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Keywords

higher education, tuition, financial aid, student outcomes, student debt

Comments

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**The Role of Tuition, Financial Aid Policies, and Student Outcomes on
Average Student Debt**

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The Role of Tuition, Financial Aid Policies, and Student Outcomes on Average Student Debt

Abstract

Rising college student debt levels have recently received considerable media coverage and have even been the topic of policy proposals that link rising student debt with tuition inflation. This paper examines the role that tuition, financial aid policies, and academic outcomes play in determining variation in average student debt levels across higher education institutions. A focus solely on tuition as the culprit in rising student debt misses the significant role that financial aid policies and student outcomes play in determining debt levels across non-profit higher education institutions. Specifically, being need-blind in admissions, meeting-full-need, limiting loans, and graduating students in high paying majors can have a larger impact on student debt levels than simply the cost of attendance.

Introduction

Higher education institutions in the United States have recently come under increasing attack for graduating students with debt levels that are considered by many to be overly burdensome. Recent headlines highlight the fact that aggregate student debt has now surpassed total credit card expenditures in the United States. For example, a headline from an October 2011 *USA Today* issue reports that, “Student Loan Debt Surpasses \$1 Trillion.” The article goes on to discuss that students borrowed over \$100 billion in the previous year alone. A 2012 report, *Grading Student Loans*, by the Federal Reserve Bank of New York points out that of the 37 million borrowers who have outstanding student loan balances as of the third-quarter of 2011, 14.4 percent, or about 5.4 million borrowers, have at least one past due student loan account. Cumulatively, these past due balances amount to \$85 billion, or approximately 10 percent of the total outstanding student loan balance.

The College Board’s annual *Trends in Student Aid* (2011) reports that in the 2009-2010 academic-year approximately 55 percent of public four-year college students who graduated from the institutions at which they began their studies graduated with some level of student debt. Their average cumulative level of borrowing was approximately \$22,000. Similarly, about two-thirds of those earning bachelor's degrees from private nonprofit institutions had debt averaging \$28,100. Borrowing in the Federal Stafford Loan Program (both subsidized and unsubsidized) among all students increased by 61 percent from 2000-01 to 2010-11, from \$3,256 to \$5,253 per FTE, in constant 2010 dollars.¹

¹ Figure 1. College Board’s Trend in Student Aid 2011.

Clearly student borrowing and cumulative student debt levels have increased dramatically over the past decade. This rise in debt levels coupled with the stagnant employment market caused by the recession of 2007 to 2009 has led to increases in default rates and student debt balances in arrears. The general angst surrounding student borrowing has prompted calls for political action to alleviate the onerous burden of student debt experienced by some of the borrowers. These actions, so far, have led to legislation extending the interest rate cap of 3.4 percent on new subsidized Stafford loan borrowing for another year. There have also been calls for legislation allowing student debt to be forgiven when declaring bankruptcy, an action that is not permitted under current bankruptcy laws, although no action has been taken on this front as of yet. Similarly, President Obama, in a January 2012 speech at the University of Michigan said that higher education has become an imperative for success in the United States, but the cost has grown unrealistic for too many families and the debt burden unbearable. This speech followed in the wake of his State of the Union address where he outlined a proposal that would deny institutions access to federal financial aid funds if they did not hold tuition increases in check.

The cacophony of discourse concerning the escalating cost of higher education and the rising levels of student debt is clearly beginning to have political ramifications for the higher education industry. Colleges and universities are feeling tremendous pressure to control their tuitions and total costs or risk losing vital levels of federal support. All of this in an environment where public universities are experiencing dramatic reductions in state levels of support.

The focus on tuition levels as the sole culprit in rising levels of student debt, however, may dramatically miss the mark. Surely, tuition rates and sticker prices (tuition, fees, room, board, books and expenses) have a hand in determining student debt levels, but so too should the

financial aid and admissions policies of an institution influence student debt levels. Institutions that admit more affluent students should have lower levels of student borrowing than a college that caters to the less well to do. Similarly, colleges and universities that are need-blind in admissions, a practice that is usually perceived to be advantageous for less affluent students, may lead to higher levels of average student debt, *ceteris paribus*, while institutions that pledge to meet the full demonstrated need of all enrolled students will likely have lower levels of student borrowing. On the other hand, institutions that “gap”, that is they do not fully meet all of the demonstrated need of their students with financial aid, would be expected to have higher levels of student borrowing. These admissions and financial aid policies may play a significant role in determining the level of borrowing and student debt at an institution.

