

This article was downloaded by: [University of Colorado at Colorado Springs]
On: 21 August 2015, At: 12:38
Publisher: Routledge
Informa Ltd Registered in England and Wales Registered Number: 1072954 Registered
office: 5 Howick Place, London, SW1P 1WG



Journal of Higher Education Policy and Management

Publication details, including instructions for authors and subscription information:

<http://www.tandfonline.com/loi/cjhe20>

Institutional determinants of American undergraduate student debt

J. Dean Craig^a & Samuel R. Raisanen^b

^a Economics Department, University of Colorado at Colorado Springs, Colorado Springs, CO, USA

^b Economics Department, Central Michigan University, Mount Pleasant, MI, USA

Published online: 01 Oct 2014.



CrossMark

[Click for updates](#)

To cite this article: J. Dean Craig & Samuel R. Raisanen (2014) Institutional determinants of American undergraduate student debt, *Journal of Higher Education Policy and Management*, 36:6, 661-673, DOI: [10.1080/1360080X.2014.957892](https://doi.org/10.1080/1360080X.2014.957892)

To link to this article: <http://dx.doi.org/10.1080/1360080X.2014.957892>

PLEASE SCROLL DOWN FOR ARTICLE

Taylor & Francis makes every effort to ensure the accuracy of all the information (the "Content") contained in the publications on our platform. However, Taylor & Francis, our agents, and our licensors make no representations or warranties whatsoever as to the accuracy, completeness, or suitability for any purpose of the Content. Any opinions and views expressed in this publication are the opinions and views of the authors, and are not the views of or endorsed by Taylor & Francis. The accuracy of the Content should not be relied upon and should be independently verified with primary sources of information. Taylor and Francis shall not be liable for any losses, actions, claims, proceedings, demands, costs, expenses, damages, and other liabilities whatsoever or howsoever caused arising directly or indirectly in connection with, in relation to or arising out of the use of the Content.

This article may be used for research, teaching, and private study purposes. Any substantial or systematic reproduction, redistribution, reselling, loan, sub-licensing, systematic supply, or distribution in any form to anyone is expressly forbidden. Terms &

Conditions of access and use can be found at <http://www.tandfonline.com/page/terms-and-conditions>

Institutional determinants of American undergraduate student debt

J. Dean Craig^a and Samuel R. Raisanen^{b*}

^a*Economics Department, University of Colorado at Colorado Springs, Colorado Springs, CO, USA;*

^b*Economics Department, Central Michigan University, Mount Pleasant, MI, USA*

Between 2005 and 2013, student loan debt in the US increased at a rate of 13.3 per cent per annum. This rise in collegiate student debt has become the focus of any number of new proposals and policies at both the state and national levels. While considering broad policies to stem this rising tide are admirable, they do little to help a graduating high school student interested in minimising their debt level choose between competing institutions of higher learning. In this paper, we analyse the institutional characteristics that result in students assuming higher debt levels. We use a data set compiled from the 2011 Integrated Postsecondary Education Data System and supplement from a variety of sources with additional institutional characteristics such as location and weather to investigate this question. After controlling for the cost of attending the institution, we find that requiring higher standardised test scores on entrance exams and being located in less urban areas result in lower average debt by graduates. Additionally, we identify a non-linear relationship between the income levels of students' families and the debt with which they graduate, with middle-income students and families being the most heavily burdened by debt.

Keywords: cost of higher education; financial aid; undergraduate student debt

Introduction

As the cost of attending university has increased, and access to higher education has improved, many more American students have turned to borrowing as a key source of funding for their postsecondary educations. This borrowing has come in the form of subsidised and unsubsidised government Stafford loans, loans to parents of students and private borrowing (US Department of Education, 2014). Students use the loans to pay for tuition and books, room and board, student fees and other living expenses. These expenses have grown considerably faster than the rate of inflation (College Board, 2014) causing students to significantly increase their borrowing. The Project on Student Debt reports that 71 per cent of US students graduating in 2012 had some amount of student debt (Institute for College Access and Success, 2013).

According to the New York Federal Reserve's *Quarterly Household Debt and Credit Report* (Household Debt & Credit, 2013), student loan debt has increased from \$364 billion in the first quarter of 2005 to \$966 billion as of the third quarter of 2013. This constitutes a 13 per cent annual increase in student loan debt over the 9-year period. The increase is a result of having more borrowers and larger amounts borrowed. The number of people with student debt as of the fourth quarter of 2012 was 38.8 million, a 66 per cent increase from 2005. The average student loan balance in this time frame has risen from \$16,651 to \$24,803, a 49 per cent increase. Americans now have more student loan debt

*Corresponding author. Email: samuel.raisanen@cmich.edu

than credit card debt. Delinquency rates on student loans have been increasing over the past decade, recently hitting as high as 17 per cent by the end of 2012 (Lee, 2013).

