(0.24)	(0.87)
Observations	6270	6270	6270	6270

Note: Models run solely for students self-identifying as White. Standard errors in parentheses. + = $p < 0.10$; * = $p < 0.05$; ** = $p < .01$; *** = $p < .001$. Observations are rounded due to NCES guidelines.

Table A65

*Results of OLS Reduced Form, Dependent Variable: Salary (Full Model)**Subpopulation: White*

	Loan		Federal Loan	
	2009	2012	2009	2012
Change in Average Tuition and Fees	1,005.96	2495.30	1005.96	2,495.30
	(1238.12)	(1663.17)	(1238.12)	(1,663.17)
Father's Education	-1,623.08	13171.99	-1623.08	13,171.99
	(9,052.78)	(11,857.68)	(9,052.78)	(11,857.68)
Change in Average Tuition and Fees * Father's Education	256.56	-1,989.99	256.56	-1,989.99
	(1,236.61)	(1,666.37)	(1,236.61)	(1,666.37)
Age	346.83	873.96	346.83	873.96
	(339.98)	(552.10)	(339.98)	(552.10)
Female	-6,432.14***	-10,159.60***	-6432.14***	-10,159.60***
	(461.04)	(721.83)	(461.04)	(721.83)
Prior Income	-0.00	-0.02	-0.00	-0.02
	(0.01)	(0.02)	(0.01)	(0.02)
Prior Income * Prior Income	0.00	0.00+	0.00	0.00+
	(0.00)	(0.00)	(0.00)	(0.00)
Entrance Examination (in SAT)	-0.73	4.95*	-0.73	4.95*
	(1.44)	(2.21)	(1.44)	(2.21)
Institutional Selectivity (Reference: Nonselective)				
Less Selective	-129.57	-617.41	-129.57	-617.41
	(1,417.96)	(1,928.36)	(1,417.96)	(1,928.36)
Selective	-815.99	-895.84	-815.99	-895.84
	(1,154.88)	(1,640.24)	(1,154.88)	(1,640.24)
Most Selective	3,720.79**	4,392.85*	3,720.79**	4,392.85*
	(1,335.65)	(1,930.41)	(1,335.65)	(1,930.41)
Private Control	-3,020.83***	-4,374.35**	-3020.83***	-4,374.35**
	(896.54)	(1,360.88)	(896.54)	(1,360.88)
2-Year or Less	-59.02	-495.26	-59.02	-495.26
	(1,258.79)	(1,794.70)	(1,258.79)	(1,794.70)
College GPA	870.11+	942.91	870.11+	942.91
	(480.12)	(728.15)	(480.12)	(728.15)
Entering Tuition & Fees	-0.02	0.15+	-0.02	0.15+
	(0.06)	(0.09)	(0.06)	(0.09)
Married	2,473.15**	2,764.86*	2,473.15**	2,764.86*

	(844.72)	(1,237.13)	(844.72)	(1,237.13)
Dependents	1,565.39 ⁺	1,986.05	1,565.39 ⁺	1,986.05
	(893.46)	(2,182.67)	(893.46)	(2,182.67)
Constant	19,594.27 ⁺	5,932.59	19,594.27 ⁺	5,932.59
	(11,565.21)	(16,385.77)	(11,565.21)	(16,385.77)
Observations	6270	6270	6270	6270

Note: Reduced form model of the IV model for undergraduate debt's effect on early-career occupation salary. Models run solely for students self-identifying as White. Standard errors in parentheses. ⁺ = $p < 0.10$; * = $p < 0.05$; ** = $p < .01$; *** = $p < .001$. Observations are rounded due to NCES guidelines.

Table A66

*Results of Two-Stage Least Squares, Dependent Variable: Salary
First Stage Full Model; Subpopulation: White*

	Loan		Federal Loan	
	2009	2012	2009	2012
Change in Average Tuition and Fees	0.31	0.31	0.30	0.30
	(0.28)	(0.28)	(0.29)	(0.29)
Father's Education	-0.93	-0.93	-0.71	-0.71
	(2.00)	(2.00)	(2.07)	(2.07)
Change in Average Tuition and Fees * Father's Education	0.06	0.06	0.05	0.05
	(0.28)	(0.28)	(0.29)	(0.29)
Age	-0.01	-0.01	-0.03	-0.03
	(0.08)	(0.08)	(0.08)	(0.08)
Female	0.25*	0.25*	0.24*	0.24*
	(0.11)	(0.11)	(0.11)	(0.11)
Prior Income	-0.00***	-0.00***	-0.00***	-0.00***
	(0.00)	(0.00)	(0.00)	(0.00)
Prior Income * Prior Income	0.00**	0.00**	0.00***	0.00***
	(0.00)	(0.00)	(0.00)	(0.00)
Entrance Examination (in SAT)	-0.00***	-0.00***	-0.00***	-0.00***
	(0.00)	(0.00)	(0.00)	(0.00)
Institutional Selectivity (Reference: Nonselective)				
Less Selective	0.75*	0.75*	0.71+	0.71+
	(0.37)	(0.37)	(0.37)	(0.37)
Selective	0.38	0.38	0.21	0.21
	(0.30)	(0.30)	(0.30)	(0.30)
Most Selective	-0.54	-0.54	-0.77*	-0.77*
	(0.34)	(0.34)	(0.34)	(0.34)
Private Control	0.13	0.13	0.07	0.07
	(0.23)	(0.23)	(0.23)	(0.23)
2-Year or Less	1.11***	1.11***	0.89**	0.89**
	(0.32)	(0.32)	(0.32)	(0.32)
College GPA	-0.38**	-0.38**	-0.31*	-0.31*
	(0.13)	(0.13)	(0.13)	(0.13)
Entering Tuition & Fees	0.00***	0.00***	0.00***	0.00***
	(0.00)	(0.00)	(0.00)	(0.00)

Married	-0.78*** (0.21)	-0.78*** (0.21)	-0.76*** (0.21)	-0.76*** (0.21)
Dependents	0.58*** (0.17)	0.58*** (0.17)	0.63*** (0.18)	0.63*** (0.18)
Constant	9.60*** (2.57)	9.60*** (2.57)	8.97*** (2.63)	8.97*** (2.63)
Observations	6270	6270	6270	6270
Wu-Hausman (<i>p</i> -value)	19.03 (0.000)	7.33 (0.007)	20.60 (0.000)	7.87 (0.005)
Minimum eigenvalue	11.06	11.06	9.59	9.59
<i>F</i> -bias crit, <i>F</i> -size crit	13.91, 22.3	13.91, 22.3	13.91, 22.3	13.91, 22.3
Sargan (<i>p</i> -value)	3.09 (0.213)	3.15 (0.207)	2.20 (0.333)	2.73 (0.255)

Note: Excluded instruments: change in average tuition and fees, father's education, and change in average tuition and fees interacted with father's education. Models run solely for students self-identifying as White. Standard errors in parentheses. + = $p < 0.10$; * = $p < 0.05$; ** = $p < .01$; *** = $p < .001$. Observations are rounded due to NCES guidelines.

Table A67

*Results of Two-Stage Least Squares, Dependent Variable: Salary
Second Stage Full Model; Subpopulation: White*

	Loan		Federal Loan	
	2009	2012	2009	2012
Cumulative Loans (Log)	0.12*** (0.04)	0.22* (0.10)	0.14*** (0.04)	0.24* (0.11)
Age	0.02 (0.01)	0.01 (0.05)	0.02 (0.02)	0.01 (0.05)
Female	-0.23*** (0.02)	-0.29*** (0.06)	-0.23*** (0.03)	-0.30*** (0.06)
Prior Income	0.00** (0.00)	0.00+ (0.00)	0.00** (0.00)	0.00+ (0.00)
Prior Income * Prior Income	-0.00 (0.00)	-0.00 (0.00)	-0.00 (0.00)	-0.00 (0.00)
Entrance Examination (in SAT)	0.00 (0.00)	0.00*** (0.00)	0.00 (0.00)	0.00*** (0.00)
Institutional Selectivity (Reference: Nonselective)				
Less Selective	-0.08 (0.08)	0.03 (0.19)	-0.08 (0.08)	0.02 (0.19)
Selective	-0.08 (0.06)	-0.04 (0.15)	-0.06 (0.06)	-0.00 (0.15)
Most Selective	0.19** (0.07)	0.28 (0.18)	0.23** (0.08)	0.34+ (0.20)
Private Control	-0.11* (0.05)	-0.03 (0.11)	-0.10* (0.05)	-0.02 (0.11)
2-Year or Less	-0.13+ (0.07)	-0.17 (0.17)	-0.11 (0.07)	-0.14 (0.17)
College GPA	0.04 (0.03)	0.08 (0.07)	0.03 (0.03)	0.07 (0.07)
Entering Tuition & Fees	-0.00* (0.00)	-0.00* (0.00)	-0.00* (0.00)	-0.00* (0.00)
Married	0.19*** (0.05)	0.25* (0.12)	0.20*** (0.05)	0.26* (0.12)
Dependents	-0.04 (0.05)	-0.16 (0.11)	-0.05 (0.05)	-0.18 (0.12)
Constant	8.72*** (0.55)	7.23*** (1.57)	8.64*** (0.58)	7.12*** (1.62)
Observations	6270	6270	6270	6270

Wu-Hausman (<i>p</i> -value)	19.03 (0.000)	7.33 (0.007)	20.60 (0.000)	7.87 (0.005)
Minimum eigenvalue	11.06	11.06	9.59	9.59
<i>F</i> -bias crit, <i>F</i> -size crit	13.91, 22.3	13.91, 22.3	13.91, 22.3	13.91, 22.3
Sargan (<i>p</i> -value)	3.09 (0.213)	3.15 (0.207)	2.20 (0.333)	2.73 (0.255)

Note: Excluded instruments: change in average tuition and fees, father's education, and change in average tuition and fees interacted with father's education. Models run solely for students self-identifying as White. Standard errors in parentheses. + = $p < 0.10$; * = $p < 0.05$; ** = $p < .01$; *** = $p < .001$. Observations are rounded due to NCES guidelines.

Table A68

Results of OLS, Dependent Variable: Salary (Full Model)
Subpopulation: African American

	Loan		Federal Loan	
	2009	2012	2009	2012
Cumulative Loans Borrowed 2009 (Log)	0.004	-0.013	0.003	-0.003
	(0.01)	(0.03)	(0.01)	(0.03)
Age	-0.025 (0.03)	-0.163 (0.17)	-0.026 (0.03)	-0.162 (0.17)
Female	-0.112 (0.08)	-0.473 ⁺ (0.27)	-0.111 (0.08)	-0.480 ⁺ (0.27)
Prior Income	-0.000 (0.00)	0.000 (0.00)	-0.000 (0.00)	0.000 (0.00)
Prior Income * Prior Income	0.000 (0.00)	-0.000 (0.00)	0.000 (0.00)	-0.000 (0.00)
Entrance Examination (in SAT)	0.000 (0.00)	0.002* (0.00)	0.000 (0.00)	0.002* (0.00)
Institutional Selectivity (Reference: Nonselective)				
Less Selective	0.019 (0.16)	0.203 (0.65)	0.021 (0.16)	0.191 (0.64)
Selective	0.044 (0.16)	0.061 (0.62)	0.046 (0.16)	0.051 (0.62)
Most Selective	0.156 (0.22)	0.794 (0.72)	0.158 (0.22)	0.784 (0.72)
Private Control	-0.121 (0.12)	0.281 (0.56)	-0.121 (0.12)	0.279 (0.56)
2-Year or Less	0.078 (0.17)	-0.525 (0.75)	0.080 (0.17)	-0.524 (0.74)
College GPA	0.047 (0.07)	0.160 (0.28)	0.045 (0.07)	0.169 (0.28)
Entering Tuition & Fees	-0.000 (0.00)	-0.000* (0.00)	-0.000 (0.00)	-0.000* (0.00)
Married	0.261* (0.12)	0.103 (0.63)	0.263* (0.12)	0.088 (0.63)
Dependents	0.086* (0.04)	0.155 (0.24)	0.086* (0.04)	0.154 (0.24)
Constant	10.236*** (0.74)	10.799** (3.40)	10.254*** (0.73)	10.637** (3.39)
Observations	510	510	510	510

Note: Models run solely for students self-identifying as African American. Standard errors in parentheses. + = $p < 0.10$; * = $p < 0.05$; ** = $p < .01$; *** = $p < .001$. Observations are rounded due to NCES guidelines.

Table A69

Results of OLS Reduced Form, Dependent Variable: Salary (Full Model)
Subpopulation: African American

	Loan		Federal Loan	
	2009	2012	2009	2012
Change in Average Tuition and Fees	1,450.16	-258.45	1,450.16	-258.45
	(1,535.60)	(1,798.23)	(1,535.60)	(1,798.23)
Father's Education	234.87	-4,328.55	234.87	-4,328.55
	(11,425.58)	(13,937.76)	(11,425.58)	(13,937.76)
Change in Average Tuition and Fees * Father's Education	-65.10	1,206.64	-65.10	1,206.64
	(1,609.87)	(1,948.80)	(1,609.87)	(1,948.80)
Age	48.01	-1,673.11	48.01	-1,673.11
	(724.66)	(1,064.06)	(724.66)	(1,064.06)
Female	-4,823.83**	-11,483.74***	-4,823.83**	-11,483.74***
	(1,815.51)	(2,622.20)	(1,815.51)	(2,622.20)
Prior Income	0.00	-0.01	0.00	-0.01
	(0.04)	(0.05)	(0.04)	(0.05)
Prior Income * Prior Income	0.00	-0.00	0.00	-0.00
	(0.00)	(0.00)	(0.00)	(0.00)
Entrance Examination (in SAT)	10.39*	23.25***	10.39*	23.25***
	(4.70)	(6.59)	(4.70)	(6.59)
Institutional Selectivity (Reference: Nonselective)				
Less Selective	-2,769.45	2,136.68	-2,769.45	2,136.68
	(3,414.69)	(4,355.95)	(3,414.69)	(4,355.95)
Selective	-1,017.93	3,044.01	-1,017.93	3,044.01
	(3,283.01)	(4,051.22)	(3,283.01)	(4,051.22)
Most Selective	2,793.87	10,091.01+	2,793.87	10,091.01+
	(4,296.78)	(5,234.43)	(4,296.78)	(5,234.43)
Private Control	-2,519.90	1,020.45	-2,519.90	1,020.45
	(2,793.75)	(4,255.26)	(2,793.75)	(4,255.26)
2-Year or Less	-516.00	-1,450.28	-516.00	-1,450.28
	(3,463.88)	(4,482.22)	(3,463.88)	(4,482.22)
College GPA	2,532.46+	7,063.27**	2,532.46+	7,063.27**
	(1,508.17)	(2,236.88)	(1,508.17)	(2,236.88)
Entering Tuition & Fees	-0.25	-0.60*	-0.25	-0.60*
	(0.20)	(0.30)	(0.20)	(0.30)
Married	4,105.87	1,774.76	4,105.87	1,774.76

	(3,172.16)	(5,229.65)	(3,172.16)	(5,229.65)
Dependents	1,749.54 ⁺	1,925.30	1,749.54 ⁺	1,925.30
	(1,007.11)	(1,866.30)	(1,007.11)	(1,866.30)
Constant	6,902.87	31,369.26	6,902.87	31,369.26
	(18,465.56)	(24,235.95)	(18,465.56)	(24,235.95)
Observations	510	510	510	510

Note: Reduced form model of the IV model for undergraduate debt's effect on early-career occupation salary. Models run solely for students self-identifying as African American.

Standard errors in parentheses. ⁺ = $p < 0.10$; * = $p < 0.05$; ** = $p < .01$; *** = $p < .001$.

Observations are rounded due to NCES guidelines.

Table A70

*Results of Two-Stage Least Squares, Dependent Variable: Salary
First Stage Full Model; Subpopulation: African American*

	Loan		Federal Loan	
	2009	2012	2009	2012
Change in Average Tuition and Fees	0.86*	0.86*	0.78+	0.78+
	(0.43)	(0.43)	(0.42)	(0.42)
Father's Education	2.69	2.69	2.11	2.11
	(3.28)	(3.28)	(3.14)	(3.14)
Change in Average Tuition and Fees * Father's Education	-0.40	-0.40	-0.31	-0.31
	(0.44)	(0.44)	(0.43)	(0.43)
Age	-0.07	-0.07	-0.03	-0.03
	(0.19)	(0.19)	(0.19)	(0.19)
Female	0.71+	0.71+	0.66+	0.66+
	(0.37)	(0.37)	(0.39)	(0.39)
Prior Income	-0.00	-0.00	-0.00	-0.00
	(0.00)	(0.00)	(0.00)	(0.00)
Prior Income*Prior Income	-0.00	-0.00	0.00	0.00
	(0.00)	(0.00)	(0.00)	(0.00)
Entrance Examination (in SAT)	-0.00*	-0.00*	-0.00**	-0.00**
	(0.00)	(0.00)	(0.00)	(0.00)
Institutional Selectivity (Reference: Nonselective)				
Less Selective	0.41	0.41	0.07	0.07
	(0.88)	(0.88)	(0.87)	(0.87)
Selective	0.29	0.29	0.27	0.27
	(0.86)	(0.86)	(0.83)	(0.83)
Most Selective	0.30	0.30	0.14	0.14
	(1.06)	(1.06)	(1.05)	(1.05)
Private Control	0.29	0.29	0.46	0.46
	(0.61)	(0.61)	(0.67)	(0.67)
2-Year or Less	-0.36	-0.36	-0.96	-0.96
	(0.99)	(0.99)	(0.98)	(0.98)
College GPA	-0.90*	-0.90*	-0.74*	-0.74*
	(0.35)	(0.35)	(0.36)	(0.36)
Entering Tuition & Fees	-0.00	-0.00	-0.00	-0.00
	(0.00)	(0.00)	(0.00)	(0.00)

Married	1.12*	1.12*	0.88	0.88
	(0.47)	(0.47)	(0.58)	(0.58)
Dependents	-0.09	-0.09	-0.01	-0.01
	(0.26)	(0.26)	(0.27)	(0.27)
Constant	8.54 ⁺	8.54 ⁺	8.99 ⁺	8.99 ⁺
	(5.10)	(5.10)	(5.06)	(5.06)
Observations	510	510	510	510
Wu-Hausman (<i>p</i> -value)	4.40 (0.036)	0.05 (0.822)	4.66 (0.031)	0.04 (0.848)
Minimum eigenvalue	4.25	4.25	3.53	3.53
<i>F</i> -bias crit, <i>F</i> -size crit	13.91, 22.3	13.91, 22.3	13.91, 22.3	13.91, 22.3
Sargan (<i>p</i> -value)	0.59 (0.744)	0.76 (0.683)	0.43 (0.807)	0.76 (0.684)

Note: Excluded instruments: change in average tuition and fees, father's education, and change in average tuition and fees interacted with father's education. Models run solely for students self-identifying as African American. Standard errors in parentheses. ⁺ = $p < 0.10$; * = $p < 0.05$; ** = $p < .01$; *** = $p < .001$. Observations are rounded due to NCES guidelines.

Table A71

*Results of Two-Stage Least Squares, Dependent Variable: Salary
Second Stage Full Model; Subpopulation: African American*

	Loan		Federal Loan	
	2009	2012	2009	2012
Cumulative Loans (Log)	0.12*	0.04	0.13*	0.04
	(0.06)	(0.22)	(0.06)	(0.22)
Age	-0.01	-0.15	-0.01	-0.16
	(0.05)	(0.17)	(0.05)	(0.17)
Female	-0.19 ⁺	-0.51 ⁺	-0.19 ⁺	-0.51 ⁺
	(0.10)	(0.28)	(0.10)	(0.28)
Prior Income	0.00	0.00	0.00	0.00
	(0.00)	(0.00)	(0.00)	(0.00)
Prior Income * Prior Income	0.00	-0.00	0.00	-0.00
	(0.00)	(0.00)	(0.00)	(0.00)
Entrance Examination (in SAT)	0.00 ⁺	0.00 [*]	0.00 ⁺	0.00 [*]
	(0.00)	(0.00)	(0.00)	(0.00)
Institutional Selectivity (Reference: Nonselective)				
Less Selective	-0.10	0.15	-0.06	0.16
	(0.18)	(0.69)	(0.18)	(0.66)
Selective	-0.07	0.01	-0.07	0.01
	(0.17)	(0.64)	(0.17)	(0.64)
Most Selective	0.06	0.75	0.08	0.75
	(0.23)	(0.73)	(0.23)	(0.72)
Private Control	-0.15	0.27	-0.17	0.26
	(0.13)	(0.55)	(0.14)	(0.55)
2-Year or Less	0.12	-0.51	0.20	-0.48
	(0.18)	(0.73)	(0.20)	(0.73)
College GPA	0.15 ⁺	0.21	0.14	0.20
	(0.09)	(0.30)	(0.09)	(0.29)
Entering Tuition & Fees	-0.00	-0.00 [*]	-0.00	-0.00 [*]
	(0.00)	(0.00)	(0.00)	(0.00)
Married	0.10	0.03	0.12	0.04
	(0.14)	(0.65)	(0.15)	(0.64)
Dependents	0.08	0.15	0.07	0.15
	(0.05)	(0.24)	(0.05)	(0.24)
Constant	8.42 ^{***}	9.99 [*]	8.31 ^{***}	9.92 [*]
	(1.19)	(4.51)	(1.25)	(4.57)
Observations	510	510	510	510

Wu-Hausman (<i>p</i> -value)	4.40 (0.036)	0.05 (0.822)	4.66 (0.031)	0.04 (0.848)
Minimum eigenvalue	4.25	4.25	3.53	3.53
<i>F</i> -bias crit, <i>F</i> -size crit	13.91, 22.3	13.91, 22.3	13.91, 22.3	13.91, 22.3
Sargan (<i>p</i> -value)	0.59 (0.744)	0.76 (0.683)	0.43 (0.807)	0.76 (0.684)

Note: Excluded instruments: change in average tuition and fees, father's education, and change in average tuition and fees interacted with father's education. Models run solely for students self-identifying as African American. Standard errors in parentheses. + = $p < 0.10$; * = $p < 0.05$; ** = $p < .01$; *** = $p < .001$. Observations are rounded due to NCES guidelines.

Table A72

*Results of OLS, Dependent Variable: Salary (Full Model)**Subpopulation: Latino*

	Loan		Federal Loan	
	2009	2012	2009	2012
Cumulative Loans Borrowed 2009 (Log)	-0.007	-0.010	-0.006	0.002
	(0.01)	(0.03)	(0.01)	(0.03)
Age	0.092*	-0.266	0.091*	-0.268
	(0.04)	(0.27)	(0.04)	(0.27)
Female	-0.087	-0.090	-0.085	-0.090
	(0.07)	(0.25)	(0.07)	(0.25)
Prior Income	-0.000	-0.000	-0.000	-0.000
	(0.00)	(0.00)	(0.00)	(0.00)
Prior Income * Prior Income	0.000	-0.000	0.000	-0.000
	(0.00)	(0.00)	(0.00)	(0.00)
Entrance Examination (in SAT)	0.000	0.001	0.000	0.001
	(0.00)	(0.00)	(0.00)	(0.00)
Institutional Selectivity (Reference: Nonselective)				
Less Selective	-0.229	-0.021	-0.225	-0.013
	(0.17)	(0.84)	(0.17)	(0.84)
Selective	-0.116	0.142	-0.109	0.133
	(0.14)	(0.75)	(0.14)	(0.76)
Most Selective	-0.127	0.311	-0.117	0.318
	(0.17)	(0.86)	(0.17)	(0.86)
Private Control	0.043	-0.477	0.047	-0.474
	(0.11)	(0.40)	(0.11)	(0.40)
2-Year or Less	-0.321*	0.102	-0.314*	0.097
	(0.16)	(0.73)	(0.16)	(0.74)
College GPA	-0.004	-0.104	-0.003	-0.096
	(0.07)	(0.30)	(0.07)	(0.29)
Entering Tuition & Fees	0.000	0.000	0.000	0.000
	(0.00)	(0.00)	(0.00)	(0.00)
Married	0.160+	-0.124	0.156+	-0.131
	(0.09)	(0.46)	(0.09)	(0.46)
Dependents	0.100	0.233	0.098	0.236
	(0.08)	(0.32)	(0.08)	(0.32)
Constant	8.580***	13.964**	8.575***	13.868**
	(0.75)	(5.04)	(0.75)	(5.07)
Observations	540	540	540	540

Note: Models run solely for students self-identifying as Latino. Standard errors in parentheses. + = $p < 0.10$; * = $p < 0.05$; ** = $p < .01$; *** = $p < .001$. Observations are rounded due to NCES guidelines.

Table A73

Results of OLS Reduced Form, Dependent Variable: Salary (Full Model)
Subpopulation: Latino

	Loan		Federal Loan	
	2009	2012	2009	2012
Change in Average Tuition and Fees	220.87	1,023.03	220.87	1,023.03
	(1,103.56)	(1,666.48)	(1,103.56)	(1,666.48)
Father's Education	1,408.69	17,347.51	1,408.69	17,347.51
	(8,763.95)	(12,914.05)	(8,763.95)	(12,914.05)
Change in Average Tuition and Fees * Father's Education	-332.71	-2,855.08	-332.71	-2,855.08
	(1,232.73)	(1,800.30)	(1,232.73)	(1,800.30)
Age	1,760.21*	-1,099.69	1,760.21*	-1,099.69
	(867.27)	(1,604.62)	(867.27)	(1,604.62)
Female	-4,818.31**	-7,159.96**	-4,818.31**	-7,159.96**
	(1,701.55)	(2,503.37)	(1,701.55)	(2,503.37)
Prior Income	0.02	0.01	0.02	0.01
	(0.03)	(0.04)	(0.03)	(0.04)
Prior Income * Prior Income	-0.00	-0.00	-0.00	-0.00
	(0.00)	(0.00)	(0.00)	(0.00)
Entrance Examination (in SAT)	2.69	14.96+	2.69	14.96+
	(5.25)	(8.07)	(5.25)	(8.07)
Institutional Selectivity (Reference: Nonselective)				
Less Selective	-4,976.34	-2,262.31	-4,976.34	-2,262.31
	(3,735.00)	(5,164.85)	(3,735.00)	(5,164.85)
Selective	-3,202.76	-1,281.49	-3,202.76	-1,281.49
	(3,286.33)	(4,501.17)	(3,286.33)	(4,501.17)
Most Selective	-114.14	3,942.27	-114.14	3,942.27
	(4,045.67)	(5,257.38)	(4,045.67)	(5,257.38)
Private Control	-630.18	-4,614.67	-630.18	-4,614.67
	(2,875.75)	(4,879.64)	(2,875.75)	(4,879.64)
2-Year or Less	-5,401.69	465.71	-5,401.69	465.71
	(3,619.28)	(4,756.21)	(3,619.28)	(4,756.21)
College GPA	1,204.01	1,862.67	1,204.01	1,862.67
	(1,826.50)	(2,634.68)	(1,826.50)	(2,634.68)
Entering Tuition & Fees	0.11	0.45	0.11	0.45
	(0.19)	(0.29)	(0.19)	(0.29)
Married	4,134.56+	118.74	4,134.56+	118.74

	(2,370.84)	(3,460.58)	(2,370.84)	(3,460.58)
Dependents	2,576.69	5,728.58*	2,576.69	5,728.58*
	(1,867.95)	(2,499.42)	(1,867.95)	(2,499.42)
Constant	-3,875.07	36,402.53	-3,875.07	36,402.53
	(19,246.84)	(33,845.11)	(19,246.84)	(33,845.11)
Observations	540	540	540	540

Note: Reduced form model of the IV model for undergraduate debt's effect on early-career occupation salary. Models run solely for students self-identifying as Latino. Standard errors in parentheses. + = $p < 0.10$; * = $p < 0.05$; ** = $p < .01$; *** = $p < .001$. Observations are rounded due to NCES guidelines.

Table A74

Results of Two-Stage Least Squares, Dependent Variable: Salary
First Stage Full Model; Subpopulation: Latino

	Loan		Federal Loan	
	2009	2012	2009	2012
Change in Average Tuition and Fees	0.67	0.67	0.77⁺	0.77⁺
	(0.41)	(0.41)	(0.41)	(0.41)
Father's Education	1.94	1.94	0.91	0.91
	(2.94)	(2.94)	(2.98)	(2.98)
Change in Average Tuition and Fees * Father's Education	-0.24	-0.24	-0.07	-0.07
	(0.40)	(0.40)	(0.41)	(0.41)
Age	0.18	0.18	0.06	0.06
	(0.25)	(0.25)	(0.26)	(0.26)
Female	-0.02	-0.02	0.28	0.28
	(0.37)	(0.37)	(0.38)	(0.38)
Prior Income	-0.00*	-0.00*	-0.00*	-0.00*
	(0.00)	(0.00)	(0.00)	(0.00)
Prior Income * Prior Income	0.00	0.00	0.00	0.00
	(0.00)	(0.00)	(0.00)	(0.00)
Entrance Examination (in SAT)	-0.00	-0.00	-0.00 ⁺	-0.00 ⁺
	(0.00)	(0.00)	(0.00)	(0.00)
Institutional Selectivity (Reference: Nonselective)				
Less Selective	-0.78	-0.78	-0.29	-0.29
	(1.11)	(1.11)	(1.27)	(1.27)
Selective	0.75	0.75	2.02 ⁺	2.02 ⁺
	(0.93)	(0.93)	(1.08)	(1.08)
Most Selective	-0.59	-0.59	0.93	0.93
	(1.09)	(1.09)	(1.22)	(1.22)
Private Control	-0.76	-0.76	-0.43	-0.43
	(0.77)	(0.77)	(0.81)	(0.81)
2-Year or Less	0.89	0.89	2.34*	2.34*
	(0.99)	(0.99)	(1.13)	(1.13)
College GPA	-0.57	-0.57	-0.43	-0.43
	(0.48)	(0.48)	(0.48)	(0.48)
Entering Tuition & Fees	0.00 ⁺	0.00 ⁺	0.00	0.00
	(0.00)	(0.00)	(0.00)	(0.00)

Married	0.72 (0.59)	0.72 (0.59)	0.23 (0.66)	0.23 (0.66)
Dependents	-0.32 (0.42)	-0.32 (0.42)	-0.72 (0.48)	-0.72 (0.48)
Constant	2.88 (5.67)	2.88 (5.67)	2.65 (5.75)	2.65 (5.75)
Observations	540	540	540	540
Wu-Hausman (<i>p</i> -value)	0.04 (0.846)	0.09 (0.762)	0.04 (0.838)	0.00 (0.977)
Minimum eigenvalue	2.43	2.43	4.52	4.52
<i>F</i> -bias crit, <i>F</i> -size crit	13.91, 22.3	13.91, 22.3	13.91, 22.3	13.91, 22.3
Sargan (<i>p</i> -value)	0.35 (0.839)	2.40 (0.302)	0.35 (0.837)	2.49 (0.287)

Note: Excluded instruments: change in average tuition and fees, father's education, and change in average tuition and fees interacted with father's education. Models run solely for students self-identifying as Latino. Standard errors in parentheses. + = $p < 0.10$; * = $p < 0.05$; ** = $p < .01$; *** = $p < .001$. Observations are rounded due to NCES guidelines.

Table A75

Results of Two-Stage Least Squares, Dependent Variable: Salary
Second Stage Full Model; Subpopulation: Latino

	Loan		Federal Loan	
	2009	2012	2009	2012
Cumulative Loans (Log)	0.01	0.06	0.00	0.01
	(0.07)	(0.21)	(0.06)	(0.15)
Age	0.09*	-0.28	0.09*	-0.27
	(0.04)	(0.27)	(0.04)	(0.27)
Female	-0.09	-0.09	-0.09	-0.09
	(0.07)	(0.24)	(0.07)	(0.25)
Prior Income	-0.00	0.00	-0.00	-0.00
	(0.00)	(0.00)	(0.00)	(0.00)
Prior Income * Prior Income	0.00	-0.00	0.00	-0.00
	(0.00)	(0.00)	(0.00)	(0.00)
Entrance Examination (in SAT)	0.00	0.00	0.00	0.00
	(0.00)	(0.00)	(0.00)	(0.00)
Institutional Selectivity (Reference: Nonselective)				
Less Selective	-0.22	0.04	-0.22	-0.01
	(0.18)	(0.81)	(0.16)	(0.82)
Selective	-0.12	0.10	-0.13	0.13
	(0.14)	(0.78)	(0.17)	(0.84)
Most Selective	-0.12	0.37	-0.12	0.32
	(0.18)	(0.82)	(0.17)	(0.88)
Private Control	0.05	-0.45	0.05	-0.47
	(0.11)	(0.41)	(0.10)	(0.39)
2-Year or Less	-0.32*	0.08	-0.33+	0.09
	(0.16)	(0.74)	(0.18)	(0.79)
College GPA	0.01	-0.05	0.00	-0.09
	(0.08)	(0.35)	(0.08)	(0.31)
Entering Tuition & Fees	0.00	0.00	0.00	0.00
	(0.00)	(0.00)	(0.00)	(0.00)
Married	0.15	-0.18	0.15+	-0.13
	(0.10)	(0.49)	(0.09)	(0.46)
Dependents	0.10	0.25	0.10	0.24
	(0.08)	(0.31)	(0.08)	(0.30)
Constant	8.47***	13.37*	8.49***	13.82**
	(1.02)	(5.33)	(0.93)	(5.15)
Observations	540	540	540	540

Wu-Hausman (<i>p</i> -value)	0.04 (0.846)	0.09 (0.762)	0.04 (0.838)	0.00 (0.977)
Minimum eigenvalue	2.43	2.43	4.52	4.52
<i>F</i> -bias crit, <i>F</i> -size crit	13.91, 22.3	13.91, 22.3	13.91, 22.3	13.91, 22.3
Sargan (<i>p</i> -value)	0.35 (0.839)	2.40 (0.302)	0.35 (0.837)	2.49 (0.287)

Note: Excluded instruments: change in average tuition and fees, father's education, and change in average tuition and fees interacted with father's education. Models run solely for students self-identifying as Latino. Standard errors in parentheses. + = $p < 0.10$; * = $p < 0.05$; ** = $p < .01$; *** = $p < .001$. Observations are rounded due to NCES guidelines.