Similarly, students who are more likely to graduate and who pursue majors in fields with greater earnings potential should be more willing to assume debt in pursuit of their degrees. As a result, one would expect institutions with higher graduation rates and a higher proportion of degrees awarded in more lucrative majors would have higher levels of average student debt.

The primary focus both in the media and the political arena has been on the role of tuition in determining student debt levels. This paper will examine the role that admissions and financial aid policies and student outcomes play in determining the level of student debt across institutions conditional on the cost of attendance at four-year, non-profit colleges and universities.

Literature Review

There is a scarcity of analysis directly addressing the institutional determinants of average student debt levels. There is greater coverage of the importance of student loans on college enrollment and choice decision, and on the implications of student debt on educational outcomes. The following brief literature review highlights the most recent and applicable of the studies on loans and their implications.

The literature on the impact of student borrowing on college enrollment and specific college choice decisions is in general agreement on the positive influence that student borrowing plays on enrollment decisions, at least for some students. For example, Buss, Parker, and Rivenburg (2004) utilize data from a set of selective liberal arts colleges and find that student loans increase the likelihood of enrollment, at least within this selective sector of higher education. Similarly, Linsenmeier, Rosen, and Rouse (2006) take advantage of a unique natural experiment at a private, highly selective university that eliminated loans for all low-income students. They found that enrollment increased by a rather paltry 3 percentage points as a result of this policy change, and the increase was not statistically significant. On the other hand, they found a more robust and statistically significant increase of 8 to 10 percentage points in the likelihood of enrollment among minority applicants. Examining the broader question of whether no-loan policies have a significant impact on matriculation decisions Waddell and Singell (2011) conclude that adopting a policy of no-loans (all grant aid) for low-income students leads to the matriculation of students with higher levels of financial need. The primary conclusion of these and most other studies is that reducing student loan levels has a positive, although not necessarily a particularly large, impact on the enrollment decisions of low-income students.

Another vein of the student debt literature examines the impact of student borrowing on various measures of educational outcomes. For example, Minicozzi (2005) finds that higher levels of student debt upon graduation leads students to take higher paying first jobs, but jobs with lower wage growth. Tumen and Shulruf (2008) and Monks (2001) conclude that higher levels of student indebtedness do not discourage students from pursuing additional investments in education; however, Luong (2010) reports that student borrowers had lower savings rates, less assets, less net worth, and are less likely to own their own home by age 29. Similarly, Rothstein and Rouse (2011) once again utilizing a natural experiment at a single, private, highly selective (anonymous) university find that higher levels of debt prompt graduates to choose higher paying jobs, and those with more debt are less likely to choose “public interest” jobs. This is consistent with a study by Erica Field (2009), who finds that loans have a negative and statistically significant impact on choosing public service employment among a set of law school graduates from New York University. Most recently, Avery and Turner (2012) frame higher education and student debt as an investment with an uncertain payoff. Their general conclusion is that for most students the payoff to an undergraduate degree is worth the level of debt assumed by most students. In summary, the results concerning the impact of debt on educational outcomes is quite mixed and depends heavily on the sample of graduates examined and the outcome being examined.

Macy and Terry’s (2007) study is perhaps the analysis that most closely approximates the question addressed in this paper. Examining data from the top 200 colleges and universities based on the *U.S. News and World Report*, they conclude that tuition and fees is the single most significant determinant of variation in average student debt levels across institutions. They also find that the percent of students with debt, the size of the institution, the endowment value, the

percent of classes with fifty or more students, the alumni giving rate, and the percent of Hispanic students are significant in determining variation in average student debt levels across institutions.

This paper contributes to this literature by investigating the impact of admissions and financial aid policies and student outcomes on average student debt. The existing literature has focused on the influence of loans on enrollment decisions or the impact of loans on educational outcomes. Only one other study to my knowledge has examined variation across institutions in average student debt, but was not able to control for differences in institutional aid policies and student outcomes and the role they play in determining average student indebtedness. This study will fill that void.

Data

The data for this analysis comes from the College Board's 2011 Annual Survey of Colleges (ASC) merged with the 2011 Integrated Postsecondary Education Data System (IPEDS) database. The ASC data set contains survey responses from 3,920 accredited undergraduate colleges and universities across the United States. To participate in the survey an institution must offer at least an associate's degree and be accredited by a regional or national accrediting agency recognized by the U.S. Department of Education. According to the 2011 U.S. Digest of Education Statistics there are 4,599 degree granting institutions in the United States, so the Annual Survey of Colleges sample represents over 85 percent of all degree granting institutions, and an even higher percent of accredited degree granting institutions.