The majority of economic research on student debt over the past decade has focused on individuals and the impact student debt has had on their decisions and lives. In this paper, we examine student debt by institution to better understand which characteristics of universities lead their students to incur higher debt loads. In addition, we divide the distribution of aid given by each institution into five family income ranges to determine whether the distribution of aid impacts student debt. Referencing a 2011 panel study of 841 American colleges and universities, we confirm that the higher the cost of education, the higher the level of student borrowing. This, however, is only a minor part of the story. We also identify that the proportion of part-time students, quality of students and to whom aid is given are all significant determinants of debt levels for graduates of an institution.

Recent literature

Recent literature examining student debt has focused on three main questions: how does debt affect current and potential students, how does debt affect future choices such as employment and can a student repay the debt they incur? Other than the impact of the rising price of higher education, very little work has been done to examine the intuitional characteristics associated with higher debt among students.

How does debt affect current and potential students?

Accruing debt can clearly affect the choices that students make, including, which major to attain, which job to take upon graduation, which university to attend and even whether to attend university at all. Burdman (2005) argues that increased access to credit markets has led to increased borrowing by students, many of whom would have been unable to attend their school of choice in the absence of student loans. For students who are averse to borrowing, however, the overabundance of loans as financial aid reduces their choice of university and decreases their probability of completing, or even attending university. As further evidence that student loans are a heavy burden on lower income students, Linsenmeier, Rosen, and Rouse (2006) examined implementation of a no-loan financial aid policy at an unspecified major north-eastern United States university in 1998. They found that the new no-loan policy led to a three percentage point increase in matriculation by low-income students and an eight to ten percentage point increase in matriculation by low-income minority students.

More recent studies, however, contradict parts of Burdman's findings. Tumen and Shulruf (2008), in a multi-year study, find that increased student debt does not discourage students from resuming their studies. Additionally, Waddell and Singell (2011) find that no-loan programmes do not increase enrolment of first-generation students but rather attract higher need students who in turn displace some of the slightly less needy students. While individual student decisions are outside the scope of our study, to address the differing impact of debt on students from poorer or richer families, we include data on the price of attending each university for five income categories.

Can students repay the debt they incur?

Debt is not of itself a bad thing. Students are incurring debt to better their future prospects. In order to measure whether the level of debt has become burdensome, we must examine

whether students can repay the debt they incur and how it affects their decisions. Harrast (2004) finds that at the individual level at one major unnamed American university, many students are borrowing in excess of lender recommended levels. This suggests that students are assuming a high risk of defaulting on the loans. In Harrast's study, students' major, ethnicity, grade point average and age are all relevant factors in determining the level of debt students assume while gender was not.

Gross, Cekic, Hossler, and Hillman (2009) perform a literature search, from 1978 to 2007, to identify the individual and institutional factors that contribute to default. They find that there are lower default rates for 4-year institutions compared to 2-year institutions and that students who attend universities with larger endowments have fewer defaults. Additionally, students of colour and older students are more likely to default after controlling for earning, but why this is so is unexplained. Additionally, they note, that the risk of default increases with the size of monthly payments and decreases with parental income.

Watson and Barnao (2011) develop a typology of student debtors. After conducting interviews with debtors and obtaining quantitative data on loan repayment, they group debtors into four categories: Life Indebted, Traditionalists, Entrepreneurs and Expedient Payers. Life Indebted debtors tend to make minimum payments, taking most of their lifetime to pay off their loans. Traditionalists plan to pay back the loan in a steady manner and do so in a reasonable period. Entrepreneurs choose not to repay the loan because the interest on the loan is less than what they can earn as a return on the money and they use the low-interest loan to fund other activities. Expedient Payers cut consumption to increase incremental payments and quickly pay off the loan. Watson and Barnao find that attitudes towards debt significantly affect individuals' repayment schedules.

At the institutional level, these studies suggest that ethnicity, average academic quality of the students attending, average parental income and the university endowment should be correlated with debt levels. While we have data on ethnicity and academic quality of the student (via entrance exam scores), parental income is only reported for those students who apply for aid and is aggregated into broad categories. As such, it is left out in our analysis. Likewise, private institutions, comprising 48 per cent of our data set, are not required to report their endowments and as such we do not consider endowment. We do, however, include whether the university is a public or private institution.