Table A76

*Results of OLS, Dependent Variable: Salary (Full Model)**Subpopulation: Asian*

	Loan		Federal Loan	
	2009	2012	2009	2012
Cumulative Loans Borrowed 2009 (Log)	0.009	0.012	0.009	0.019
	(0.01)	(0.03)	(0.01)	(0.03)
Age	-0.018	0.046	-0.017	0.047
	(0.05)	(0.17)	(0.05)	(0.17)
Female	-0.255**	-0.529 ⁺	-0.255**	-0.528 ⁺
	(0.08)	(0.29)	(0.08)	(0.29)
Prior Income	0.000	0.000	0.000	0.000
	(0.00)	(0.00)	(0.00)	(0.00)
Prior Income * Prior Income	-0.000	0.000	-0.000	0.000
	(0.00)	(0.00)	(0.00)	(0.00)
Entrance Examination (in SAT)	-0.000	0.002**	-0.000	0.002**
	(0.00)	(0.00)	(0.00)	(0.00)
Institutional Selectivity (Reference: Nonselective)				
Less Selective	0.132	1.267	0.130	1.246
	(0.29)	(1.26)	(0.29)	(1.26)
Selective	0.023	0.342	0.025	0.329
	(0.27)	(1.31)	(0.27)	(1.30)
Most Selective	-0.005	0.389	-0.003	0.373
	(0.29)	(1.31)	(0.29)	(1.31)
Private Control	-0.154	-0.366	-0.152	-0.374
	(0.21)	(0.54)	(0.21)	(0.54)
2-Year or Less	-0.065	-0.270	-0.062	-0.288
	(0.29)	(1.39)	(0.29)	(1.39)
College GPA	-0.000	0.065	-0.004	0.064
	(0.09)	(0.36)	(0.09)	(0.37)
Entering Tuition & Fees	0.000	-0.000	0.000	-0.000
	(0.00)	(0.00)	(0.00)	(0.00)
Married	-0.101	-0.158	-0.104	-0.166
	(0.22)	(0.92)	(0.22)	(0.92)
Dependents	-0.271	0.768	-0.271	0.784
	(0.39)	(0.54)	(0.39)	(0.54)
Constant	10.522***	6.219	10.523***	6.180
	(1.07)	(4.06)	(1.07)	(4.05)
Observations	440	440	440	440

Note: Models run solely for students self-identifying as Asian. Standard errors in parentheses. + = $p < 0.10$; * = $p < 0.05$; ** = $p < .01$; *** = $p < .001$. Observations are rounded due to NCES guidelines.

Table A77

*Results of OLS Reduced Form, Dependent Variable: Salary (Full Model)**Subpopulation: Asian*

	Loan		Federal Loan	
	2009	2012	2009	2012
Change in Average Tuition and Fees	2,062.10	952.03	2,062.10	952.03
	(1,522.95)	(2,935.61)	(1,522.95)	(2,935.61)
Father's Education	2,198.83	5,349.11	2,198.83	5,349.11
	(10,944.71)	(21,265.89)	(10,944.71)	(21,265.89)
Change in Average Tuition and Fees * Father's Education	-687.42	-1,353.96	-687.42	-1,353.96
	(1,600.03)	(3,078.21)	(1,600.03)	(3,078.21)
Age	-447.99	69.23	-447.99	69.23
	(1,390.04)	(2,378.92)	(1,390.04)	(2,378.92)
Female	-6,697.77**	-11,464.71***	-6,697.77**	-11,464.71***
	(2,092.55)	(3,278.20)	(2,092.55)	(3,278.20)
Prior Income	-0.02	-0.05	-0.02	-0.05
	(0.04)	(0.06)	(0.04)	(0.06)
Prior Income * Prior Income	0.00	0.00	0.00	0.00
	(0.00)	(0.00)	(0.00)	(0.00)
Entrance Examination (in SAT)	8.91	29.39**	8.91	29.39**
	(6.33)	(10.39)	(6.33)	(10.39)
Institutional Selectivity (Reference: Nonselective)				
Less Selective	2,009.55	7,105.67	2,009.55	7,105.67
	(7,141.20)	(9,237.75)	(7,141.20)	(9,237.75)
Selective	1,792.20	6,366.84	1,792.20	6,366.84
	(6,567.29)	(8,599.14)	(6,567.29)	(8,599.14)
Most Selective	2,342.25	3,374.53	2,342.25	3,374.53
	(7,126.64)	(9,277.37)	(7,126.64)	(9,277.37)
Private Control	-5,306.72	-15,700.37**	-5,306.72	-15,700.37**
	(4,937.10)	(5,808.98)	(4,937.10)	(5,808.98)
2-Year or Less	2,750.34	6,874.48	2,750.34	6,874.48
	(7,249.09)	(9,587.85)	(7,249.09)	(9,587.85)
College GPA	2,490.20	8,676.49*	2,490.20	8,676.49*
	(2,404.49)	(3,529.09)	(2,404.49)	(3,529.09)
Entering Tuition & Fees	0.13	0.62+	0.13	0.62+
	(0.29)	(0.35)	(0.29)	(0.35)
Married	-3,881.40	265.14	-3,881.40	265.14

	(3,497.78)	(6,557.51)	(3,497.78)	(6,557.51)
Dependents	-6,701.79	-7,704.67	-6,701.79	-7,704.67
	(5,582.31)	(7,494.47)	(5,582.31)	(7,494.47)
Constant	13,972.49	-19,890.15	13,972.49	-19,890.15
	(30,180.34)	(49,393.76)	(30,180.34)	(49,393.76)
Observations	440	440	440	440

Note: Reduced form model of the IV model for undergraduate debt's effect on early-career occupation salary. Models run solely for students self-identifying as Asian. Standard errors in parentheses. + = $p < 0.10$; * = $p < 0.05$; ** = $p < .01$; *** = $p < .001$. Observations are rounded due to NCES guidelines.

Table A78

Results of Two-Stage Least Squares, Dependent Variable: Salary
First Stage Full Model; Subpopulation: Asian

	Loan		Federal Loan	
	2009	2012	2009	2012
Change in Average Tuition and Fees	1.36^{***}	1.36^{***}	1.31^{***}	1.31^{***}
	(0.29)	(0.29)	(0.28)	(0.28)
Father's Education	3.89	3.89	2.96	2.96
	(2.47)	(2.47)	(2.39)	(2.39)
Change in Average Tuition and Fees * Father's Education	-0.63⁺	-0.63⁺	-0.51	-0.51
	(0.33)	(0.33)	(0.32)	(0.32)
Age	0.14	0.14	0.08	0.08
	(0.32)	(0.32)	(0.31)	(0.31)
Female	-0.28	-0.28	-0.21	-0.21
	(0.43)	(0.43)	(0.43)	(0.43)
Prior Income	-0.00 ^{**}	-0.00 ^{**}	-0.00 ^{**}	-0.00 ^{**}
	(0.00)	(0.00)	(0.00)	(0.00)
Prior Income * Prior Income	0.00	0.00	0.00	0.00
	(0.00)	(0.00)	(0.00)	(0.00)
Entrance Examination (in SAT)	0.00	0.00	0.00	0.00
	(0.00)	(0.00)	(0.00)	(0.00)
Institutional Selectivity (Reference: Nonselective)				
Less Selective	2.10	2.10	2.32	2.32
	(2.49)	(2.49)	(2.40)	(2.40)
Selective	2.11	2.11	1.86	1.86
	(2.10)	(2.10)	(2.00)	(2.00)
Most Selective	2.31	2.31	2.13	2.13
	(2.15)	(2.15)	(2.05)	(2.05)
Private Control	1.08	1.08	0.86	0.86
	(1.13)	(1.13)	(1.11)	(1.11)
2-Year or Less	3.14	3.14	2.96	2.96
	(2.18)	(2.18)	(2.08)	(2.08)
College GPA	-0.55	-0.55	-0.20	-0.20
	(0.53)	(0.53)	(0.53)	(0.53)
Entering Tuition & Fees	-0.00	-0.00	-0.00	-0.00
	(0.00)	(0.00)	(0.00)	(0.00)

Married	0.86 (1.12)	0.86 (1.12)	1.12 (1.09)	1.12 (1.09)
Dependents	-3.42 ⁺ (1.82)	-3.42 ⁺ (1.82)	-3.35 ⁺ (1.71)	-3.35 ⁺ (1.71)
Constant	-4.96 (7.96)	-4.96 (7.96)	-4.66 (7.75)	-4.66 (7.75)
Observations	440	440	440	440
Wu-Hausman (<i>p</i> -value)	1.57 (0.211)	0.56 (0.455)	1.78 (0.183)	0.41 (0.523)
Minimum eigenvalue	7.96	7.96	8.12	8.12
<i>F</i> -bias crit, <i>F</i> -size crit	13.91, 22.3	13.91, 22.3	13.91, 22.3	13.91, 22.3
Sargan (<i>p</i> -value)	1.33 (0.514)	0.41 (0.815)	1.10 (0.577)	0.50 (0.779)

Note: Excluded instruments: change in average tuition and fees, father's education, and change in average tuition and fees interacted with father's education. Models run solely for students self-identifying as Asian. Standard errors in parentheses. ⁺ = $p < 0.10$; * = $p < 0.05$; ** = $p < .01$; *** = $p < .001$. Observations are rounded due to NCES guidelines.

Table A79

*Results of Two-Stage Least Squares, Dependent Variable: Salary
Second Stage Full Model; Subpopulation: Asian*

	Loan		Federal Loan	
	2009	2012	2009	2012
Cumulative Loans (Log)	0.06	0.11	0.06⁺	0.11
	(0.04)	(0.18)	(0.04)	(0.17)
Age	-0.02	0.04	-0.02	0.05
	(0.05)	(0.17)	(0.05)	(0.17)
Female	-0.23 ^{**}	-0.49 ⁺	-0.24 ^{**}	-0.50 ⁺
	(0.08)	(0.29)	(0.08)	(0.29)
Prior Income	0.00	0.00	0.00	0.00
	(0.00)	(0.00)	(0.00)	(0.00)
Prior Income * Prior Income	-0.00	0.00	-0.00	0.00
	(0.00)	(0.00)	(0.00)	(0.00)
Entrance Examination (in SAT)	-0.00	0.00 ^{**}	-0.00	0.00 ^{**}
	(0.00)	(0.00)	(0.00)	(0.00)
Institutional Selectivity (Reference: Nonselective)				
Less Selective	0.02	1.03	0.01	1.03
	(0.36)	(1.33)	(0.35)	(1.34)
Selective	-0.10	0.08	-0.09	0.13
	(0.32)	(1.39)	(0.31)	(1.37)
Most Selective	-0.13	0.11	-0.13	0.15
	(0.34)	(1.39)	(0.33)	(1.37)
Private Control	-0.23	-0.52	-0.22	-0.49
	(0.22)	(0.60)	(0.22)	(0.59)
2-Year or Less	-0.21	-0.59	-0.20	-0.54
	(0.34)	(1.48)	(0.33)	(1.46)
College GPA	0.04	0.14	0.02	0.10
	(0.09)	(0.38)	(0.09)	(0.37)
Entering Tuition & Fees	0.00	-0.00	0.00	-0.00
	(0.00)	(0.00)	(0.00)	(0.00)
Married	-0.13	-0.21	-0.14	-0.23
	(0.23)	(0.88)	(0.23)	(0.88)
Dependents	-0.16	1.01	-0.15	0.99
	(0.40)	(0.65)	(0.40)	(0.64)
Constant	10.26 ^{***}	5.65	10.25 ^{***}	5.70
	(1.08)	(4.09)	(1.09)	(4.09)
Observations	440	440	440	440

Wu-Hausman (<i>p</i> -value)	1.57 (0.211)	0.56 (0.455)	1.78 (0.183)	0.41 (0.523)
Minimum eigenvalue	7.96	7.96	8.12	8.12
<i>F</i> -bias crit, <i>F</i> -size crit	13.91, 22.3	13.91, 22.3	13.91, 22.3	13.91, 22.3
Sargan (<i>p</i> -value)	1.33 (0.514)	0.41 (0.815)	1.10 (0.577)	0.50 (0.779)

Note: Excluded instruments: change in average tuition and fees, father's education, and change in average tuition and fees interacted with father's education. Models run solely for students self-identifying as Asian. Standard errors in parentheses. + = $p < 0.10$; * = $p < 0.05$; ** = $p < .01$; *** = $p < .001$. Observations are rounded due to NCES guidelines.

Table A80

*Results of OLS, Dependent Variable: Salary (Full Model)**Subpopulation: Other Race*

	Loan		Federal Loan	
	2009	2012	2009	2012
Cumulative Loans Borrowed 2009 (Log)	0.012	-0.026	0.004	-0.034
	(0.01)	(0.02)	(0.01)	(0.02)
Age	-0.076 (0.06)	-0.108 (0.12)	-0.071 (0.06)	-0.101 (0.12)
Female	-0.186* (0.09)	-0.157 (0.27)	-0.183* (0.09)	-0.152 (0.27)
Prior Income	-0.000 (0.00)	0.000 (0.00)	-0.000 (0.00)	0.000 (0.00)
Prior Income * Prior Income	0.000 (0.00)	-0.000 (0.00)	0.000+ (0.00)	-0.000 (0.00)
Entrance Examination (in SAT)	-0.000 (0.00)	0.002 (0.00)	-0.000 (0.00)	0.002 (0.00)
Institutional Selectivity (Reference: Nonselective)				
Less Selective	-0.549+ (0.29)	-0.048 (0.40)	-0.525+ (0.30)	0.002 (0.39)
Selective	-0.338 (0.22)	-0.477 (0.33)	-0.323 (0.22)	-0.426 (0.32)
Most Selective	-0.112 (0.26)	-0.635 (0.43)	-0.116 (0.26)	-0.621 (0.42)
Private Control	0.193 (0.17)	-1.127* (0.48)	0.189 (0.17)	-1.147* (0.48)
2-Year or Less	-0.248 (0.23)	-0.558 (0.45)	-0.227 (0.23)	-0.508 (0.43)
College GPA	0.002 (0.10)	-0.184 (0.28)	-0.004 (0.10)	-0.177 (0.28)
Entering Tuition & Fees	-0.000 (0.00)	0.000* (0.00)	-0.000 (0.00)	0.000* (0.00)
Married	0.179 (0.13)	0.605+ (0.35)	0.165 (0.13)	0.602+ (0.35)
Dependents	0.138+ (0.07)	0.022 (0.32)	0.143* (0.07)	0.027 (0.32)
Constant	11.924*** (1.17)	11.491*** (2.47)	11.904*** (1.16)	11.338*** (2.44)
Observations	280	280	280	280

Note: Models run solely for students self-identifying as American Indian/Alaskan Native, Native Hawaiian/other Pacific Islander, other, or more than one race. Standard errors in parentheses. + = $p < 0.10$; * = $p < 0.05$; ** = $p < .01$; *** = $p < .001$. Observations are rounded due to NCES guidelines.

Table A81

Results of OLS Reduced Form, Dependent Variable: Salary (Full Model)
Subpopulation: Other Race

	Loan		Federal Loan	
	2009	2012	2009	2012
Change in Average Tuition and Fees	-734.53	1,615.94	-734.53	1,615.94
	(1,678.37)	(3,362.07)	(1,678.37)	(3,362.07)
Father's Education	-27,375.55*	-614.94	-27,375.55*	-614.94
	(12,136.99)	(23,411.32)	(12,136.99)	(23,411.32)
Change in Average Tuition and Fees * Father's Education	3,691.31*	-174.61	3,691.31*	-174.61
	(1,718.17)	(3,350.86)	(1,718.17)	(3,350.86)
Age	-1,033.85	-2,206.95	-1,033.85	-2,206.95
	(1,514.07)	(2,101.03)	(1,514.07)	(2,101.03)
Female	-7,166.31*	-8,383.80*	-7,166.31*	-8,383.80*
	(2,891.67)	(3,459.90)	(2,891.67)	(3,459.90)
Prior Income	0.01	0.06	0.01	0.06
	(0.05)	(0.05)	(0.05)	(0.05)
Prior Income * Prior Income	0.00	-0.00	0.00	-0.00
	(0.00)	(0.00)	(0.00)	(0.00)
Entrance Examination (in SAT)	4.58	9.87	4.58	9.87
	(7.85)	(10.61)	(7.85)	(10.61)
Institutional Selectivity (Reference: Nonselective)				
Less Selective	-13,788.93	-15,808.87	-13,788.93	-15,808.87
	(9,000.55)	(13,616.80)	(9,000.55)	(13,616.80)
Selective	-7,976.82	-11,314.89	-7,976.82	-11,314.89
	(8,268.10)	(12,926.27)	(8,268.10)	(12,926.27)
Most Selective	395.99	-11,244.95	395.99	-11,244.95
	(10,508.44)	(14,663.03)	(10,508.44)	(14,663.03)
Private Control	5,877.20	-8,908.81	5,877.20	-8,908.81
	(7,934.48)	(9,241.07)	(7,934.48)	(9,241.07)
2-Year or Less	-5,141.35	-11,618.07	-5,141.35	-11,618.07
	(8,686.40)	(13,489.18)	(8,686.40)	(13,489.18)
College GPA	390.22	-2,867.02	390.22	-2,867.02
	(2,519.65)	(3,500.00)	(2,519.65)	(3,500.00)
Entering Tuition & Fees	-0.50	0.04	-0.50	0.04
	(0.50)	(0.57)	(0.50)	(0.57)
Married	73.19	3,955.64	73.19	3,955.64

	(3,467.19)	(5,467.10)	(3,467.19)	(5,467.10)
Dependents	1,845.33	-369.13	1,845.33	-369.13
	(2,029.73)	(3,885.45)	(2,029.73)	(3,885.45)
Constant	61,786.62 ⁺	84,359.31 ⁺	61,786.62 ⁺	84,359.31 ⁺
	(32,589.90)	(45,698.12)	(32,589.90)	(45,698.12)
Observations	280	280	280	280

Note: Reduced form model of the IV model for undergraduate debt's effect on early-career occupation salary. Models run solely for students self-identifying as American Indian/Alaskan Native, Native Hawaiian/other Pacific Islander, other, or more than one race. Standard errors in parentheses. ⁺ = $p < 0.10$; * = $p < 0.05$; ** = $p < .01$; *** = $p < .001$. Observations are rounded due to NCES guidelines.

Table A82

Results of Two-Stage Least Squares, Dependent Variable: Salary
First Stage Full Model; Subpopulation: Other Race

	Loan		Federal Loan	
	2009	2012	2009	2012
Change in Average Tuition and Fees	1.35*	1.35*	1.19+	1.19+
	(0.65)	(0.65)	(0.64)	(0.64)
Father's Education	5.80	5.80	5.44	5.44
	(4.97)	(4.97)	(4.99)	(4.99)
Change in Average Tuition and Fees * Father's Education	-0.54	-0.54	-0.53	-0.53
	(0.66)	(0.66)	(0.65)	(0.65)
Age	0.61+	0.61+	0.70*	0.70*
	(0.31)	(0.31)	(0.30)	(0.30)
Female	0.58	0.58	0.61	0.61
	(0.55)	(0.55)	(0.54)	(0.54)
Prior Income	-0.00+	-0.00+	-0.00**	-0.00**
	(0.00)	(0.00)	(0.00)	(0.00)
Prior Income * Prior Income	0.00	0.00	0.00*	0.00*
	(0.00)	(0.00)	(0.00)	(0.00)
Entrance Examination (in SAT)	0.00	0.00	0.00	0.00
	(0.00)	(0.00)	(0.00)	(0.00)
Institutional Selectivity (Reference: Nonselective)				
Less Selective	3.67+	3.67+	4.32*	4.32*
	(2.00)	(2.00)	(2.11)	(2.11)
Selective	2.56	2.56	3.50+	3.50+
	(1.86)	(1.86)	(1.85)	(1.85)
Most Selective	0.29	0.29	0.66	0.66
	(2.05)	(2.05)	(2.02)	(2.02)
Private Control	-1.20	-1.20	-1.53	-1.53
	(1.09)	(1.09)	(1.08)	(1.08)
2-Year or Less	4.24*	4.24*	4.80*	4.80*
	(1.95)	(1.95)	(1.96)	(1.96)
College GPA	-0.58	-0.58	-0.24	-0.24
	(0.63)	(0.63)	(0.62)	(0.62)
Entering Tuition & Fees	0.00	0.00	0.00+	0.00+
	(0.00)	(0.00)	(0.00)	(0.00)

Married	-1.68 (1.14)	-1.68 (1.14)	-1.38 (1.15)	-1.38 (1.15)
Dependents	0.16 (0.65)	0.16 (0.65)	0.23 (0.63)	0.23 (0.63)
Constant	-16.24* (7.47)	-16.24* (7.47)	-18.24* (7.45)	-18.24* (7.45)
Observations	280	280	280	280
Wu-Hausman (<i>p</i> -value)	1.82 (0.179)	0.41 (0.524)	2.13 (0.146)	0.38 (0.537)
Minimum eigenvalue	4.29	4.287	2.98	2.98
<i>F</i> -bias crit, <i>F</i> -size crit	13.91, 22.3	13.91, 22.3	13.91, 22.3	13.91, 22.3
Sargan (<i>p</i> -value)	2.79 (0.248)	0.13 (0.937)	2.73 (0.255)	0.13 (0.937)

Note: Excluded instruments: change in average tuition and fees, father's education, and change in average tuition and fees interacted with father's education. Models run solely for students self-identifying as American Indian/Alaskan Native, Native Hawaiian/other Pacific Islander, other, or more than one race. Standard errors in parentheses. + = $p < 0.10$; * = $p < 0.05$; ** = $p < .01$; *** = $p < .001$. Observations are rounded due to NCES guidelines.

Table A83

*Results of Two-Stage Least Squares, Dependent Variable: Salary
Second Stage Full Model; Subpopulation: Other Race*

	Loan		Federal Loan	
	2009	2012	2009	2012
Cumulative Loans (Log)	0.07⁺ (0.04)	-0.11 (0.10)	0.09 (0.06)	-0.13 (0.12)
Age	-0.11 (0.07)	-0.06 (0.13)	-0.13 (0.08)	-0.04 (0.14)
Female	-0.21* (0.10)	-0.12 (0.25)	-0.22* (0.11)	-0.10 (0.25)
Prior Income	0.00 (0.00)	-0.00 (0.00)	0.00 (0.00)	-0.00 (0.00)
Prior Income * Prior Income	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)
Entrance Examination (in SAT)	-0.00 (0.00)	0.00 (0.00)	-0.00 (0.00)	0.00 (0.00)
Institutional Selectivity (Reference: Nonselective)				
Less Selective	-0.76* (0.35)	0.23 (0.55)	-0.86* (0.40)	0.39 (0.65)
Selective	-0.48* (0.27)	-0.29 (0.44)	-0.60* (0.34)	-0.10 (0.53)
Most Selective	-0.10 (0.29)	-0.65 (0.49)	-0.13 (0.33)	-0.60 (0.45)
Private Control	0.24 (0.19)	-1.19* (0.47)	0.29 (0.20)	-1.26** (0.48)
2-Year or Less	-0.43 (0.30)	-0.32 (0.47)	-0.53 (0.37)	-0.15 (0.52)
College GPA	0.04 (0.10)	-0.23 (0.26)	0.02 (0.11)	-0.20 (0.26)
Entering Tuition & Fees	-0.00 (0.00)	0.00* (0.00)	-0.00 (0.00)	0.00* (0.00)
Married	0.28* (0.17)	0.47 (0.36)	0.28 (0.18)	0.47 (0.38)
Dependents	0.10 (0.09)	0.07 (0.31)	0.09 (0.10)	0.09 (0.32)
Constant	12.18*** (1.28)	11.16*** (2.54)	12.54*** (1.38)	10.60*** (2.79)
Observations	8030	8030	8030	8030

Wu-Hausman (<i>p</i> -value)	28.96 (0.000)	9.220 (0.002)	30.60 (0.000)	9.13 (0.003)
Minimum eigenvalue	26.27	26.27	24.07	24.07
<i>F</i> -bias crit, <i>F</i> -size crit	13.91, 22.3	13.91, 22.3	13.91, 22.3	13.91, 22.3
Sargan (<i>p</i> -value)	3.04 (0.219)	1.01 (0.604)	2.44 (0.295)	1.16 (0.561)

Note: Excluded instruments: change in average tuition and fees, father's education, and change in average tuition and fees interacted with father's education. Models run solely for students self-identifying as American Indian/Alaskan Native, Native Hawaiian/other Pacific Islander, other, or more than one race. Standard errors in parentheses. + = $p < 0.10$; * = $p < 0.05$; ** = $p < .01$; *** = $p < .001$. Observations are rounded due to NCES guidelines.

Table A84

Results of OLS, Dependent Variable: Graduate School Aspirations (Full Model)
Subpopulation: Low-Income

	Loan	Federal Loan
Cumulative Loans Borrowed 2009 (Log)	0.006*	0.007**
	(0.00)	(0.00)
Female	0.072*** (0.02)	0.072*** (0.02)
Race/Ethnicity (Reference: White)		
African American	0.167*** (0.03)	0.165*** (0.03)
Latino	0.128*** (0.03)	0.129*** (0.03)
Asian	0.190*** (0.04)	0.192*** (0.04)
Other Race	0.109* (0.04)	0.108* (0.04)
Entrance Examination (in SAT)	0.000*** (0.00)	0.000*** (0.00)
Institutional Selectivity (Reference: Nonselective)		
Less Selective	0.049 (0.06)	0.046 (0.06)
Selective	0.111* (0.05)	0.109* (0.05)
Most Selective	0.179** (0.06)	0.177** (0.06)
Private Control	-0.022 (0.04)	-0.024 (0.04)
2-Year or Less	-0.082+ (0.05)	-0.079+ (0.05)
College GPA	0.050** (0.02)	0.051** (0.02)
Entering Tuition & Fees	0.000 (0.00)	0.000 (0.00)
Married	0.009 (0.06)	0.007 (0.06)
Dependents	-0.035 (0.02)	-0.034 (0.02)
Constant	-0.069 (0.09)	-0.077 (0.09)
Observations	2220	2220

Note: The primary covariate of interest in the models is cumulative loans borrowed from 2003–2004 to 2008–2009 (loan) and cumulative federal loans borrowed over the same period (federal loan). Models run solely for students with prior income at or below the 25th percentile. Standard errors in parentheses. + = $p < 0.10$; * = $p < 0.05$; ** = $p < .01$; *** = $p < .001$. Observations are rounded due to NCES guidelines.

Table A85

Results of OLS Reduced Form, Dependent Variable: Graduate School Aspirations (Full Model)
Subpopulation: Low-Income

	Loan	Federal Loan
Change in Average Tuition and Fees	-0.01	-0.01
	(0.02)	(0.02)
Mother's Education	0.01	0.01
	(0.17)	(0.17)
Change in Average Tuition and Fees * Mother's Education	0.00	0.00
	(0.02)	(0.02)
Female	0.07***	0.07***
	(0.02)	(0.02)
Race/Ethnicity (Reference: White)		
African American	0.17***	0.17***
	(0.03)	(0.03)
Latino	0.13***	0.13***
	(0.03)	(0.03)
Asian	0.19***	0.19***
	(0.04)	(0.04)
Other Race	0.11*	0.11*
	(0.04)	(0.04)
Entrance Examination (in SAT)	0.00***	0.00***
	(0.00)	(0.00)
Institutional Selectivity (Reference: Nonselective)		
Less Selective	0.06	0.06
	(0.06)	(0.06)
Selective	0.12*	0.12*
	(0.05)	(0.05)
Most Selective	0.18**	0.18**
	(0.06)	(0.06)
Private Control	-0.01	-0.01
	(0.04)	(0.04)
2-Year or Less	-0.10+	-0.10+
	(0.05)	(0.05)
College GPA	0.05**	0.05**
	(0.02)	(0.02)
Entering Tuition & Fees	0.00+	0.00+
	(0.00)	(0.00)
Married	0.01	0.01
	(0.06)	(0.06)

Dependents	-0.03 (0.02)	-0.03 (0.02)
Constant	0.03 (0.20)	0.03 (0.20)
Observations	2220	2220

Note: Reduced form equation for the IV model of undergraduate debt's effect on graduate aspirations. Models run solely for students with prior income at or below the 25th percentile. Standard errors in parentheses. + = $p < 0.10$; * = $p < 0.05$; ** = $p < .01$; *** = $p < .001$. Observations are rounded due to NCES guidelines.

Table A86

*Results of Two-Stage Least Squares, Dependent Variable: Graduate School Aspirations
First Stage Full Model; Subpopulation: Low-Income*

	Loan	Federal Loan
Change in Average Tuition and Fees	1.07***	0.93***
	(0.19)	(0.19)
Mother's Education	3.65**	2.86*
	(1.37)	(1.36)
Change in Average Tuition and Fees * Mother's Education	-0.56**	-0.42*
	(0.19)	(0.19)
Female	0.03	0.08
	(0.18)	(0.18)
Race/Ethnicity (Reference: White)		
African American	1.36***	1.33***
	(0.23)	(0.23)
Latino	-0.04	-0.19
	(0.28)	(0.28)
Asian	-0.78*	-0.76*
	(0.36)	(0.36)
Other Race	0.25	0.35
	(0.39)	(0.39)
Entrance Examination (in SAT)	-0.00	-0.00
	(0.00)	(0.00)
Institutional Selectivity (Reference: Nonselective)		
Less Selective	1.00*	1.09*
	(0.45)	(0.47)
Selective	0.75+	0.84*
	(0.40)	(0.42)
Most Selective	-0.33	-0.08
	(0.55)	(0.56)
Private Control	0.01	0.29
	(0.37)	(0.38)
2-Year or Less	-0.58	-0.70+
	(0.41)	(0.42)
College GPA	-0.23	-0.22
	(0.15)	(0.15)
Entering Tuition & Fees	0.00	0.00
	(0.00)	(0.00)
Married	-0.23	0.15
	(0.63)	(0.63)

Dependents	-0.13 (0.23)	-0.23 (0.23)
Constant	-0.48 (1.57)	0.01 (1.55)
Observations	2220	2220
Wu-Hausman (<i>p</i> -value)	1.25 (0.264)	1.29 (0.256)
Minimum eigenvalue	11.43	9.42
<i>F</i> -bias crit, <i>F</i> -size crit	13.91, 22.3	13.91, 22.3
Sargan (<i>p</i> -value)	0.38 (0.826)	0.43 (0.806)

Note: Excluded instruments: change in average tuition and fees, mother's education, and change in average tuition and fees interacted with mother's education. Models run solely for students with prior income at or below the 25th percentile. Standard errors in parentheses. + = $p < 0.10$; * = $p < 0.05$; ** = $p < .01$; *** = $p < .001$. Observations are rounded due to NCES guidelines.

Table A87

*Results of Two-Stage Least Squares, Dependent Variable: Graduate School Aspirations
Second Stage Full Model; Subpopulation: Low-Income.*

	Loan	Federal Loan
Cumulative Loans (Log)	-0.02	-0.02
	(0.02)	(0.02)
Female	0.07***	0.07***
	(0.02)	(0.02)
Race/Ethnicity (Reference: White)		
African American	0.20***	0.20***
	(0.04)	(0.04)
Latino	0.12***	0.12***
	(0.03)	(0.03)
Asian	0.17***	0.17***
	(0.04)	(0.04)
Other Race	0.11*	0.12*
	(0.05)	(0.05)
Entrance Examination (in SAT)	0.00***	0.00***
	(0.00)	(0.00)
Institutional Selectivity (Reference: Nonselective)		
Less Selective	0.07	0.08
	(0.06)	(0.07)
Selective	0.13*	0.13*
	(0.05)	(0.05)
Most Selective	0.17**	0.18**
	(0.06)	(0.06)
Private Control	-0.02	-0.01
	(0.04)	(0.05)
2-Year or Less	-0.10+	-0.11+
	(0.05)	(0.06)
College GPA	0.04*	0.05*
	(0.02)	(0.02)
Entering Tuition & Fees	0.00+	0.00+
	(0.00)	(0.00)
Married	0.00	0.01
	(0.07)	(0.07)
Dependents	-0.04	-0.04
	(0.03)	(0.03)
Constant	0.07	0.07
	(0.16)	(0.16)
Observations	2220	2220
Wu-Hausman (<i>p</i> -value)	1.25 (0.264)	1.29 (0.256)

Minimum eigenvalue	11.43	9.42
<i>F</i> -bias crit, <i>F</i> -size crit	13.91, 22.3	13.91, 22.3
Sargan (<i>p</i> -value)	0.38 (0.826)	0.43 (0.806)

Note: Excluded instruments: change in average tuition and fees, mother's education, and change in average tuition and fees interacted with mother's education. Models run solely for students with prior income at or below the 25th percentile. Standard errors in parentheses. + = $p < 0.10$; * = $p < 0.05$; ** = $p < .01$; *** = $p < .001$. Observations are rounded due to NCES guidelines.

Table A88

*Results of OLS, Dependent Variable: Graduate School Aspirations (Full Model)
Subpopulation: Mid- to Low-Income*

	Loan	Federal Loan
Cumulative Loans Borrowed 2009 (Log)	0.008***	0.007**
	(0.00)	(0.00)
Female	0.068*** (0.02)	0.068*** (0.02)
Race/Ethnicity (Reference: White)		
African American	0.209*** (0.03)	0.208*** (0.03)
Latino	0.095** (0.04)	0.093** (0.04)
Asian	0.093* (0.04)	0.092* (0.04)
Other Race	0.057 (0.04)	0.055 (0.04)
Entrance Examination (in SAT)	0.000*** (0.00)	0.000*** (0.00)
Institutional Selectivity (Reference: Nonselective)		
Less Selective	-0.074 (0.06)	-0.077 (0.06)
Selective	0.020 (0.05)	0.018 (0.05)
Most Selective	0.044 (0.06)	0.042 (0.06)
Private Control	-0.054 (0.04)	-0.058 (0.04)
2-Year or Less	-0.160** (0.05)	-0.164** (0.05)
College GPA	0.084*** (0.02)	0.083*** (0.02)
Entering Tuition & Fees	0.000* (0.00)	0.000* (0.00)
Married	-0.004 (0.16)	-0.007 (0.16)
Dependents	0.057 (0.08)	0.058 (0.08)
Constant	-0.050 (0.09)	-0.034 (0.09)
Observations	2220	2220

Note: The primary covariate of interest in the models is cumulative loans borrowed from 2003–2004 to 2008–2009 (loan) and cumulative federal loans borrowed over the same period (federal loan). Models run solely for students with prior income above the 25th percentile and up to and including the 50th percentile. Standard errors in parentheses. + = $p < 0.10$; * = $p < 0.05$; ** = $p < .01$; *** = $p < .001$. Observations are rounded due to NCES guidelines.