The focus of this paper is on variation in average student debt across non-profit, four year colleges and universities. Toward this objective I impose a number of restrictions on the data set to construct the sample used in this analysis (see Table 1). I eliminate for-profit institutions as they rarely reported average debt levels in this survey (892 institutions), and institutions whose highest degree awarded is an associate's degree (1,040), as it is inappropriate to compare borrowing for two years of study to indebtedness for four years of education. I also eliminated observations where important variable values were not reported. Specifically, I omit observations where the institution did not report the percent of students with debt or the average debt (1,000), the percent of the class receiving financial aid or the reported percent was greater than 100 percent (191), or the percent of need met with financial aid and/or the cost of attendance (50). These restrictions result in a final sample of 747 four-year, bachelor's degree or higher awarding, accredited institutions, with valid data on the financial aid profile of their graduating classes.

The primary focus of this analysis concerns average student debt levels across institutions. The Annual Survey of Colleges questionnaire defines indebtedness as the "aggregate dollar amount borrowed through any loan program (federal, state, subsidized, unsubsidized, private, etc.; excluding parent loans) while the student was enrolled at an institution. Student loans co-signed by a parent are assumed to be the responsibility of the student and should be included." There are two measures of average student debt utilized in this paper: 1.) average student debt for those with debt; and, 2.) total average debt among all graduates, including those who did not borrow. The first is usually the number presented in the popular media. For example, a New York Times (2012) expose on student borrowing reports that among borrowers the average student debt in 2011 was \$23,300, citing the Federal Reserve

of New York report mentioned above. The sample of institutions used in this analysis has average (across institutions) student debt among borrowers of \$ 24,646 (see Table 2 for summary measures). The undergraduate enrollment weighted average student debt used in this paper is \$22,799. These results indicate that the restrictions placed on the sample outlined above do not appear to skew the results toward significantly higher or lower average levels of student debt. Similarly, the total average debt, including non-borrowers, in the sample used in this paper is \$16,769 (across institutions), while the undergraduate enrollment weighted average is \$13,772.

Additional variables used in this analysis include dummy variables indicating whether the institution admitted its 2010-2011 fall class in a need-blind manner (that is they did not consider an applicant's financial aid profile in determining whether to admit them or not), and if they met the full demonstrated need of all admitted students. Meeting-full-need means that all of the difference between the tuition, room, and board of an institution and what a family is expected to contribute for their child's higher education expenses is met with grant aid, loans, or work-study. The opposite of meeting-full-need is called "gapping". The degree or percent to which an institution gaps its students, on average, is also used as a control variable in this analysis. The expectation is that the more an institution gaps its students the higher the level of student debt. As meeting-full-need can be achieved with varying degrees of loans versus grant aid, I also include dummy variables indicating whether an institution has a policy of no-loans for all students, such that all of a student's demonstrated need is met with grant aid, and a dummy variable for whether an institution has a policy of limited loans, such that students below a certain income threshold have all of his or her need met with grant aid, as defined by *The Project on Student Debt* for 2009-2010. Other control variables used are the percent of the entering class receiving financial aid, the percent of the entering class receiving Pell grants, and the median

SAT score of the entering class. These variables are intended to capture the economic profile of the student body. The lower the percent of the class receiving aid and Pell grants the more affluent the class, *ceteris paribus*. Similarly, the higher the SAT score of the class the more affluent the student body generally, given the high, consistent and positive correlation between family income and standardized test scores. I use the total cost of attendance (tuition, fee, room, board, books and expenses) to measure the cost of the institution. For public universities I use an undergraduate enrollment weighted average of the in-state and out-of-state cost of attendance. I also include total expenditures per student in order to examine whether institutions with greater resources utilize that wealth to reduce the level of borrowing of its students. I also include among the independent variables in the following analyses the four year undergraduate graduation rate and the percent of all graduates who obtained degrees in majors with above median earnings. These majors were identified from the *Center on Education and the Work Force's* 2012 analysis of earnings by college major. The majors with above median earnings are engineering, mathematics and statistics, physical sciences, science technologies, social sciences, health professions, and business. Controls for public versus private institutions, highest degree awarded, and institutional size are also utilized in the following analyses.