How does debt affect future choices such as employment?

The accumulation of debt can have a significant impact on the choices that students make both during university and upon graduation. Field (2009) conducted an experiment at New York University (NYU) offering differing financial aid packages to law students and then measuring the career choice of the participants. Students assigned to low-debt aid packages were twice as likely to enter into public interest law. Broadly this suggests that students with higher debt levels choose to enter into higher paying jobs than they would choose if they were less debt burdened. Likewise, Minicozzi (2005) finds a similar result. Using the 1987 National Postsecondary Student Aid Survey, he identifies that students with higher debt take on jobs with higher initial earnings but lower income growth potential. Students with lower debt take on jobs with lower initial income but higher growth potential. Rothstein and Rouse (2011) confirm these results.

While debt seems to impact career choices, Monks (2001) notes that student debt does not seem to be a significant factor in the choice of pursuing a graduate or professional degree. More recently, however, Zhang (2013) counters this result. Using the Baccalaureate

and Beyond 93/97 survey data, he finds that for public university graduates, student debt has a negative and significant effect on graduate school attendance. This negative effect is concentrated on more costly programmes associated with doctoral, masters of business administration and first professional degrees. Debt level, however, has no effect on the choice of a master's programme. Zhang, however, does not see evidence that debt has any impact on early career choices such as salary, sector of occupation, marital status and homeownership.

While the career choices of students from a given university are not generally available, these results along with our findings suggest that institutional policies that affect student debt will have an impact on the employment and further education decisions of university students.

Institutional characteristics

Most of the above studies have looked at individual behaviour. We focus on institutional characteristics. There are relatively few existing studies on how institutional characteristics can affect student debt. Macy and Terry (2011), using US News & World Report's data, find that the primary determinants of average student debt at an institution are: per cent of university students with debt, rates of tuition and other fees, size of the institution, value of the institution's endowment, per cent of classes with 50 or more students, the alumni giving rate and per cent of Hispanic students. Our study confirms and builds upon many of these results. Using a similar data set to our study, the working paper of Monks (2014), identifies that need-blind admissions, meeting full-need, limiting loans and graduating students in high-paying majors can have a larger impact on student debt levels than simply lowering the cost of attendance. Institutional studies are important because they can advise students where to attend and help craft better policy aimed at reducing student debt loads.

Data

Primary data for this study comes from the 2011 Integrated Postsecondary Education Data System (IPEDS), the College Board 2011 Annual Survey of Colleges and the College Scorecards from the US Department of Education's College Affordability and Transparency Center (College Scorecard, 2013). We compiled additional control data about each school from CollegeData.com (College 411 Match Search, 2013) and the National Center for Education Statistics College Navigator (2013). We compiled data for all 865 US 4-year, non-profit, institutions of higher learning with 2000 or more enrolled undergraduate students. Due to a few missing observations on graduation rates and schools who did not report standardised test scores of applicants, 24 schools were omitted leaving 841 usable observations.

2011 Annual Survey of Colleges

The *Annual Survey of Colleges* is a Web-based survey of nearly 4000 accredited undergraduate colleges and universities in the US about the characteristics of each university including programmes, costs, application requirements and deadlines (Annual Survey, 2013). We accessed the survey data through CollegeData.com. The freshman retention rate; 4-, 5- and 6-year graduation rates; number of full- and part-time undergraduate students; average student financial need met; number of students taking out loans; number

of parents taking out PLUS loans (Parent Loans for Undergraduate Students); ethnicity composition of the student body; standardised test scores of applicants; high school rank of applicants and whether the institution was private or public were collected from this source. Additionally, CollegeData.com supplements the Annual Survey of Colleges with information regarding the setting of the university (from very large city to rural environment) and weather variables such as days of precipitation, January average low temperature and September average high temperature.

2011 Integrated Postsecondary Education Data System

The IPEDS is an annual data set compiled by the National Postsecondary Education Cooperative. While this is a large data set, which overlaps with other sources, we used this data to supplement the Annual Survey of Colleges data with information regarding students' housing choices (on campus, off campus, with family) and family income levels. Additionally, the net price of attending a given institution, total cost of tuition, books, room and board less scholarships and grants, is broken down into five income categories. In this formulation, net price of attending is the average yearly price actually charged to first-time, full-time undergraduate students receiving student aid which need not be reimbursed (scholarships, work study, etc.) at an institution of higher education after deducting such aid. Finally, the city and state of each school comes from the IPEDS data.