Table A89

Results of OLS Reduced Form, Dependent Variable: Graduate School Aspirations (Full Model)
Subpopulation: Mid- to Low-Income

	Loan	Federal Loan
Change in Average Tuition and Fees	-0.04	-0.04
	(0.05)	(0.05)
Mother's Education	-0.22	-0.22
	(0.36)	(0.36)
Change in Average Tuition and Fees * Mother's Education	0.03	0.03
	(0.05)	(0.05)
Female	0.07***	0.07***
	(0.01)	(0.01)
Race/Ethnicity (Reference: White)		
African American	0.22***	0.22***
	(0.03)	(0.03)
Latino	0.09*	0.09*
	(0.04)	(0.04)
Asian	0.09*	0.09*
	(0.04)	(0.04)
Other Race	0.06	0.06
	(0.04)	(0.04)
Entrance Examination (in SAT)	0.00***	0.00***
	(0.00)	(0.00)
Institutional Selectivity (Reference: Nonselective)		
Less Selective	-0.07	-0.07
	(0.06)	(0.06)
Selective	0.02	0.02
	(0.05)	(0.05)
Most Selective	0.03	0.03
	(0.06)	(0.06)
Private Control	-0.05	-0.05
	(0.05)	(0.05)
2-Year or Less	-0.18***	-0.18***
	(0.05)	(0.05)
College GPA	0.08***	0.08***
	(0.02)	(0.02)
Entering Tuition & Fees	0.00*	0.00*
	(0.00)	(0.00)
Married	-0.00	-0.00
	(0.17)	(0.17)

Dependents	0.06 (0.08)	0.06 (0.08)
Constant	0.30 (0.38)	0.30 (0.38)
Observations	2220	2220

Note: Reduced form equation for the IV model of undergraduate debt's effect on graduate aspirations. Models run solely for students with prior income above the 25th percentile and up to and including the 50th percentile. Standard errors in parentheses. + = $p < 0.10$; * = $p < 0.05$; ** = $p < .01$; *** = $p < .001$. Observations are rounded due to NCES guidelines.

Table A90

*Results of Two-Stage Least Squares, Dependent Variable: Graduate School Aspirations
First Stage full model; Subpopulations: Mid- to Low-Income*

	Loan	Federal Loan
Change in Average Tuition and Fees	0.77⁺	0.90[*]
	(0.40)	(0.39)
Mother's Education	4.66	5.80[*]
	(3.01)	(2.90)
Change in Average Tuition and Fees * Mother's Education	-0.66⁺	-0.83[*]
	(0.39)	(0.38)
Female	0.09	0.10
	(0.18)	(0.18)
Race/Ethnicity (Reference: White)		
African American	0.83 ^{**}	0.99 ^{**}
	(0.30)	(0.31)
Latino	-0.74 [*]	-0.60 ⁺
	(0.34)	(0.34)
Asian	-0.94 [*]	-0.95 [*]
	(0.47)	(0.47)
Other Race	-0.36	-0.15
	(0.39)	(0.39)
Entrance Examination (in SAT)	-0.00 ⁺	-0.00
	(0.00)	(0.00)
Institutional Selectivity (Reference: Nonselective)		
Less Selective	-0.17	0.12
	(0.49)	(0.52)
Selective	-0.44	-0.26
	(0.42)	(0.45)
Most Selective	-1.79 ^{**}	-1.67 ^{**}
	(0.55)	(0.57)
Private Control	-0.30	0.22
	(0.38)	(0.37)
2-Year or Less	-1.73 ^{***}	-1.46 ^{**}
	(0.44)	(0.46)
College GPA	-0.53 ^{**}	-0.48 ^{**}
	(0.17)	(0.17)
Entering Tuition & Fees	0.00 ^{***}	0.00 ^{***}
	(0.00)	(0.00)
Married	-0.13	0.22
	(1.76)	(1.72)

Dependents	-0.14 (0.98)	-0.36 (0.92)
Constant	4.28 (3.13)	2.17 (3.04)
Observations	2220	2220
Wu-Hausman (<i>p</i> -value)	1.38 (0.240)	1.37 (0.242)
Minimum eigenvalue	1.16	1.59
<i>F</i> -bias crit, <i>F</i> -size crit	13.91, 22.3	13.91, 22.3
Sargan (<i>p</i> -value)	0.09 (0.954)	0.12 (0.940)

Note: Excluded instruments: change in average tuition and fees, mother's education, and change in average tuition and fees interacted with mother's education. Models run solely for students with prior income above the 25th percentile and up to and including the 50th percentile. Standard errors in parentheses. + = $p < 0.10$; * = $p < 0.05$; ** = $p < .01$; *** = $p < .001$. Observations are rounded due to NCES guidelines.

Table A91

*Results of Two-Stage Least Squares, Dependent Variable: Graduate School Aspirations
Second Stage Full Model; Subpopulation: Mid- to Low-Income*

	Loan	Federal Loan
Cumulative Loans (Log)	-0.06 (0.07)	-0.05 (0.06)
Female	0.07** (0.02)	0.07** (0.02)
Race/Ethnicity (Reference: White)		
African American	0.27*** (0.07)	0.27*** (0.07)
Latino	0.05 (0.07)	0.06 (0.05)
Asian	0.03 (0.09)	0.04 (0.08)
Other Race	0.03 (0.06)	0.05 (0.05)
Entrance Examination (in SAT)	0.00* (0.00)	0.00** (0.00)
Institutional Selectivity (Reference: Nonselective)		
Less Selective	-0.08 (0.07)	-0.07 (0.07)
Selective	-0.01 (0.06)	0.00 (0.06)
Most Selective	-0.08 (0.15)	-0.06 (0.12)
Private Control	-0.07 (0.06)	-0.04 (0.05)
2-Year or Less	-0.28+ (0.15)	-0.25* (0.11)
College GPA	0.05 (0.04)	0.06 (0.04)
Entering Tuition & Fees	0.00 (0.00)	0.00+ (0.00)
Married	-0.01 (0.21)	0.01 (0.20)
Dependents	0.05 (0.11)	0.04 (0.10)
Constant	0.61 (0.72)	0.46 (0.51)
Observations	2220	2220
Wu-Hausman (<i>p</i> -value)	1.38 (0.240)	1.37 (0.242)

Minimum eigenvalue	1.16	1.59
<i>F</i> -bias crit, <i>F</i> -size crit	13.91, 22.3	13.91, 22.3
Sargan (<i>p</i> -value)	0.09 (0.954)	0.12 (0.940)

Note: Excluded instruments: change in average tuition and fees, mother's education, and change in average tuition and fees interacted with mother's education. Models run solely for students with prior income above the 25th percentile and up to and including the 50th percentile. Standard errors in parentheses. + = $p < 0.10$; * = $p < 0.05$; ** = $p < .01$; *** = $p < .001$. Observations are rounded due to NCES guidelines.

Table A92

*Results of OLS, Dependent Variable: Graduate School Aspirations (Full Model)
Subpopulation: Mid- to High-Income*

	Loan	Federal Loan
Cumulative Loans Borrowed 2009 (Log)	0.002	0.002
	(0.00)	(0.00)
Female	0.095*** (0.02)	0.095*** (0.02)
Race/Ethnicity (Reference: White)		
African American	0.051 (0.04)	0.050 (0.04)
Latino	0.100* (0.04)	0.100* (0.04)
Asian	0.095* (0.04)	0.096* (0.04)
Other Race	0.035 (0.05)	0.035 (0.05)
Entrance Examination (in SAT)	0.000*** (0.00)	0.000*** (0.00)
Institutional Selectivity (Reference: Nonselective)		
Less Selective	0.014 (0.07)	0.013 (0.07)
Selective	0.096+ (0.05)	0.095+ (0.05)
Most Selective	0.111+ (0.06)	0.111+ (0.06)
Private Control	0.034 (0.04)	0.034 (0.04)
2-Year or Less	-0.146** (0.05)	-0.147** (0.05)
College GPA	0.083*** (0.02)	0.083*** (0.02)
Entering Tuition & Fees	0.000 (0.00)	0.000 (0.00)
Married	0.080 (0.29)	0.086 (0.30)
Dependents	0.035 (0.24)	0.032 (0.24)
Constant	-0.044 (0.09)	-0.045 (0.09)
Observations	2220	2220

Note: The primary covariate of interest in the models is cumulative loans borrowed from 2003-2004 to 2008-2009 (loan) and cumulative federal loans borrowed over the same period (federal loan). Models run solely for students with prior income above the 50th percentile and up to and including the 75th percentile. Standard errors in parentheses. + = $p < 0.10$; * = $p < 0.05$; ** = $p < .01$; *** = $p < .001$. Observations are rounded due to NCES guidelines.

Table A93

*Results of OLS Reduced Form, Dependent Variable: Graduate School Aspirations (Full Model)
Subpopulation: Mid- to High-Income*

	Loan	Federal Loan
Change in Average Tuition and Fees	-0.08⁺	-0.08⁺
	(0.05)	(0.05)
Mother's Education	-0.55⁺	-0.55⁺
	(0.33)	(0.33)
Change in Average Tuition and Fees * Mother's Education	0.07	0.07
	(0.05)	(0.05)
Female	0.09 ^{***}	0.09 ^{***}
	(0.02)	(0.02)
Race/Ethnicity (Reference: White)		
African American	0.05	0.05
	(0.04)	(0.04)
Latino	0.09 [*]	0.09 [*]
	(0.04)	(0.04)
Asian	0.09 [*]	0.09 [*]
	(0.04)	(0.04)
Other Race	0.03	0.03
	(0.05)	(0.05)
Entrance Examination (in SAT)	0.00 ^{***}	0.00 ^{***}
	(0.00)	(0.00)
Institutional Selectivity (Reference: Nonselective)		
Less Selective	0.02	0.02
	(0.07)	(0.07)
Selective	0.10 ⁺	0.10 ⁺
	(0.05)	(0.05)
Most Selective	0.11 ⁺	0.11 ⁺
	(0.06)	(0.06)
Private Control	0.04	0.04
	(0.04)	(0.04)
2-Year or Less	-0.16 ^{**}	-0.16 ^{**}
	(0.06)	(0.06)
College GPA	0.08 ^{***}	0.08 ^{***}
	(0.02)	(0.02)
Entering Tuition & Fees	0.00	0.00
	(0.00)	(0.00)
Married	0.08	0.08
	(0.28)	(0.28)
Dependents	0.03	0.03

	(0.24)	(0.24)
Constant	0.63 ⁺	0.63 ⁺
	(0.34)	(0.34)
<hr/>		
Observations	2220	2220
<hr/>		

Note: Reduced form equation for the IV model of undergraduate debt's effect on graduate aspirations. Models run solely for students with prior income above the 50th percentile and up to and including the 75th percentile. Standard errors in parentheses. ⁺ = $p < 0.10$; * = $p < 0.05$; ** = $p < .01$; *** = $p < .001$. Observations are rounded due to NCES guidelines.

Table A94

*Results of Two-Stage Least Squares, Dependent Variable: Graduate School Aspirations
First Stage Full Model; Subpopulation: Mid- to High-Income*

	Loan	Federal Loan
Change in Average Tuition and Fees	-0.04	-0.11
	(0.61)	(0.58)
Mother's Education	-0.20	-1.40
	(4.39)	(4.16)
Change in Average Tuition and Fees * Mother's Education	0.04	0.19
	(0.62)	(0.58)
Female	0.01	0.01
	(0.20)	(0.19)
Race/Ethnicity (Reference: White)		
African American	1.41***	1.70***
	(0.37)	(0.37)
Latino	0.26	0.16
	(0.39)	(0.39)
Asian	-1.68**	-1.81***
	(0.54)	(0.50)
Other Race	-0.37	-0.27
	(0.50)	(0.48)
Entrance Examination (in SAT)	-0.00+	-0.00
	(0.00)	(0.00)
Institutional Selectivity (Reference: Nonselective)		
Less Selective	0.58	0.89
	(0.61)	(0.61)
Selective	0.50	0.80
	(0.50)	(0.49)
Most Selective	-1.25*	-1.00+
	(0.60)	(0.58)
Private Control	1.53***	1.49***
	(0.37)	(0.36)
2-Year or Less	-0.62	-0.31
	(0.53)	(0.52)
College GPA	-0.44*	-0.42*
	(0.18)	(0.18)
Entering Tuition & Fees	0.00	0.00
	(0.00)	(0.00)
Married	5.33***	2.06
	(0.72)	(2.36)

Dependents	-2.30 ⁺ (1.25)	-0.76 (1.82)
Constant	8.50 ⁺ (4.47)	8.03 ⁺ (4.25)
Observations	2220	2220
Wu-Hausman (<i>p</i> -value)	0.06 (0.806)	0.06 (0.800)
Minimum eigenvalue	0.01	0.11
<i>F</i> -bias crit, <i>F</i> -size crit	13.91, 22.3	13.91, 22.3
Sargan (<i>p</i> -value)	0.74 (0.689)	2.72 (0.256)

Note: Excluded instruments: change in average tuition and fees, mother's education, and change in average tuition and fees interacted with mother's education. Models run solely for students with prior income above the 50th percentile and up to and including the 75th percentile. Standard errors in parentheses. ⁺ = $p < 0.10$; * = $p < 0.05$; ** = $p < .01$; *** = $p < .001$. Observations are rounded due to NCES guidelines.

Table A95

*Results of Two-Stage Least Squares, Dependent Variable: Graduate School Aspirations
Second Stage Full Model; Subpopulation: Mid- to High-Income*

	Loan	Federal Loan
Cumulative Loans (Log)	0.18	-0.04
	(1.60)	(0.19)
Female	0.09*	0.10***
	(0.04)	(0.02)
Race/Ethnicity (Reference: White)		
African American	-0.20	0.12
	(2.25)	(0.32)
Latino	0.05	0.11*
	(0.43)	(0.05)
Asian	0.40	0.02
	(2.69)	(0.35)
Other Race	0.10	0.02
	(0.60)	(0.07)
Entrance Examination (in SAT)	0.00	0.00
	(0.00)	(0.00)
Institutional Selectivity (Reference: Nonselective)		
Less Selective	-0.09	0.05
	(0.93)	(0.19)
Selective	0.01	0.13
	(0.80)	(0.16)
Most Selective	0.33	0.07
	(2.00)	(0.20)
Private Control	-0.24	0.10
	(2.44)	(0.29)
2-Year or Less	-0.04	-0.16 ⁺
	(0.99)	(0.09)
College GPA	0.16	0.07
	(0.70)	(0.08)
Entering Tuition & Fees	-0.00	0.00
	(0.00)	(0.00)
Married	-0.87	0.17
	(8.51)	(0.43)
Dependents	0.45	-0.00
	(3.67)	(0.32)
Constant	-1.52	0.27
	(13.18)	(1.37)
Observations	2220	2220
Wu-Hausman (<i>p</i> -value)	0.06 (0.806)	0.06 (0.800)

Minimum eigenvalue	0.01	0.11
<i>F</i> -bias crit, <i>F</i> -size crit	13.91, 22.3	13.91, 22.3
Sargan (<i>p</i> -value)	0.74 (0.689)	2.72 (0.256)

Note: Excluded instruments: change in average tuition and fees, mother's education, and change in average tuition and fees interacted with mother's education. Models run solely for students with prior income above the 50th percentile and up to and including the 75th percentile. Standard errors in parentheses. + = $p < 0.10$; * = $p < 0.05$; ** = $p < .01$; *** = $p < .001$. Observations are rounded due to NCES guidelines.

Table A96

*Results of OLS, Dependent Variable: Graduate School Aspirations (Full Model)
Subpopulation: High-Income*

	Loan	Federal Loan
Cumulative Loans Borrowed 2009 (Log)	0.002	0.002
	(0.00)	(0.00)
Female	0.057** (0.02)	0.058** (0.02)
Race/Ethnicity (Reference: White)		
African American	0.099+ (0.05)	0.100+ (0.05)
Latino	-0.002 (0.04)	-0.002 (0.04)
Asian	0.061 (0.04)	0.060 (0.04)
Other Race	0.051 (0.04)	0.050 (0.04)
Entrance Examination (in SAT)	0.000*** (0.00)	0.000*** (0.00)
Institutional Selectivity (Reference: Nonselective)		
Less Selective	0.072 (0.09)	0.073 (0.09)
Selective	0.111 (0.07)	0.111 (0.07)
Most Selective	0.119+ (0.07)	0.119+ (0.07)
Private Control	-0.035 (0.03)	-0.035 (0.03)
2-Year or Less	-0.084 (0.07)	-0.083 (0.07)
College GPA	0.097*** (0.02)	0.096*** (0.02)
Entering Tuition & Fees	0.000 (0.00)	0.000 (0.00)
Married	-0.517*** (0.03)	-0.519*** (0.03)
Dependents	---	---
Constant	-0.124 (0.10)	-0.121 (0.10)
Observations	2220	2220

Note: The primary covariate of interest in the models is cumulative loans borrowed from 2003–2004 to 2008–2009 (loan) and cumulative federal loans borrowed over the same period (federal loan). Models run solely for students with prior income above the 75th percentile. Standard errors in parentheses. + = $p < 0.10$; * = $p < 0.05$; ** = $p < .01$; *** = $p < .001$. Coefficients for dependents measure not included due to lack of variation. Observations are rounded due to NCES guidelines.

Table A97

Results of OLS Reduced Form, Dependent Variable: Graduate School Aspirations (Full Model)
Subpopulation: High-Income

	Loan	Federal Loan
Change in Average Tuition and Fees	0.12⁺	0.12⁺
	(0.07)	(0.07)
Mother's Education	1.03[*]	1.03[*]
	(0.44)	(0.44)
Change in Average Tuition and Fees * Mother's Education	-0.10	-0.10
	(0.07)	(0.07)
Female	0.06 ^{**}	0.06 ^{**}
	(0.02)	(0.02)
Race/Ethnicity (Reference: White)		
African American	0.10 [*]	0.10 [*]
	(0.05)	(0.05)
Latino	0.02	0.02
	(0.05)	(0.05)
Asian	0.06	0.06
	(0.04)	(0.04)
Other Race	0.05	0.05
	(0.04)	(0.04)
Entrance Examination (in SAT)	0.00 ^{***}	0.00 ^{***}
	(0.00)	(0.00)
Institutional Selectivity (Reference: Nonselective)		
Less Selective	0.07	0.07
	(0.08)	(0.08)
Selective	0.11	0.11
	(0.07)	(0.07)
Most Selective	0.12	0.12
	(0.07)	(0.07)
Private Control	-0.04	-0.04
	(0.03)	(0.03)
2-Year or Less	-0.07	-0.07
	(0.07)	(0.07)
College GPA	0.09 ^{***}	0.09 ^{***}
	(0.02)	(0.02)
Entering Tuition & Fees	0.00	0.00
	(0.00)	(0.00)
Married	-0.53 ^{***}	-0.53 ^{***}
	(0.03)	(0.03)

Dependents	---	---
	---	---
Constant	-1.22**	-1.22**
	(0.46)	(0.46)
Observations	2220	2220

Note: Reduced form equation for the IV model of undergraduate debt's effect on graduate aspirations. Models run solely for students with prior income above the 75th percentile. Standard errors in parentheses. + = $p < 0.10$; * = $p < 0.05$; ** = $p < .01$; *** = $p < .001$. Coefficients for dependents measure not included due to lack of variation. Observations are rounded due to NCES guidelines.

Table A98

*Results of Two-Stage Least Squares, Dependent Variable: Graduate School Aspirations
First Stage Full Model; Subpopulation: High-Income*

	Loan	Federal Loan
Change in Average Tuition and Fees	-0.15	-0.39
	(0.83)	(0.77)
Mother's Education	0.56	-1.22
	(6.52)	(6.19)
Change in Average Tuition and Fees * Mother's Education	0.16	0.36
	(0.82)	(0.76)
Female	0.34	0.23
	(0.21)	(0.20)
Race/Ethnicity (Reference: White)		
African American	2.16***	2.08***
	(0.56)	(0.56)
Latino	0.67	0.66
	(0.50)	(0.48)
Asian	-0.47	-0.33
	(0.52)	(0.50)
Other Race	-0.68	-0.70
	(0.49)	(0.46)
Entrance Examination (in SAT)	-0.00**	-0.00***
	(0.00)	(0.00)
Institutional Selectivity (Reference: Nonselective)		
Less Selective	-1.01	-1.46+
	(0.87)	(0.81)
Selective	-1.34*	-1.35*
	(0.67)	(0.64)
Most Selective	-1.97**	-2.02**
	(0.72)	(0.69)
Private Control	0.31	0.50
	(0.40)	(0.39)
2-Year or Less	-1.58*	-2.06**
	(0.72)	(0.68)
College GPA	-0.30	-0.07
	(0.21)	(0.20)
Entering Tuition & Fees	0.00+	0.00
	(0.00)	(0.00)
Married	-3.91***	-3.24***
	(0.33)	(0.31)

Dependents	---	---
	---	---
Constant	7.90 (6.65)	9.46 (6.30)
Observations	2220	2220
Wu-Hausman (<i>p</i> -value)	3.38 (0.066)	1.98 (0.160)
Minimum eigenvalue	0.63	0.55
<i>F</i> -bias crit, <i>F</i> -size crit	13.91, 22.3	13.91, 22.3
Sargan (<i>p</i> -value)	0.91 (0.636)	1.81 (0.405)

Note: Excluded instruments: change in average tuition and fees, mother's education, and change in average tuition and fees interacted with mother's education. Models run solely for students with prior income above the 75th percentile. Standard errors in parentheses. + = $p < 0.10$; * = $p < 0.05$; ** = $p < .01$; *** = $p < .001$. Coefficients for dependents measure not included due to lack of variation. Observations are rounded due to NCES guidelines.

Table A99

*Results of Two-Stage Least Squares, Dependent Variable: Graduate School Aspirations
Second Stage Full Model; Subpopulation: High-Income*

	Loan	Federal Loan
Cumulative Loans (Log)	0.12	0.10
	(0.11)	(0.12)
Female	0.02	0.04
	(0.05)	(0.04)
Race/Ethnicity (Reference: White)		
African American	-0.15	-0.11
	(0.26)	(0.25)
Latino	-0.06	-0.06
	(0.09)	(0.09)
Asian	0.12	0.09
	(0.09)	(0.07)
Other Race	0.13	0.12
	(0.11)	(0.10)
Entrance Examination (in SAT)	0.00*	0.00*
	(0.00)	(0.00)
Institutional Selectivity (Reference: Nonselective)		
Less Selective	0.19	0.22
	(0.17)	(0.21)
Selective	0.27	0.25
	(0.19)	(0.19)
Most Selective	0.35	0.32
	(0.25)	(0.26)
Private Control	-0.07	-0.08
	(0.07)	(0.07)
2-Year or Less	0.10	0.12
	(0.21)	(0.26)
College GPA	0.13**	0.10***
	(0.05)	(0.03)
Entering Tuition & Fees	-0.00	-0.00
	(0.00)	(0.00)
Married	-0.07	-0.20
	(0.44)	(0.38)
Dependents	-0.04	-0.04
	(0.03)	(0.03)
Constant	-1.10	-0.91
	(0.98)	(0.94)
Observations	2220	2220
Wu-Hausman (<i>p</i> -value)	3.38 (0.066)	1.98 (0.160)

Minimum eigenvalue	0.63	0.55
<i>F</i> -bias crit, <i>F</i> -size crit	13.91, 22.3	13.91, 22.3
Sargan (<i>p</i> -value)	0.91 (0.636)	1.81 (0.405)

Note: Excluded instrument: change in average tuition and fees, mother's education, and change in average tuition and fees interacted with mother's education. Models run solely for students with prior income above the 75th percentile. Standard errors in parentheses. + = $p < 0.10$; * = $p < 0.05$; ** = $p < .01$; *** = $p < .001$. Coefficients for dependents measure not included due to lack of variation. Observations are rounded due to NCES guidelines.

Table A100

Results of OLS, Dependent Variable: Graduate School Enrollment (Full Model)
Subpopulation: Low-Income

	Loan		Federal Loan	
	2009	2012	2009	2012
Cumulative Loans Borrowed 2009 (Log)	-0.007**	-0.006*	-0.005*	-0.004+
	(0.00)	(0.00)	(0.00)	(0.00)
Age	-0.023**	-0.023*	-0.023**	-0.024*
	(0.01)	(0.01)	(0.01)	(0.01)
Female	-0.030	0.010	-0.030	0.009
	(0.02)	(0.02)	(0.02)	(0.02)
Race/Ethnicity (Reference: White)				
African American	0.132***	0.166***	0.132***	0.166***
	(0.03)	(0.04)	(0.03)	(0.04)
Latino	0.062+	0.097**	0.061+	0.097**
	(0.03)	(0.04)	(0.03)	(0.04)
Asian	0.003	0.069+	0.006	0.071+
	(0.04)	(0.04)	(0.04)	(0.04)
Other Race	-0.074+	0.019	-0.072+	0.021
	(0.04)	(0.05)	(0.04)	(0.05)
Entrance Examination (in SAT)	0.000*	0.000***	0.000*	0.000***
	(0.00)	(0.00)	(0.00)	(0.00)
Institutional Selectivity (Reference: Nonselective)				
Less Selective	0.055	0.048	0.056	0.049
	(0.06)	(0.06)	(0.06)	(0.06)
Selective	0.082+	0.070	0.082+	0.071
	(0.05)	(0.05)	(0.05)	(0.05)
Most Selective	0.101+	0.121*	0.104+	0.124*
	(0.06)	(0.06)	(0.06)	(0.06)
Private Control	0.038	0.056	0.041	0.058
	(0.04)	(0.04)	(0.04)	(0.04)
2-Year or Less	0.010	0.054	0.010	0.054
	(0.05)	(0.05)	(0.05)	(0.05)
College GPA	0.172***	0.187***	0.174***	0.189***
	(0.02)	(0.02)	(0.02)	(0.02)
Entering Tuition & Fees	-0.000	-0.000	-0.000	-0.000
	(0.00)	(0.00)	(0.00)	(0.00)
Married	-0.072**	-0.079**	-0.071**	-0.078**
	(0.03)	(0.03)	(0.03)	(0.03)

Dependents	0.023 (0.02)	0.040+ (0.02)	0.022 (0.02)	0.040+ (0.02)
Constant	0.048 (0.19)	-0.056 (0.20)	0.019 (0.19)	-0.075 (0.20)
Observations	2460	2460	2460	2460

Note: Models run solely for students with a prior income equal to or below the 25th percentile. Standard errors in parentheses. + = $p < 0.10$; * = $p < 0.05$; ** = $p < .01$; *** = $p < .001$. Observations are rounded due to NCES guidelines.

Table A101

*Results of OLS Reduced Form, Dependent Variable: Graduate School Enrollment (Full Model)
Subpopulation: Low-Income*

	Loan		Federal Loan	
	2009	2012	2009	2012
Change in Average Tuition and Fees	-0.04	-0.03	-0.04	-0.03
	(0.02)	(0.02)	(0.02)	(0.02)
Father's Education	0.06	0.05	0.06	0.05
	(0.16)	(0.16)	(0.16)	(0.16)
Change in Average Tuition and Fees * Father's Education	-0.00	-0.00	-0.00	-0.00
	(0.02)	(0.02)	(0.02)	(0.02)
Age	-0.03**	-0.03**	-0.03**	-0.03**
	(0.01)	(0.01)	(0.01)	(0.01)
Female	-0.03+	0.01	-0.03+	0.01
	(0.02)	(0.02)	(0.02)	(0.02)
Race/Ethnicity (Reference: White)				
African American	0.12***	0.15***	0.12***	0.15***
	(0.04)	(0.04)	(0.04)	(0.04)
Latino	0.06+	0.10**	0.06+	0.10**
	(0.04)	(0.04)	(0.04)	(0.04)
Asian	0.00	0.07+	0.00	0.07+
	(0.04)	(0.04)	(0.04)	(0.04)
Other Race	-0.08+	0.01	-0.08+	0.01
	(0.04)	(0.05)	(0.04)	(0.05)
Entrance Examination (in SAT)	0.00*	0.00***	0.00*	0.00***
	(0.00)	(0.00)	(0.00)	(0.00)
Institutional Selectivity (Reference: Nonselective)				
Less Selective	0.05	0.05	0.05	0.05
	(0.06)	(0.06)	(0.06)	(0.06)
Selective	0.08	0.07	0.08	0.07
	(0.05)	(0.05)	(0.05)	(0.05)
Most Selective	0.10+	0.12*	0.10+	0.12*
	(0.06)	(0.06)	(0.06)	(0.06)
Private Control	0.05	0.07+	0.05	0.07+
	(0.04)	(0.04)	(0.04)	(0.04)
2-Year or Less	-0.02	0.03	-0.02	0.03
	(0.05)	(0.06)	(0.05)	(0.06)

College GPA	0.17*** (0.02)	0.19*** (0.02)	0.17*** (0.02)	0.19*** (0.02)
Entering Tuition & Fees	-0.00 (0.00)	-0.00 (0.00)	-0.00 (0.00)	-0.00 (0.00)
Married	-0.08** (0.03)	-0.08** (0.03)	-0.08** (0.03)	-0.08** (0.03)
Dependents	0.03 (0.02)	0.04+ (0.02)	0.03 (0.02)	0.04+ (0.02)
Constant	0.27 (0.25)	0.12 (0.26)	0.27 (0.25)	0.12 (0.26)
Observations	2460	2460	2460	2460

Note: Reduced form model of the IV model for undergraduate debt's effect on graduate school enrollment. Models run solely for students with a prior income equal to or below the 25th percentile. Standard errors in parentheses. + = $p < 0.10$; * = $p < 0.05$; ** = $p < .01$; *** = $p < .001$. Observations are rounded due to NCES guidelines.

Table A102

*Results of Two-Stage Least Squares, Dependent Variable: Graduate School Enrollment
First Stage Full Model; Subpopulation: Low-Income*

	Loan		Federal Loan	
	2009	2012	2009	2012
Change in Average Tuition and Fees	0.90***	0.90***	0.83***	0.83***
	(0.20)	(0.20)	(0.20)	(0.20)
Father's Education	2.44	2.44	1.69	1.69
	(1.49)	(1.49)	(1.50)	(1.50)
Change in Average Tuition and Fees * Father's Education	-0.32	-0.32	-0.22	-0.22
	(0.21)	(0.21)	(0.21)	(0.21)
Age	0.09	0.09	0.11	0.11
	(0.08)	(0.08)	(0.08)	(0.08)
Female	0.22	0.22	0.26	0.26
	(0.17)	(0.17)	(0.17)	(0.17)
Race/Ethnicity (Reference: White)				
African American	0.95***	0.95***	1.19***	1.19***
	(0.25)	(0.25)	(0.26)	(0.26)
Latino	-0.00	-0.00	-0.21	-0.21
	(0.30)	(0.30)	(0.32)	(0.32)
Asian	-0.88**	-0.88**	-0.72*	-0.72*
	(0.33)	(0.33)	(0.34)	(0.34)
Other Race	-0.32	-0.32	-0.12	-0.12
	(0.43)	(0.43)	(0.43)	(0.43)
Entrance Examination (in SAT)	-0.00**	-0.00**	-0.00*	-0.00*
	(0.00)	(0.00)	(0.00)	(0.00)
Institutional Selectivity (Reference: Nonselective)				
Less Selective	-0.19	-0.19	-0.01	-0.01
	(0.54)	(0.54)	(0.58)	(0.58)
Selective	0.19	0.19	0.41	0.41
	(0.46)	(0.46)	(0.49)	(0.49)
Most Selective	-0.69	-0.69	-0.33	-0.33
	(0.52)	(0.52)	(0.55)	(0.55)
Private Control	-1.50***	-1.50***	-1.44***	-1.44***
	(0.31)	(0.31)	(0.32)	(0.32)
2-Year or Less	1.24**	1.24**	1.56**	1.56**
	(0.48)	(0.48)	(0.51)	(0.51)

College GPA	-0.40*	-0.40*	-0.24	-0.24
	(0.19)	(0.19)	(0.20)	(0.20)
Entering Tuition & Fees	0.00***	0.00***	0.00***	0.00***
	(0.00)	(0.00)	(0.00)	(0.00)
Married	-0.58*	-0.58*	-0.66*	-0.66*
	(0.25)	(0.25)	(0.26)	(0.26)
Dependents	0.20	0.20	0.21	0.21
	(0.17)	(0.17)	(0.18)	(0.18)
Constant	1.40	1.40	0.19	0.19
	(2.18)	(2.18)	(2.22)	(2.22)
Observations	2460	2460	2460	2460
Wu-Hausman (<i>p</i> -value)	8.22 (0.004)	4.90 (0.027)	9.81 (0.002)	5.71 (0.017)
Minimum eigenvalue	21.86	21.86	20.59	20.59
<i>F</i> -bias crit, <i>F</i> -size crit	13.91, 22.3	13.91, 22.3	13.91, 22.3	13.91, 22.3
Sargan (<i>p</i> -value)	3.89 (0.143)	2.11 (0.347)	3.12 (0.210)	1.68 (0.432)

Note: Excluded instruments: change in average tuition and fees, father's education, and change in average tuition and fees interacted with father's education. Models run solely for students with a prior income equal to or below the 25th percentile. Standard errors in parentheses. + = $p < 0.10$; * = $p < 0.05$; ** = $p < .01$; *** = $p < .001$. Observations are rounded due to NCES guidelines.