Empirical Results

The following regression analyses investigate the influence of price, admissions practices, financial aid policies, and student outcomes on the average student debt of the graduating classes across non-profit, four year postsecondary institutions in the United States. Specifically, Table 3 presents the results of regressing the average student debt among borrowers

(Specification (1)) on the cost of attendance, expenditures per student, dummy variables for being need-blind in admissions, meeting-full-need, a no-loan policy, and limited-loan policy, the average percentage of demonstrated need not met by financial aid (the percent gap), the percent of the entering class receiving financial aid, the percent with Pell grants, the percent of graduates with higher paying majors, the SAT mid-point (average of the 25th and 75th percentile scores on the SAT critical reading and math tests), the four year graduation rate, the number of full time equivalent (FTE) degree seeking undergraduates (as a measure of institutional size), and dummy variables for public control (versus private control), highest degree awarded of masters, or highest degree awarded doctorate (versus bachelor's degree). All average debt levels, cost of attendance, and expenditure per student values are in natural log form, so that the coefficient on the natural log of cost and expenditures per student indicate the elasticity of student debt with respect to these variables, while the coefficients on the other variables approximate the percentage change in student debt for a unit change in the independent variables. Meeting-full-need is included as a control variable in addition to the percent gap because adhering to such a policy may have a differential impact on student borrowing beyond that of simply having a gap of zero percent. Meeting-full-need is a relatively simple policy to explain to prospective students and thus may lead to a different applicant pool than would occur if an institution is not constrained by this policy. All regressions are estimated using weighted least squares, where the weight is full-time-equivalent undergraduate enrollment to account for the varying institution sizes used in calculating the average debt levels.

Specification (1) in Table 3 presents the results of the regression of the natural log of average student debt among borrowers on the exogenous variables outlined above. Before turning to the variables of primary concern it is interesting to note that there is not a significant

difference in average indebtedness between public and private institutions, among borrowers. Similarly, institutional size (number of FTE undergraduates) and type (baccalaureate, masters, doctoral) are not significant in determining average student indebtedness.

The quality of the institution as measured by the SAT mid-point is significant in determining the average student debt among borrowers. Institutions with higher average SAT scores have lower levels of student borrowing. This may be because of the strong correlation between student SAT scores and family income and because institutions with higher average SAT scores also tend to be institutions with greater institutional resources which they may be able to use to lower student borrowing. Turning to the variables and policies of primary interest, it is not surprising to discover that the cost of attendance is significant in determining student debt. It is interesting, however, to find that cost is inelastic in determining student debt. The elasticity of student debt with respect to tuition is only .209. This implies, for example, that a 10 percent increase in the cost of attendance results on average in a 2.1 percent increase in average student debt. Institutional expenditures per student, a measure of both institutional resources and expenses, significantly increases average student borrowing. It appears that institutions with higher levels of spending per student pass at least some of these higher expenses on to their students in the form of increased levels of student debt. Once again this effect while statistically significant is inelastic in magnitude.

Admissions and financial aid policies play a significant role in determining student borrowing. Institutions that report to be need-blind in admissions have average student indebtedness that is approximately 33 percent ($\exp(.282)-1$) higher than comparable institutions that are not need blind in admissions. Evaluated at \$24,000 in student debt this translates to

approximately \$7,800 in additional borrowing at need-blind institutions compared to those that are not need-blind in admitting their freshmen class. While it is usually considered beneficial for applicants and students for an institution to practice need-blind admissions, as it creates greater opportunities for students from lower-income families, it appears to have the unintended consequence of leading to higher average debt levels as more low income students constitute the subsequent graduating class.

On the other hand, institutions that meet the full demonstrated need of their students have significantly lower levels of student debt upon graduation. Specifically, institutions that meet-full-need have average student debt that is approximately 17 percent ($\exp(-.182)-1$) lower than institutions that do not meet-full-need. This is not surprising as students at institutions that gap may have to turn to additional loans to meet their education expenses. It is surprising to discover that the percent of gapping by an institution does not have a statistically significant impact on student debt upon graduation. It may be that families turn to other forms of funding such as home equity or PLUS loans in the presence of substantial gapping. It is also surprising to note that the percent of students receiving financial aid does not play a significant role in determining average debt among student borrowers, while the percent of students receiving Pell grants actually lowers the level of debt among borrowers. It appears to be the case that, conditional on the other regressors, the more students that receive Pell grants the lower the level of debt needed to meet educational expenses. In part it seems that Pell grants are replacing loans for low income students or that institutions that limit loan levels to their students attract more Pell recipients.