College scorecard

On 13 February 2013, the US Department of Education released the college scorecard interactive tool. The scorecard included data regarding the cost of attending each institution, the 6-year graduation rate of each school, the average amount of debt accrued by graduates of the school and the default rate on federal student loans within 3 years of entering repayment. The data were retrieved from the website during May and June of 2013 though it is based on the 2011 IPEDS data.

Empirical specification

We estimate a general reduced form model for institution i using the following specification:

$$DEBT_i = \alpha_0 + \alpha_1 TIME_i + \alpha_2 SAT_i + \alpha_3 ENVIRON_i + \alpha_4 TYPE_i + \alpha_5 AID_i + X_i' \beta + e_i$$

where the average $DEBT$ at institution i is a function of the time it takes an average student to complete the degree, the average ability of its students, the environment the institution is located in, the type of students who attend the institution, the need met of the students by income group and a vector of additional controls captured by X . We hypothesise that: $\alpha_1 > 0$ meaning that schools with students who take longer to graduate, all else equal, will produce students who incur greater debt; $\alpha_2 < 0$ meaning that, all else equal, schools with higher ability students will graduate students with lower debt; $\alpha_3 > 0$ meaning that schools in more urban environments will graduate students with higher debt; $\alpha_4 > 0$ meaning that schools with more undergraduates, more undergraduates living on campus and a higher percentage of full-time students will graduate students with higher debt; and have no *ex ante* hypothesis for α_5 .

We use three variables and one interaction variable to assess the effect of *TIME*. The first variable, *Four year*, is the 4-year graduation rate of the institution in percentage points. The second variable, *Six year*, is the 6-year graduation rate of the institution in percentage points. The third variable for time is *Drop first*, which is the amount of students in percentage points who dropped out of the institution before the beginning of their second year. Finally, we interact *Six year* with *Full-time undergrads*, which is defined below, to try to separate students who take longer to graduate because they are part-time students from full-time students who take longer than the traditional 4 years to graduate. For *SAT*, we use the institution's 75th percentile scholastic aptitude test (SAT) score. While not a perfect measure, SAT scores control for the academic ability of students at the institution prior to matriculation. For *ENVIRON* (environment), we have a panel of dummy variables on the setting of the university. These classifications are: *Rural*, *Small town*, *Large town*, *Small city*, *Large city* and *Very large city* for the surrounding population and *Precipitation*, *Low temp.* and *High temp.* for weather variables. We posit that weather and urban setting are correlated with availability of outside activities which could affect student borrowing. For *TYPE*, we have *Undergrads*; the number of undergraduates at the institution, *Full-time undergrads* the percentage points of undergraduates that are full-time and four variables describing the percentage points of students in different living situations: *On campus*, *Off campus*, *With family* and *Unknown*. For *AID*, we have five variables that partition the average aid given to five income classes less the average aid given out at the institution weighted by the per cent of students in that category. The groupings are: \$0 to \$30,000, \$30,001 to \$48,000, \$48,001 to \$75,000, \$75,001 to \$110,000 and \$110,001 or more. So for instance:

$$AID1 = (NetPrice_{Inc \leq \$30,000} - NetPrice_{Inst Avg}) * PERCSTUDENTS_{Inc \leq \$30,000}$$

where the net prices are for those students applying for aid from families making less than \$30,000 per year minus the institution's average and *PERCSTUDENTS* is the per cent of students at the institution applying for aid from families making less than \$30,000 per year. We include control variables for total cost of the institution, weather characteristics of the school, racial composition, whether the institution is a member of a Bowl Championship Series (BCS, the top level of collegiate American football) conference and whether the institution is classified as public or private. [Table 1](#) provides a full listing of all variables and their sources. Summary statistics for all variables used are presented in [Table 2](#). In order to determine whether our model was specified correctly, joint *F*-tests and model selection tests using the Akaike information criterion were carried out. The selection was carried out using the groupings *TIME*, *SAT*, *ENVIRON*, *TYPE*, *AID* and controls. Results indicate that the model is appropriately specified and are available from the authors upon request.

Examining the summary statistics, the average student debt at an institution is approximately \$18,000 and average annual tuition is approximately \$16,500. The average institution has a 4-year graduation rate of 37 per cent, a 6-year graduation rate of about 56 per cent and a 75th percentile of SAT scores around 1170. The majority of institutions are located in a large town or small city. The average institution has around 8000 undergraduate students, of whom 85 per cent are full-time students, with a majority being white students, and a greater part living on campus. Approximately 46 per cent of the institutions are private and 14 per cent of institutions are affiliated with a BCS conference for

Table 1. Variable descriptions.