Table A103

*Results of Two-Stage Least Squares, Dependent Variable: Graduate School Enrollment
Second Stage Full Model; Subpopulation: Low-Income*

	Loan		Federal Loan	
	2009	2012	2009	2012
Cumulative Loans (Log)	-0.05** (0.02)	-0.04* (0.02)	-0.05** (0.02)	-0.04* (0.02)
Age	-0.02* (0.01)	-0.02* (0.01)	-0.02* (0.01)	-0.02* (0.01)
Female	-0.02 (0.02)	0.02 (0.02)	-0.02 (0.02)	0.02 (0.02)
Race/Ethnicity (Reference: White)				
African American	0.16*** (0.04)	0.19*** (0.04)	0.17*** (0.04)	0.20*** (0.04)
Latino	0.05 (0.04)	0.09* (0.04)	0.04 (0.04)	0.08* (0.04)
Asian	-0.05 (0.04)	0.03 (0.04)	-0.04 (0.04)	0.03 (0.04)
Other Race	-0.09* (0.05)	0.00 (0.05)	-0.09+ (0.05)	0.01 (0.05)
Entrance Examination (in SAT)	0.00 (0.00)	0.00* (0.00)	0.00 (0.00)	0.00** (0.00)
Institutional Selectivity (Reference: Nonselective)				
Less Selective	0.05 (0.06)	0.04 (0.07)	0.06 (0.06)	0.05 (0.07)
Selective	0.09+ (0.05)	0.08 (0.05)	0.10+ (0.05)	0.09 (0.06)
Most Selective	0.07 (0.06)	0.09 (0.06)	0.08 (0.06)	0.11+ (0.06)
Private Control	-0.02 (0.05)	0.01 (0.05)	-0.02 (0.05)	0.01 (0.05)
2-Year or Less	0.04 (0.05)	0.08 (0.06)	0.06 (0.06)	0.09 (0.06)
College GPA	0.15*** (0.02)	0.17*** (0.02)	0.16*** (0.02)	0.18*** (0.02)
Entering Tuition & Fees	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)
Married	-0.10** (0.03)	-0.10** (0.03)	-0.11*** (0.03)	-0.11** (0.03)

Dependents	0.04 (0.02)	0.05* (0.02)	0.04 (0.02)	0.05* (0.02)
Constant	0.42+ (0.26)	0.25 (0.25)	0.35 (0.24)	0.19 (0.24)
Observations	2460	2460	2460	2460
Wu-Hausman (<i>p</i> -value)	8.22 (0.004)	4.90 (0.027)	9.81 (0.002)	5.71 (0.017)
Minimum eigenvalue	21.86	21.86	20.59	20.59
<i>F</i> -bias crit, <i>F</i> -size crit	13.91, 22.3	13.91, 22.3	13.91, 22.3	13.91, 22.3
Sargan (<i>p</i> -value)	3.89 (0.143)	2.11 (0.347)	3.12 (0.210)	1.68 (0.432)

Note: Excluded instruments: change in average tuition and fees, father's education, and change in average tuition and fees interacted with father's education. Models run solely for students with a prior income equal to or below the 25th percentile. Standard errors in parentheses. + = $p < 0.10$; * = $p < 0.05$; ** = $p < .01$; *** = $p < .001$. Observations are rounded due to NCES guidelines.

Table A104

Results of OLS, Dependent Variable: Graduate School Enrollment (Full Model)
Subpopulation: Mid- to Low-Income

	Loan		Federal Loan	
	2009	2012	2009	2012
Cumulative Loans Borrowed 2009 (Log)	-0.003	-0.000	-0.002	0.001
	(0.00)	(0.00)	(0.00)	(0.00)
Age	-0.012	-0.025 ⁺	-0.012	-0.025 ⁺
	(0.01)	(0.01)	(0.01)	(0.01)
Female	0.019	0.029	0.019	0.029
	(0.02)	(0.02)	(0.02)	(0.02)
Race/Ethnicity (Reference: White)				
African American	0.188 ^{***}	0.244 ^{***}	0.188 ^{***}	0.244 ^{***}
	(0.04)	(0.04)	(0.04)	(0.04)
Latino	0.020	0.030	0.020	0.031
	(0.03)	(0.04)	(0.03)	(0.04)
Asian	0.105 ^{**}	0.121 ^{***}	0.106 ^{**}	0.123 ^{***}
	(0.03)	(0.03)	(0.03)	(0.03)
Other Race	0.119 [*]	0.108 [*]	0.119 [*]	0.108 [*]
	(0.05)	(0.05)	(0.05)	(0.05)
Entrance Examination (in SAT)	0.000 ^{***}	0.000 ^{**}	0.000 ^{***}	0.000 ^{**}
	(0.00)	(0.00)	(0.00)	(0.00)
Institutional Selectivity (Reference: Nonselective)				
Less Selective	-0.008	-0.013	-0.008	-0.013
	(0.07)	(0.07)	(0.07)	(0.07)
Selective	0.002	0.013	0.002	0.013
	(0.05)	(0.06)	(0.05)	(0.06)
Most Selective	0.018	0.056	0.018	0.057
	(0.06)	(0.06)	(0.06)	(0.06)
Private Control	0.037	0.013	0.037	0.013
	(0.04)	(0.04)	(0.04)	(0.04)
2-Year or Less	-0.045	0.007	-0.045	0.006
	(0.06)	(0.06)	(0.06)	(0.06)
College GPA	0.192 ^{***}	0.209 ^{***}	0.193 ^{***}	0.210 ^{***}
	(0.02)	(0.02)	(0.02)	(0.02)
Entering Tuition & Fees	-0.000	0.000	-0.000	0.000
	(0.00)	(0.00)	(0.00)	(0.00)
Married	-0.022	-0.037	-0.021	-0.037
	(0.03)	(0.03)	(0.03)	(0.03)

Dependents	-0.017 (0.02)	0.005 (0.03)	-0.018 (0.02)	0.005 (0.03)
Constant	-0.325 (0.28)	-0.082 (0.27)	-0.332 (0.28)	-0.091 (0.27)
Observations	2460	2460	2460	2460

Note: Models run solely for students with a prior income above the 25th percentile and up to and including the 50th percentile. Standard errors in parentheses. + = $p < 0.10$; * = $p < 0.05$; ** = $p < .01$; *** = $p < .001$. Observations are rounded due to NCES guidelines.

Table A105

Results of OLS Reduced Form, Dependent Variable: Graduate School Enrollment (Full Model)
Subpopulation: Mid- to Low-Income

	Loan		Federal Loan	
	2009	2012	2009	2012
Change in Average Tuition and Fees	-0.05*	-0.06**	-0.05*	-0.06**
	(0.02)	(0.02)	(0.02)	(0.02)
Father's Education	-0.06	-0.05	-0.06	-0.05
	(0.16)	(0.15)	(0.16)	(0.15)
Change in Average Tuition and Fees * Father's Education	0.02	0.01	0.02	0.01
	(0.02)	(0.02)	(0.02)	(0.02)
Age	-0.02	-0.03*	-0.02	-0.03*
	(0.01)	(0.01)	(0.01)	(0.01)
Female	0.02	0.03	0.02	0.03
	(0.02)	(0.02)	(0.02)	(0.02)
Race/Ethnicity (Reference: White)				
African American	0.18***	0.23***	0.18***	0.23***
	(0.04)	(0.04)	(0.04)	(0.04)
Latino	0.03	0.02	0.03	0.02
	(0.03)	(0.04)	(0.03)	(0.04)
Asian	0.11***	0.11***	0.11***	0.11***
	(0.03)	(0.03)	(0.03)	(0.03)
Other Race	0.11*	0.10+	0.11*	0.10+
	(0.05)	(0.05)	(0.05)	(0.05)
Entrance Examination (in SAT)	0.00**	0.00**	0.00**	0.00**
	(0.00)	(0.00)	(0.00)	(0.00)
Institutional Selectivity (Reference: Nonselective)				
Less Selective	-0.00	0.00	-0.00	0.00
	(0.06)	(0.07)	(0.06)	(0.07)
Selective	0.01	0.03	0.01	0.03
	(0.05)	(0.06)	(0.05)	(0.06)
Most Selective	0.03	0.07	0.03	0.07
	(0.06)	(0.06)	(0.06)	(0.06)
Private Control	0.05	0.04	0.05	0.04
	(0.04)	(0.04)	(0.04)	(0.04)
2-Year or Less	-0.07	-0.02	-0.07	-0.02
	(0.06)	(0.06)	(0.06)	(0.06)

College GPA	0.19*** (0.02)	0.20*** (0.02)	0.19*** (0.02)	0.20*** (0.02)
Entering Tuition & Fees	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)
Married	-0.01 (0.03)	-0.02 (0.03)	-0.01 (0.03)	-0.02 (0.03)
Dependents	-0.01 (0.02)	0.02 (0.03)	-0.01 (0.02)	0.02 (0.03)
Constant	0.05 (0.33)	0.44 (0.31)	0.05 (0.33)	0.44 (0.31)
Observations	2460	2460	2460	2460

Note: Reduced form model of the IV model for undergraduate debt's effect on graduate school enrollment. Models run solely for students with a prior income above the 25th percentile and up to and including the 50th percentile. Standard errors in parentheses. + = $p < 0.10$; * = $p < 0.05$; ** = $p < .01$; *** = $p < .001$. Observations are rounded due to NCES guidelines.

Table A106

*Results of Two-Stage Least Squares, Dependent Variable: Graduate School Enrollment
First Stage Full Model; Subpopulations: Mid- to Low-Income*

	Loan		Federal Loan	
	2009	2012	2009	2012
Change in Average Tuition and Fees	0.85***	0.85***	0.80***	0.80***
	(0.21)	(0.21)	(0.21)	(0.21)
Father's Education	1.49	1.49	1.48	1.48
	(1.60)	(1.60)	(1.62)	(1.62)
Change in Average Tuition and Fees * Father's Education	-0.27	-0.27	-0.28	-0.28
	(0.22)	(0.22)	(0.22)	(0.22)
Age	0.21*	0.21*	0.22*	0.22*
	(0.10)	(0.10)	(0.10)	(0.10)
Female	0.20	0.20	0.12	0.12
	(0.16)	(0.16)	(0.17)	(0.17)
Race/Ethnicity (Reference: White)				
African American	0.28	0.28	0.28	0.28
	(0.28)	(0.28)	(0.29)	(0.29)
Latino	-0.78*	-0.78*	-0.95**	-0.95**
	(0.31)	(0.31)	(0.31)	(0.31)
Asian	-1.21***	-1.21***	-1.35***	-1.35***
	(0.29)	(0.29)	(0.30)	(0.30)
Other Race	0.12	0.12	0.02	0.02
	(0.38)	(0.38)	(0.41)	(0.41)
Entrance Examination (in SAT)	-0.00+	-0.00+	-0.00*	-0.00*
	(0.00)	(0.00)	(0.00)	(0.00)
Institutional Selectivity (Reference: Nonselective)				
Less Selective	0.16	0.16	-0.03	-0.03
	(0.52)	(0.52)	(0.53)	(0.53)
Selective	-0.10	-0.10	-0.21	-0.21
	(0.43)	(0.43)	(0.44)	(0.44)
Most Selective	-0.37	-0.37	-0.58	-0.58
	(0.49)	(0.49)	(0.50)	(0.50)
Private Control	-0.01	-0.01	-0.10	-0.10
	(0.34)	(0.34)	(0.36)	(0.36)
2-Year or Less	0.72	0.72	0.43	0.43
	(0.47)	(0.47)	(0.48)	(0.48)

College GPA	-0.57** (0.20)	-0.57** (0.20)	-0.49* (0.20)	-0.49* (0.20)
Entering Tuition & Fees	0.00* (0.00)	0.00* (0.00)	0.00* (0.00)	0.00* (0.00)
Married	-0.51+ (0.28)	-0.51+ (0.28)	-0.44 (0.28)	-0.44 (0.28)
Dependents	0.32+ (0.19)	0.32+ (0.19)	0.31 (0.19)	0.31 (0.19)
Constant	0.88 (2.61)	0.88 (2.61)	0.98 (2.67)	0.98 (2.67)
Observations	2460	2460	2460	2460
Wu-Hausman (<i>p</i> -value)	12.23 (0.000)	23.160 (0.000)	12.84 (0.000)	22.91 (0.000)
Minimum eigenvalue	18.26	18.26	14.43	14.43
<i>F</i> -bias crit, <i>F</i> -size crit	13.91, 22.3	13.91, 22.3	13.91, 22.3	13.91, 22.3
Sargan (<i>p</i> -value)	0.64 (0.725)	1.04 (0.593)	0.39 (0.823)	1.44 (0.487)

Note: Excluded instruments: change in average tuition and fees, father's education, and change in average tuition and fees interacted with father's education. Models run solely for students with a prior income above the 25th percentile and up to and including the 50th percentile. Standard errors in parentheses. + = $p < 0.10$; * = $p < 0.05$; ** = $p < .01$; *** = $p < .001$. Observations are rounded due to NCES guidelines.

Table A107

*Results of Two-Stage Least Squares, Dependent Variable: Graduate School Enrollment
Second Stage Full Model; Subpopulation: Mid- to Low-Income*

	Loan		Federal Loan	
	2009	2012	2009	2012
Cumulative Loans (Log)	-0.06** (0.02)	-0.08*** (0.02)	-0.07** (0.02)	-0.09*** (0.02)
Age	-0.00 (0.02)	-0.01 (0.02)	-0.00 (0.02)	-0.01 (0.02)
Female	0.03 (0.02)	0.04+ (0.02)	0.02 (0.02)	0.04 (0.02)
Race/Ethnicity (Reference: White)				
African American	0.20*** (0.04)	0.26*** (0.04)	0.20*** (0.04)	0.26*** (0.04)
Latino	-0.03 (0.04)	-0.04 (0.05)	-0.04 (0.04)	-0.05 (0.05)
Asian	0.03 (0.04)	0.02 (0.05)	0.02 (0.05)	-0.00 (0.05)
Other Race	0.12* (0.06)	0.11+ (0.06)	0.11* (0.06)	0.10 (0.07)
Entrance Examination (in SAT)	0.00* (0.00)	0.00 (0.00)	0.00+ (0.00)	0.00 (0.00)
Institutional Selectivity (Reference: Nonselective)				
Less Selective	0.01 (0.07)	0.01 (0.09)	-0.00 (0.08)	-0.00 (0.09)
Selective	0.00 (0.06)	0.02 (0.07)	-0.00 (0.06)	0.00 (0.07)
Most Selective	0.00 (0.07)	0.03 (0.08)	-0.01 (0.07)	0.01 (0.08)
Private Control	0.05 (0.04)	0.03 (0.05)	0.04 (0.05)	0.02 (0.05)
2-Year or Less	-0.02 (0.07)	0.04 (0.08)	-0.04 (0.07)	0.02 (0.08)
College GPA	0.15*** (0.03)	0.15*** (0.03)	0.15*** (0.03)	0.16*** (0.03)
Entering Tuition & Fees	0.00 (0.00)	0.00* (0.00)	0.00 (0.00)	0.00* (0.00)
Married	-0.04 (0.04)	-0.06 (0.04)	-0.04 (0.04)	-0.06 (0.04)

Dependents	0.01 (0.02)	0.04 (0.03)	0.01 (0.03)	0.04 (0.03)
Constant	0.13 (0.34)	0.56 ⁺ (0.34)	0.15 (0.35)	0.58 (0.36)
Observations	2460	2460	2460	2460
Wu-Hausman (<i>p</i> -value)	12.23 (0.000)	23.160 (0.000)	12.84 (0.000)	22.91 (0.000)
Minimum eigenvalue	18.26	18.26	14.43	14.43
<i>F</i> -bias crit, <i>F</i> -size crit	13.91, 22.3	13.91, 22.3	13.91, 22.3	13.91, 22.3
Sargan (<i>p</i> -value)	0.64 (0.725)	1.04 (0.593)	0.39 (0.823)	1.44 (0.487)

Note: Excluded instruments: change in average tuition and fees, father's education, and change in average tuition and fees interacted with father's education. Models run solely for students with a prior income above the 25th percentile and up to and including the 50th percentile. Standard errors in parentheses. ⁺ = $p < 0.10$; * = $p < 0.05$; ** = $p < .01$; *** = $p < .001$. Observations are rounded due to NCES guidelines.

Table A108

Results of OLS, Dependent Variable: Graduate School Enrollment (Full Model)
Subpopulations: Mid- to High-Income

	Loan		Federal Loan	
	2009	2012	2009	2012
Cumulative Loans Borrowed 2009 (Log)	-0.006**	-0.006*	-0.005*	-0.006**
	(0.00)	(0.00)	(0.00)	(0.00)
Age	-0.044*	-0.032+	-0.045*	-0.033+
	(0.02)	(0.02)	(0.02)	(0.02)
Female	-0.001	0.030	-0.001	0.030
	(0.02)	(0.02)	(0.02)	(0.02)
Race/Ethnicity (Reference: White)				
African American	0.063	0.195***	0.061	0.193***
	(0.05)	(0.05)	(0.05)	(0.05)
Latino	0.038	0.105*	0.037	0.104*
	(0.04)	(0.04)	(0.04)	(0.04)
Asian	0.083+	0.118*	0.083+	0.118*
	(0.05)	(0.05)	(0.05)	(0.05)
Other Race	0.034	0.013	0.034	0.011
	(0.06)	(0.06)	(0.06)	(0.06)
Entrance Examination (in SAT)	0.000	0.000*	0.000	0.000*
	(0.00)	(0.00)	(0.00)	(0.00)
Institutional Selectivity (Reference: Nonselective)				
Less Selective	-0.025	-0.021	-0.025	-0.020
	(0.06)	(0.06)	(0.06)	(0.06)
Selective	0.072	0.047	0.071	0.047
	(0.04)	(0.05)	(0.04)	(0.05)
Most Selective	0.153**	0.103+	0.152**	0.102+
	(0.05)	(0.06)	(0.05)	(0.06)
Private Control	0.131**	0.062	0.130**	0.063
	(0.04)	(0.04)	(0.04)	(0.04)
2-Year or Less	0.026	0.033	0.024	0.032
	(0.05)	(0.06)	(0.05)	(0.05)
College GPA	0.156***	0.188***	0.157***	0.188***
	(0.02)	(0.02)	(0.02)	(0.02)
Entering Tuition & Fees	-0.000***	-0.000	-0.000***	-0.000
	(0.00)	(0.00)	(0.00)	(0.00)
Married	-0.118*	-0.139**	-0.118*	-0.139**
	(0.05)	(0.05)	(0.05)	(0.05)

Dependents	0.022 (0.05)	0.063 (0.05)	0.022 (0.05)	0.064 (0.05)
Constant	0.508 (0.34)	0.163 (0.37)	0.508 (0.34)	0.181 (0.37)
Observations	2460	2460	2460	2460

Note: Models run solely for students with a prior income above the 50th percentile and up to and including the 75th percentile. Standard errors in parentheses. + = $p < 0.10$; * = $p < 0.05$; ** = $p < .01$; *** = $p < .001$. Observations are rounded due to NCES guidelines.

Table A109

*Results of OLS Reduced Form, Dependent Variable: Graduate School Enrollment (Full Model)
Subpopulation: Mid- to High-Income*

	Loan		Federal Loan	
	2009	2012	2009	2012
Change in Average Tuition and Fees	0.00	-0.07⁺	0.00	-0.07⁺
	(0.05)	(0.04)	(0.05)	(0.04)
Father's Education	0.24	-0.33	0.24	-0.33
	(0.32)	(0.30)	(0.32)	(0.30)
Change in Average Tuition and Fees * Father's Education	-0.05	0.03	-0.05	0.03
	(0.05)	(0.04)	(0.05)	(0.04)
Age	-0.05**	-0.04*	-0.05**	-0.04*
	(0.02)	(0.02)	(0.02)	(0.02)
Female	-0.01	0.02	-0.01	0.02
	(0.02)	(0.02)	(0.02)	(0.02)
Race/Ethnicity (Reference: White)				
African American	0.06	0.19***	0.06	0.19***
	(0.05)	(0.05)	(0.05)	(0.05)
Latino	0.02	0.09*	0.02	0.09*
	(0.04)	(0.04)	(0.04)	(0.04)
Asian	0.08	0.11*	0.08	0.11*
	(0.05)	(0.05)	(0.05)	(0.05)
Other Race	0.03	0.01	0.03	0.01
	(0.06)	(0.06)	(0.06)	(0.06)
Entrance Examination (in SAT)	0.00	0.00*	0.00	0.00*
	(0.00)	(0.00)	(0.00)	(0.00)
Institutional Selectivity (Reference: Nonselective)				
Less Selective	-0.02	-0.01	-0.02	-0.01
	(0.05)	(0.06)	(0.05)	(0.06)
Selective	0.08 ⁺	0.05	0.08 ⁺	0.05
	(0.04)	(0.05)	(0.04)	(0.05)
Most Selective	0.16**	0.11 ⁺	0.16**	0.11 ⁺
	(0.05)	(0.06)	(0.05)	(0.06)
Private Control	0.14***	0.07	0.14***	0.07
	(0.04)	(0.04)	(0.04)	(0.04)
2-Year or Less	-0.01	0.01	-0.01	0.01
	(0.05)	(0.05)	(0.05)	(0.05)

College GPA	0.15*** (0.02)	0.19*** (0.02)	0.15*** (0.02)	0.19*** (0.02)
Entering Tuition & Fees	-0.00* (0.00)	0.00 (0.00)	-0.00* (0.00)	0.00 (0.00)
Married	-0.09+ (0.05)	-0.12* (0.05)	-0.09+ (0.05)	-0.12* (0.05)
Dependents	0.02 (0.05)	0.07 (0.06)	0.02 (0.05)	0.07 (0.06)
Constant	0.72 (0.48)	0.86+ (0.47)	0.72 (0.48)	0.86+ (0.47)
Observations	2460	2460	2460	2460

Note: Reduced form model of the IV model for undergraduate debt's effect on graduate school enrollment. Models run solely for students with a prior income above the 50th percentile and up to and including the 75th percentile. Standard errors in parentheses. + = $p < 0.10$; * = $p < 0.05$; ** = $p < .01$; *** = $p < .001$. Observations are rounded due to NCES guidelines.

Table A110

*Results of Two-Stage Least Squares, Dependent Variable: Graduate School Enrollment
First Stage Full Model; Subpopulation: Mid- to High-Income*

	Loan		Federal Loan	
	2009	2012	2009	2012
Change in Average Tuition and Fees	0.50	0.50	0.37	0.37
	(0.39)	(0.39)	(0.38)	(0.38)
Father's Education	-0.52	-0.52	-1.22	-1.22
	(2.78)	(2.78)	(2.66)	(2.66)
Change in Average Tuition and Fees * Father's Education	-0.02	-0.02	0.07	0.07
	(0.40)	(0.40)	(0.38)	(0.38)
Age	0.05	0.05	-0.12	-0.12
	(0.18)	(0.18)	(0.18)	(0.18)
Female	0.31	0.31	0.31 ⁺	0.31 ⁺
	(0.19)	(0.19)	(0.19)	(0.19)
Race/Ethnicity (Reference: White)				
African American	-0.07	-0.07	-0.39	-0.39
	(0.40)	(0.40)	(0.43)	(0.43)
Latino	-0.00	-0.00	-0.13	-0.13
	(0.36)	(0.36)	(0.37)	(0.37)
Asian	-0.37	-0.37	-0.36	-0.36
	(0.45)	(0.45)	(0.44)	(0.44)
Other Race	-0.69	-0.69	-0.88	-0.88
	(0.55)	(0.55)	(0.55)	(0.55)
Entrance Examination (in SAT)	-0.00 ^{***}	-0.00 ^{***}	-0.00 ^{**}	-0.00 ^{**}
	(0.00)	(0.00)	(0.00)	(0.00)
Institutional Selectivity (Reference: Nonselective)				
Less Selective	0.89	0.89	1.00 ⁺	1.00 ⁺
	(0.58)	(0.58)	(0.58)	(0.58)
Selective	0.77 ⁺	0.77 ⁺	0.72	0.72
	(0.47)	(0.47)	(0.46)	(0.46)
Most Selective	0.38	0.38	0.18	0.18
	(0.56)	(0.56)	(0.55)	(0.55)
Private Control	1.06 [*]	1.06 [*]	1.05 [*]	1.05 [*]
	(0.43)	(0.43)	(0.42)	(0.42)
2-Year or Less	1.61 ^{**}	1.61 ^{**}	1.29 [*]	1.29 [*]
	(0.52)	(0.52)	(0.51)	(0.51)

College GPA	-0.55** (0.21)	-0.55** (0.21)	-0.51* (0.21)	-0.51* (0.21)
Entering Tuition & Fees	-0.00 (0.00)	-0.00 (0.00)	-0.00 (0.00)	-0.00 (0.00)
Married	-0.56 (0.54)	-0.56 (0.54)	-0.57 (0.54)	-0.57 (0.54)
Dependents	0.33 (0.47)	0.33 (0.47)	0.56 (0.46)	0.56 (0.46)
Constant	6.47 (4.53)	6.47 (4.53)	9.64* (4.41)	9.64* (4.41)
Observations	2460	2460	2460	2460
Wu-Hausman (<i>p</i> -value)	11.81 (0.000)	7.37 (0.007)	11.26 (0.001)	6.30 (0.012)
Minimum eigenvalue	7.58	7.58	6.36	6.37
<i>F</i> -bias crit, <i>F</i> -size crit	13.91, 22.3	13.91, 22.3	13.91, 22.3	13.91, 22.3
Sargan (<i>p</i> -value)	7.62 (0.022)	5.94 (0.051)	7.88 (0.019)	6.80 (0.033)

Note: Excluded instruments: change in average tuition and fees, father's education, and change in average tuition and fees interacted with father's education. Models run solely for students with a prior income above the 50th percentile and up to and including the 75th percentile. Standard errors in parentheses. + = $p < 0.10$; * = $p < 0.05$; ** = $p < .01$; *** = $p < .001$. Observations are rounded due to NCES guidelines.

Table A111

*Results of Two-Stage Least Squares, Dependent Variable: Graduate School Enrollment
Second Stage Full Model; Subpopulation: Mid- to High-Income*

	Loan		Federal Loan	
	2009	2012	2009	2012
Cumulative Loans (Log)	-0.08** (0.03)	-0.07* (0.03)	-0.09** (0.03)	-0.07* (0.03)
Age	-0.05* (0.02)	-0.04 (0.02)	-0.06** (0.02)	-0.05+ (0.02)
Female	0.02 (0.03)	0.05+ (0.03)	0.02 (0.03)	0.05+ (0.03)
Race/Ethnicity (Reference: White)				
African American	0.05 (0.06)	0.19*** (0.06)	0.03 (0.06)	0.16** (0.06)
Latino	0.04 (0.05)	0.11* (0.05)	0.03 (0.05)	0.10* (0.05)
Asian	0.05 (0.06)	0.09+ (0.06)	0.05 (0.06)	0.09+ (0.06)
Other Race	-0.02 (0.07)	-0.03 (0.06)	-0.04 (0.08)	-0.05 (0.06)
Entrance Examination (in SAT)	-0.00 (0.00)	0.00 (0.00)	-0.00 (0.00)	0.00 (0.00)
Institutional Selectivity (Reference: Nonselective)				
Less Selective	0.05 (0.08)	0.04 (0.08)	0.06 (0.08)	0.05 (0.08)
Selective	0.14* (0.06)	0.10 (0.06)	0.13* (0.06)	0.10 (0.06)
Most Selective	0.18** (0.07)	0.13+ (0.07)	0.17* (0.07)	0.12+ (0.07)
Private Control	0.22*** (0.06)	0.14* (0.06)	0.23*** (0.07)	0.14* (0.06)
2-Year or Less	0.13+ (0.07)	0.12 (0.08)	0.11 (0.07)	0.10 (0.07)
College GPA	0.11*** (0.03)	0.15*** (0.03)	0.11*** (0.03)	0.15*** (0.03)
Entering Tuition & Fees	-0.00* (0.00)	0.00 (0.00)	-0.00* (0.00)	0.00 (0.00)
Married	-0.14* (0.06)	-0.16* (0.06)	-0.14* (0.07)	-0.16* (0.06)

Dependents	0.06 (0.07)	0.09 (0.06)	0.08 (0.07)	0.11+ (0.06)
Constant	1.36* (0.53)	0.88+ (0.53)	1.58** (0.60)	1.03+ (0.60)
Observations	2460	2460	2460	2460
Wu-Hausman (<i>p</i> -value)	11.81 (0.000)	7.37 (0.007)	11.26 (0.001)	6.30 (0.012)
Minimum eigenvalue	7.58	7.58	6.36	6.37
<i>F</i> -bias crit, <i>F</i> -size crit	13.91, 22.3	13.91, 22.3	13.91, 22.3	13.91, 22.3
Sargan (<i>p</i> -value)	7.62 (0.022)	5.94 (0.051)	7.88 (0.019)	6.80 (0.033)

Note: Excluded instruments: change in average tuition and fees, father's education, and change in average tuition and fees interacted with father's education. Models run solely for students with prior income above the 50th percentile and up to and including the 75th percentile. Standard errors in parentheses. + = $p < 0.10$; * = $p < 0.05$; ** = $p < .01$; *** = $p < .001$. Observations are rounded due to NCES guidelines.

Table A112

Results of OLS, Dependent Variable: Graduate School Enrollment (Full Model)
Subpopulation: High-Income

	Loan		Federal Loan	
	2009	2012	2009	2012
Cumulative Loans Borrowed 2009 (Log)	-0.001	-0.000	-0.003	-0.002
	(0.00)	(0.00)	(0.00)	(0.00)
Age	-0.020	-0.008	-0.020	-0.008
	(0.02)	(0.02)	(0.02)	(0.02)
Female	0.045*	0.027	0.045*	0.028
	(0.02)	(0.02)	(0.02)	(0.02)
Race/Ethnicity (Reference: White)				
African American	0.097+	0.184***	0.098+	0.186***
	(0.05)	(0.05)	(0.05)	(0.05)
Latino	0.060	0.062	0.060	0.062
	(0.05)	(0.05)	(0.05)	(0.05)
Asian	0.052	0.021	0.050	0.019
	(0.05)	(0.05)	(0.05)	(0.05)
Other Race	0.050	0.019	0.050	0.019
	(0.05)	(0.05)	(0.05)	(0.05)
Entrance Examination (in SAT)	0.000***	0.000***	0.000***	0.000**
	(0.00)	(0.00)	(0.00)	(0.00)
Institutional Selectivity (Reference: Nonselective)				
Less Selective	-0.034	-0.148+	-0.032	-0.146+
	(0.07)	(0.08)	(0.07)	(0.08)
Selective	0.024	-0.052	0.024	-0.052
	(0.06)	(0.07)	(0.06)	(0.07)
Most Selective	0.023	-0.002	0.022	-0.004
	(0.06)	(0.07)	(0.07)	(0.07)
Private Control	0.004	-0.018	0.005	-0.017
	(0.04)	(0.04)	(0.04)	(0.04)
2-Year or Less	-0.028	-0.112	-0.028	-0.111
	(0.07)	(0.07)	(0.07)	(0.08)
College GPA	0.164***	0.226***	0.164***	0.225***
	(0.02)	(0.02)	(0.02)	(0.02)
Entering Tuition & Fees	-0.000	0.000	-0.000	0.000
	(0.00)	(0.00)	(0.00)	(0.00)
Married	-0.067	-0.155	-0.070	-0.156
	(0.11)	(0.11)	(0.11)	(0.11)

Dependents	-0.111 ⁺	-0.127 ⁺	-0.107 ⁺	-0.122 ⁺
	(0.06)	(0.07)	(0.06)	(0.07)
Constant	-0.271	-0.397	-0.254	-0.376
	(0.32)	(0.34)	(0.32)	(0.34)
Observations	2460	2460	2460	2460

Note: Models run solely for students with a prior income above the 75th percentile. Standard errors in parentheses. ⁺ = $p < 0.10$; * = $p < 0.05$; ** = $p < .01$; *** = $p < .001$. Observations are rounded due to NCES guidelines.

Table A113

*Results of OLS Reduced Form, Dependent Variable: Graduate School Enrollment (Full Model)
Subpopulation: High-Income*

	Loan		Federal Loan	
	2009	2012	2009	2012
Change in Average Tuition and Fees	-0.15	0.03	-0.15	0.03
	(0.11)	(0.13)	(0.11)	(0.13)
Father's Education	-0.71	0.58	-0.71	0.58
	(0.81)	(0.95)	(0.81)	(0.95)
Change in Average Tuition and Fees * Father's Education	0.10	-0.08	0.10	-0.08
	(0.11)	(0.13)	(0.11)	(0.13)
Age	-0.03	-0.01	-0.03	-0.01
	(0.02)	(0.02)	(0.02)	(0.02)
Female	0.04*	0.02	0.04*	0.02
	(0.02)	(0.02)	(0.02)	(0.02)
Race/Ethnicity (Reference: White)				
African American	0.09+	0.18***	0.09+	0.18***
	(0.05)	(0.05)	(0.05)	(0.05)
Latino	0.06	0.06	0.06	0.06
	(0.05)	(0.05)	(0.05)	(0.05)
Asian	0.05	0.02	0.05	0.02
	(0.05)	(0.05)	(0.05)	(0.05)
Other Race	0.05	0.02	0.05	0.02
	(0.06)	(0.05)	(0.06)	(0.05)
Entrance Examination (in SAT)	0.00***	0.00**	0.00***	0.00**
	(0.00)	(0.00)	(0.00)	(0.00)
Institutional Selectivity (Reference: Nonselective)				
Less Selective	-0.04	-0.15+	-0.04	-0.15+
	(0.07)	(0.08)	(0.07)	(0.08)
Selective	0.03	-0.04	0.03	-0.04
	(0.06)	(0.07)	(0.06)	(0.07)
Most Selective	0.02	-0.00	0.02	-0.00
	(0.06)	(0.07)	(0.06)	(0.07)
Private Control	0.02	0.00	0.02	0.00
	(0.04)	(0.04)	(0.04)	(0.04)
2-Year or Less	-0.07	-0.15*	-0.07	-0.15*
	(0.07)	(0.08)	(0.07)	(0.08)

College GPA	0.16*** (0.02)	0.22*** (0.02)	0.16*** (0.02)	0.22*** (0.02)
Entering Tuition & Fees	0.00 (0.00)	0.00* (0.00)	0.00 (0.00)	0.00* (0.00)
Married	-0.04 (0.11)	-0.11 (0.11)	-0.04 (0.11)	-0.11 (0.11)
Dependents	-0.10 (0.06)	-0.13+ (0.07)	-0.10 (0.06)	-0.13+ (0.07)
Constant	0.88 (0.90)	-0.51 (1.04)	0.88 (0.90)	-0.51 (1.04)
Observations	2460	2460	2460	2460

Note: Reduced form model of the IV model for undergraduate debt's effect on graduate school enrollment. Models run solely for students with a prior income above the 75th percentile. Standard errors in parentheses. + = $p < 0.10$; * = $p < 0.05$; ** = $p < .01$; *** = $p < .001$. Observations are rounded due to NCES guidelines.