The above outlined results imply that being need-blind increases average student debt, while meeting-full-need lowers student debt. Meeting-full-need may mean dramatically

different things across institutions. For example, a student with demonstrated need of \$20,000 may have all of that need met with grant at one institution, while another institution meets half that need with loans and half with grant aid. Clearly, the borrowing implications of these meeting-full-need policies are quite different. To account for these differences I include a dummy variable for institutions that have a no-loans policy for all of their students on need-based aid, and a separate dummy variable for institutions that have a limited-loans policy whereby students below a given income threshold have all of their need met with grant aid. Despite these policies, students, of course, are free to borrow on their own. These policies have a significant impact on student borrowing. Institutions with no-loans policies have average student debt (from all sources) that is 47 percent lower than comparable institutions without this policy. Similarly, institutions with a limited-loan policy have average borrowing that is approximately 12 percent lower.

Pricing and financial aid policies should not be the sole criteria students utilize in determining their level of borrowing, and in fact they are not. The higher the graduation rate of an institution the higher should be the level of average student debt. Likewise, the percent of the graduating class with degrees in majors with above median expected earnings the higher should be the level of student debt upon graduation. As expected the higher the likelihood of graduation and the better the employment prospects of an institution's graduates the higher their level of average debt.

In short, it appears that the cost of attendance plays a statistically significant, important, but inelastic effect on student debt, while the financial aid policies of being need-blind, meeting-full-need, and policies of restricting or even eliminating loans are all significant and meaningful

in determining the average student debt levels among borrowers. The expected academic and labor market success of an institution's graduates also are significant in determining student indebtedness.

The total average student debt among all graduates from an institution, including non-borrowers, is perhaps a more meaningful and comprehensive measure of the debt burden placed on an institution's graduates. For example, an institution where only twenty percent of the students borrow but has average debt among borrowers of \$30,000 is arguably placing less of a loan burden on its graduates than an institution where eighty percent of its graduates have an average debt of \$25,000. Specification (2) of Table 3 regresses the natural log of the total average student debt (including non-borrowers) against the independent variables. While many of the results are qualitatively similar to the previous results the magnitudes of their effects are usually even larger in determining total average debt in comparison to the average debt only among borrowers.

Once again, the cost of attendance and expenditures per student have positive and statistically significant but inelastic effects on student debt. Being need-blind and meeting-full-need are also significant in determining total average debt and the magnitudes of their effects are noticeably larger than their effects on average student debt just among borrowers. Similarly, the percent of students with aid has a positive, significant, and even larger impact on total debt than it does on average debt among borrowers. No-loan and limited-loan policies significantly reduce total student debt, as well. The influence of the graduation rate and the mix of majors is once again significant in determining total student debt, with amplified effect. In short, all of the factors that were found to be significant in determining average student debt among borrowers

are also significant in determining the total average student debt, including non-borrowers. The primary difference in the results is in the size of the coefficients. In particular, the coefficients on the financial aid and academic outcome variables are substantially larger in magnitude. Ignoring non-borrowers and the impact of policy changes on whether one borrows or not can have an even larger impact on the true level of average debt than just focusing on the level of debt among borrowers.

All of the above analyses implicitly assume that the impact of costs and aid policies on debt levels is the same across the public and private higher education sectors. Chow-tests reject the null hypothesis of equality of the coefficients across the public and private sectors (at the 1 percent level) for both the regression using the natural logs of average student debt (F-stat=3.37) and total average student debt (F-stat=2.83).

Table 4 presents the regression results for both measures of student debt for public institutions only. The results in some instances vary dramatically across higher education sector. Specification (1) reports results for the regression of the natural log of average student debt among borrowers at public institutions. It is interesting to find that the cost of attendance is not significant in determining average student debt across public institutions. On the other hand, expenditures per student is positive and significant in determining student debt. Public institutions usually have much more comparable levels of cost of attendance (at least within state) but considerable variation in the expenditures per student. Flagship state institutions usually have much higher levels of expenditures per student. It appears that these additional costs are passed on to students in the form of loans.

Public institutions that admit their class on a need-blind basis have higher average student debt than those that do not. Few public institutions adhere to meeting-full-need and thus the coefficient on this variable, while negative, is not statistically significant. Similarly, there are no public institutions in this sample that have a no-loan policy, while the public institutions that have a limited-loan policy graduate students with average debt that is approximately 14 percent lower than those that do not. The higher the percent of the class receiving Pell grants the lower the level of debt. This again suggest that Pell grants may be acting to replace loans or that institutions are actively attempting to lower the loan levels of their neediest students.