Variable	Description	Variable	Description
DEBT	Average debt of graduating students in \$'000. Source: College Scorecard	On campus, off campus, with family, unknown	Per cent of students who have associated living situation in percentage points. Source: Integrated Postsecondary Education Data System
Four year	Four-year graduation rate in percentage points. Source: Annual Survey of Colleges	AID1	The average aid given to students whose family income is less than \$30,000 minus the average aid given to students at the institution in dollars weighted by the per cent of students in this group. Source: Integrated Postsecondary Education Data System
Six year	Six-year graduation rate in percentage points. Source: Annual Survey of Colleges	AID2	The average aid given to students whose family income is between \$30,001 and \$48,000 minus the average aid given to students at the institution in dollars weighted by the per cent of students in this group. Source: Integrated Postsecondary Education Data System
Drop first	Per cent of students who dropped out in their first year in percentage points. Source: Annual Survey of Colleges	AID3	The average aid given to students whose family income is between \$48,001 and \$75,000 minus the average aid given to students at the institution in dollars weighted by the per cent of students in this group. Source: Integrated Postsecondary Education Data System
SAT	Max of 75th percentile for the ACT and SAT converted to the SAT scale. Source: Annual Survey of Colleges	AID4	The average aid given to students whose family income is between \$75,001 and \$110,000 minus the average aid given to students at the institution in dollars weighted by the per cent of students in this group. Source: Integrated Postsecondary Education Data System

(continued)

Table 1. (Continued).

Variable	Description	Variable	Description
Rural	One if the institution was located in an area with a rural population and zero otherwise. Source: CollegeData.com	AID5	The average aid given to students whose family income is more than \$110,001 minus the average aid given to students at the institution in dollars weighted by the per cent of students in this group. Source: Integrated Postsecondary Education Data System
Small town	One if the institution is located in an area with a small town population and zero otherwise. Source: CollegeData.com	Total cost	Total cost of attending the institution minus the aid received in dollars. Source: Integrated Postsecondary Education Data System
Large town	One if the institution is located in an area with a large town population and zero otherwise. Source: CollegeData.com	Precipitation	Average annual days of rainfall. Source: CollegeData.com
Small city	One if the institution is located in an area with a small city population and zero otherwise. Source: CollegeData.com	Low temp.	Average low temperature in January at the institution in degrees Fahrenheit. Source: CollegeData.com
Large city	One if the institution is located in an area with a large city population and zero otherwise. Source: CollegeData.com	High temp.	Average high temperature in September at the institution in degrees Fahrenheit. Source: CollegeData.com
Very large city	One if the institution is located in an area with a very large city population and zero otherwise. Source: CollegeData.com	Native, Asian, Black, Hispanic, White, Islander, Multirace	Percentage of institution population that is associated category in percentage points. Source: Annual Survey of Colleges
Undergrads	Number of undergraduates at the institution. Source: Annual Survey of Colleges	BCS	Dummy variable equal to one if the institution is a member of a Bowl Championship Series conference for American football and zero otherwise. Source: NCAA.com
Full-time undergrads	Per cent of undergraduate students who are classified as full-time in percentage points. Source: Annual Survey of Colleges	Private	Dummy variable equal to one if the institution is a private institution and zero otherwise. Source: Annual Survey of Colleges

Table 2. Sample averages.

	Mean	Max.	Min.	SD
Debt	18,198.80	41,563.00	1000.00	4628.67
Four year	37.46	90.60	2.20	22.34
Six year	55.80	97.00	12.00	18.46
Drop first	22.67	60.00	1.00	11.05
SAT	1169.82	1575.00	505.00	137.76
Rural	0.02	1.00	0.00	0.15
Small town	0.10	1.00	0.00	0.30
Large town	0.27	1.00	0.00	0.45
Small city	0.32	1.00	0.00	0.47
Large city	0.09	1.00	0.00	0.28
Very large city	0.20	1.00	0.00	0.40
Undergraduates	8288.62	58,404.00	488.00	7996.04
Full-time undergrads	85.65	100.00	34.20	11.78
On campus	76.24	100.00	0.00	24.33
Off campus	6.42	74.78	0.00	10.22
With family	13.94	100.00	0.00	18.72
Unknown	3.41	61.64	0.00	8.11
AID1	897.72	6992.71	-6022.72	882.33
AID2	395.03	3939.00	-1574.17	508.73
AID3	-29.41	3152.42	-3755.78	633.57
AID4	-484.12	2383.17	-3524.04	550.05
AID5	-1190.54	2571.86	-9800.91	1497.41
Total cost	16,519.10	42,882.00	909.00	7075.19
Precipitation	114.55	278.00	23.00	27.83
Low temp.	24.30	71.00	-18.50	11.99
High temp.	81.94	103.50	61.60	5.69
Native	0.77	30.80	0.00	2.15
Asian	4.98	51.00	0.00	6.98
Black	14.34	100.00	0.00	21.16
Hispanic	8.75	95.70	0.00	11.32
White	62.95	97.10	0.00	23.75
Islander	0.38	90.70	0.00	3.34
Multirace	2.18	83.50	0.00	3.54
BCS	0.14	1.00	0.00	0.35
Private	0.46	1.00	0.00	0.50