Table A114

*Results of Two-Stage Least Squares, Dependent Variable: Graduate School Enrollment
First Stage Full Model; Subpopulation: High-Income*

	Loan		Federal Loan	
	2009	2012	2009	2012
Change in Average Tuition and Fees	1.07	1.07	1.77*	1.77*
	(1.00)	(1.00)	(0.74)	(0.74)
Father's Education	7.42	7.42	13.10*	13.10*
	(7.49)	(7.49)	(5.32)	(5.32)
Change in Average Tuition and Fees * Father's Education	-0.95	-0.95	-1.59*	-1.59*
	(0.99)	(0.99)	(0.74)	(0.74)
Age	-0.12	-0.12	-0.05	-0.05
	(0.19)	(0.19)	(0.19)	(0.19)
Female	0.06	0.06	0.12	0.12
	(0.20)	(0.20)	(0.20)	(0.20)
Race/Ethnicity (Reference: White)				
African American	1.06+	1.06+	1.06*	1.06*
	(0.56)	(0.56)	(0.53)	(0.53)
Latino	0.22	0.22	0.10	0.10
	(0.46)	(0.46)	(0.44)	(0.44)
Asian	-1.27*	-1.27*	-1.43**	-1.43**
	(0.50)	(0.50)	(0.47)	(0.47)
Other Race	0.73	0.73	0.25	0.25
	(0.53)	(0.53)	(0.52)	(0.52)
Entrance Examination (in SAT)	-0.00***	-0.00***	-0.00***	-0.00***
	(0.00)	(0.00)	(0.00)	(0.00)
Institutional Selectivity (Reference: Nonselective)				
Less Selective	1.51*	1.51*	1.38+	1.38+
	(0.77)	(0.77)	(0.75)	(0.75)
Selective	0.53	0.53	0.28	0.28
	(0.64)	(0.64)	(0.62)	(0.62)
Most Selective	-0.41	-0.41	-0.77	-0.77
	(0.69)	(0.69)	(0.67)	(0.67)
Private Control	1.18**	1.18**	0.87*	0.87*
	(0.39)	(0.39)	(0.37)	(0.37)
2-Year or Less	0.59	0.59	0.34	0.34
	(0.73)	(0.73)	(0.70)	(0.70)

College GPA	-0.37 (0.24)	-0.37 (0.24)	-0.29 (0.23)	-0.29 (0.23)
Entering Tuition & Fees	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)
Married	0.24 (1.03)	0.24 (1.03)	-0.99 (1.04)	-0.99 (1.04)
Dependents	2.23*** (0.65)	2.23*** (0.65)	2.67** (0.94)	2.67** (0.94)
Constant	4.26 (8.74)	4.26 (8.74)	-3.71 (6.87)	-3.71 (6.87)
Observations	2460	2460	2460	2460
Wu-Hausman (<i>p</i> -value)	9.82 (0.002)	6.444 (0.011)	6.62 (0.010)	4.63 (0.031)
Minimum eigenvalue	0.53	0.53	1.99	1.99
<i>F</i> -bias crit, <i>F</i> -size crit	13.91, 22.3	13.91, 22.3	13.91, 22.3	13.91, 22.3
Sargan (<i>p</i> -value)	0.67 (0.715)	2.07 (0.355)	3.68 (0.159)	6.78 (0.034)

Note: Excluded instruments: change in average tuition and fees, father's education, and change in average tuition and fees interacted with father's education. Models run solely for students with a prior income above the 75th percentile. Standard errors in parentheses. + = $p < 0.10$; * = $p < 0.05$; ** = $p < .01$; *** = $p < .001$. Observations are rounded due to NCES guidelines.

Table A115

*Results of Two-Stage Least Squares, Dependent Variable: Graduate School Enrollment
Second Stage Full Model; Subpopulation: High-Income*

	Loan		Federal Loan	
	2009	2012	2009	2012
Cumulative Loans (Log)	-0.24 (0.21)	-0.20 (0.19)	-0.11* (0.05)	-0.09+ (0.05)
Age	-0.06 (0.06)	-0.04 (0.05)	-0.03 (0.03)	-0.02 (0.03)
Female	0.06 (0.05)	0.04 (0.05)	0.06+ (0.03)	0.04 (0.03)
Race/Ethnicity (Reference: White)				
African American	0.35 (0.27)	0.40+ (0.24)	0.21* (0.10)	0.28** (0.09)
Latino	0.11 (0.13)	0.10 (0.11)	0.07 (0.07)	0.07 (0.06)
Asian	-0.26 (0.30)	-0.24 (0.27)	-0.10 (0.10)	-0.11 (0.10)
Other Race	0.22 (0.20)	0.16 (0.18)	0.07 (0.08)	0.04 (0.07)
Entrance Examination (in SAT)	-0.00 (0.00)	-0.00 (0.00)	-0.00 (0.00)	-0.00 (0.00)
Institutional Selectivity (Reference: Nonselective)				
Less Selective	0.33 (0.38)	0.16 (0.34)	0.11 (0.13)	-0.02 (0.14)
Selective	0.15 (0.21)	0.06 (0.19)	0.06 (0.10)	-0.02 (0.10)
Most Selective	-0.08 (0.21)	-0.09 (0.19)	-0.06 (0.11)	-0.08 (0.11)
Private Control	0.30 (0.28)	0.23 (0.25)	0.10 (0.07)	0.07 (0.07)
2-Year or Less	0.08 (0.22)	-0.02 (0.20)	-0.01 (0.11)	-0.10 (0.11)
College GPA	0.07 (0.10)	0.15+ (0.09)	0.13*** (0.03)	0.20*** (0.03)
Entering Tuition & Fees	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)
Married	-0.01 (0.30)	-0.10 (0.24)	-0.18 (0.19)	-0.25 (0.17)

Dependents	0.42 (0.49)	0.32 (0.43)	0.15 (0.19)	0.10 (0.18)
Constant	2.87 (2.88)	2.24 (2.57)	0.97 (0.76)	0.68 (0.77)
Observations	2460	2460	2460	2460
Wu-Hausman (<i>p</i> -value)	9.82 (0.002)	6.444 (0.011)	6.62 (0.010)	4.63 (0.031)
Minimum eigenvalue	0.53	0.53	1.99	1.99
<i>F</i> -bias crit, <i>F</i> -size crit	13.91, 22.3	13.91, 22.3	13.91, 22.3	13.91, 22.3
Sargan (<i>p</i> -value)	0.67 (0.715)	2.07 (0.355)	3.68 (0.159)	6.78 (0.034)

Note: Excluded instruments: change in average tuition and fees, father's education, and change in average tuition and fees interacted with father's education. Models run solely for students with a prior income above the 75th percentile. Standard errors in parentheses. + = $p < 0.10$; * = $p < 0.05$; ** = $p < .01$; *** = $p < .001$. Observations are rounded due to NCES guidelines.

Table A116

*Results of OLS, Dependent Variable: Salary (Full Model)**Subpopulation: Low-Income*

	Loan		Federal Loan	
	2009	2012	2009	2012
Cumulative Loans Borrowed 2009 (Log)	0.007	-0.007	0.003	-0.012
	(0.00)	(0.01)	(0.00)	(0.01)
Age	-0.001	0.034	-0.001	0.034
	(0.02)	(0.05)	(0.02)	(0.05)
Female	-0.235***	-0.251*	-0.234***	-0.249*
	(0.03)	(0.10)	(0.03)	(0.10)
Race/Ethnicity (Reference: White)				
African American	-0.085	-0.570*	-0.084	-0.563*
	(0.06)	(0.23)	(0.06)	(0.23)
Latino	0.003	-0.204	0.004	-0.208
	(0.06)	(0.22)	(0.06)	(0.22)
Asian	0.017	-0.357	0.013	-0.362
	(0.07)	(0.25)	(0.07)	(0.25)
Other Race	0.015	-0.303	0.012	-0.303
	(0.07)	(0.24)	(0.07)	(0.24)
Entrance Examination (in SAT)	-0.000	0.001**	-0.000	0.001**
	(0.00)	(0.00)	(0.00)	(0.00)
Institutional Selectivity (Reference: Nonselective)				
Less Selective	0.005	-0.071	0.005	-0.067
	(0.10)	(0.27)	(0.10)	(0.27)
Selective	0.080	-0.201	0.081	-0.197
	(0.08)	(0.23)	(0.08)	(0.23)
Most Selective	0.242*	0.017	0.238*	0.016
	(0.10)	(0.26)	(0.10)	(0.25)
Private Control	-0.120 ⁺	-0.194	-0.126*	-0.200
	(0.06)	(0.18)	(0.06)	(0.18)
2-Year or Less	-0.022	-0.317	-0.020	-0.308
	(0.09)	(0.25)	(0.09)	(0.25)
College GPA	0.010	0.084	0.008	0.084
	(0.04)	(0.11)	(0.04)	(0.11)
Entering Tuition & Fees	-0.000	-0.000	-0.000	-0.000
	(0.00)	(0.00)	(0.00)	(0.00)
Married	-0.028	-0.001	-0.030	-0.006
	(0.05)	(0.13)	(0.05)	(0.13)

Dependents	0.079*	0.097	0.080*	0.098
	(0.03)	(0.09)	(0.03)	(0.09)
Constant	10.224***	8.743***	10.255***	8.761***
	(0.34)	(1.15)	(0.34)	(1.15)
Observations	2010	2010	2010	2010

Note: Models run solely for students with a prior income equal to or below the 25th percentile. Standard errors in parentheses. + = $p < 0.10$; * = $p < 0.05$; ** = $p < .01$; *** = $p < .001$. Observations are rounded due to NCES guidelines.

Table A117

*Results of OLS Reduced Form, Dependent Variable: Salary (Full Model)**Subpopulation: Low-Income*

	Loan		Federal Loan	
	2009	2012	2009	2012
Change in Average Tuition and Fees	889.14	760.32	889.14	760.32
	(817.61)	(1,458.99)	(817.61)	(1,458.99)
Father's Education	3,025.32	9,516.01	3,025.32	9,516.01
	(6,223.47)	(10,894.98)	(6,223.47)	(10,894.98)
Change in Average Tuition and Fees * Father's education	-363.91	-1,485.61	-363.91	-1,485.61
	(865.35)	(1,517.96)	(865.35)	(1,517.96)
Age	-93.01	784.02	-93.01	784.02
	(431.77)	(587.51)	(431.77)	(587.51)
Female	-7,403.27***	-12,083.84***	-7,403.27***	-12,083.84***
	(872.42)	(1,228.68)	(872.42)	(1,228.68)
Race/Ethnicity (Reference: White)				
African American	-1,128.08	-1,627.77	-1,128.08	-1,627.77
	(1,350.99)	(1,998.93)	(1,350.99)	(1,998.93)
Latino	236.23	1,977.63	236.23	1,977.63
	(1,405.83)	(2,284.06)	(1,405.83)	(2,284.06)
Asian	3,211.93	6,051.11*	3,211.93	6,051.11*
	(1,985.77)	(2,808.59)	(1,985.77)	(2,808.59)
Other Race	-263.53	-4,668.58+	-263.53	-4,668.58+
	(2,079.04)	(2,770.92)	(2,079.04)	(2,770.92)
Entrance Examination (in SAT)	2.91	12.73**	2.91	12.73**
	(2.55)	(4.11)	(2.55)	(4.11)
Institutional Selectivity (Reference: Nonselective)				
Less Selective	-616.25	-3,586.46	-616.25	-3,586.46
	(2,439.56)	(3,342.20)	(2,439.56)	(3,342.20)
Selective	2,089.49	-1,141.42	2,089.49	-1,141.42
	(2,164.72)	(3,010.31)	(2,164.72)	(3,010.31)
Most Selective	7,435.33**	5,093.62	7,435.33**	5,093.62
	(2,539.84)	(3,520.50)	(2,539.84)	(3,520.50)
Private Control	-2,590.65	-2,445.39	-2,590.65	-2,445.39
	(1,775.62)	(2,544.03)	(1,775.62)	(2,544.03)
2-Year or Less	-465.96	-3,967.33	-465.96	-3,967.33
	(2,254.60)	(3,098.40)	(2,254.60)	(3,098.40)

College GPA	1,817.08*	3,322.92*	1,817.08*	3,322.92*
	(911.81)	(1,298.41)	(911.81)	(1,298.41)
Entering Tuition & Fees	-0.11	0.02	-0.11	0.02
	(0.12)	(0.17)	(0.12)	(0.17)
Married	-1,403.25	-1,060.69	-1,403.25	-1,060.69
	(1,147.08)	(1,684.80)	(1,147.08)	(1,684.80)
Dependents	2,462.71*	868.09	2,462.71*	868.09
	(1,005.17)	(1,113.70)	(1,005.17)	(1,113.70)
Constant	21,349.82 ⁺	7,373.79	21,349.82 ⁺	7,373.79
	(11,047.75)	(16,068.90)	(11,047.75)	(16,068.90)
Observations	2010	2010	2010	2010

Note: Reduced form model of the IV model for undergraduate debt's effect on early-career occupation salary. Models run solely for students with a prior income equal to or below the 25th percentile. Standard errors in parentheses. ⁺ = $p < 0.10$; * = $p < 0.05$; ** = $p < .01$; *** = $p < .001$. Observations are rounded due to NCES guidelines.

Table A118

Results of Two-Stage Least Squares, Dependent Variable: Salary
First Stage Full Model; Subpopulation: Low-Income

	Loan		Federal Loan	
	2009	2012	2009	2012
Change in Average Tuition and Fees	0.90***	0.90***	0.84***	0.84***
	(0.23)	(0.23)	(0.23)	(0.23)
Father's Education	3.39*	3.39*	2.59	2.59
	(1.72)	(1.72)	(1.71)	(1.71)
Change in Average Tuition and Fees * Father's Education	-0.44+	-0.44+	-0.34	-0.34
	(0.24)	(0.24)	(0.24)	(0.24)
Age	0.16+	0.16+	0.16+	0.16+
	(0.09)	(0.09)	(0.09)	(0.09)
Female	0.32+	0.32+	0.34+	0.34+
	(0.18)	(0.18)	(0.19)	(0.19)
Race/Ethnicity (Reference: White)				
African American	0.87**	0.87**	1.18***	1.18***
	(0.29)	(0.29)	(0.30)	(0.30)
Latino	0.18	0.18	-0.09	-0.09
	(0.33)	(0.33)	(0.36)	(0.36)
Asian	-0.88*	-0.88*	-0.78*	-0.78*
	(0.38)	(0.38)	(0.38)	(0.38)
Other Race	-0.58	-0.58	-0.28	-0.28
	(0.45)	(0.45)	(0.45)	(0.45)
Entrance Examination (in SAT)	-0.00+	-0.00+	-0.00	-0.00
	(0.00)	(0.00)	(0.00)	(0.00)
Institutional Selectivity (Reference: Nonselective)				
Less Selective	0.12	0.12	0.28	0.28
	(0.58)	(0.58)	(0.62)	(0.62)
Selective	0.29	0.29	0.50	0.50
	(0.50)	(0.50)	(0.53)	(0.53)
Most Selective	-0.79	-0.79	-0.49	-0.49
	(0.56)	(0.56)	(0.60)	(0.60)
Private Control	-1.50***	-1.50***	-1.31***	-1.31***
	(0.35)	(0.35)	(0.36)	(0.36)
2-Year or Less	1.27*	1.27*	1.61**	1.61**
	(0.52)	(0.52)	(0.55)	(0.55)

College GPA	-0.46*	-0.46*	-0.25	-0.25
	(0.21)	(0.21)	(0.22)	(0.22)
Entering Tuition & Fees	0.00***	0.00***	0.00***	0.00***
	(0.00)	(0.00)	(0.00)	(0.00)
Married	-0.53+	-0.53+	-0.65*	-0.65*
	(0.28)	(0.28)	(0.29)	(0.29)
Dependents	0.13	0.13	0.11	0.11
	(0.21)	(0.21)	(0.22)	(0.22)
Constant	-0.20	-0.20	-1.50	-1.50
	(2.55)	(2.55)	(2.59)	(2.59)
Observations	2010	2010	2010	2010
Wu-Hausman (<i>p</i> -value)	2.85 (0.092)	0.14 (0.711)	3.35 (0.068)	0.12 (0.731)
Minimum eigenvalue	14.42	14.42	13.70	13.70
<i>F</i> -bias crit, <i>F</i> -size crit	13.91, 22.3	13.91, 22.3	13.91, 22.3	13.91, 22.3
Sargan (<i>p</i> -value)	0.01 (0.952)	2.94 (0.230)	0.03 (0.983)	2.98 (0.225)

Note: Excluded instruments: change in average tuition and fees, father's education, and change in average tuition and fees interacted with father's education. Models run solely for students with a prior income equal to or below the 25th percentile. Standard errors in parentheses. + = $p < 0.10$; * = $p < 0.05$; ** = $p < .01$; *** = $p < .001$. Observations are rounded due to NCES guidelines.

Table A119

*Results of Two-Stage Least Squares, Dependent Variable: Salary
Second Stage Full Model; Subpopulation: Low-Income*

	Loan		Federal Loan	
	2009	2012	2009	2012
Cumulative Loans (Log)	0.05+ (0.03)	0.02 (0.11)	0.05+ (0.03)	0.02 (0.11)
Age	-0.01 (0.02)	0.03 (0.05)	-0.01 (0.02)	0.03 (0.05)
Female	-0.25*** (0.03)	-0.26** (0.10)	-0.25*** (0.04)	-0.26* (0.10)
Race/Ethnicity (Reference: White)				
African American	-0.11+ (0.06)	-0.59* (0.24)	-0.13+ (0.07)	-0.59* (0.24)
Latino	0.01 (0.06)	-0.20 (0.22)	0.02 (0.06)	-0.20 (0.22)
Asian	0.07 (0.08)	-0.32 (0.29)	0.07 (0.08)	-0.33 (0.28)
Other Race	0.05 (0.08)	-0.28 (0.26)	0.03 (0.07)	-0.29 (0.25)
Entrance Examination (in SAT)	0.00 (0.00)	0.00** (0.00)	0.00 (0.00)	0.00** (0.00)
Institutional Selectivity (Reference: Nonselective)				
Less Selective	-0.01 (0.10)	-0.08 (0.28)	-0.01 (0.10)	-0.08 (0.28)
Selective	0.06 (0.08)	-0.21 (0.24)	0.05 (0.08)	-0.21 (0.24)
Most Selective	0.28** (0.10)	0.04 (0.27)	0.26** (0.10)	0.03 (0.26)
Private Control	-0.05 (0.08)	-0.15 (0.25)	-0.06 (0.07)	-0.17 (0.23)
2-Year or Less	-0.07 (0.09)	-0.35 (0.27)	-0.08 (0.09)	-0.34 (0.29)
College GPA	0.03 (0.04)	0.10 (0.12)	0.02 (0.04)	0.09 (0.11)
Entering Tuition & Fees	-0.00 (0.00)	-0.00 (0.00)	-0.00 (0.00)	-0.00 (0.00)
Married	0.00 (0.05)	0.02 (0.15)	0.01 (0.05)	0.01 (0.16)

Dependents	0.07 ⁺ (0.04)	0.09 (0.10)	0.07 ⁺ (0.04)	0.09 (0.09)
Constant	9.89 ^{***} (0.40)	8.52 ^{***} (1.46)	9.98 ^{***} (0.38)	8.61 ^{***} (1.34)
Observations	2010	2010	2010	2010
Wu-Hausman (<i>p</i> -value)	2.85 (0.092)	0.14 (0.711)	3.35 (0.068)	0.12 (0.731)
Minimum eigenvalue	14.42	14.42	13.70	13.70
<i>F</i> -bias crit, <i>F</i> -size crit	13.91, 22.3	13.91, 22.3	13.91, 22.3	13.91, 22.3
Sargan (<i>p</i> -value)	0.01 (0.952)	2.94 (0.230)	0.03 (0.983)	2.98 (0.225)

Note: Excluded instruments: change in average tuition and fees, father's education, and change in average tuition and fees interacted with father's education. Models run solely for students with a prior income equal to or below the 25th percentile. Standard errors in parentheses. ⁺ = $p < 0.10$; * = $p < 0.05$; ** = $p < .01$; *** = $p < .001$. Observations are rounded due to NCES guidelines.

Table A120

*Results of OLS, Dependent Variable: Salary (Full Model)**Subpopulation: Mid- to Low-Income*

	Loan		Federal Loan	
	2009	2012	2009	2012
Cumulative Loans Borrowed 2009 (Log)	0.008⁺	0.006	0.004	0.013
	(0.00)	(0.01)	(0.00)	(0.01)
Age	0.010 (0.02)	-0.053 (0.09)	0.011 (0.02)	-0.053 (0.09)
Female	-0.265 ^{***} (0.03)	-0.291 ^{**} (0.10)	-0.264 ^{***} (0.03)	-0.292 ^{**} (0.10)
Race/Ethnicity (Reference: White)				
African American	-0.054 (0.06)	-0.543 [*] (0.24)	-0.052 (0.06)	-0.545 [*] (0.24)
Latino	0.039 (0.06)	-0.177 (0.20)	0.038 (0.06)	-0.171 (0.20)
Asian	-0.030 (0.07)	-1.013 ^{***} (0.30)	-0.033 (0.07)	-1.004 ^{***} (0.30)
Other Race	-0.139 (0.10)	-0.074 (0.23)	-0.139 (0.10)	-0.073 (0.23)
Entrance Examination (in SAT)	-0.000 (0.00)	0.001 ⁺ (0.00)	-0.000 (0.00)	0.001 ⁺ (0.00)
Institutional Selectivity (Reference: Nonselective)				
Less Selective	-0.011 (0.10)	-0.031 (0.23)	-0.010 (0.10)	-0.030 (0.23)
Selective	0.006 (0.09)	-0.194 (0.19)	0.006 (0.09)	-0.193 (0.19)
Most Selective	0.162 ⁺ (0.10)	0.089 (0.22)	0.161 ⁺ (0.10)	0.092 (0.22)
Private Control	-0.111 ⁺ (0.06)	-0.244 (0.16)	-0.108 ⁺ (0.06)	-0.245 (0.16)
2-Year or Less	-0.017 (0.09)	-0.400 ⁺ (0.23)	-0.015 (0.09)	-0.398 ⁺ (0.23)
College GPA	-0.031 (0.03)	0.017 (0.09)	-0.033 (0.03)	0.019 (0.09)
Entering Tuition & Fees	0.000 (0.00)	-0.000 (0.00)	0.000 (0.00)	-0.000 (0.00)
Married	0.112 ^{**} (0.04)	0.019 (0.13)	0.111 [*] (0.04)	0.021 (0.13)

Dependents	0.050 (0.04)	0.016 (0.14)	0.051 (0.04)	0.013 (0.14)
Constant	10.287*** (0.47)	10.898*** (1.59)	10.318*** (0.47)	10.847*** (1.60)
Observations	2010	2010	2010	2010

Note: Models run solely for students with a prior income above the 25th percentile and up to and including the 50th percentile. Standard errors in parentheses. + = $p < 0.10$; * = $p < 0.05$; ** = $p < .01$; *** = $p < .001$. Observations are rounded due to NCES guidelines.

Table A121

*Results of OLS Reduced Form, Dependent Variable: Salary (Full Model)**Subpopulation: Mid- to Low-Income*

	Loan		Federal Loan	
	2009	2012	2009	2012
Change in Average Tuition and Fees	2,316.85*	2,971.92+	2,316.85*	2,971.92+
	(919.22)	(1,548.10)	(919.22)	(1,548.10)
Father's Education	1,927.87	10,323.74	1,927.87	10,323.74
	(6,851.82)	(11,406.79)	(6,851.82)	(11,406.79)
Change in Average Tuition and Fees * Father's Education	-620.34	-1,599.43	-620.34	-1,599.43
	(959.45)	(1,613.82)	(959.45)	(1,613.82)
Age	491.82	921.88	491.82	921.88
	(617.79)	(1,199.92)	(617.79)	(1,199.92)
Female	-8,235.41***	-11,536.83***	-8,235.41***	-11,536.83***
	(808.28)	(1,366.78)	(808.28)	(1,366.78)
Race/Ethnicity (Reference: White)				
African American	-102.70	-1,382.32	-102.70	-1,382.32
	(1,370.50)	(2,058.84)	(1,370.50)	(2,058.84)
Latino	1,748.59	2,551.57	1,748.59	2,551.57
	(1,471.79)	(2,091.52)	(1,471.79)	(2,091.52)
Asian	1,037.45	852.62	1,037.45	852.62
	(1,696.03)	(2,719.80)	(1,696.03)	(2,719.80)
Other Race	-2,381.76	-468.63	-2,381.76	-468.63
	(1,911.57)	(3,112.84)	(1,911.57)	(3,112.84)
Entrance Examination (in SAT)	1.38	6.84+	1.38	6.84+
	(2.45)	(3.67)	(2.45)	(3.67)
Institutional Selectivity (Reference: Nonselective)				
Less Selective	-2,780.18	-2,623.62	-2,780.18	-2,623.62
	(2,149.38)	(3,077.24)	(2,149.38)	(3,077.24)
Selective	-918.19	-874.41	-918.19	-874.41
	(1,890.79)	(2,713.79)	(1,890.79)	(2,713.79)
Most Selective	3,307.06	3,650.84	3,307.06	3,650.84
	(2,239.63)	(3,162.48)	(2,239.63)	(3,162.48)
Private Control	-4,280.68**	-7,198.06**	-4,280.68**	-7,198.06**
	(1,505.01)	(2,314.53)	(1,505.01)	(2,314.53)
2-Year or Less	85.96	-863.46	85.96	-863.46
	(2,055.28)	(2,976.46)	(2,055.28)	(2,976.46)

College GPA	608.02 (831.14)	2,226.76+ (1,271.10)	608.02 (831.14)	2,226.76+ (1,271.10)
Entering Tuition & Fees	-0.02 (0.10)	0.06 (0.15)	-0.02 (0.10)	0.06 (0.15)
Married	1,574.39 (1,081.95)	-108.73 (1,745.67)	1,574.39 (1,081.95)	-108.73 (1,745.67)
Dependents	1,584.48+ (862.81)	4,300.13 (2,760.46)	1,584.48+ (862.81)	4,300.13 (2,760.46)
Constant	10,403.86 (14,193.15)	-2,142.13 (26,029.59)	10,403.86 (14,193.15)	-2,142.13 (26,029.59)
Observations	2010	2010	2010	2010

Note: Reduced form model of the IV model for undergraduate debt's effect on early-career occupation salary. Models run solely for students with a prior income above the 25th percentile and up to and including the 50th percentile. Standard errors in parentheses. + = $p < 0.10$; * = $p < 0.05$; ** = $p < .01$; *** = $p < .001$. Observations are rounded due to NCES guidelines.

Table A122

*Results of Two-Stage Least Squares, Dependent Variable: Salary
First Stage Full Model; Subpopulation: Mid- to Low-Income*

	Loan		Federal Loan	
	2009	2012	2009	2012
Change in Average Tuition and Fees	0.75**	0.75**	0.67*	0.67*
	(0.29)	(0.29)	(0.30)	(0.30)
Father's Education	1.35	1.35	1.36	1.36
	(2.15)	(2.15)	(2.20)	(2.20)
Change in Average Tuition and Fees * Father's Education	-0.26	-0.26	-0.26	-0.26
	(0.29)	(0.29)	(0.30)	(0.30)
Age	0.20+	0.20+	0.18	0.18
	(0.11)	(0.11)	(0.11)	(0.11)
Female	0.28	0.28	0.21	0.21
	(0.18)	(0.18)	(0.18)	(0.18)
Race/Ethnicity (Reference: White)				
African American	0.54+	0.54+	0.44	0.44
	(0.29)	(0.29)	(0.32)	(0.32)
Latino	-0.49	-0.49	-0.71*	-0.71*
	(0.33)	(0.33)	(0.34)	(0.34)
Asian	-1.00**	-1.00**	-1.16**	-1.16**
	(0.36)	(0.36)	(0.37)	(0.37)
Other Race	0.05	0.05	-0.03	-0.03
	(0.46)	(0.46)	(0.48)	(0.48)
Entrance Examination (in SAT)	-0.00+	-0.00+	-0.00+	-0.00+
	(0.00)	(0.00)	(0.00)	(0.00)
Institutional Selectivity (Reference: Nonselective)				
Less Selective	0.05	0.05	-0.07	-0.07
	(0.54)	(0.54)	(0.57)	(0.57)
Selective	-0.16	-0.16	-0.19	-0.19
	(0.45)	(0.45)	(0.49)	(0.49)
Most Selective	-0.39	-0.39	-0.49	-0.49
	(0.52)	(0.52)	(0.56)	(0.56)
Private Control	0.23	0.23	0.09	0.09
	(0.36)	(0.36)	(0.38)	(0.38)
2-Year or Less	0.52	0.52	0.23	0.23
	(0.49)	(0.49)	(0.53)	(0.53)

College GPA	-0.43*	-0.43*	-0.36+	-0.36+
	(0.21)	(0.21)	(0.22)	(0.22)
Entering Tuition & Fees	0.00*	0.00*	0.00*	0.00*
	(0.00)	(0.00)	(0.00)	(0.00)
Married	-0.46	-0.46	-0.37	-0.37
	(0.30)	(0.30)	(0.30)	(0.30)
Dependents	0.26	0.26	0.30	0.30
	(0.19)	(0.19)	(0.20)	(0.20)
Constant	1.60	1.60	1.99	1.99
	(3.15)	(3.15)	(3.24)	(3.24)
Observations	2010	2010	2010	2010
Wu-Hausman (<i>p</i> -value)	14.46 (0.000)	5.87 (0.015)	15.18 (0.000)	5.5 (0.019)
Minimum eigenvalue	9.90	9.90	6.91	6.91
<i>F</i> -bias crit, <i>F</i> -size crit	13.91, 22.3	13.91, 22.3	13.91, 22.3	13.91, 22.3
Sargan (<i>p</i> -value)	0.13 (0.938)	6.95 (0.031)	0.23 (0.893)	6.64 (0.036)

Note: Excluded instruments: change in average tuition and fees, father's education, and change in average tuition and fees interacted with father's education. Models run solely for students with a prior income above the 25th percentile and up to and including the 50th percentile. Standard errors in parentheses. + = $p < 0.10$; * = $p < 0.05$; ** = $p < .01$; *** = $p < .001$. Observations are rounded due to NCES guidelines.

Table A123

*Results of Two-Stage Least Squares, Dependent Variable: Salary
Second Stage Full Model; Subpopulation: Mid- to Low-Income*

	Loan		Federal Loan	
	2009	2012	2009	2012
Cumulative Loans (Log)	0.14** (0.05)	0.25⁺ (0.15)	0.16** (0.06)	0.29⁺ (0.17)
Age	-0.01 (0.03)	-0.08 (0.09)	-0.01 (0.03)	-0.09 (0.10)
Female	-0.30*** (0.04)	-0.36** (0.11)	-0.29*** (0.04)	-0.35** (0.12)
Race/Ethnicity (Reference: White)				
African American	-0.11 (0.07)	-0.66* (0.26)	-0.11 (0.08)	-0.65* (0.26)
Latino	0.10 (0.07)	-0.06 (0.23)	0.14 ⁺ (0.08)	0.02 (0.25)
Asian	0.09 (0.09)	-0.77* (0.34)	0.14 (0.11)	-0.69 ⁺ (0.36)
Other Race	-0.13 (0.11)	-0.06 (0.26)	-0.12 (0.12)	-0.04 (0.27)
Entrance Examination (in SAT)	0.00 (0.00)	0.00* (0.00)	0.00 (0.00)	0.00* (0.00)
Institutional Selectivity (Reference: Nonselective)				
Less Selective	-0.03 (0.12)	-0.06 (0.26)	-0.01 (0.13)	-0.03 (0.28)
Selective	0.01 (0.10)	-0.18 (0.21)	0.02 (0.11)	-0.16 (0.23)
Most Selective	0.20 ⁺ (0.11)	0.17 (0.25)	0.23 ⁺ (0.13)	0.21 (0.28)
Private Control	-0.16* (0.08)	-0.34 ⁺ (0.20)	-0.14 ⁺ (0.08)	-0.31 (0.20)
2-Year or Less	-0.04 (0.11)	-0.45 ⁺ (0.25)	-0.01 (0.12)	-0.38 (0.27)
College GPA	0.04 (0.05)	0.15 (0.13)	0.03 (0.05)	0.14 (0.13)
Entering Tuition & Fees	-0.00 (0.00)	-0.00 ⁺ (0.00)	-0.00 (0.00)	-0.00 ⁺ (0.00)
Married	0.15* (0.06)	0.10 (0.16)	0.15* (0.06)	0.09 (0.16)

Dependents	0.00 (0.05)	-0.08 (0.15)	-0.01 (0.05)	-0.10 (0.16)
Constant	9.28*** (0.66)	8.97*** (2.02)	9.18*** (0.73)	8.77*** (2.14)
Observations	2010	2010	2010	2010
Wu-Hausman (<i>p</i> -value)	14.46 (0.000)	5.87 (0.015)	15.18 (0.000)	5.5 (0.019)
Minimum eigenvalue	9.90	9.90	6.91	6.91
<i>F</i> -bias crit, <i>F</i> -size crit	13.91, 22.3	13.91, 22.3	13.91, 22.3	13.91, 22.3
Sargan (<i>p</i> -value)	0.13 (0.938)	6.95 (0.031)	0.23 (0.893)	6.64 (0.036)

Note: Excluded instruments: change in average tuition and fees, father's education, and change in average tuition and fees interacted with father's education. Models run solely for students with a prior income above the 25th percentile and up to and including the 50th percentile. Standard errors in parentheses. + = $p < 0.10$; * = $p < 0.05$; ** = $p < .01$; *** = $p < .001$. Observations are rounded due to NCES guidelines.

