

Transferring the Cost of Higher Education To Students and Families: Who Bears the Greatest Burden?

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Abstract—The statistical results of this study confirm what many in the popular media have been saying. The greatest burden of the increasing level of student debt is falling on middle class families. In addition to income differences, we also find that that there are gender, race and ethnic differences in the burden of student debt. Specifically, these results suggest that the rising burden of student debt will disproportionately fall on females and African Americans. We also find that non-traditional students (older, independent/not living with family of origin, and having their own children) had higher propensity to have debt after college than more traditional college students, although being married tends to neutralize this effect.

Keywords—Public Financing of Higher Education, Student Debt Burdens, Financial Aid.

I. INTRODUCTION

In the U.S., as in other countries, public financing of higher education has fallen precipitously in recent years. There has been an ongoing transfer of the cost of higher education from state and local governments to students and families as states have struggled to cope with budget shortfalls during the Great Recession. Between 2001-2011, state and local support for colleges declined by more than 24%, while tuition and fees rose by over 70% at U.S. public institutions. Tuition hikes at public colleges and universities have significantly outpaced both the rate of inflation and the growth in household income. With states sharply reducing their funding of higher education, students must rely on federal and institutional aid and loans to meet the rising costs of college. While federal stimulus money allowed for an increase in the maximum award for Pell Grants and expanded tuition tax breaks for two years (2009-2011), these provisions have now expired. Studies show that declining state and federal support for higher education has led to a reduction in institutional aid at most public universities. So what is a student to do? As institutional aid and federal grants have been cut, students must rely more heavily on student loans to meet their financial needs. In the U.S., the most recent statistics show that students owe more than \$1 trillion in outstanding debt, and about 67% of students with bachelor's degrees borrow money to attend college. Between 2007 and 2013, federal student loans (not from private lenders) have increased more than 60%, and in 2012, the student debt of college graduates averaged more than \$26,000,

with many owing twice that amount.

The alarming state of student debt has significant efficiency effects across a wide swath of society. For example, the American Medical Association has made reducing student debt a major priority of its policy advocacy because the heavy debt burdens of medical students (the average student debt for 2011 medical graduates was \$161,290) contributes to the high cost of medical care and to the shortage of primary care physicians in the U.S.¹ The American Bar Association (ABA) has long been concerned that high debt burdens prevent many law school graduates from choosing public law careers, but they are now concerned that debt burdens have become so large that students will have little chance of paying off their debts in any field of law. The ABA is advocating for more transparency in law school job placement rates so that students know the risks before taking out thousands of dollars in student loans. The Federal Reserve issued a special report on student debt in February 2013² showing that student debt is the only source of household debt that has continued to rise since the financial crisis of 2008. The Fed's Board of Directors expressed concern that the high level of student debt would depress consumer spending and slow economic growth for at least the next three years.

There are also equity concerns surrounding the growing burden of student debt. Since the founding of the Republic, access to higher education has been the cornerstone of social and economic mobility in the U.S. The great period of economic growth and income equalization following World War II was spurred on by the G.I. Bill and the increased support to institutions of higher education provided by state governments. Data show that both of these trends (growth and equalization) have stalled in recent years. The decreased level of state support for higher education and its concomitant increased level of student debt have the potential to not just stall these trends but to reverse them. Economists from both sides of the political spectrum are concerned that student debt is contributing to U.S. income inequality. The headline of a May 2012 article in the online publication CNN Money states that, "Debt inequality is the new income inequality."

¹ This information comes from the American Medical Association's website at <http://www.ama-assn.org/ama/pub/about-ama/our-people/member-groups-sections/medical-student-section/advocacy-policy/medical-student-debt/background.page>.

² The report can be found on-line at <http://www.newyorkfed.org/studentloandebt/>.

According to the article, the proportion of debt to income for the bottom 95% of the income distribution grew from 62% of income in 1983 to 148% of income in 2007. Over the same period, the proportion of debt to income for the top 5% decreased from 76% to 64%. The report attributes much of the growth in the debt burden of the bottom 95% to the growth in student loan debt which now exceeds credit card debt and car loan debt as the largest source of consumer debt behind mortgage loans. In order to know if student debt is actually contributing to increased income inequality, it is important to understand the demographic and economic characteristics of the students who are taking on these large debt burdens. This study is designed to investigate this issue at a large regional state university in the post-2008 economy.