Academic outcomes influence debt levels in the public sector, as well. The higher the four year graduation rate the higher the level of student debt at graduation, as expected. Similarly, the higher the proportion of graduates in top paying fields the greater the level of student debt, although this result is not significant at conventional levels (p-value=.143, two-tailed test). As was found overall, public institutions with higher average SAT scores have lower levels of student debt.

Perhaps the most striking result among public institutions is that the cost of attendance is not a significant determinant of student debt. Financial aid policies and institutional practices and policies in the form of expenditures, graduation rates, and the mix of majors are important in determining student borrowing at public institutions.

Specification (2) of Table 4 presents the results of regressing total average student debt (including non-borrowers) on the policy variables, at public institutions. The primary difference in results from specification (1) is that the percent of students receiving aid is positive and significant in influencing total average student debt, but not the level of debt among borrowers.

Public institutions with a high percent of student on financial aid do not appear to adjust the level of debt incurred by their borrowers in response to these numbers, but obviously it does affect the level of total average student debt.

As was found in the overall regressions, those variables that are significant in determining average student debt among borrowers are also significant in determining total average student debt across all students at public institutions, with magnitudes that are even larger. For example, following a need-blind admissions policy increased average student debt by 48 percent, but increased total average student debt by 64 percent. Similarly, having a limited loan policy lowered debt by 13 percent among borrowers, and by 22 percent across all students.

Specification (1) of Table 5 outlines the results for the regression of average student debt among borrowers for private colleges and universities. The cost of attendance is positive and significant in determining student debt among borrowers, with an elasticity of .610. This result is likely attributable to the fact that tuition levels at private universities are much higher than at public universities, so that a ten percent increase in the cost of attendance at a typical private university represents a much larger dollar increase in cost. On the other hand, expenditures per student is not significant in determining student debt levels. For private universities, being need-blind in admissions does not have a significant impact on average student debt, but meeting-full-need does have a statistically significant influence on student debt. This result may be because private institutions have a higher average sticker price, so meeting-full-need may have a bigger impact on debt than the mix of students admitted. More of the students at private institutions may have to take on debt than at public institutions, and among private institutions this is even more pronounced at institutions that do not meet-full-need. The degree of gapping is not

statistically significant, while the percent of students with aid does significantly influence the levels of debt among borrowers. Private institutions with a higher percentage of students on financial aid pass along those costs to borrowers in the form of higher loans.

Unlike public institutions there are a number of private institutions with either no-loan or limited-loan policies. Private institutions with no-loan policies have significantly and substantially lower average student debt levels than institutions that do not have this policy. On the other hand, private institutions with limited-loan policies do not have significantly different levels of student debt than institutions without this policy. It may be the case that the income thresholds on these limitations capture a small percent of all families on financial aid at private institutions.

The four year graduation rate is not significant in determining average debt at private institutions, but the mix of majors is. The higher the percent of graduates in high paying majors the higher will be the level of average student debt. It may be the case that students at private institutions have higher graduation expectations, so they are less concerned with variation across institutions in graduation rates. The average graduation rates at institutions in this sample are 53 and 29 percent at private and public institutions, respectively. The average percent of graduates in high paying majors are 43 and 44 at private and public institutions, respectively.

Specification (2) of Table 5 presents the results for total student debt at private institutions. Once again, cost of attendance is positive and significant in determining total average student debt, with an estimated elasticity of .817. This suggests that an institution with total average student debt of \$15,000 upon graduation would see average debt increase by approximately \$1,225 for a ten percent increase in the cost of attendance. Similarly, meeting-

full-need, but not being need-blind, is statistically significant in determining total average student debt. Private institutions that meet-full-need have total average student debt that is approximately 18 percent lower than private institutions that do not meet-full-need. For an institution with total average debt of \$15,000, this translates to a reduction in total average debt upon graduation of approximately \$2,700. The percent of the student body receiving aid positively and significantly influences total average student debt, as well. Once again, adhering to a no-loan policy substantially lowers total average student debt, while an increase in students from higher paying majors leads to higher levels of total average student debt.

The primary finding from the above analyses is that while the cost of attendance clearly plays a significant role in determining levels of student debt across institutions at private institutions (but not at public institutions), it is not the sole, nor necessarily the primary, driver in determining variation in average student debt levels across institutions. Admissions and financial aid policies and academic outcomes also are major factors in differentiating student debt levels across institutions. Specifically, being need-blind in admissions has a significant impact on average debt levels across public institutions, while meeting-full-need has a significant impact on borrowing at private colleges and universities. Similarly, no-loan and limited-loan policies have a significant impact on the levels of average student debt across institutions. Academic selectivity is also significant in influencing average debt levels across all institutions. The higher the average SAT score of an institution, the lower the levels of average debt. Students also appear to respond as expected to the likely value of their educational investments. In general, the higher the likelihood of graduation the higher is the level of average debt at graduation. Similarly, the greater the percentage of students with top paying majors the higher is the level of average debt. Additionally, a focus on average debt among borrowers rather than the

total average debt ignores the importance of and variation in the percent of the student body that graduates with debt across institutions.