Table A124

*Results of OLS, Dependent Variable: Salary (Full Model)**Subpopulation: Mid- to High-Income*

	Loan		Federal Loan	
	2009	2012	2009	2012
Cumulative Loans Borrowed 2009 (Log)	0.004	0.022⁺	0.003	0.021⁺
	(0.00)	(0.01)	(0.00)	(0.01)
Age	0.027	-0.097	0.027	-0.096
	(0.02)	(0.09)	(0.02)	(0.09)
Female	-0.153 ^{***}	-0.312 ^{**}	-0.153 ^{***}	-0.312 ^{**}
	(0.03)	(0.10)	(0.03)	(0.10)
Race/Ethnicity (Reference: White)				
African American	-0.065	-0.318	-0.064	-0.312
	(0.07)	(0.28)	(0.07)	(0.28)
Latino	-0.074	-0.144	-0.074	-0.142
	(0.07)	(0.24)	(0.07)	(0.24)
Asian	0.055	-0.112	0.054	-0.117
	(0.09)	(0.29)	(0.09)	(0.29)
Other Race	-0.063	0.014	-0.064	0.012
	(0.12)	(0.23)	(0.12)	(0.23)
Entrance Examination (in SAT)	-0.000	0.001 ^{**}	-0.000	0.001 ^{**}
	(0.00)	(0.00)	(0.00)	(0.00)
Institutional Selectivity (Reference: Nonselective)				
Less Selective	-0.064	0.326	-0.063	0.327
	(0.09)	(0.39)	(0.09)	(0.39)
Selective	-0.169 [*]	0.363	-0.168 [*]	0.367
	(0.07)	(0.33)	(0.07)	(0.33)
Most Selective	-0.171 ⁺	-0.014	-0.169 ⁺	-0.007
	(0.09)	(0.38)	(0.09)	(0.38)
Private Control	-0.151 [*]	-0.315	-0.150 [*]	-0.313
	(0.07)	(0.24)	(0.07)	(0.24)
2-Year or Less	-0.136 ⁺	0.354	-0.135 ⁺	0.360
	(0.08)	(0.36)	(0.08)	(0.36)
College GPA	0.003	-0.022	0.003	-0.024
	(0.04)	(0.12)	(0.04)	(0.12)
Entering Tuition & Fees	0.000 [*]	0.000	0.000 [*]	0.000
	(0.00)	(0.00)	(0.00)	(0.00)
Married	0.389 ^{***}	0.170	0.388 ^{***}	0.167
	(0.07)	(0.28)	(0.07)	(0.28)

Dependents	-0.242**	0.158	-0.242**	0.155
	(0.09)	(0.22)	(0.09)	(0.22)
Constant	9.850***	10.340***	9.861***	10.345***
	(0.48)	(1.74)	(0.48)	(1.75)
Observations	2010	2010	2010	2010

Note: Models run solely for students with a prior income above the 50th percentile and up to and including the 75th percentile. Standard errors in parentheses. + = $p < 0.10$; * = $p < 0.05$; ** = $p < .01$; *** = $p < .001$. Observations are rounded due to NCES guidelines.

Table A125

*Results of OLS Reduced Form, Dependent Variable: Salary (Full Model)**Subpopulation: Mid- to High-Income*

	Loan		Federal Loan	
	2009	2012	2009	2012
Change in Average Tuition and Fees	497.68	2,877.00	497.68	2,877.00
	(1,539.05)	(1,978.01)	(1,539.05)	(1,978.01)
Father's Education	-4,773.63	16,859.15	-4,773.63	16,859.15
	(10,928.67)	(13,790.10)	(10,928.67)	(13,790.10)
Change in Average Tuition and Fees * Father's Education	1,043.26	-2,539.38	1,043.26	-2,539.38
	(1,545.64)	(2,021.85)	(1,545.64)	(2,021.85)
Age	804.01	-1,346.77	804.01	-1,346.77
	(624.68)	(991.55)	(624.68)	(991.55)
Female	-4,343.15***	-7,938.52***	-4,343.15***	-7,938.52***
	(792.50)	(1,151.81)	(792.50)	(1,151.81)
Race/Ethnicity (Reference: White)				
African American	-1,246.07	-1,707.90	-1,246.07	-1,707.90
	(1,763.83)	(2,573.27)	(1,763.83)	(2,573.27)
Latino	-576.39	1,164.15	-576.39	1,164.15
	(1,554.70)	(2,665.67)	(1,554.70)	(2,665.67)
Asian	2,414.51	5,664.63 ⁺	2,414.51	5,664.63 ⁺
	(2,213.30)	(3,369.96)	(2,213.30)	(3,369.96)
Other Race	1,468.70	-678.91	1,468.70	-678.91
	(2,813.56)	(3,485.24)	(2,813.56)	(3,485.24)
Entrance Examination (in SAT)	0.31	10.75**	0.31	10.75**
	(2.59)	(3.84)	(2.59)	(3.84)
Institutional Selectivity (Reference: Nonselective)				
Less Selective	-1,063.90	866.26	-1,063.90	866.26
	(2,200.75)	(3,092.96)	(2,200.75)	(3,092.96)
Selective	-4,396.79*	-401.42	-4,396.79*	-401.42
	(1,734.77)	(2,393.39)	(1,734.77)	(2,393.39)
Most Selective	-3,096.56	-980.04	-3,096.56	-980.04
	(2,153.19)	(3,060.72)	(2,153.19)	(3,060.72)
Private Control	-4,133.03**	-6,297.75**	-4,133.03**	-6,297.75**
	(1,543.50)	(2,442.21)	(1,543.50)	(2,442.21)
2-Year or Less	-2,333.31	1,791.71	-2,333.31	1,791.71
	(1,945.56)	(2,759.16)	(1,945.56)	(2,759.16)

College GPA	793.38 (838.76)	282.12 (1,213.83)	793.38 (838.76)	282.12 (1,213.83)
Entering Tuition & Fees	0.13 (0.10)	0.34* (0.15)	0.13 (0.10)	0.34* (0.15)
Married	10,517.80*** (2,395.20)	8,416.37* (3,374.23)	10,517.80*** (2,395.20)	8,416.37* (3,374.23)
Dependents	-7,355.55** (2,313.11)	-3,803.02 (2,868.06)	-7,355.55** (2,313.11)	-3,803.02 (2,868.06)
Constant	11,909.75 (16,662.62)	34,853.27 (23,273.25)	11,909.75 (16,662.62)	34,853.27 (23,273.25)
Observations	2010	2010	2010	2010

Note: Reduced form model of the IV model for undergraduate debt's effect on early-career occupation salary. Models run solely for students with a prior income above the 50th percentile and up to and including the 75th percentile. Standard errors in parentheses. + = $p < 0.10$; * = $p < 0.05$; ** = $p < .01$; *** = $p < .001$. Observations are rounded due to NCES guidelines.

Table A126

*Results of Two-Stage Least Squares, Dependent Variable: Salary
First Stage Full Model; Subpopulation: Mid- to High-Income*

	Loan		Federal Loan	
	2009	2012	2009	2012
Change in Average Tuition and Fees	0.44	0.44	0.36	0.36
	(0.41)	(0.41)	(0.40)	(0.40)
Father's Education	-2.18	-2.18	-2.58	-2.58
	(2.97)	(2.97)	(2.85)	(2.85)
Change in Average Tuition and Fees * Father's Education	0.13	0.13	0.20	0.20
	(0.42)	(0.42)	(0.40)	(0.40)
Age	-0.10	-0.10	-0.17	-0.17
	(0.20)	(0.20)	(0.19)	(0.19)
Female	0.20	0.20	0.24	0.24
	(0.21)	(0.21)	(0.21)	(0.21)
Race/Ethnicity (Reference: White)				
African American	0.14	0.14	-0.16	-0.16
	(0.44)	(0.44)	(0.46)	(0.46)
Latino	-0.15	-0.15	-0.23	-0.23
	(0.41)	(0.41)	(0.42)	(0.42)
Asian	-0.58	-0.58	-0.39	-0.39
	(0.54)	(0.54)	(0.53)	(0.53)
Other Race	-0.44	-0.44	-0.36	-0.36
	(0.59)	(0.59)	(0.58)	(0.58)
Entrance Examination (in SAT)	-0.00**	-0.00**	-0.00*	-0.00*
	(0.00)	(0.00)	(0.00)	(0.00)
Institutional Selectivity (Reference: Nonselective)				
Less Selective	1.07+	1.07+	1.07+	1.07+
	(0.63)	(0.63)	(0.62)	(0.62)
Selective	0.98+	0.98+	0.83+	0.83+
	(0.51)	(0.51)	(0.49)	(0.49)
Most Selective	0.78	0.78	0.47	0.47
	(0.61)	(0.61)	(0.60)	(0.60)
Private Control	1.12*	1.12*	1.09*	1.09*
	(0.47)	(0.47)	(0.47)	(0.47)
2-Year or Less	1.78**	1.78**	1.54**	1.54**
	(0.57)	(0.57)	(0.55)	(0.55)

College GPA	-0.54*	-0.54*	-0.48*	-0.48*
	(0.24)	(0.24)	(0.24)	(0.24)
Entering Tuition & Fees	-0.00	-0.00	-0.00	-0.00
	(0.00)	(0.00)	(0.00)	(0.00)
Married	-0.59	-0.59	-0.45	-0.45
	(0.61)	(0.61)	(0.60)	(0.60)
Dependents	0.57	0.57	0.75	0.75
	(0.51)	(0.51)	(0.50)	(0.50)
Constant	10.11*	10.11*	11.07*	11.07*
	(4.89)	(4.89)	(4.77)	(4.77)
Observations	2010	2010	2010	2010
Wu-Hausman (<i>p</i> -value)	2.44 (0.118)	4.69 (0.030)	2.82 (0.093)	4.74 (0.030)
Minimum eigenvalue	8.57	8.57	8.23	8.23
<i>F</i> -bias crit, <i>F</i> -size crit	13.91, 22.3	13.91, 22.3	13.91, 22.3	13.91, 22.3
Sargan (<i>p</i> -value)	11.09 (0.004)	0.04 (0.981)	4.74 (0.030)	0.05 (0.974)

Note: Excluded instruments: change in average tuition and fees, father's education, and change in average tuition and fees interacted with father's education. Models run solely for students with a prior income above the 50th percentile and up to and including the 75th percentile. Standard errors in parentheses. + = $p < 0.10$; * = $p < 0.05$; ** = $p < .01$; *** = $p < .001$. Observations are rounded due to NCES guidelines.

Table A127

*Results of Two-Stage Least Squares, Dependent Variable: Salary
Second Stage Full Model; Subpopulation: Mid- to High-Income*

	Loan		Federal Loan	
	2009	2012	2009	2012
Cumulative Loans (Log)	0.05	0.23⁺	0.06	0.24
	(0.04)	(0.14)	(0.04)	(0.14)
Age	0.04	-0.05	0.04	-0.03
	(0.03)	(0.10)	(0.03)	(0.11)
Female	-0.16 ^{***}	-0.34 ^{**}	-0.16 ^{***}	-0.35 ^{**}
	(0.03)	(0.11)	(0.03)	(0.11)
Race/Ethnicity (Reference: White)				
African American	-0.07	-0.34	-0.05	-0.27
	(0.08)	(0.29)	(0.08)	(0.30)
Latino	-0.07	-0.12	-0.06	-0.10
	(0.08)	(0.26)	(0.08)	(0.26)
Asian	0.08	0.02	0.08	-0.03
	(0.09)	(0.31)	(0.09)	(0.31)
Other Race	-0.04	0.11	-0.04	0.09
	(0.12)	(0.28)	(0.12)	(0.29)
Entrance Examination (in SAT)	0.00	0.00 ^{***}	0.00	0.00 ^{***}
	(0.00)	(0.00)	(0.00)	(0.00)
Institutional Selectivity (Reference: Nonselective)				
Less Selective	-0.12	0.10	-0.12	0.09
	(0.10)	(0.42)	(0.10)	(0.43)
Selective	-0.22 ^{**}	0.15	-0.21 ^{**}	0.18
	(0.08)	(0.36)	(0.08)	(0.35)
Most Selective	-0.21 [*]	-0.18	-0.19 [*]	-0.11
	(0.10)	(0.41)	(0.10)	(0.41)
Private Control	-0.21 ^{**}	-0.59 ⁺	-0.22 ^{**}	-0.59 ⁺
	(0.08)	(0.34)	(0.08)	(0.34)
2-Year or Less	-0.21 [*]	0.05	-0.20 [*]	0.09
	(0.09)	(0.40)	(0.09)	(0.39)
College GPA	0.03	0.10	0.03	0.09
	(0.04)	(0.15)	(0.04)	(0.15)
Entering Tuition & Fees	0.00 ⁺	0.00	0.00 ⁺	0.00
	(0.00)	(0.00)	(0.00)	(0.00)
Married	0.40 ^{***}	0.22	0.40 ^{***}	0.19
	(0.08)	(0.29)	(0.08)	(0.29)

Dependents	-0.28** (0.10)	0.01 (0.26)	-0.29** (0.10)	-0.04 (0.27)
Constant	9.17*** (0.70)	7.34** (2.59)	9.08*** (0.72)	7.16** (2.69)
Observations	2010	2010	2010	2010
Wu-Hausman (<i>p</i> -value)	2.44 (0.118)	4.69 (0.030)	2.82 (0.093)	4.74 (0.030)
Minimum eigenvalue	8.57	8.57	8.23	8.23
<i>F</i> -bias crit, <i>F</i> -size crit	13.91, 22.3	13.91, 22.3	13.91, 22.3	13.91, 22.3
Sargan (<i>p</i> -value)	11.09 (0.004)	0.04 (0.981)	4.74 (0.030)	0.05 (0.974)

Note: Excluded instruments: change in average tuition and fees, father's education, and change in average tuition and fees interacted with father's education. Models run solely for students with a prior income above the 50th percentile and up to and including the 75th percentile. Standard errors in parentheses. + = $p < 0.10$; * = $p < 0.05$; ** = $p < .01$; *** = $p < .001$. Observations are rounded due to NCES guidelines.

Table A128

*Results of OLS, Dependent Variable: Salary (Full Model)**Subpopulation: High-Income*

	Loan		Federal Loan	
	2009	2012	2009	2012
Cumulative Loans Borrowed 2009 (Log)	-0.004	0.012	-0.004	0.013
	(0.00)	(0.01)	(0.00)	(0.01)
Age	0.009	-0.267 ⁺	0.009	-0.267 ⁺
	(0.03)	(0.15)	(0.03)	(0.15)
Female	-0.117 ^{***}	-0.184 ⁺	-0.117 ^{***}	-0.185 ⁺
	(0.04)	(0.10)	(0.04)	(0.10)
Race/Ethnicity (Reference: White)				
African American	-0.048	-0.655 ⁺	-0.048	-0.656 ⁺
	(0.10)	(0.38)	(0.10)	(0.38)
Latino	0.091	-0.206	0.091	-0.204
	(0.08)	(0.26)	(0.08)	(0.26)
Asian	0.057	-0.210	0.055	-0.206
	(0.11)	(0.26)	(0.11)	(0.25)
Other Race	0.085	-0.037	0.082	-0.029
	(0.09)	(0.26)	(0.08)	(0.26)
Entrance Examination (in SAT)	-0.000	0.001 [*]	-0.000	0.001 [*]
	(0.00)	(0.00)	(0.00)	(0.00)
Institutional Selectivity (Reference: Nonselective)				
Less Selective	0.065	0.526	0.065	0.528
	(0.12)	(0.34)	(0.12)	(0.34)
Selective	0.021	0.115	0.020	0.118
	(0.10)	(0.31)	(0.10)	(0.31)
Most Selective	0.174	0.446	0.173	0.450
	(0.11)	(0.33)	(0.11)	(0.33)
Private Control	0.016	0.197	0.016	0.199
	(0.06)	(0.21)	(0.06)	(0.21)
2-Year or Less	0.095	0.146	0.093	0.151
	(0.11)	(0.35)	(0.11)	(0.35)
College GPA	-0.021	-0.094	-0.021	-0.095
	(0.03)	(0.11)	(0.03)	(0.11)
Entering Tuition & Fees	0.000	-0.000	0.000	-0.000
	(0.00)	(0.00)	(0.00)	(0.00)
Married	0.618 ^{***}	1.097 ^{***}	0.616 ^{***}	1.101 ^{***}
	(0.13)	(0.28)	(0.13)	(0.29)

Dependents	0.004 (0.08)	-1.152 (0.83)	0.004 (0.08)	-1.149 (0.83)
Constant	10.200*** (0.53)	14.564*** (2.83)	10.200*** (0.53)	14.576*** (2.83)
Observations	2010	2010	2010	2010

Note: Models run solely for students with a prior income above the 75th percentile. Standard errors in parentheses. + = $p < 0.10$; * = $p < 0.05$; ** = $p < .01$; *** = $p < .001$. Observations are rounded due to NCES guidelines.

Table A129

Results of OLS Reduced Form, Dependent Variable: Salary (Full Model)
Subpopulation: High-Income

	Loan		Federal Loan	
	2009	2012	2009	2012
Change in Average Tuition and Fees	2,392.86	633.44	2,392.86	633.44
	(4,176.11)	(7,121.05)	(4,176.11)	(7,121.05)
Father's Education	14,212.96	-235.82	14,212.96	-235.82
	(30,967.77)	(52,463.35)	(30,967.77)	(52,463.35)
Change in Average Tuition and Fees * Father's Education	-1,185.75	-380.23	-1,185.75	-380.23
	(4,146.50)	(7,080.78)	(4,146.50)	(7,080.78)
Age	292.35	-2,306.25*	292.35	-2,306.25*
	(749.68)	(1,117.70)	(749.68)	(1,117.70)
Female	-4,769.16***	-8,531.66***	-4,769.16***	-8,531.66***
	(883.07)	(1,439.33)	(883.07)	(1,439.33)
Race/Ethnicity (Reference: White)				
African American	559.09	-4,303.97	559.09	-4,303.97
	(2,296.80)	(2,833.69)	(2,296.80)	(2,833.69)
Latino	3,919.00+	-13.09	3,919.00+	-13.09
	(2,068.02)	(2,865.91)	(2,068.02)	(2,865.91)
Asian	3,136.84	-870.34	3,136.84	-870.34
	(2,377.45)	(4,605.68)	(2,377.45)	(4,605.68)
Other Race	4,005.53	-505.81	4,005.53	-505.81
	(3,895.26)	(3,296.54)	(3,895.26)	(3,296.54)
Entrance Examination (in SAT)	-0.46	2.09	-0.46	2.09
	(2.75)	(4.12)	(2.75)	(4.12)
Institutional Selectivity (Reference: Nonselective)				
Less Selective	1,269.37	4,091.17	1,269.37	4,091.17
	(3,050.13)	(4,168.67)	(3,050.13)	(4,168.67)
Selective	202.33	654.49	202.33	654.49
	(2,525.09)	(3,824.38)	(2,525.09)	(3,824.38)
Most Selective	5,134.66+	7,314.89+	5,134.66+	7,314.89+
	(2,762.28)	(4,141.48)	(2,762.28)	(4,141.48)
Private Control	-2,051.56	-5,417.19*	-2,051.56	-5,417.19*
	(1,619.89)	(2,360.56)	(1,619.89)	(2,360.56)
2-year or Less	2,801.90	2,311.50	2,801.90	2,311.50
	(2,846.52)	(4,230.70)	(2,846.52)	(4,230.70)

College GPA	943.72 (862.95)	426.16 (1,429.73)	943.72 (862.95)	426.16 (1,429.73)
Entering Tuition & Fees	0.03 (0.10)	0.37* (0.16)	0.03 (0.10)	0.37* (0.16)
Married	21,752.20*** (6,140.81)	22,223.76** (7,041.74)	21,752.20*** (6,140.81)	22,223.76** (7,041.74)
Dependents	-1,653.92 (4,009.75)	-11,772.15+ (6,443.31)	-1,653.92 (4,009.75)	-11,772.15+ (6,443.31)
Constant	1,176.22 (35,836.21)	79,183.47 (58,787.31)	1,176.22 (35,836.21)	79,183.47 (58,787.31)
Observations	2010	2010	2010	2010

Note: Reduced form model of the IV model for undergraduate debt's effect on early-career occupation salary. Models run solely for students with a prior income above the 75th percentile. Standard errors in parentheses. + = $p < 0.10$; * = $p < 0.05$; ** = $p < .01$; *** = $p < .001$. Observations are rounded due to NCES guidelines.

Table A130

*Results of Two-Stage Least Squares, Dependent Variable: Salary
First Stage Full Model; Subpopulation: High-Income*

	Loan		Federal Loan	
	2009	2012	2009	2012
Change in Average Tuition and Fees	1.10	1.10	1.76*	1.76*
	(1.04)	(1.04)	(0.80)	(0.80)
Father's Education	7.39	7.39	13.06*	13.06*
	(7.68)	(7.68)	(5.63)	(5.63)
Change in Average tuition and Fees * Father's Education	-0.94	-0.94	-1.57*	-1.57*
	(1.03)	(1.03)	(0.79)	(0.79)
Age	-0.21	-0.21	-0.17	-0.17
	(0.21)	(0.21)	(0.20)	(0.20)
Female	0.05	0.05	0.13	0.13
	(0.23)	(0.23)	(0.22)	(0.22)
Race/Ethnicity (Reference: White)				
African American	0.71	0.71	0.81	0.81
	(0.64)	(0.64)	(0.61)	(0.61)
Latino	0.45	0.45	0.31	0.31
	(0.51)	(0.51)	(0.49)	(0.49)
Asian	-1.15 ⁺	-1.15 ⁺	-1.50 ^{**}	-1.50 ^{**}
	(0.62)	(0.62)	(0.57)	(0.57)
Other Race	0.98 ⁺	0.98 ⁺	0.36	0.36
	(0.57)	(0.57)	(0.57)	(0.57)
Entrance Examination (in SAT)	-0.00 ^{***}	-0.00 ^{***}	-0.00 ^{***}	-0.00 ^{***}
	(0.00)	(0.00)	(0.00)	(0.00)
Institutional Selectivity (Reference: Nonselective)				
Less Selective	1.89 [*]	1.89 [*]	1.74 [*]	1.74 [*]
	(0.83)	(0.83)	(0.81)	(0.81)
Selective	0.82	0.82	0.59	0.59
	(0.70)	(0.70)	(0.68)	(0.68)
Most Selective	-0.22	-0.22	-0.51	-0.51
	(0.76)	(0.76)	(0.74)	(0.74)
Private Control	1.01 [*]	1.01 [*]	0.80 ⁺	0.80 ⁺
	(0.44)	(0.44)	(0.42)	(0.42)
2-Year or Less	1.02	1.02	0.68	0.68
	(0.79)	(0.79)	(0.77)	(0.77)

College GPA	-0.30 (0.26)	-0.30 (0.26)	-0.26 (0.25)	-0.26 (0.25)
Entering Tuition & Fees	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)
Married	0.10 (1.21)	0.10 (1.21)	-0.17 (1.11)	-0.17 (1.11)
Dependents	2.26** (0.72)	2.26** (0.72)	2.20* (0.97)	2.20* (0.97)
Constant	4.91 (9.05)	4.91 (9.05)	-2.22 (7.26)	-2.22 (7.26)
Observations	2010	2010	2010	2010
Wu-Hausman (<i>p</i> -value)	12.34 (0.000)	0.12 (0.725)	12.02 (0.001)	0.002 (0.967)
Minimum eigenvalue	0.70	0.70	1.98	1.98
<i>F</i> -bias crit, <i>F</i> -size crit	13.91, 22.3	13.91, 22.3	13.91, 22.3	13.91, 22.3
Sargan (<i>p</i> -value)	0.12 (0.943)	2.10 (0.350)	0.44 (0.801)	2.38 (0.304)

Note: Excluded instruments: change in average tuition and fees, father's education, and change in average tuition and fees interacted with father's education. Models run solely for students with a prior income above the 75th percentile. Standard errors in parentheses. + = $p < 0.10$; * = $p < 0.05$; ** = $p < .01$; *** = $p < .001$. Observations are rounded due to NCES guidelines.

Table A131

*Results of Two-Stage Least Squares, Dependent Variable: Salary
Second Stage Full Model; Subpopulation: High-Income*

	Loan		Federal Loan	
	2009	2012	2009	2012
Cumulative Loans (Log)	0.36 (0.31)	0.11 (0.26)	0.22* (0.11)	0.01 (0.13)
Age	0.10 (0.11)	-0.24 (0.17)	0.06 (0.06)	-0.27+ (0.16)
Female	-0.13 (0.09)	-0.19+ (0.10)	-0.14* (0.06)	-0.18+ (0.10)
Race/Ethnicity (Reference: White)				
African American	-0.30 (0.34)	-0.72+ (0.44)	-0.22 (0.19)	-0.65+ (0.40)
Latino	-0.06 (0.24)	-0.25 (0.28)	0.03 (0.14)	-0.20 (0.26)
Asian	0.48 (0.45)	-0.09 (0.36)	0.39+ (0.23)	-0.22 (0.29)
Other Race	-0.27 (0.37)	-0.13 (0.36)	0.01 (0.16)	-0.03 (0.26)
Entrance Examination (in SAT)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)
Institutional Selectivity (Reference: Nonselective)				
Less Selective	-0.62 (0.68)	0.34 (0.56)	-0.32 (0.29)	0.54 (0.39)
Selective	-0.29 (0.38)	0.03 (0.36)	-0.11 (0.20)	0.12 (0.31)
Most Selective	0.26 (0.31)	0.47 (0.35)	0.29 (0.21)	0.45 (0.34)
Private Control	-0.37 (0.38)	0.09 (0.35)	-0.18 (0.15)	0.21 (0.23)
2-Year or Less	-0.21 (0.42)	0.06 (0.39)	-0.01 (0.22)	0.15 (0.34)
College GPA	0.09 (0.14)	-0.06 (0.12)	0.04 (0.07)	-0.10 (0.10)
Entering Tuition & Fees	-0.00 (0.00)	-0.00 (0.00)	-0.00 (0.00)	-0.00 (0.00)
Married	0.57 (0.46)	1.08*** (0.32)	0.66* (0.28)	1.10*** (0.28)

Dependents	-0.81 (0.75)	-1.37 (0.99)	-0.43 (0.34)	-1.14 (0.80)
Constant	5.10 (4.61)	13.18** (4.97)	7.33*** (1.72)	14.67*** (3.63)
Observations	2010	2010	2010	2010
Wu-Hausman (<i>p</i> -value)	12.34 (0.000)	0.12 (0.725)	12.02 (0.001)	0.002 (0.967)
Minimum eigenvalue	0.70	0.70	1.98	1.98
<i>F</i> -bias crit, <i>F</i> -size crit	13.91, 22.3	13.91, 22.3	13.91, 22.3	13.91, 22.3
Sargan (<i>p</i> -value)	0.12 (0.943)	2.10 (0.350)	0.44 (0.801)	2.38 (0.304)

Note: Excluded instrument: change in average tuition and fees, father's education, and change in average tuition and fees interacted with father's education. Models run solely for students with a prior income above the 75th percentile. Standard errors in parentheses. + = $p < 0.10$; * = $p < 0.05$; ** = $p < .01$; *** = $p < .001$. Observations are rounded due to NCES guidelines.

Table A132

Results of OLS, Dependent Variable: Graduate School Aspirations (Full Model)
State Fixed Effects

	Home State		Post-College State	
	Loan	Federal Loan	Loan	Federal Loan
Cumulative Loans Borrowed 2009 (Log)	0.005***	0.005***	0.004***	0.005***
	(0.001)	(0.001)	(0.001)	(0.001)
Female	0.073***	0.073***	0.072***	0.072***
	(0.010)	(0.010)	(0.010)	(0.010)
Race/Ethnicity (Reference: White)				
African American	0.128***	0.127***	0.129***	0.128***
	(0.018)	(0.018)	(0.018)	(0.018)
Latino	0.075***	0.075***	0.081***	0.081***
	(0.019)	(0.019)	(0.019)	(0.019)
Asian	0.101***	0.101***	0.110***	0.110***
	(0.021)	(0.021)	(0.021)	(0.021)
Other Race	0.055*	0.054*	0.057**	0.056*
	(0.022)	(0.022)	(0.022)	(0.022)
Prior Income	0.000***	0.000***	0.000***	0.000***
	(0.000)	(0.000)	(0.000)	(0.000)
Prior Income * Prior Income	-0.000**	-0.000**	-0.000*	-0.000*
	(0.000)	(0.000)	(0.000)	(0.000)
Entrance Examination (in SAT)	0.000***	0.000***	0.000***	0.000***
	(0.000)	(0.000)	(0.000)	(0.000)
Institutional Selectivity (Reference: Nonselective)				
Less Selective	0.009	0.008	0.002	0.001
	(0.034)	(0.034)	(0.036)	(0.036)
Selective	0.074**	0.073**	0.066*	0.065*
	(0.028)	(0.028)	(0.029)	(0.029)
Most Selective	0.079*	0.078*	0.065*	0.064+
	(0.032)	(0.032)	(0.033)	(0.033)
Private Control	-0.019	-0.020	-0.023	-0.024
	(0.020)	(0.020)	(0.022)	(0.022)
2-Year or Less	-0.132***	-0.132***	-0.137***	-0.137***
	(0.029)	(0.029)	(0.030)	(0.030)
College GPA	0.078***	0.078***	0.078***	0.078***
	(0.009)	(0.009)	(0.009)	(0.009)

Entering Tuition & Fees	0.000*	0.000*	0.000**	0.000**
	(0.000)	(0.000)	(0.000)	(0.000)
Married	0.012	0.011	0.012	0.011
	(0.056)	(0.056)	(0.057)	(0.057)
Dependents	-0.026	-0.025	-0.022	-0.021
	(0.023)	(0.023)	(0.023)	(0.023)
Constant	-0.009	-0.009	-0.002	-0.002
	(0.062)	(0.062)	(0.065)	(0.064)
Observations	8880	8880	8870	8870

Note: State fixed effects are included for either the legal residence (home state) or the post-college enrollment state (post-college state). The primary covariate of interest in the models is cumulative loans borrowed from 2003–2004 to 2008–2009 (loan) and cumulative federal loans borrowed over the same period (federal loan). Standard errors in parentheses. + = $p < 0.10$; * = $p < 0.05$; ** = $p < .01$; *** = $p < .001$. Observations are rounded due to NCES guidelines.

Table A133

*Results of OLS Reduced Form, Dependent Variable: Graduate School Aspirations (Full Model)
State Fixed Effects*

	Home State		Post-College State	
	Loan	Federal Loan	Loan	Federal Loan
Change in Average Tuition and Fees	-0.02	-0.02	-0.03⁺	-0.03⁺
	(0.02)	(0.02)	(0.02)	(0.02)
Mother's Education	-0.07	-0.07	-0.11	-0.11
	(0.14)	(0.14)	(0.14)	(0.14)
Change in Average Tuition and Fees * Mother's Education	0.01	0.01	0.02	0.02
	(0.02)	(0.02)	(0.02)	(0.02)
Female	0.07 ^{***}	0.07 ^{***}	0.07 ^{***}	0.07 ^{***}
	(0.01)	(0.01)	(0.01)	(0.01)
Race/Ethnicity (Reference: White)				
African American	0.13 ^{***}	0.13 ^{***}	0.13 ^{***}	0.13 ^{***}
	(0.02)	(0.02)	(0.02)	(0.02)
Latino	0.08 ^{***}	0.08 ^{***}	0.08 ^{***}	0.08 ^{***}
	(0.02)	(0.02)	(0.02)	(0.02)
Asian	0.10 ^{***}	0.10 ^{***}	0.11 ^{***}	0.11 ^{***}
	(0.02)	(0.02)	(0.02)	(0.02)
Other Race	0.06 [*]	0.06 [*]	0.06 ^{**}	0.06 ^{**}
	(0.02)	(0.02)	(0.02)	(0.02)
Prior Income	0.00 ^{**}	0.00 ^{**}	0.00 ^{**}	0.00 ^{**}
	(0.00)	(0.00)	(0.00)	(0.00)
Prior Income * Prior Income	-0.00 [*]	-0.00 [*]	-0.00 [*]	-0.00 [*]
	(0.00)	(0.00)	(0.00)	(0.00)
Entrance Examination (in SAT)	0.00 ^{***}	0.00 ^{***}	0.00 ^{***}	0.00 ^{***}
	(0.00)	(0.00)	(0.00)	(0.00)
Institutional Selectivity (Reference: Nonselective)				
Less Selective	0.02	0.02	0.01	0.01
	(0.03)	(0.03)	(0.04)	(0.04)
Selective	0.08 ^{**}	0.08 ^{**}	0.07 [*]	0.07 [*]
	(0.03)	(0.03)	(0.03)	(0.03)
Most Selective	0.08 [*]	0.08 [*]	0.06 ⁺	0.06 ⁺
	(0.03)	(0.03)	(0.03)	(0.03)

Private Control	-0.01 (0.02)	-0.01 (0.02)	-0.01 (0.02)	-0.01 (0.02)
2-Year or Less	-0.15*** (0.03)	-0.15*** (0.03)	-0.15*** (0.03)	-0.15*** (0.03)
College GPA	0.08*** (0.01)	0.08*** (0.01)	0.08*** (0.01)	0.08*** (0.01)
Entering Tuition & Fees	0.00** (0.00)	0.00** (0.00)	0.00** (0.00)	0.00** (0.00)
Married	0.01 (0.06)	0.01 (0.06)	0.01 (0.06)	0.01 (0.06)
Dependents	-0.03 (0.02)	-0.03 (0.02)	-0.02 (0.02)	-0.02 (0.02)
Constant	0.18 (0.15)	0.18 (0.15)	0.26 (0.16)	0.26 (0.16)
Observations	8880	8880	8870	8870

Note: State fixed effects are included for either the legal residence (home state) or the post-college enrollment state (post-college state). Reduced form equation for the IV model of undergraduate debt's effect on graduate aspirations. Standard errors in parentheses. + = $p < 0.10$; * = $p < 0.05$; ** = $p < .01$; *** = $p < .001$. Observations are rounded due to NCES guidelines.