American football. We also observe that on average more aid is given to lower income brackets and less is given to higher income brackets as would be expected.

Empirical results

We present results of our specification for the determinants of debt in Table 3. To begin with, we note that the coefficient on *Drop first* is negative and highly statistically significant. This is unsurprising. If an institution has a greater number of students dropping out before the beginning of their sophomore year the students are not spending as much on tuition and as a result incurring lower average debt. The coefficients on *Six year* and *Six year*full-time undergrads* are not statistically significant, prohibiting us from drawing any firm conclusions. The coefficient for *Total cost* is positive and statistically significant while the coefficient estimate for *Total cost²* is negative and statistically significant. This means that as the average total cost of a student attending increases,

Table 3. Determinants of debt.

Variable	Coefficient estimate [standard error]	Variable	Coefficient estimate [standard error]
Drop first	-153.0*** [25.04]	Small town	920.1 [694.0]
Four year	15.11 [21.05]	Large town	858.2 [650.9]
Six year	-94.48 [63.79]	Small city	876.6 [653.6]
Six year*full-time undergrads	1.278 [0.795]	Large city	1033 [718.6]
Total cost	0.703*** [0.0850]	Very large city	1667** [726.3]
Total cost ²	-8.37e ⁻⁰⁶ *** [1.93e ⁻⁰⁶]	Private	379.6 [496.0]
Undergrads	0.0203 [0.0232]	On campus	44.78*** [13.07]
Full-time undergrads	-23.94 [37.18]	With family	49.66*** [16.18]
Rain	-0.809 [5.625]	Unknown	4.212 [17.04]
Low temp.	-9.526 [14.15]	AID1	0.292 [0.189]
High temp.	-14.96 [26.56]	AID2	-0.990** [0.493]
SAT	-5.139*** [1.788]	AID3	-1.300*** [0.466]
BCS	-8.486 [384.8]	AID4	-0.328 [0.393]
Constant	15,616*** [4314]	AID5	0.500*** [0.130]
Controls included for race composition	Yes	Observations	841
R ²	0.63		

Notes: ***significant at the 0.01 level; **significant at the 0.05 level; *significant at the 0.1 level, robust standard errors in parentheses.

debt increases but at a decreasing rate. We note that the combined effect of *Total cost* and *Total cost*² does eventually turn negative. This change of direction would happen at approximately \$84,000 of average total cost. This number is roughly double our highest observation of average student debt.

Our controls for racial make-up have signs consistent with previous literature and are jointly significant (excluded category is White). Interestingly, the coefficient on *SAT* is negative and statistically significant. While it should be noted that while institutions with high ability students are more likely earn more scholarships, we have controlled for scholarships and aid with the *Total cost* variable. In essence, institutions with higher average ability students, graduate students with lower average debt after controlling for scholarships and aid. Our controls, *BCS* and *Private* are not statistically significant. We see the lack of statistical significance on *Private* as strong evidence that our variables for ability, racial make-up, time to graduate and environment are adequately controlling for the larger debt load for students graduating from private institutions. (Within our sample the average debt conditional on attending a public institution is \$16,102 while conditional on attending a private institution is \$20,419.84.) None of the environmental dummies are statistically significant in reference to the excluded variable *Rural* with the exception of *Very large city*. In addition, *Very large city* is statistically significantly from all other categories except *Large city* at the 5 per cent level indicating an additional consumption value for being located in a very large urban area. The coefficient associated with *On campus* is positive and statistically significant indicating that institutions that have a greater percentage of students living on campus as opposed to the excluded category *Off campus*, graduate students with greater debt. This may be due to having a captive market, or perhaps because students can roll on-campus housing into the cost of tuition and therefore defer the cost to smooth consumption. The coefficient on *With family* is less intuitive. One possible explanation for it being positive and statistically significant with

reference to the excluded category *Off campus* is that families may be using student loans as a method to escape income constraints.