II. LITERATURE REVIEW

Several studies have examined the impact of high student debt on economic decisions made after graduation. For example, Baum and Sanders [2] find that students with heavy debt burdens are less likely to attend graduate and professional school. This finding was confirmed in a 2003 study by Millet [8]. Millet also finds that many of these indebted students are unable to live outside their family homes, making it difficult for them to relocate in order to find employment. Baum and O'Malley [1] find that highly indebted students are less likely to make long term investments in homes and cars. The results of these studies are even more significant when one considers that they were written before the recent escalation of student debt levels following the 2008 financial crisis and recession.

Hansen and Rhodes [4] examined data in California from the 1980's and concluded that only 4% of dependent and 5% of independent students graduated with excessive debt burdens, but one doubts that they would reach the same conclusion today. There is a growing need to re-examine the issue of student indebtedness in light of the ubiquity of the issue today and the consequences that debt has on the futures of the most indebted students.

Who are the students with the heaviest debt burdens? The way in which student debt affects the distribution of income depends to a large extent on the answer to this question, and yet few studies have examined the economic and demographic characteristics of student borrowers. Using a sample of Canadian students over the period of 1982 through 1999, Finnie [3] finds, not surprisingly, that students from low income households are more likely to take out loans than students from higher income households. Kapsalis [5] confirms this result using data from the 1999-2000 Canada Student Loans Program. He finds that 52% of all full-time postsecondary students with parental income below \$40,000 received a loan in 2000, compared with only 14% of students with parental income of \$80,000 and over. Finally, the only other known study is an early one by Nettles [9] that finds that African American and Hispanic students are more likely to take out student loans than Whites.

Baum and O'Malley [1] take a slightly different approach to

the issue of socioeconomic differences in student indebtedness. They examine debt burden relative to the post-graduation situation of the student rather than to their family of origin's situation at the time of college. Using data from the 2002 National Student Loan Survey (NASLS) they found that there were statistically significant differences in the burden that student debt imposes on low-income and minority students relative to White, higher income students. For example, students who received Pell grants while they were undergraduates earned significantly lower average incomes out of college than their non-Pell grant counterparts. Also, significantly higher percentages of Pell grant students reported that their student loan debt had delayed several important milestones in their lives such as moving out of their parents' homes, buying a car and getting married. They also found racial differences in the burden of student debt. Higher percentages of African Americans and Hispanic students reported that their debt burdens limited their choices and imposed a greater hardship than they had anticipated relative to White and Asian students. Although these results suggest that student loan debt might place a disproportionately higher burden on minority and low income students, none of these studies use multivariate statistical methods or data that reflect the new student loan environment caused by public sector fiscal tightening. Therefore, it seems that a new empirical study of the demographic and socioeconomic incidence of student debt burdens is certainly warranted.

III. DATA AND METHODOLOGY

Similar to the procedure used in Scott and Garen [11], this study estimates a probit model and a truncated Tobit model in order to develop estimates of the amount of student loans taken out by students at a large state university. Many take out no loans at all and others carry a significant loan burden after graduation. We choose this methodology instead of the Tobit model which restricts the coefficients on the exogenous right hand side variables to have the same impact on both 1) the probability of taking out a student loan and 2) the total loans outstanding at graduation, given that the student has taken out a loan. This study follows the methodology of Cragg [3] which estimate the two equations separately, which provides a flexible functional form that allows the Tobit as a special case.

Equations 1 and 2 show the probit and truncated Tobit models which are estimated. Equation 1 estimates a probit measuring the probability of taking out a loan as a function of demographic and student characteristics and equation 2 estimates the truncated tobit which shows the individual's total student loan burden, given that the individual chooses to borrow for school.

$$1) f(Y_t=0 | X_t) = \Phi(-X_t'\beta_1)$$

$$2) f(Y_t | Y_t > 0) = \varphi(Y_t - X_t'\beta_2/\sigma)$$

Our data include the individual and household financial information and the academic and demographic information for all students who graduated in 2012 and had completed the Free Application for Federal Student Aid (FAFSA) at some

point during their college years. This rich source of data allows us to examine the way in which variables such as race, ethnicity, degree earned, household composition, academic performance and household income affect the likelihood and magnitude of student debt. As the cost of higher education is shifted from the public sector to the students, this study will provide new information about the degree to which this burden is shared among demographic and socioeconomic groups.

IV. EMPIRICAL RESULTS

The descriptive statistics for the variables used in the analysis are shown in Table 1. The categorical variables have been converted into dummy variables so the mean of the variable represents the proportion of the sample that possesses that characteristic. For example, 63% of the sample is female. The only continuous variable in the sample is age at the time of graduation and its mean is 27.89. This indicates that the student population is slightly older, which is typical for a regional university where a number of students are not traditional co-eds. This is also evident by the fact that 43% of the students are not dependent upon their parents for financial support, and 65% of them have transferred in from another college (usually a community college).