Table A134

*Results of Two-Stage Least Squares, Dependent Variable: Graduate School Aspirations
First Stage Full Model; State Fixed Effects*

	Home State		Post-College State	
	Loan	Federal Loan	Loan	Federal Loan
Change in Average Tuition and Fees	0.96***	0.92***	1.00***	0.95***
	(0.17)	(0.17)	(0.19)	(0.18)
Mother's Education	4.25***	3.85**	4.48***	4.06**
	(1.24)	(1.20)	(1.31)	(1.27)
Change in Average Tuition and Fees * Mother's Education	-0.58***	-0.52**	-0.61***	-0.55**
	(0.17)	(0.16)	(0.18)	(0.17)
Female	0.12	0.11	0.13	0.12
	(0.10)	(0.09)	(0.10)	(0.09)
Race/Ethnicity (Reference: White)				
African American	1.42***	1.48***	1.32***	1.40***
	(0.16)	(0.16)	(0.16)	(0.16)
Latino	0.16	0.16	0.12	0.11
	(0.19)	(0.18)	(0.19)	(0.18)
Asian	-0.71**	-0.64**	-0.87***	-0.83***
	(0.24)	(0.23)	(0.24)	(0.23)
Other Race	-0.09	0.03	-0.15	-0.01
	(0.22)	(0.22)	(0.22)	(0.22)
Prior Income	-0.00***	-0.00***	-0.00***	-0.00***
	(0.00)	(0.00)	(0.00)	(0.00)
Prior Income * Prior Income	0.00*	0.00**	0.00*	0.00**
	(0.00)	(0.00)	(0.00)	(0.00)
Entrance Examination (in SAT)	-0.00*	-0.00*	-0.00*	-0.00*
	(0.00)	(0.00)	(0.00)	(0.00)
Institutional Selectivity (Reference: Nonselective)				
Less Selective	0.48	0.65*	0.43	0.61*
	(0.30)	(0.30)	(0.30)	(0.31)
Selective	0.15	0.35	0.17	0.36
	(0.25)	(0.26)	(0.25)	(0.26)
Most Selective	-0.64*	-0.47	-0.62*	-0.43
	(0.30)	(0.31)	(0.31)	(0.31)
Private Control	0.90***	1.02***	0.98***	1.07***

	(0.20)	(0.20)	(0.21)	(0.21)
2-Year or Less	-1.02***	-0.90***	-1.07***	-0.97***
	(0.27)	(0.27)	(0.27)	(0.27)
College GPA	-0.37***	-0.30***	-0.36***	-0.30***
	(0.09)	(0.09)	(0.09)	(0.09)
Entering Tuition & Fees	-0.00	-0.00+	-0.00	-0.00*
	(0.00)	(0.00)	(0.00)	(0.00)
Married	-0.03	0.17	-0.08	0.13
	(0.59)	(0.58)	(0.60)	(0.59)
Dependents	-0.47*	-0.57**	-0.48*	-0.59**
	(0.22)	(0.22)	(0.22)	(0.22)
Constant	1.48	1.03	1.29	0.83
	(1.40)	(1.37)	(1.48)	(1.45)
Observations	8880	8880	8870	8870
Wu-Hausman (<i>p</i> -value)	3.18 (0.075)	3.15 (0.076)	5.83 (0.016)	5.83 (0.016)
Minimum eigenvalue	12.30	12.85	11.69	12.35
<i>F</i> -bias crit, <i>F</i> -size crit	13.91, 22.3	13.91, 22.3	13.91, 22.3	13.91, 22.3
Sargan (<i>p</i> -value)	0.92 (0.631)	1.03 (0.560)	0.91 (0.635)	1.02 (0.601)

Note: State fixed effects are included for either the legal residence (home state) or the post-college enrollment state (post-college state). Excluded instruments: change in average tuition and fees, mother's education, and change in average tuition and fees interacted with mother's education. Standard errors in parentheses. + = $p < 0.10$; * = $p < 0.05$; ** = $p < .01$; *** = $p < .001$. Observations are rounded due to NCES guidelines.

Table A135

*Results of Two-Stage Least Squares, Dependent Variable: Graduate School Aspirations
Second Stage Full Model; State Fixed Effects*

	Home State		Post-College State	
	Loan	Federal Loan	Loan	Federal Loan
Cumulative Loans (Log)	-0.02	-0.02	-0.04⁺	-0.04⁺
	(0.02)	(0.02)	(0.02)	(0.02)
Female	0.08 ^{***}	0.08 ^{***}	0.08 ^{***}	0.08 ^{***}
	(0.01)	(0.01)	(0.01)	(0.01)
Race/Ethnicity (Reference: White)				
African American	0.17 ^{***}	0.17 ^{***}	0.18 ^{***}	0.18 ^{***}
	(0.03)	(0.03)	(0.03)	(0.03)
Latino	0.08 ^{***}	0.08 ^{***}	0.08 ^{***}	0.08 ^{***}
	(0.02)	(0.02)	(0.02)	(0.02)
Asian	0.08 ^{**}	0.08 ^{**}	0.07 ^{**}	0.07 ^{**}
	(0.03)	(0.02)	(0.03)	(0.03)
Other Race	0.05 [*]	0.06 [*]	0.05 [*]	0.06 [*]
	(0.02)	(0.02)	(0.02)	(0.02)
Prior Income	0.00	0.00	-0.00	-0.00
	(0.00)	(0.00)	(0.00)	(0.00)
Prior Income * Prior Income	-0.00 ⁺	-0.00	-0.00	-0.00
	(0.00)	(0.00)	(0.00)	(0.00)
Entrance Examination (in SAT)	0.00 ^{***}	0.00 ^{***}	0.00 ^{***}	0.00 ^{***}
	(0.00)	(0.00)	(0.00)	(0.00)
Institutional Selectivity (Reference: Nonselective)				
Less Selective	0.03	0.03	0.02	0.03
	(0.04)	(0.04)	(0.04)	(0.04)
Selective	0.08 ^{**}	0.09 ^{**}	0.08 [*]	0.08 ^{**}
	(0.03)	(0.03)	(0.03)	(0.03)
Most Selective	0.06 ⁺	0.07 ⁺	0.04	0.05
	(0.03)	(0.03)	(0.04)	(0.04)
Private Control	0.01	0.01	0.02	0.03
	(0.03)	(0.03)	(0.03)	(0.03)
2-Year or Less	-0.17 ^{***}	-0.17 ^{***}	-0.19 ^{***}	-0.19 ^{***}
	(0.04)	(0.04)	(0.04)	(0.04)
College GPA	0.07 ^{***}	0.07 ^{***}	0.06 ^{***}	0.07 ^{***}

	(0.01)	(0.01)	(0.01)	(0.01)
Entering Tuition & Fees	0.00**	0.00*	0.00**	0.00*
	(0.00)	(0.00)	(0.00)	(0.00)
Married	0.01	0.01	0.01	0.01
	(0.06)	(0.06)	(0.06)	(0.06)
Dependents	-0.04	-0.04	-0.04	-0.05 ⁺
	(0.03)	(0.03)	(0.03)	(0.03)
Constant	0.23	0.21	0.34*	0.31 ⁺
	(0.16)	(0.15)	(0.17)	(0.16)
Observations	8880	8880	8870	8870
Wu-Hausman (<i>p</i> -value)	3.18 (0.075)	3.15 (0.076)	5.83 (0.016)	5.83 (0.016)
Minimum eigenvalue	12.30	12.85	11.69	12.35
<i>F</i> -bias crit, <i>F</i> -size crit	13.91, 22.3	13.91, 22.3	13.91, 22.3	13.91, 22.3
Sargan (<i>p</i> -value)	0.92 (0.631)	1.03 (0.560)	0.91 (0.635)	1.02 (0.601)

Note: State fixed effects are included for either the legal residence (home state) or the post-college enrollment state (post-college state). Excluded instrument: change in average tuition and fees, mother's education, and change in average tuition and fees interacted with mother's education. Standard errors in parentheses. ⁺ = $p < 0.10$; * = $p < 0.05$; ** = $p < .01$; *** = $p < .001$. Observations are rounded due to NCES guidelines.

Table A136

Results of OLS, Dependent Variable: Graduate School Enrollment (Full Model)
Home State Fixed Effects

	Loan		Federal Loan	
	2009	2012	2009	2012
Cumulative Loans Borrowed 2009 (Log)	-0.003**	-0.002+	-0.003*	-0.002+
	(0.001)	(0.001)	(0.001)	(0.001)
Age	-0.017** (0.006)	-0.018** (0.006)	-0.017** (0.006)	-0.018** (0.006)
Female	0.008 (0.010)	0.024* (0.010)	0.008 (0.010)	0.024* (0.010)
Race/Ethnicity (Reference: White)				
African American	0.114*** (0.021)	0.182*** (0.021)	0.113*** (0.021)	0.182*** (0.021)
Latino	0.024 (0.019)	0.055** (0.020)	0.023 (0.020)	0.055** (0.020)
Asian	0.056** (0.020)	0.079*** (0.020)	0.056** (0.020)	0.079*** (0.020)
Other Race	0.032 (0.027)	0.041 (0.028)	0.031 (0.027)	0.040 (0.028)
Prior Income	-0.000 (0.000)	0.000 (0.000)	-0.000 (0.000)	0.000 (0.000)
Prior Income * Prior Income	-0.000 (0.000)	-0.000 (0.000)	-0.000 (0.000)	-0.000 (0.000)
Entrance Examination (in SAT)	0.000*** (0.000)	0.000*** (0.000)	0.000*** (0.000)	0.000*** (0.000)
Institutional Selectivity (Reference: Nonselective)				
Less Selective	0.025 (0.032)	-0.001 (0.034)	0.025 (0.032)	-0.001 (0.034)
Selective	0.059* (0.026)	0.039 (0.028)	0.059* (0.026)	0.039 (0.028)
Most Selective	0.067* (0.029)	0.073* (0.032)	0.067* (0.029)	0.073* (0.032)
Private Control	0.029 (0.020)	0.019 (0.021)	0.028 (0.020)	0.019 (0.021)

2-Year or Less	0.002 (0.028)	0.015 (0.030)	0.002 (0.028)	0.015 (0.030)
College GPA	0.184*** (0.011)	0.215*** (0.012)	0.185*** (0.011)	0.215*** (0.012)
Entering Tuition & Fees	-0.000 (0.000)	0.000 (0.000)	-0.000 (0.000)	0.000 (0.000)
Married	-0.068*** (0.018)	-0.080*** (0.019)	-0.068*** (0.018)	-0.080*** (0.019)
Dependents	0.006 (0.014)	0.025 (0.015)	0.006 (0.014)	0.025 (0.015)
Constant	-0.126 (0.133)	-0.108 (0.137)	-0.130 (0.133)	-0.107 (0.137)
Observations	9820	9820	9820	9820

Note: State fixed effects are included for the state of legal residence (home state). Standard errors in parentheses. + = $p < 0.10$; * = $p < 0.05$; ** = $p < .01$; *** = $p < .001$. Observations are rounded due to NCES guidelines.

Table A137

*Results of OLS Reduced Form, Dependent Variable: Graduate School Enrollment (Full Model)
Home State Fixed Effects*

	Loan		Federal Loan	
	2009	2012	2009	2012
Change in Average Tuition and Fees	-0.03*	-0.04*	-0.03*	-0.04*
	(0.01)	(0.01)	(0.01)	(0.01)
Father's Education	0.05	-0.02	0.05	-0.02
	(0.11)	(0.11)	(0.11)	(0.11)
Change in Average Tuition and Fees * Father's Education	-0.00	0.00	-0.00	0.00
	(0.01)	(0.02)	(0.01)	(0.02)
Age	-0.02**	-0.02***	-0.02**	-0.02***
	(0.01)	(0.01)	(0.01)	(0.01)
Female	0.00	0.02*	0.00	0.02*
	(0.01)	(0.01)	(0.01)	(0.01)
Race/Ethnicity (Reference: White)				
African American	0.11***	0.17***	0.11***	0.17***
	(0.02)	(0.02)	(0.02)	(0.02)
Latino	0.02	0.05*	0.02	0.05*
	(0.02)	(0.02)	(0.02)	(0.02)
Asian	0.06**	0.07***	0.06**	0.07***
	(0.02)	(0.02)	(0.02)	(0.02)
Other Race	0.03	0.04	0.03	0.04
	(0.03)	(0.03)	(0.03)	(0.03)
Prior Income	-0.00	0.00	-0.00	0.00
	(0.00)	(0.00)	(0.00)	(0.00)
Prior Income * Prior Income	0.00	-0.00	0.00	-0.00
	(0.00)	(0.00)	(0.00)	(0.00)
Entrance Examination (in SAT)	0.00***	0.00***	0.00***	0.00***
	(0.00)	(0.00)	(0.00)	(0.00)
Institutional Selectivity (Reference: Nonselective)				
Less Selective	0.03	0.00	0.03	0.00
	(0.03)	(0.03)	(0.03)	(0.03)
Selective	0.06*	0.04	0.06*	0.04

	(0.03)	(0.03)	(0.03)	(0.03)
Most Selective	0.07*	0.08*	0.07*	0.08*
	(0.03)	(0.03)	(0.03)	(0.03)
Private Control	0.04+	0.03	0.04+	0.03
	(0.02)	(0.02)	(0.02)	(0.02)
2-Year or Less	-0.02	-0.01	-0.02	-0.01
	(0.03)	(0.03)	(0.03)	(0.03)
College GPA	0.18***	0.21***	0.18***	0.21***
	(0.01)	(0.01)	(0.01)	(0.01)
Entering Tuition & Fees	0.00	0.00*	0.00	0.00*
	(0.00)	(0.00)	(0.00)	(0.00)
Married	-0.06***	-0.08***	-0.06***	-0.08***
	(0.02)	(0.02)	(0.02)	(0.02)
Dependents	0.01	0.03*	0.01	0.03*
	(0.01)	(0.02)	(0.01)	(0.02)
Constant	0.09	0.20	0.09	0.20
	(0.17)	(0.18)	(0.17)	(0.18)
Observations	9820	9820	9820	9820

Note: State fixed effects are included for the state of legal residence (home state). Reduced form model of the IV model for undergraduate debt's effect on graduate school enrollment. Standard errors in parentheses. + = $p < 0.10$; * = $p < 0.05$; ** = $p < .01$; *** = $p < .001$. Observations are rounded due to NCES guidelines.

Table A138

*Results of Two-Stage Least Squares, Dependent Variable: Graduate School Enrollment
First Stage Full Model; Home State Fixed Effects*

	Loan		Federal Loan	
	2009	2012	2009	2012
Change in Average Tuition and Fees	0.86***	0.86***	0.79***	0.79***
	(0.13)	(0.13)	(0.13)	(0.13)
Father's Education	2.91**	2.91**	2.51*	2.51*
	(0.98)	(0.98)	(0.98)	(0.98)
Change in Average Tuition and Fees * Father's Education	-0.43**	-0.43**	-0.38**	-0.38**
	(0.14)	(0.14)	(0.14)	(0.14)
Age	0.03	0.03	0.02	0.02
	(0.06)	(0.06)	(0.06)	(0.06)
Female	0.19*	0.19*	0.19*	0.19*
	(0.09)	(0.09)	(0.09)	(0.09)
Race/Ethnicity (Reference: White)				
African American	0.64***	0.64***	0.65***	0.65***
	(0.17)	(0.17)	(0.17)	(0.17)
Latino	0.13	0.13	-0.04	-0.04
	(0.18)	(0.18)	(0.18)	(0.18)
Asian	-0.67***	-0.67***	-0.70***	-0.70***
	(0.19)	(0.19)	(0.19)	(0.19)
Other Race	0.20	0.20	0.05	0.05
	(0.24)	(0.24)	(0.24)	(0.24)
Prior Income	-0.00***	-0.00***	-0.00***	-0.00***
	(0.00)	(0.00)	(0.00)	(0.00)
Prior Income * Prior Income	0.00***	0.00***	0.00***	0.00***
	(0.00)	(0.00)	(0.00)	(0.00)
Entrance Examination (in SAT)	-0.00***	-0.00***	-0.00***	-0.00***
	(0.00)	(0.00)	(0.00)	(0.00)
Institutional Selectivity (Reference: Nonselective)				
Less Selective	0.31	0.31	0.31	0.31
	(0.29)	(0.29)	(0.30)	(0.30)
Selective	0.33	0.33	0.31	0.31
	(0.24)	(0.24)	(0.25)	(0.25)
Most Selective	-0.21	-0.21	-0.28	-0.28

	(0.28)	(0.28)	(0.28)	(0.28)
Private Control	0.49*	0.49*	0.40*	0.40*
	(0.19)	(0.19)	(0.19)	(0.19)
2-Year or Less	0.98***	0.98***	0.88**	0.88**
	(0.26)	(0.26)	(0.27)	(0.27)
College GPA	-0.60***	-0.60***	-0.50***	-0.50***
	(0.11)	(0.11)	(0.10)	(0.10)
Entering Tuition & Fees	0.00	0.00	0.00	0.00
	(0.00)	(0.00)	(0.00)	(0.00)
Married	-0.32+	-0.32+	-0.39*	-0.39*
	(0.17)	(0.17)	(0.17)	(0.17)
Dependents	0.33**	0.33**	0.37**	0.37**
	(0.12)	(0.12)	(0.12)	(0.12)
Constant	4.04*	4.04*	4.02*	4.02*
	(1.58)	(1.58)	(1.59)	(1.59)
Observations	9820	9820	9820	9820
Wu-Hausman (<i>p</i> -value)	26.04 (0.000)	29.17 (0.000)	27.21 (0.000)	29.72 (0.000)
Minimum eigenvalue	30.44	30.44	28.33	28.33
<i>F</i> -bias crit, <i>F</i> -size crit	13.91, 22.3	13.91, 22.3	13.91, 22.3	13.91, 22.3
Sargan (<i>p</i> -value)	4.74 (0.094)	2.54 (0.282)	3.95 (0.139)	1.98 (0.372)

Note: State fixed effects are included for the state of legal residence (home state). Excluded instruments: change in average tuition and fees, father's education, and change in average tuition and fees interacted with father's education. Standard errors in parentheses. + = $p < 0.10$; * = $p < 0.05$; ** = $p < .01$; *** = $p < .001$. Observations are rounded due to NCES guidelines.

Table A139

*Results of Two-Stage Least Squares, Dependent Variable: Graduate School Enrollment
Second Stage Full Model; Home State Fixed Effects*

	Loan		Federal Loan	
	2009	2012	2009	2012
Cumulative Loans (Log)	-0.06*** (0.01)	-0.07*** (0.01)	-0.06*** (0.01)	-0.07*** (0.01)
Age	-0.02* (0.01)	-0.02** (0.01)	-0.02* (0.01)	-0.02** (0.01)
Female	0.02 (0.01)	0.03** (0.01)	0.02 (0.01)	0.03** (0.01)
Race/Ethnicity (Reference: White)				
African American	0.15*** (0.02)	0.22*** (0.03)	0.15*** (0.03)	0.22*** (0.03)
Latino	0.03 (0.02)	0.06* (0.02)	0.02 (0.02)	0.05* (0.02)
Asian	0.01 (0.02)	0.03 (0.03)	0.01 (0.03)	0.03 (0.03)
Other Race	0.04 (0.03)	0.05 (0.03)	0.03 (0.03)	0.04 (0.03)
Prior Income	-0.00*** (0.00)	-0.00** (0.00)	-0.00*** (0.00)	-0.00*** (0.00)
Prior Income * Prior Income	0.00+ (0.00)	0.00 (0.00)	0.00* (0.00)	0.00 (0.00)
Entrance Examination (in SAT)	0.00+ (0.00)	0.00* (0.00)	0.00+ (0.00)	0.00* (0.00)
Institutional Selectivity (Reference: Nonselective)				
Less Selective	0.05 (0.04)	0.02 (0.04)	0.05 (0.04)	0.02 (0.04)
Selective	0.08** (0.03)	0.07+ (0.03)	0.08** (0.03)	0.06+ (0.03)
Most Selective	0.06+ (0.03)	0.06 (0.04)	0.05 (0.03)	0.06 (0.04)
Private Control	0.06** (0.02)	0.06* (0.03)	0.06* (0.02)	0.05* (0.03)
2-Year or Less	0.04 (0.03)	0.06 (0.04)	0.04 (0.03)	0.06 (0.04)
College GPA	0.14*** (0.02)	0.17*** (0.02)	0.15*** (0.01)	0.18*** (0.02)

Entering Tuition & Fees	0.00 (0.00)	0.00* (0.00)	0.00 (0.00)	0.00* (0.00)
Married	-0.08*** (0.02)	-0.10*** (0.02)	-0.09*** (0.02)	-0.10*** (0.02)
Dependents	0.03+ (0.02)	0.05** (0.02)	0.03* (0.02)	0.06** (0.02)
Constant	0.51* (0.21)	0.59** (0.22)	0.51* (0.22)	0.59** (0.22)
Observations	9820	9820	9820	9820
Wu-Hausman (<i>p</i> -value)	26.04 (0.000)	29.17 (0.000)	27.21 (0.000)	29.72 (0.000)
Minimum eigenvalue	30.44	30.44	28.33	28.33
<i>F</i> -bias crit, <i>F</i> -size crit	13.91, 22.3	13.91, 22.3	13.91, 22.3	13.91, 22.3
Sargan (<i>p</i> -value)	4.74 (0.094)	2.54 (0.282)	3.95 (0.139)	1.98 (0.372)

Note: State fixed effects are included for the state of legal residence (home state). Excluded instrument: change in average tuition and fees, father's education, and change in average tuition and fees interacted with father's education. Standard errors in parentheses. + = $p < 0.10$; * = $p < 0.05$; ** = $p < .01$; *** = $p < .001$. Observations are rounded due to NCES guidelines.

Table A140

*Results of OLS, Dependent Variable: Graduate School Enrollment (Full Model)
Post-college State Fixed Effects*

	Loan		Federal Loan	
	2009	2012	2009	2012
Cumulative Loans Borrowed 2009 (Log)	-0.003**	-0.002+	-0.003**	-0.002*
	(0.001)	(0.001)	(0.001)	(0.001)
Age	-0.019** (0.006)	-0.019** (0.007)	-0.019** (0.006)	-0.019** (0.007)
Female	0.007 (0.010)	0.022* (0.010)	0.007 (0.010)	0.022* (0.010)
Race/Ethnicity (Reference: White)				
African American	0.120*** (0.021)	0.181*** (0.021)	0.120*** (0.021)	0.181*** (0.021)
Latino	0.031 (0.019)	0.062** (0.020)	0.030 (0.019)	0.062** (0.020)
Asian	0.055** (0.020)	0.080*** (0.020)	0.056** (0.020)	0.080*** (0.020)
Other Race	0.030 (0.027)	0.041 (0.028)	0.029 (0.027)	0.041 (0.028)
Prior Income	-0.000 (0.000)	0.000 (0.000)	-0.000 (0.000)	0.000 (0.000)
Prior Income * Prior Income	-0.000 (0.000)	-0.000 (0.000)	-0.000 (0.000)	-0.000 (0.000)
Entrance Examination (in SAT)	0.000*** (0.000)	0.000*** (0.000)	0.000*** (0.000)	0.000*** (0.000)
Institutional Selectivity (Reference: Nonselective)				
Less Selective	0.025 (0.032)	-0.009 (0.034)	0.024 (0.032)	-0.008 (0.034)
Selective	0.061* (0.026)	0.034 (0.028)	0.061* (0.026)	0.034 (0.028)
Most Selective	0.079** (0.029)	0.074* (0.031)	0.079** (0.029)	0.074* (0.031)
Private Control	0.036+ (0.020)	0.021 (0.020)	0.035+ (0.020)	0.021 (0.020)

2-Year or Less	0.008 (0.028)	0.015 (0.030)	0.007 (0.028)	0.015 (0.030)
College GPA	0.184*** (0.011)	0.215*** (0.012)	0.184*** (0.011)	0.215*** (0.012)
Entering Tuition & Fees	-0.000 (0.000)	0.000 (0.000)	-0.000 (0.000)	0.000 (0.000)
Married	-0.063*** (0.018)	-0.072*** (0.019)	-0.064*** (0.018)	-0.073*** (0.019)
Dependents	0.009 (0.014)	0.026+ (0.016)	0.009 (0.014)	0.027+ (0.016)
Constant	-0.110 (0.133)	-0.119 (0.138)	-0.116 (0.133)	-0.119 (0.138)
Observations	9820	9820	9820	9820

Note: State fixed effects are included for the post-college enrollment state. Standard errors in parentheses. + = $p < 0.10$; * = $p < 0.05$; ** = $p < .01$; *** = $p < .001$. Observations are rounded due to NCES guidelines.

Table A141

*Results of OLS Reduced Form, Dependent Variable: Graduate School Enrollment (Full Model)
Post-College State Fixed Effects*

	Loan		Federal Loan	
	2009	2012	2009	2012
Change in Average Tuition and Fees	-0.03*	-0.04**	-0.03*	-0.04**
	(0.01)	(0.01)	(0.01)	(0.01)
Father's Education	0.03	-0.03	0.03	-0.03
	(0.11)	(0.11)	(0.11)	(0.11)
Change in Average Tuition and Fees * Father's Education	-0.00	0.00	-0.00	0.00
	(0.01)	(0.02)	(0.01)	(0.02)
Age	-0.02***	-0.02***	-0.02***	-0.02***
	(0.01)	(0.01)	(0.01)	(0.01)
Female	0.00	0.02+	0.00	0.02+
	(0.01)	(0.01)	(0.01)	(0.01)
Race/Ethnicity (Reference: White)				
African American	0.11***	0.17***	0.11***	0.17***
	(0.02)	(0.02)	(0.02)	(0.02)
Latino	0.03	0.06**	0.03	0.06**
	(0.02)	(0.02)	(0.02)	(0.02)
Asian	0.06**	0.08***	0.06**	0.08***
	(0.02)	(0.02)	(0.02)	(0.02)
Other Race	0.03	0.04	0.03	0.04
	(0.03)	(0.03)	(0.03)	(0.03)
Prior Income	-0.00	0.00	-0.00	0.00
	(0.00)	(0.00)	(0.00)	(0.00)
Prior Income * Prior Income	0.00	-0.00	0.00	-0.00
	(0.00)	(0.00)	(0.00)	(0.00)
Entrance Examination (in SAT)	0.00***	0.00***	0.00***	0.00***
	(0.00)	(0.00)	(0.00)	(0.00)
Institutional Selectivity (Reference: Nonselective)				
Less Selective	0.03	-0.01	0.03	-0.01
	(0.03)	(0.03)	(0.03)	(0.03)
Selective	0.06*	0.04	0.06*	0.04

	(0.03)	(0.03)	(0.03)	(0.03)
Most Selective	0.08**	0.08*	0.08**	0.08*
	(0.03)	(0.03)	(0.03)	(0.03)
Private Control	0.04*	0.03	0.04*	0.03
	(0.02)	(0.02)	(0.02)	(0.02)
2-Year or Less	-0.01	-0.01	-0.01	-0.01
	(0.03)	(0.03)	(0.03)	(0.03)
College GPA	0.18***	0.21***	0.18***	0.21***
	(0.01)	(0.01)	(0.01)	(0.01)
Entering Tuition & Fees	0.00	0.00*	0.00	0.00*
	(0.00)	(0.00)	(0.00)	(0.00)
Married	-0.06**	-0.07***	-0.06**	-0.07***
	(0.02)	(0.02)	(0.02)	(0.02)
Dependents	0.02	0.03*	0.02	0.03*
	(0.01)	(0.02)	(0.01)	(0.02)
Constant	0.12	0.20	0.12	0.20
	(0.17)	(0.18)	(0.17)	(0.18)
Observations	9820	9820	9820	9820

Note: State fixed effects are included for the post-college enrollment state. Reduced form model of the IV model for undergraduate debt's effect on graduate school enrollment. Standard errors in parentheses. + = $p < 0.10$; * = $p < 0.05$; ** = $p < .01$; *** = $p < .001$. Observations are rounded due to NCES guidelines.

Table A142

*Results of Two-Stage Least Squares, Dependent Variable: Graduate School Enrollment
First Stage Full Model; Post-College State Fixed Effects*

	Loan		Federal Loan	
	2009	2012	2009	2012
Change in Average Tuition and Fees	0.83***	0.83***	0.77***	0.77***
	(0.13)	(0.13)	(0.13)	(0.13)
Father's Education	2.78**	2.78**	2.41*	2.41*
	(0.98)	(0.98)	(0.98)	(0.98)
Change in Average Tuition and Fees * Father's Education	-0.41**	-0.41**	-0.36**	-0.36**
	(0.13)	(0.13)	(0.14)	(0.14)
Age	0.02	0.02	0.01	0.01
	(0.06)	(0.06)	(0.06)	(0.06)
Female	0.19*	0.19*	0.19*	0.19*
	(0.09)	(0.09)	(0.09)	(0.09)
Race/Ethnicity (Reference: White)				
African American	0.59***	0.59***	0.60***	0.60***
	(0.17)	(0.17)	(0.17)	(0.17)
Latino	0.09	0.09	-0.08	-0.08
	(0.18)	(0.18)	(0.18)	(0.18)
Asian	-0.72***	-0.72***	-0.75***	-0.75***
	(0.19)	(0.19)	(0.19)	(0.19)
Other Race	0.16	0.16	0.02	0.02
	(0.23)	(0.23)	(0.23)	(0.23)
Prior Income	-0.00***	-0.00***	-0.00***	-0.00***
	(0.00)	(0.00)	(0.00)	(0.00)
Prior Income * Prior Income	0.00***	0.00***	0.00***	0.00***
	(0.00)	(0.00)	(0.00)	(0.00)
Entrance Examination (in SAT)	-0.00***	-0.00***	-0.00***	-0.00***
	(0.00)	(0.00)	(0.00)	(0.00)
Institutional Selectivity (Reference: Nonselective)				
Less Selective	0.35	0.35	0.37	0.37
	(0.29)	(0.29)	(0.30)	(0.30)
Selective	0.33	0.33	0.33	0.33
	(0.24)	(0.24)	(0.25)	(0.25)
Most Selective	-0.27	-0.27	-0.32	-0.32

	(0.28)	(0.28)	(0.28)	(0.28)
Private Control	0.30	0.30	0.22	0.22
	(0.19)	(0.19)	(0.19)	(0.19)
2-Year or Less	1.00***	1.00***	0.91***	0.91***
	(0.26)	(0.26)	(0.27)	(0.27)
College GPA	-0.57***	-0.57***	-0.47***	-0.47***
	(0.10)	(0.10)	(0.10)	(0.10)
Entering Tuition & Fees	0.00+	0.00+	0.00+	0.00+
	(0.00)	(0.00)	(0.00)	(0.00)
Married	-0.43*	-0.43*	-0.50**	-0.50**
	(0.17)	(0.17)	(0.17)	(0.17)
Dependents	0.31*	0.31*	0.34**	0.34**
	(0.12)	(0.12)	(0.13)	(0.13)
Constant	4.76**	4.76**	4.62**	4.62**
	(1.56)	(1.56)	(1.58)	(1.58)
Observations	9820	9820	9820	9820
Wu-Hausman (<i>p</i> -value)	27.57 (0.000)	31.88 (0.000)	28.64 (0.000)	32.28 (0.000)
Minimum eigenvalue	30.06	30.06	28.64	27.62
<i>F</i> -bias crit, <i>F</i> -size crit	13.91, 22.3	13.91, 22.3	13.91, 22.3	13.91, 22.3
Sargan (<i>p</i> -value)	4.10 (0.128)	2.13 (0.344)	3.44 (0.180)	1.67 (0.434)

Note: State fixed effects are included for the post-college enrollment state. Excluded instruments: change in average tuition and fees, father's education, and change in average tuition and fees interacted with father's education. Standard errors in parentheses. + = $p < 0.10$; * = $p < 0.05$; ** = $p < .01$; *** = $p < .001$. Observations are rounded due to NCES guidelines.

Table A143

*Results of Two-Stage Least Squares, Dependent Variable: Graduate School Enrollment
Second Stage Full Model; Post-College State Fixed Effects*

	Loan		Federal Loan	
	2009	2012	2009	2012
Cumulative Loans (Log)	-0.06*** (0.01)	-0.07*** (0.01)	-0.07*** (0.01)	-0.07*** (0.02)
Age	-0.02* (0.01)	-0.02** (0.01)	-0.02* (0.01)	-0.02** (0.01)
Female	0.02 (0.01)	0.03** (0.01)	0.02 (0.01)	0.03** (0.01)
Race/Ethnicity (Reference: White)				
African American	0.15*** (0.02)	0.22*** (0.03)	0.15*** (0.03)	0.22*** (0.03)
Latino	0.03 (0.02)	0.06* (0.02)	0.02 (0.02)	0.05* (0.02)
Asian	0.01 (0.02)	0.03 (0.03)	0.00 (0.03)	0.02 (0.03)
Other Race	0.04 (0.03)	0.05 (0.03)	0.03 (0.03)	0.04 (0.03)
Prior Income	-0.00*** (0.00)	-0.00** (0.00)	-0.00*** (0.00)	-0.00*** (0.00)
Prior Income * Prior Income	0.00* (0.00)	0.00 (0.00)	0.00* (0.00)	0.00 (0.00)
Entrance Examination (in SAT)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)
Institutional Selectivity (Reference: Nonselective)				
Less Selective	0.05 (0.04)	0.02 (0.04)	0.05 (0.04)	0.02 (0.04)
Selective	0.09** (0.03)	0.06+ (0.03)	0.09** (0.03)	0.06+ (0.04)
Most Selective	0.06+ (0.03)	0.06 (0.04)	0.06+ (0.03)	0.05 (0.04)
Private Control	0.06** (0.02)	0.05* (0.02)	0.06* (0.02)	0.04+ (0.02)
2-Year or Less	0.05 (0.03)	0.07+ (0.04)	0.05 (0.03)	0.06 (0.04)
College GPA	0.15*** (0.02)	0.17*** (0.02)	0.15*** (0.01)	0.18*** (0.02)

Entering Tuition & Fees	0.00 (0.00)	0.00** (0.00)	0.00 (0.00)	0.00** (0.00)
Married	-0.09*** (0.02)	-0.10*** (0.02)	-0.09*** (0.02)	-0.11*** (0.02)
Dependents	0.03* (0.02)	0.05** (0.02)	0.04* (0.02)	0.06** (0.02)
Constant	0.58** (0.22)	0.66** (0.23)	0.58** (0.22)	0.65** (0.23)
Observations	9820	9820	9820	9820
Wu-Hausman (<i>p</i> -value)	27.57 (0.000)	31.88 (0.000)	28.64 (0.000)	32.28 (0.000)
Minimum eigenvalue	30.06	30.06	28.64	27.62
<i>F</i> -bias crit, <i>F</i> -size crit	13.91, 22.3	13.91, 22.3	13.91, 22.3	13.91, 22.3
Sargan (<i>p</i> -value)	4.10 (0.128)	2.13 (0.344)	3.44 (0.180)	1.67 (0.434)

Note: State fixed effects are included for the post-college enrollment state. Excluded instrument: change in average tuition and fees, father's education, and change in average tuition and fees interacted with father's education. Standard errors in parentheses. + = $p < 0.10$; * = $p < 0.05$; ** = $p < .01$; *** = $p < .001$. Observations are rounded due to NCES guidelines.