Finally investigating the coefficients on the aid variables, we see an interesting overall pattern emerge. Note that *AID3* and *AID5* are statistically significant at any conventional level, *AID2* is statistically significant at the 5 per cent level and *AID1* is nearly statistically significant at the 10 per cent level. Starting at the low-income level, institutions that on average give more aid to the low-income ranges, graduate students with greater debt. The same is true for institutions that give more aid to the wealthiest income bracket. However, institutions that provide more aid on average to the middle-income ranges, graduate students with less average debt. Following this finding to its conclusion, we could prescribe that to reduce average debt of graduating students, more aid should be given to the middle-income ranges.

Conclusions

Our results point towards a number of clear suggestions for students and institutions wanting to minimise debt levels upon graduation. For students, attending a less expensive university is important, but not as important as one might think. For example, switching from a university with a net price of \$15,000 per year to a university with a net price of \$20,000 per year only increases the average students' debt by \$2050. While the income distribution of students attending these universities is likely to be different, there seems to be important structural differences between these institutions that allow more expensive universities to partially offset the impact of their higher sticker price. Additionally, the size of the impact of higher net price on debt is reduced the more expensive the university. Taken together, this implies that while price matters, it has less of an effect than expected, and should not be the only factor considered.

As important a factor as tuition and room and board are in determining student debt, the location of the university matters considerably. At universities in more urban areas, students borrow larger amounts for their education. Students attending university in rural locations borrow the least. There is then an increase of \$920 in borrowing while attending a university in a small town. As the size of the town grows, so does student borrowing, peaking with very large cities, where students borrow \$1667 more than those attending a similar university in a rural setting. Because we have controlled for room and board including the cost of living in off-campus housing, we hypothesise that the increased borrowing is likely being used to fund social activities only available in larger population settings.

While at school, students often face the choice of attending full-time or part-time. Our data show that schools with more part-time students have lower average debt. Attending school part-time seems to be an effective method for avoiding debt as it allows students to earn more while in school and thus funds their education. Holding all else constant, an institution with the same number of students but one percentage point more part-time students than another will have an average student debt of \$47 less. (This calculation is the partial derivative of debt with respect to *FULL-TIME UNDERGRAD* evaluated at the mean value of *SIX YEAR*:

$$\frac{\partial DEBT}{\partial FULL-TIME UNDERGRAD} = -23.94 + 1.278 * \overline{SIX YEAR} = 47.38.$$

This coefficient has a standard error of 18.71 for a *p*-value = 0.01152.) While \$47 is not a large amount, it implies that for the average institution where net price is \$16,519, and

undergraduate students number 8289, of which 85 per cent are full-time students, the full-time students must be incurring \$4737 more debt than the part-time students. We expected to find that schools where students attended longer than the traditional 4 years would have higher student debt levels; we found this to be insignificant. This is likely because the comparison group includes students who did not graduate within 6 years but attended longer than 1 year. Students who do not graduate but attend longer than 4 years may lower their debt by graduating. On the other hand, students who drop out just prior to their senior year would increase their debt by staying until graduation. These competing effects appear to be partially offsetting and result in an insignificant coefficient on *SIX YEAR*.

Finally, all else being equal, schools with better students, measured by scores on entrance exams of admitted freshmen, graduate students with less average debt. If this is due to better students borrowing less, then a worse student cannot reduce their debt liability by attending a better school. We cannot, however, rule out the possibility that schools with better students on average encourage all students at their institutions to borrow less.

As for the institutions themselves, besides lowering the sticker price of the institution, we find two important changes to policy that can lower student debt. While we are not convinced that universities have an incentive to lower student debt, since additional student borrowing often corresponds to added revenue for the university, a university might address student debt as a competitive advantage. As argued above, students taking more than 4 years to graduate borrow more. As a result, implementing policies that encourage students to graduate within 4 years is critical to reducing debt incurred by students at the institution. Second, the distribution of financial aid matters a great deal. Our analysis provides evidence that students from families in the lower middle-income ranges, \$30,000 to \$75,000 in annual income, receive too little financial aid relative to students from high-income families. Transferring a dollar in aid from a student from a high-income family (annual income above \$110,000), to a student from a middle-income family (annual income between \$48,000 and \$75,000), reduces average student debt by \$1.80. By focusing more aid on the middle-income students, student debt can be reduced considerably without increasing total aid.