Conclusion

Recent media coverage of growing student debt and the subsequent policy proposals to address it have assumed that tuition and university sticker prices are the primary if not sole factor driving the rise in student indebtedness. This assumption ignores the substantial impact that college and university admissions and financial aid policies and academic outcomes play in determining variation in average student debt levels across institutions. In fact, this paper finds that while the cost of attendance does play a statistically significant role in determining student debt levels at private institutions, admissions and financial aid policies, graduation rates, and the mix of majors across students are also significant and important in determining student debt levels. Specifically, whether an institution is need-blind in admitting its students and/or meets the full demonstrated need of all of its students can increase average student debt upon graduation by as much as thirty percent. The impact of these policies varies substantially across higher education sectors. Being need-blind has a significant impact on student borrowing at public institutions, while meeting-full-need has a statistically significant impact on student debt at private institutions. Additionally, no-loan and limited-loan policies are also important in determining student debt levels, even conditional on broader financial aid policies.

Public universities that adhere to a need-blind admissions policy have a higher average student debt upon graduation. A need-blind admissions policy is usually viewed as a positive

and socially beneficial practice that increases the probability of enrolling more low-income students. In the event that this policy is effective in increasing low-income enrollment it clearly leads to higher levels of average debt upon graduation, as the mix of students at a particular institution becomes less affluent. If institutions are penalized for having higher levels of student debt, this may lead them to adopt admissions and financial aid policies that are less conducive to enrolling low-income students. Institutions, both public and private, may become more selective in admissions with a heightened focus on SAT scores, which are highly, positively correlated with family income, and thus highly, negatively correlated with student debt. Similarly, institutions may no longer practice need-blind admissions, but rather turn to need-aware admissions practices in order to manage the income profile and subsequent borrowing levels of their student bodies. While this will clearly lead to lower levels of student debt, it is not clear that doing so is a social welfare improving outcome.

The results of this paper clearly indicate that policy advocates interested in rising college costs and escalating student debt should not simply focus on tuition levels and tuition inflation, but rather focus policy directives on admissions and financial aid policies that affect net price and encourage students to pursue fields with an adequate return on investment despite the level of debt. Policies that solely focus on tuition levels and tuition growth are overly simplistic and ignore other important factors in determining student debt.

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Table 1**Sample Construction**

Total Sample	3920
Less:	
For-profits	892
Highest Degree Associates	1040
Didn't report average debt or percent with debt	1000
Pct. of class with financial aid not reported or greater than 100%	191
Pct. of need met or cost of attendance not reported	50
Final Sample	747

Table 2**Summary Measures**

	<u>Minimum</u>	<u>Maximum</u>	<u>Mean</u>	<u>Std. Deviation</u>
Percent of students with loans	1	100	65.89	16.83
Average debt among borrowers	\$947	\$56,000	\$24,646	\$7,677
Total average debt (incl. non-borrowers)	\$119	\$47,600	\$16,769	\$7,787
Public institution	0	1	0.36	0.48
Cost of attendance	\$8,986	\$58,334	\$33,537	\$12,616
Expenditures per student	\$5,291	\$270,834	\$26,153	\$22,728
Need-blind	0	1	0.88	0.33
Meet-full-need	0	1	0.08	0.26
Percentage of gap	0	98	24.86	16.74
No. of FTE undergraduates	129	46,994	5,644	6,805
SAT mid-point	760	1515	1108.79	135.66
Percent of students on financial aid	0	1	0.81	0.13
Percent high paying majors	0	1	.43	.16
4-yr graduation rate	0	92	44.13	22.07
Percent of students with Pell grants	6	100	30.59	13.88
<i>Highest degree awarded:</i>				
Masters	0	1	0.36	0.48
Doctorate	0	1	0.47	0.50