Table A144

Results of OLS, Dependent Variable: Salary (Full Model)
Home State Fixed Effects

	Loan		Federal Loan	
	2009	2012	2009	2012
Cumulative Loans Borrowed 2009 (Log)	0.003	0.008	0.002	0.008
	(0.002)	(0.006)	(0.002)	(0.006)
Age	0.014 (0.011)	-0.044 (0.043)	0.014 (0.011)	-0.044 (0.043)
Female	-0.191*** (0.017)	-0.263*** (0.049)	-0.190*** (0.017)	-0.263*** (0.049)
Race/Ethnicity (Reference: White)				
African American	-0.069+ (0.036)	-0.491*** (0.137)	-0.068+ (0.036)	-0.491*** (0.137)
Latino	-0.008 (0.034)	-0.154 (0.116)	-0.007 (0.034)	-0.153 (0.116)
Asian	0.001 (0.041)	-0.453** (0.145)	0.000 (0.041)	-0.454** (0.145)
Other Race	-0.024 (0.046)	-0.111 (0.123)	-0.023 (0.046)	-0.111 (0.123)
Prior Income	-0.000 (0.000)	-0.000 (0.000)	-0.000 (0.000)	-0.000 (0.000)
Prior Income * Prior Income	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)
Entrance Examination (in SAT)	-0.000 (0.000)	0.001*** (0.000)	-0.000 (0.000)	0.001*** (0.000)
Institutional Selectivity (Reference: Nonselective)				
Less Selective	-0.043 (0.05)	0.135 (0.16)	-0.042 (0.05)	0.135 (0.16)
Selective	-0.047 (0.043)	-0.007 (0.141)	-0.046 (0.043)	-0.006 (0.141)
Most Selective	0.067 (0.051)	0.142 (0.156)	0.067 (0.051)	0.142 (0.156)
Private Control	-0.067* (0.033)	-0.082 (0.097)	-0.066* (0.033)	-0.081 (0.097)

2-Year or Less	-0.070 (0.046)	-0.069 (0.155)	-0.069 (0.046)	-0.068 (0.155)
College GPA	-0.011 (0.018)	-0.007 (0.054)	-0.012 (0.018)	-0.008 (0.054)
Entering Tuition & Fees	0.000 (0.000)	-0.000 (0.000)	0.000 (0.000)	-0.000 (0.000)
Married	0.114*** (0.029)	0.060 (0.086)	0.113*** (0.029)	0.061 (0.086)
Dependents	0.061** (0.024)	0.043 (0.078)	0.061** (0.024)	0.043 (0.078)
Constant	10.135*** (0.228)	10.356*** (0.858)	10.152*** (0.228)	10.367*** (0.858)
Observations	8030	8030	8030	8030

Note: State fixed effects are included for the state of legal residence (home state). Standard errors in parentheses. + = $p < 0.10$; * = $p < 0.05$; ** = $p < .01$; *** = $p < .001$. Observations are rounded due to NCES guidelines.

Table A145

Results of OLS Reduced Form, Dependent Variable: Salary (Full Model)
Home State Fixed Effects

	Loan		Federal Loan	
	2009	2012	2009	2012
Change in Average Tuition and Fees	1,412.11*	1,355.67	1,412.11*	1,355.67
	(593.07)	(1,021.55)	(593.07)	(1,021.55)
Father's Education	-524.43	5,046.16	-524.43	5,046.16
	(4,318.05)	(7,310.05)	(4,318.05)	(7,310.05)
Change in Average Tuition and Fees * Father's Education	35.62	-893.74	35.62	-893.74
	(603.10)	(1,027.83)	(603.10)	(1,027.83)
Age	478.70	469.77	478.70	469.77
	(292.11)	(476.72)	(292.11)	(476.72)
Female	-6,161.86***	-10,173.16***	-6,161.86***	-10,173.16***
	(423.74)	(646.86)	(423.74)	(646.86)
Race/Ethnicity (Reference: White)				
African American	-550.09	-2,523.87*	-550.09	-2,523.87*
	(800.11)	(1,186.59)	(800.11)	(1,186.59)
Latino	512.64	63.87	512.64	63.87
	(826.99)	(1,297.42)	(826.99)	(1,297.42)
Asian	1,902.84+	2,344.34	1,902.84+	2,344.34
	(1,043.17)	(1,675.66)	(1,043.17)	(1,675.66)
Other Race	574.95	-2,036.86	574.95	-2,036.86
	(1,362.30)	(1,619.17)	(1,362.30)	(1,619.17)
Prior Income	-0.00	-0.02	-0.00	-0.02
	(0.01)	(0.02)	(0.01)	(0.02)
Prior Income * Prior Income	0.00	0.00+	0.00	0.00+
	(0.00)	(0.00)	(0.00)	(0.00)
Entrance Examination (in SAT)	1.45	7.95***	1.45	7.95***
	(1.30)	(2.00)	(1.30)	(2.00)
Institutional Selectivity (Reference: Nonselective)				
Less Selective	-1,668.90	-1,290.15	-1,668.90	-1,290.15
	(1,229.55)	(1,693.86)	(1,229.55)	(1,693.86)
Selective	-1,371.78	-809.20	-1,371.78	-809.20

	(1,035.41)	(1,468.00)	(1,035.41)	(1,468.00)
Most Selective	2,552.55*	3,115.89+	2,552.55*	3,115.89+
	(1,238.86)	(1,752.65)	(1,238.86)	(1,752.65)
Private Control	-2,539.03**	-4,956.40***	-2,539.03**	-4,956.40***
	(889.00)	(1,318.51)	(889.00)	(1,318.51)
2-Year or Less	-1,056.97	-1,146.27	-1,056.97	-1,146.27
	(1,127.79)	(1,604.02)	(1,127.79)	(1,604.02)
College GPA	1,198.11**	2,021.06**	1,198.11**	2,021.06**
	(438.55)	(658.33)	(438.55)	(658.33)
Entering Tuition & Fees	-0.07	0.15+	-0.07	0.15+
	(0.06)	(0.09)	(0.06)	(0.09)
Married	2,531.07***	2,228.67*	2,531.07***	2,228.67*
	(735.10)	(1,100.12)	(735.10)	(1,100.12)
Dependents	1,694.37**	2,248.11	1,694.37**	2,248.11
	(622.53)	(1,427.49)	(622.53)	(1,427.49)
Constant	13,360.56+	17,709.02	13,360.56+	17,709.02
	(7,532.21)	(12,064.89)	(7,532.21)	(12,064.89)
Observations	8030	8030	8030	8030

Note: State fixed effects are included for the state of legal residence (home state). Reduced form model of the IV model for undergraduate debt's effect on early-career occupation salary. Standard errors in parentheses. + = $p < 0.10$; * = $p < 0.05$; ** = $p < .01$; *** = $p < .001$. Observations are rounded due to NCES guidelines.

Table A146

*Results of Two-Stage Least Squares, Dependent Variable: Salary
First Stage Full Model; Home State Fixed Effect*

	Loan		Federal Loan	
	2009	2012	2009	2012
Change in Average Tuition and Fees	0.86***	0.86***	0.80***	0.80***
	(0.17)	(0.17)	(0.17)	(0.17)
Father's Education	3.13*	3.13*	2.76*	2.76*
	(1.23)	(1.23)	(1.23)	(1.23)
Change in Average Tuition and Fees * Father's Education	-0.46**	-0.46**	-0.41*	-0.41*
	(0.17)	(0.17)	(0.17)	(0.17)
Age	0.02	0.02	0.01	0.01
	(0.07)	(0.07)	(0.07)	(0.07)
Female	0.22*	0.22*	0.24*	0.24*
	(0.10)	(0.10)	(0.10)	(0.10)
Race/Ethnicity (Reference: White)				
African American	0.72***	0.72***	0.73***	0.73***
	(0.19)	(0.19)	(0.20)	(0.20)
Latino	0.26	0.26	0.08	0.08
	(0.20)	(0.20)	(0.20)	(0.20)
Asian	-0.59**	-0.59**	-0.61**	-0.61**
	(0.23)	(0.23)	(0.23)	(0.23)
Other Race	0.14	0.14	0.07	0.07
	(0.26)	(0.26)	(0.26)	(0.26)
Prior Income	-0.00***	-0.00***	-0.00***	-0.00***
	(0.00)	(0.00)	(0.00)	(0.00)
Prior Income * Prior Income	0.00***	0.00***	0.00***	0.00***
	(0.00)	(0.00)	(0.00)	(0.00)
Entrance Examination (in SAT)	-0.00***	-0.00***	-0.00***	-0.00***
	(0.00)	(0.00)	(0.00)	(0.00)
Institutional Selectivity (Reference: Nonselective)				
Less Selective	0.47	0.47	0.45	0.45
	(0.32)	(0.32)	(0.33)	(0.33)
Selective	0.43	0.43	0.38	0.38
	(0.27)	(0.27)	(0.28)	(0.28)
Most Selective	-0.15	-0.15	-0.23	-0.23

	(0.31)	(0.31)	(0.31)	(0.31)
Private Control	0.51*	0.51*	0.45*	0.45*
	(0.21)	(0.21)	(0.21)	(0.21)
2-Year or Less	1.04***	1.04***	0.93**	0.93**
	(0.29)	(0.29)	(0.30)	(0.30)
College GPA	-0.58***	-0.58***	-0.47***	-0.47***
	(0.12)	(0.12)	(0.12)	(0.12)
Entering Tuition & Fees	0.00	0.00	0.00	0.00
	(0.00)	(0.00)	(0.00)	(0.00)
Married	-0.26	-0.26	-0.30	-0.30
	(0.18)	(0.18)	(0.19)	(0.19)
Dependents	0.30*	0.30*	0.31*	0.31*
	(0.14)	(0.14)	(0.14)	(0.14)
Constant	3.79*	3.79*	3.64 ⁺	3.64 ⁺
	(1.88)	(1.88)	(1.90)	(1.90)
Observations	8030	8030	8030	8030
Wu-Hausman (<i>p</i> -value)	27.65 (0.000)	6.55 (0.010)	29.66 (0.000)	6.39 (0.011)
Minimum eigenvalue	21.97	21.97	20.75	20.75
<i>F</i> -bias crit, <i>F</i> -size crit	13.91, 22.3	13.91, 22.3	13.91, 22.3	13.91, 22.3
Sargan (<i>p</i> -value)	4.34 (0.114)	0.873 (0.646)	3.36 (0.186)	1.09 (0.581)

Note: State fixed effects are included for the state of legal residence (home state). Excluded instrument: change in average tuition and fees, father's education, and change in average tuition and fees interacted with father's education. Standard errors in parentheses. ⁺ = $p < 0.10$; * = $p < 0.05$; ** = $p < .01$; *** = $p < .001$. Observations are rounded due to NCES guidelines.

Table A147

*Results of Two-Stage Least Squares, Dependent Variable: Salary
Second Stage Full Model; Home State Fixed Effects*

	Loan		Federal Loan	
	2009	2012	2009	2012
Cumulative Loans (Log)	0.11*** (0.03)	0.16+ (0.09)	0.12*** (0.03)	0.17+ (0.09)
Age	0.02 (0.01)	-0.04 (0.04)	0.02 (0.01)	-0.04 (0.04)
Female	-0.21*** (0.02)	-0.29*** (0.05)	-0.21*** (0.02)	-0.29*** (0.05)
Race/Ethnicity (Reference: White)				
African American	-0.14** (0.04)	-0.59*** (0.15)	-0.14** (0.05)	-0.59*** (0.15)
Latino	-0.03 (0.04)	-0.19 (0.12)	-0.01 (0.04)	-0.16 (0.12)
Asian	0.07 (0.05)	-0.35* (0.16)	0.08 (0.05)	-0.34* (0.16)
Other Race	-0.03 (0.05)	-0.12 (0.13)	-0.02 (0.05)	-0.11 (0.13)
Prior Income	0.00*** (0.00)	0.00 (0.00)	0.00*** (0.00)	0.00 (0.00)
Prior Income * Prior Income	-0.00 (0.00)	-0.00 (0.00)	-0.00+ (0.00)	-0.00 (0.00)
Entrance Examination (in SAT)	0.00 (0.00)	0.00*** (0.00)	0.00 (0.00)	0.00*** (0.00)
Institutional Selectivity (Reference: Nonselective)				
Less Selective	-0.10 (0.06)	0.05 (0.17)	-0.10 (0.06)	0.05 (0.18)
Selective	-0.10+ (0.05)	-0.09 (0.15)	-0.10+ (0.05)	-0.08 (0.15)
Most Selective	0.08 (0.06)	0.16 (0.16)	0.09 (0.06)	0.17 (0.16)
Private Control	-0.13** (0.04)	-0.18 (0.12)	-0.13** (0.04)	-0.17 (0.11)
2-Year or Less	-0.16** (0.06)	-0.19 (0.17)	-0.15* (0.06)	-0.18 (0.17)
College GPA	0.06* (0.03)	0.09 (0.08)	0.05+ (0.03)	0.08 (0.07)

Entering Tuition & Fees	-0.00 (0.00)	-0.00 ⁺ (0.00)	-0.00 (0.00)	-0.00 ⁺ (0.00)
Married	0.14 ^{***} (0.03)	0.10 (0.09)	0.14 ^{***} (0.04)	0.10 (0.09)
Dependents	0.02 (0.03)	-0.02 (0.09)	0.02 (0.03)	-0.02 (0.09)
Constant	9.00 ^{***} (0.39)	8.71 ^{***} (1.28)	9.01 ^{***} (0.39)	8.79 ^{***} (1.27)
Observations	8030	8030	8030	8030
Wu-Hausman (<i>p</i> -value)	27.65 (0.000)	6.55 (0.010)	29.66 (0.000)	6.39 (0.011)
Minimum eigenvalue	21.97	21.97	20.75	20.75
<i>F</i> -bias crit, <i>F</i> -size crit	13.91, 22.3	13.91, 22.3	13.91, 22.3	13.91, 22.3
Sargan (<i>p</i> -value)	4.34 (0.114)	0.873 (0.646)	3.36 (0.186)	1.09 (0.581)

Note: State fixed effects are included for the state of legal residence (home state). Excluded instrument: change in average tuition and fees, father's education, and change in average tuition and fees interacted with father's education. Standard errors in parentheses. ⁺ = $p < 0.10$; * = $p < 0.05$; ** = $p < .01$; *** = $p < .001$. Observations are rounded due to NCES guidelines.

Table A148

Results of OLS, Dependent Variable: Salary (Full Model)
Post-College State Fixed Effects

	Loan		Federal Loan	
	2009	2012	2009	2012
Cumulative Loans Borrowed 2009 (Log)	0.003⁺	0.008	0.002	0.008
	(0.002)	(0.006)	(0.002)	(0.006)
Age	0.015 (0.011)	-0.039 (0.043)	0.015 (0.011)	-0.039 (0.043)
Female	-0.190 ^{***} (0.017)	-0.254 ^{***} (0.049)	-0.190 ^{***} (0.017)	-0.254 ^{***} (0.049)
Race/Ethnicity (Reference: White)				
African American	-0.078* (0.035)	-0.508 ^{***} (0.137)	-0.077* (0.035)	-0.508 ^{***} (0.137)
Latino	-0.020 (0.034)	-0.195 ⁺ (0.118)	-0.019 (0.034)	-0.193 (0.118)
Asian	-0.010 (0.041)	-0.498 ^{***} (0.145)	-0.011 (0.041)	-0.498 ^{***} (0.145)
Other Race	-0.033 (0.045)	-0.077 (0.121)	-0.033 (0.045)	-0.077 (0.121)
Prior Income	-0.000 (0.000)	-0.000 (0.000)	-0.000 (0.000)	-0.000 (0.000)
Prior Income * Prior Income	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)
Entrance Examination (in SAT)	-0.000 (0.000)	0.001 ^{***} (0.000)	-0.000 (0.000)	0.001 ^{***} (0.000)
Institutional Selectivity (Reference: Nonselective)				
Less Selective	-0.045 (0.050)	0.159 (0.165)	-0.044 (0.050)	0.159 (0.165)
Selective	-0.043 (0.042)	0.015 (0.142)	-0.043 (0.042)	0.015 (0.142)
Most Selective	0.067 (0.050)	0.161 (0.156)	0.066 (0.050)	0.161 (0.156)
Private Control	-0.055 ⁺ (0.032)	-0.063 (0.098)	-0.054 ⁺ (0.032)	-0.062 (0.098)

2-Year or Less	-0.075 (0.046)	-0.071 (0.156)	-0.073 (0.046)	-0.070 (0.156)
College GPA	-0.011 (0.018)	-0.009 (0.054)	-0.012 (0.018)	-0.010 (0.054)
Entering Tuition & Fees	-0.000 (0.000)	-0.000 (0.000)	-0.000 (0.000)	-0.000 (0.000)
Married	0.116*** (0.029)	0.062 (0.086)	0.115*** (0.029)	0.062 (0.086)
Dependents	0.060* (0.024)	0.045 (0.078)	0.060* (0.024)	0.045 (0.078)
Constant	10.103*** (0.226)	10.008*** (0.867)	10.121*** (0.225)	10.019*** (0.867)
Observations	8030	8030	8030	8030

Note: State fixed effects are included for the post-college enrollment state. Standard errors in parentheses. + = $p < 0.10$; * = $p < 0.05$; ** = $p < .01$; *** = $p < .001$. Observations are rounded due to NCES guidelines.

Table A149

Results of OLS Reduced Form, Dependent Variable: Salary (Full Model)
Post-College State Fixed Effects

	Loan		Federal Loan	
	2009	2012	2009	2012
Change in Average Tuition and Fees	1,374.77*	1,537.53	1,374.77*	1,537.53
	(596.78)	(1,028.98)	(596.78)	(1,028.98)
Father's Education	-212.19	6,421.16	-212.19	6,421.16
	(4,326.03)	(7,350.74)	(4,326.03)	(7,350.74)
Change in Average Tuition and Fees * Father's Education	30.08	-1,034.74	30.08	-1,034.74
	(604.48)	(1,032.89)	(604.48)	(1,032.89)
Age	522.31 ⁺	510.94	522.31 ⁺	510.94
	(288.28)	(471.37)	(288.28)	(471.37)
Female	-6,152.31 ^{***}	-10,070.76 ^{***}	-	-10,070.76 ^{***}
	(419.79)	(643.05)	6,152.31 ^{***}	(643.05)
Race/Ethnicity (Reference: White)				
African American	-821.10	-2,606.36*	-821.10	-2,606.36*
	(797.58)	(1,170.19)	(797.58)	(1,170.19)
Latino	52.46	-173.43	52.46	-173.43
	(828.98)	(1,259.84)	(828.98)	(1,259.84)
Asian	1,447.43	1,904.69	1,447.43	1,904.69
	(1,035.42)	(1,649.31)	(1,035.42)	(1,649.31)
Other Race	316.98	-1,903.63	316.98	-1,903.63
	(1,342.64)	(1,589.59)	(1,342.64)	(1,589.59)
Prior Income	-0.00	-0.02	-0.00	-0.02
	(0.01)	(0.02)	(0.01)	(0.02)
Prior Income * Prior Income	0.00	0.00 ⁺	0.00	0.00 ⁺
	(0.00)	(0.00)	(0.00)	(0.00)
Entrance Examination (in SAT)	1.17	7.96 ^{***}	1.17	7.96 ^{***}
	(1.29)	(2.00)	(1.29)	(2.00)
Institutional Selectivity (Reference: Nonselective)				
Less Selective	-1,727.80	-1,201.05	-1,727.80	-1,201.05
	(1,218.18)	(1,706.27)	(1,218.18)	(1,706.27)

Selective	-1,271.82 (1,030.04)	-591.32 (1,490.39)	-1,271.82 (1,030.04)	-591.32 (1,490.39)
Most Selective	2,603.65* (1,227.41)	3,495.80* (1,749.35)	2,603.65* (1,227.41)	3,495.80* (1,749.35)
Private Control	-2,032.84* (876.22)	-3,954.16** (1,287.34)	-2,032.84* (876.22)	-3,954.16** (1,287.34)
2-Year or Less	-1,266.89 (1,124.65)	-1,204.83 (1,617.09)	-1,266.89 (1,124.65)	-1,204.83 (1,617.09)
College GPA	1,155.00** (432.03)	1,867.42** (654.52)	1,155.00** (432.03)	1,867.42** (654.52)
Entering Tuition & Fees	-0.09 (0.06)	0.07 (0.09)	-0.09 (0.06)	0.07 (0.09)
Married	2,707.39*** (736.57)	2,473.91* (1,099.56)	2,707.39*** (736.57)	2,473.91* (1,099.56)
Dependents	1,682.52** (627.39)	2,236.58 (1,425.60)	1,682.52** (627.39)	2,236.58 (1,425.60)
Constant	12,630.95+ (7,447.46)	12,103.42 (12,010.85)	12,630.95+ (7,447.46)	12,103.42 (12,010.85)
Observations	8030	8030	8030	8030

Note: State fixed effects are included for the post-college enrollment state. Reduced form model of the IV model for undergraduate debt's effect on early-career occupation salary. Standard errors in parentheses. + = $p < 0.10$; * = $p < 0.05$; ** = $p < .01$; *** = $p < .001$. Observations are rounded due to NCES guidelines.

Table A150

*Results of Two-Stage Least Squares, Dependent Variable: Salary
First Stage Full Model; Post-College State Fixed Effect*

	Loan		Federal Loan	
	2009	2012	2009	2012
Change in Average Tuition and Fees	0.83***	0.83***	0.77***	0.77***
	(0.16)	(0.16)	(0.17)	(0.17)
Father's Education	2.99*	2.99*	2.63*	2.63*
	(1.21)	(1.21)	(1.22)	(1.22)
Change in Average Tuition and Fees * Father's Education	-0.45**	-0.45**	-0.39*	-0.39*
	(0.17)	(0.17)	(0.17)	(0.17)
Age	0.02	0.02	0.00	0.00
	(0.07)	(0.07)	(0.07)	(0.07)
Female	0.22*	0.22*	0.24*	0.24*
	(0.10)	(0.10)	(0.10)	(0.10)
Race/Ethnicity (Reference: White)				
African American	0.64***	0.64***	0.66***	0.66***
	(0.19)	(0.19)	(0.20)	(0.20)
Latino	0.20	0.20	0.02	0.02
	(0.20)	(0.20)	(0.20)	(0.20)
Asian	-0.65**	-0.65**	-0.68**	-0.68**
	(0.23)	(0.23)	(0.23)	(0.23)
Other Race	0.12	0.12	0.05	0.05
	(0.26)	(0.26)	(0.26)	(0.26)
Prior Income	-0.00***	-0.00***	-0.00***	-0.00***
	(0.00)	(0.00)	(0.00)	(0.00)
Prior Income * Prior Income	0.00***	0.00***	0.00***	0.00***
	(0.00)	(0.00)	(0.00)	(0.00)
Entrance Examination (in SAT)	-0.00***	-0.00***	-0.00***	-0.00***
	(0.00)	(0.00)	(0.00)	(0.00)
Institutional Selectivity (Reference: Nonselective)				
Less Selective	0.52+	0.52+	0.53	0.53
	(0.32)	(0.32)	(0.33)	(0.33)
Selective	0.43	0.43	0.41	0.41
	(0.27)	(0.27)	(0.27)	(0.27)
Most Selective	-0.21	-0.21	-0.25	-0.25

	(0.31)	(0.31)	(0.31)	(0.31)
Private Control	0.38 ⁺	0.38 ⁺	0.32	0.32
	(0.21)	(0.21)	(0.21)	(0.21)
2-Year or Less	1.05 ^{***}	1.05 ^{***}	0.97 ^{**}	0.97 ^{**}
	(0.29)	(0.29)	(0.30)	(0.30)
College GPA	-0.54 ^{***}	-0.54 ^{***}	-0.44 ^{***}	-0.44 ^{***}
	(0.12)	(0.12)	(0.12)	(0.12)
Entering Tuition & Fees	0.00	0.00	0.00	0.00
	(0.00)	(0.00)	(0.00)	(0.00)
Married	-0.36 ⁺	-0.36 ⁺	-0.39 [*]	-0.39 [*]
	(0.18)	(0.18)	(0.19)	(0.19)
Dependents	0.27 ⁺	0.27 ⁺	0.29 [*]	0.29 [*]
	(0.14)	(0.14)	(0.14)	(0.14)
Constant	4.49 [*]	4.49 [*]	4.21 [*]	4.21 [*]
	(1.85)	(1.85)	(1.87)	(1.87)
Observations	8030	8030	8030	8030
Wu-Hausman (<i>p</i> -value)	25.60 (0.000)	7.69 (0.006)	27.41 (0.000)	7.59 (0.006)
Minimum eigenvalue	21.31	21.31	19.66	19.66
<i>F</i> -bias crit, <i>F</i> -size crit	13.91, 22.3	13.91, 22.3	13.91, 22.3	13.91, 22.3
Sargan (<i>p</i> -value)	4.30 (0.117)	0.70 (0.704)	3.40 (0.182)	0.85 (0.653)

Note: State fixed effects are included for the post-college enrollment state. Excluded instruments: change in average tuition and fees, father's education, and change in average tuition and fees interacted with father's education. Standard errors in parentheses. ⁺ = $p < 0.10$; ^{*} = $p < 0.05$; ^{**} = $p < .01$; ^{***} = $p < .001$. Observations are rounded due to NCES guidelines.

Table A151

Results of Two-Stage Least Squares, Dependent Variable: Salary
 Second Stage Full Model; Post-College State Fixed Effects

	Loan		Federal Loan	
	2009	2012	2009	2012
Cumulative Loans (Log)	0.11*** (0.03)	0.18* (0.09)	0.11*** (0.03)	0.18* (0.09)
Age	0.02 (0.01)	-0.03 (0.04)	0.02 (0.01)	-0.03 (0.04)
Female	-0.21*** (0.02)	-0.29*** (0.05)	-0.21*** (0.02)	-0.29*** (0.05)
Race/Ethnicity (Reference: White)				
African American	-0.14** (0.04)	-0.61*** (0.15)	-0.14** (0.05)	-0.61*** (0.15)
Latino	-0.04 (0.04)	-0.22+ (0.12)	-0.02 (0.04)	-0.19 (0.12)
Asian	0.07 (0.05)	-0.37* (0.16)	0.07 (0.05)	-0.36* (0.16)
Other Race	-0.04 (0.05)	-0.09 (0.13)	-0.03 (0.05)	-0.08 (0.13)
Prior Income	0.00** (0.00)	0.00+ (0.00)	0.00** (0.00)	0.00+ (0.00)
Prior Income * Prior Income	-0.00 (0.00)	-0.00 (0.00)	-0.00+ (0.00)	-0.00 (0.00)
Entrance Examination (in SAT)	0.00 (0.00)	0.00*** (0.00)	0.00 (0.00)	0.00*** (0.00)
Institutional Selectivity (Reference: Nonselective)				
Less Selective	-0.11+ (0.06)	0.06 (0.18)	-0.11+ (0.06)	0.05 (0.18)
Selective	-0.10+ (0.05)	-0.07 (0.15)	-0.10+ (0.05)	-0.07 (0.15)
Most Selective	0.09 (0.06)	0.19 (0.16)	0.09 (0.06)	0.20 (0.17)
Private Control	-0.11* (0.04)	-0.15 (0.11)	-0.10* (0.04)	-0.14 (0.11)
2-Year or Less	-0.16** (0.06)	-0.21 (0.17)	-0.16** (0.06)	-0.20 (0.17)
College GPA	0.05* (0.03)	0.10 (0.07)	0.05+ (0.03)	0.08 (0.07)

Entering Tuition & Fees	-0.00 ⁺ (0.00)	-0.00 [*] (0.00)	-0.00 ⁺ (0.00)	-0.00 [*] (0.00)
Married	0.15 ^{***} (0.04)	0.12 (0.09)	0.16 ^{***} (0.04)	0.13 (0.10)
Dependents	0.02 (0.03)	-0.02 (0.09)	0.02 (0.03)	-0.02 (0.09)
Constant	8.94 ^{***} (0.40)	8.12 ^{***} (1.33)	8.95 ^{***} (0.40)	8.19 ^{***} (1.31)
Observations	8030	8030	8030	8030
Wu-Hausman (<i>p</i> -value)	25.60 (0.000)	7.69 (0.006)	27.41 (0.000)	7.59 (0.006)
Minimum eigenvalue	21.31	21.31	19.66	19.66
<i>F</i> -bias crit, <i>F</i> -size crit	13.91, 22.3	13.91, 22.3	13.91, 22.3	13.91, 22.3
Sargan (<i>p</i> -value)	4.30 (0.117)	0.70 (0.704)	3.40 (0.182)	0.85 (0.653)

Note: State fixed effects are included for the post-college enrollment state. Excluded instrument: change in average tuition and fees, father's education, and change in average tuition and fees interacted with father's education. Standard errors in parentheses. ⁺ = $p < 0.10$; ^{*} = $p < 0.05$; ^{**} = $p < .01$; ^{***} = $p < .001$. Observations are rounded due to NCES guidelines.

APPENDIX B

INVESTIGATION 2 APPENDIX

Item B1

Email sent to students for participation in phase one.

Greetings,

Hello, my name is Dominique Baker. I am working on my doctorate at Vanderbilt University and am reaching out to you about participation in a new study I am conducting.

I am studying college students' experiences with financial aid. My goal is to improve research and, ultimately, policy and practice that supports students as they make choices about their financial aid options. I am very interested in hearing about your experiences with financial aid as a graduate of [insert University here]. I'm emailing to ask if you would be willing to talk with me about this at your convenience. The interview will:

- Last about **45 minutes**
- Be **confidential**
- Occur at a time **most convenient to you**

If you are interested in learning more about this project and talking with me about your experiences with financial aid please email me, Dominique Baker, at d.baker@vanderbilt.edu. If you decide to participate, to thank you for your time you will receive a **\$25 dollar gift certificate** at the end of the interview. I am hoping to conduct the interviews the week of [insert date here] though if you are interested and that week does not work, I am happy to schedule a different time that is convenient for you

Again, I appreciate your time and thank you for considering this opportunity. Hope to hear from you soon!

Best,

Dominique Baker

Email: d.baker@vanderbilt.edu

Website: <https://my.vanderbilt.edu/dominiquebaker/>

Item B2

Interview protocol for phase one interviews.

I. Introduction

Hello, this is Dominique Baker. We previously arranged to meet to talk about a research study for my dissertation. Are you ready to talk?

Excellent. Again, I want to reiterate that your participation in this study is voluntary and that you are free at any time to stop this interview or not answer a question.

The interview should take no more than 45 minutes of your time and should likely only take 30 minutes.

Are you ready? Okay, let's begin.

II. Undergraduate Debt and Repayment

Tell me about how much money you borrowed to attend undergrad.

How do you feel about that amount?

Do you feel that it was worthwhile to borrow this amount to finance your education? Please explain why.

Would you have been willing to borrow more? Please explain why you would say yes or no.

Did you ever consider how you would repay those loans? How?

Tell me about the sources you've consulted to make your decision about how to repay your loans.

III. Postbaccalaureate Decision-Making

Tell me about your plans after graduation.

Have those plans been influenced by the amount of debt you have? If so, why? If not, why do you think that is?

If you did not have any undergraduate debt, what would your plans be after you graduate?

IV. Conclusion

Is there anything else you might like to add?

Would it be okay if I contact you again in the fall with any follow up questions?

Thank you again for your time! I appreciate your taking the time to share your views.

Item B3

Interview protocol for phase two interviews.

I. Introduction

Hello, this is Dominique Baker. We previously spoke about your perceptions about your undergraduate debt and you agreed to participate in a follow-up interview. Are you ready to talk?

Excellent. Again, I want to reiterate that your participation in this study is voluntary and that you are free at any time to stop this interview or not answer a question.

The interview should take no more than 45 minutes of your time and should likely only take 30 minutes.

Are you ready? Okay, let's begin.

II. Undergraduate Debt and Repayment

Tell me about how much money you borrowed to attend undergrad.

How do you feel as you near repayment on those loans about that amount?

Do you feel that it was worthwhile to borrow this amount to finance your education? Please explain why.

Would you have been willing to borrow more? Please explain why you would say yes or no.

Did you ever consider how you would repay those loans? How?

Tell me about the sources you've consulted to make your decision about how to repay your loans.

Have you thought about how much a monthly payment will be depending on your options?

III. Postbaccalaureate Decision-Making

Tell me about what you've been doing since we last spoke.
What are your plans for the next few years?

Are you thinking about graduate school? Please explain why or why not.

What type of career would you like to have eventually?

Have those plans been influenced by the amount of debt you have? If so, why? If not, why do you think that is?

If you did not have any undergraduate debt, what would your plans be after you graduate?

IV. Conclusion

Is there anything else you might like to add?

Would it be okay if I contact you again in the fall with any follow up questions?

Thank you again for your time! I appreciate your taking the time to share your views.

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