While there are economy-wide structural reasons for rising student debt, there are steps individual students and institutions can take to address the issue. Students concerned with incurring debt, should focus on graduating on time, attending smaller schools in smaller settings, and consider attending part-time. Institutions that are focusing on the debt levels of their students should examine their distribution of aid and work to ensure their students graduate on time.

References

- Annual Survey. (2013, June 15). *College Board*. Retrieved from <http://professionals.collegeboard.com/higher-ed/recruitment/annual-survey>
- Burdman, P. (2005). *The student debt dilemma: Debt aversion as a barrier to college access*. Research and Occasional Papers Series. Berkeley, CA: Center for Studies in Higher Education, UC.
- College 411 Match Search. (2013, May 20). *Collegedata*. Retrieved from http://www.collegedata.com/cs/search/college/college_search_tmpl.jhtml
- College Board. (2014, March 25). *Trends in college pricing. Trends in Higher Education*. Retrieved from <https://trends.collegeboard.org/college-pricing/figures-tables/average-net-price-full-time-students-over-time-public-institutions>

- College Navigator. (2013, June 15). *National education center for education statistics*. Retrieved from <https://nces.ed.gov/collegenavigator/>
- College Scorecard. (2013, June 1). *Whitehouse.gov*. Retrieved from <http://www.whitehouse.gov/issues/education/higher-education/college-score-card>
- Field, E. (2009). Educational debt burden and career choice: Evidence from a financial aid experiment at NYU law school. *American Economic Journal – Applied Economics*, 1(1), 1–21.
- Gross, J.P., Cekic, O., Hossler, D., & Hillman, N. (2009). What matters in student loan default: A review of the research literature. *Journal of Student Financial Aid*, 39(1), 19–29.
- Harrast, S.A. (2004). Undergraduate borrowing: A study of debtor students and their ability to retire undergraduate loans. *NASFAA Journal of Student Financial Aid*, 34(1), 21–37.
- Household Debt & Credit. (2013, July 24). *FRBNY consumer credit panel*. Retrieved from http://www.newyorkfed.org/householdcredit/2013-Q3/data/xls/HHD_C_Report_2013Q3.xlsx
- Institute for College Access and Success. (2013, December). *Student debt and the class of 2012*. The Project on Student Debt. Retrieved from <http://projectonstudentdebt.org/files/pub/classof2012.pdf>
- Lee, D. (2013, February 28). *Household debt and credit: Student debt*. Federal Reserve Bank of New York. Retrieved from <http://www.newyorkfed.org/newsevents/mediaadvisory/2013/Lee022813.pdf>
- Linsenmeier, D.M., Rosen, H.S., & Rouse, C.E. (2006). Financial aid packages and college enrollment decisions: An econometric case study. *Review of Economics and Statistics*, 88(1), 126–145. doi:10.1162/rest.2006.88.1.126
- Macy, A., & Terry, N. (2011). The determinants of student college debt. *Southwestern Economic Review*, 34, 15–26.
- Minicozzi, A. (2005). The short term effect of educational debt on job decisions. *Economics of Education Review*, 24(4), 417–430. doi:10.1016/j.econedurev.2004.05.008
- Monks, J. (2001). Loan burdens and educational outcomes. *Economics of Education Review*, 20(6), 545–550. doi:10.1016/S0272-7757(00)00030-3
- Monks, J. (2014). The role of institutional and state aid policies in average student debt. *The Annals of the American Academy of Political and Social Science*, 655(1), 123–142.
- Rothstein, J., & Rouse, C.E. (2011). Constrained after college: Student loans and early-career occupational choices. *Journal of Public Economics*, 95(1), 149–163. doi:10.1016/j.jpubeco.2010.09.015
- Tumen, S., & Shulruf, B. (2008). The effect of student loan schemes on students returning to study. *Journal of Higher Education Policy and Management*, 30(4), 401–414. doi:10.1080/13600800802383075
- US Department of Education. (2014, March 25). *Types of loans*. Retrieved from <http://studentaid.ed.gov/types/loans>
- Waddell, G.R., & Singell Jr, L.D. (2011). Do no-loan policies change the matriculation patterns of low-income students? *Economics of Education Review*, 30(2), 203–214. doi:10.1016/j.econedurev.2010.10.004
- Watson, J.J., & Barnao, J. (2011). Debt repayment: A typology. *International Business & Economics Research Journal (IBER)*, 8(1): 59–67.
- Zhang, L. (2013). Effects of college educational debt on graduate school attendance and early career and lifestyle choices. *Education Economics*, 21(2), 154–175. doi:10.1080/09645292.2010.545204