Table 3
Regression Results

	<u>Spec. (1)</u>		<u>Spec. (2)</u>	
Constant	7.215 (0.769)	***	6.194 (1.076)	***
Natural log of cost of attendance	.209 (0.076)	***	.279 (0.106)	***
Natural log of expenditures per student	.140 (0.037)	***	.143 (.052)	***
Need-blind	.282 (0.041)	***	.373 (0.057)	***
Meet-full-need	-.182 (.074)	**	-.289 (0.103)	***
Percent gap	-.00002 (.001)		-.001 (0.001)	
Percent of Students with Aid	.001 (.001)		.007 (0.002)	***
No loan policy for need-based aid	-.643 (0.115)	***	-.875 (0.161)	***
Limited loan policy for need-based aid	-.125 (0.043)	***	-.221 (0.060)	***
Four year graduation rate	.004 (0.001)	***	.008 (0.002)	***
Pct. of grads in high-paying majors	.301 (0.111)	***	.427 (0.155)	***
Pct. of students receiving Pell grants	-0.005 (0.002)	***	-.004 (0.002)	*
No. of FTE undergraduates (in 1,000s)	.0001 (0.002)		-.002 (0.002)	
SAT mid-point (in 100s)	-.108 (0.022)	***	-.196 (0.031)	***
Publicly controlled	-.070 (0.057)		-.100 (.079)	
Masters awarding university	.073 (0.066)		.046 (0.092)	
Doctoral awarding university	.041 (0.066)		.014 (0.092)	
R-squared	.305		.380	

Notes

Standard errors are in parenthesis.

*** (**, *) indicates significance at the 1 (5, 10) percent level.

Table 4
Regression Results for Public Institutions

	<u>Spec. (1)</u>		<u>Spec. (2)</u>	
Constant	8.757 (1.485)	***	8.054 (2.133)	***
Natural log of cost of attendance	.001 (0.153)		.029 (0.220)	
Natural log of expenditures per student	.174 (0.063)	***	.191 (.091)	**
Need-blind	.395 (0.074)	***	.492 (0.106)	***
Meet-full-need	-.168 (.294)		-.656 (0.422)	
Percent gap	.001 (.001)		-.0005 (0.002)	
Percent of Students with Aid	-.001 (.002)		.005 (0.003)	**
Limited loan policy for need-based aid	-.136 (0.103)	**	-.249 (0.099)	**
Four year graduation rate	.005 (0.002)	**	.010 (0.003)	***
Pct. of grads in high-paying majors	.366 (0.250)		.554 (0.359)	
Pct. of students receiving Pell grants	-0.004 (0.003)	*	-.005 (0.004)	
No. of FTE undergraduates (in 1,000s)	.001 (0.003)		-.002 (0.004)	
SAT mid-point (in 100s)	-.110 (0.040)	***	-.210 (0.057)	***
Masters awarding university	.196 (0.277)		.190 (0.398)	
Doctoral awarding university	.104 (0.274)		.134 (0.394)	
R-squared	.232		.244	
No. of observations	271			

Notes

Standard errors are in parenthesis.

*** (**, *) indicates significance at the 1 (5, 10) percent level.

Table 5
Regression Results for Private Institutions

	<u>Spec. (1)</u>		<u>Spec. (2)</u>	
Constant	4.528 (0.734)	***	2.468 (0.948)	***
Natural log of cost of attendance	.610 (0.073)	***	.817 (0.094)	***
Natural log of expenditures per student	-.006 (0.041)		-.069 (.053)	
Need-blind	.020 (0.040)		.048 (0.051)	
Meet-full-need	-.153 (.054)	***	-.199 (0.069)	***
Percent gap	-.0001 (.001)		.0001 (0.001)	
Percent of Students with Aid	.003 (.001)	**	.009 (0.002)	***
No loan policy for need-based aid	-.434 (0.074)	***	-.608 (0.095)	***
Limited loan policy for need-based aid	.010 (0.068)		0.003 (0.088)	
Four year graduation rate	-.0002 (0.001)		.001 (0.002)	
Pct. of grads in high-paying majors	.155 (0.082)	*	.265 (0.106)	**
Pct. of students receiving Pell grants	-0.003 (0.002)	**	.001 (0.002)	
No. of FTE undergraduates (in 1,000s)	.003 (0.003)		-.003 (0.004)	
SAT mid-point (in 100s)	-.090 (0.023)	***	-.150 (0.029)	***
Masters awarding university	.008 (0.041)		-.001 (0.053)	
Doctoral awarding university	.089 (0.045)	**	.058 (0.055)	
R-squared	.491		.651	
No. of observations	476			

Notes

Standard errors are in parenthesis.

*** (**, *) indicates significance at the 1 (5, 10) percent level.