The descriptive statistics for our sample are consistent with a university that is not considered a “flagship” institution. It caters to students who are often the first in their families to go to college, and many of them work to put themselves through school. We believe that this is a very important sample to use because these are the students who may be most affected by increases in the cost of tuition and reductions in federal and institutional forms of financial aid.

The results of the estimated models are shown in Table 2. The probit model estimates the effect of various demographic and income variables on the probability that a student takes out a loan at any time over his or her college career. The truncated Tobit model estimates the total monetary amount of loans that a student accumulates by the end of his or her college career, given that the student takes out a student loan. Separate estimation allows the inclusion of right-hand-side variables that may affect one decision but not the other.

The results of the estimated models indicate that the decision to take out a loan and the amount of accumulated student debt are influenced by gender and race variables, but these variables often have different effects on the two decisions. For example, female students are more likely than male students to take out a loan, but the amount of debt that females accumulate over the course of their educations is not significantly different than the amount of debt accumulated by males who take out loans.

African Americans are more likely to take out student loans than White students and other students of ‘Other’ races, but the amount of debt they accumulate is not significantly different from White and students of ‘Other’ races who take out loans. Hispanic students on the other hand are equally likely to take out loans as non-Hispanic students but when they do, they accumulate significantly less debt than non-Hispanic students. Asian students are both less likely to take

out loans, and when they do, they accumulate significantly less debt than White and students of ‘Other’ races.

These results may reflect the relative diversity of social capital available across different ethnic and racial groups. Some sociologists have noted the high degree of support and cooperation in the extended families of Asian American households [6], and other research notes the dearth of family financial support available in low income African American households [7]. But whatever the reason, these results suggest that the rising burden of student debt will fall disproportionately on females and African Americans, and less so on Whites and Hispanics.

As noted above, our sample contains a substantial number of ‘non-traditional’ undergraduate students. Non-traditional students tend to be slightly older, and they are more likely to be married, have children and be supporting themselves. Not surprisingly, our study shows that these ‘non-traditional’ students are more likely to rely on student loans to finance their educations than more traditional students who are single, without children and enter college right after high school. For example, older students are both more likely to take on loan debt, and they accumulate much higher levels of debt by the time they graduate than younger students.

Students who are independent of their family are more likely to have loans and to have higher accumulated debt levels by the time they graduate. In contrast, the support network provided within marriage tends to reduce the likelihood of student debt. We find that married students tend to have a lower likelihood of taking on debt, all else equal, and no significantly different levels of debt than unmarried students when they do borrow. Finally, students with children are more likely to take on student debt to pay for college, but the amount of debt is slightly less than childless graduates with loans. Overall, these results suggest that non-traditional students are likely to bear a disproportionately larger share of debt than other students unless they are married.

One strategy that many students use to reduce the soaring cost of a four year degree is to attend a local, lower priced community college for the first two years and then transfer to the more expensive university for the remaining junior and senior years. Therefore, one would expect lower debt levels for transfer students, all else equal. Our results confirm this expectation. We find that transfer students actually have a higher propensity to borrow, but a significantly lower level of accumulated debt at graduation. No doubt that a side effect, intended or unintended, of the reduction in state support for higher education is to funnel more students to the community colleges before they attend a state university. Our results suggest that students who take advantage of this strategy are probably some of the most financially vulnerable (because of their increased probability of taking out a student loan), but they do end up with significantly less debt at the end of their college years.

TABLE I
Variable Explanations and Descriptive Statistics

Variable Descriptions		Mean	Std. Dev.
FEMALE	= 1 if student is female = 0 Otherwise	0.63	0.48
BLACK	= 1 if student is Black = 0 Otherwise	0.14	0.35
HISP	= 1 if student is Hispanic = 0 Otherwise	0.08	0.27
ASIAN	= 1 if student is Asian = 0 Otherwise	0.05	0.22
MARRIED	= 1 if student is married = 0 Otherwise	0.14	0.35
KIDS	= 1 if student is has children = 0 Otherwise	0.08	0.24
INDEPT	= 1 if student is not dependent on parents = 0 Otherwise	0.43	0.50
INC1	= 1 if student household income is < \$21,900 = 0 Otherwise	0.25	0.43
INC3	= 1 if student household income is between \$44,100 and \$79,700 = 0 Otherwise	0.25	0.43
INC4	= 1 if student household income is > \$79,700 = 0 Otherwise	0.25	0.43
TRANSFER	= 1 if student transferred to the University from a community college or other college = 0 Otherwise	0.65	0.48
AGE	= Student's age at graduation (in years)	27.89	5.80
CCB	= 1 if student graduated from a college of business = 0 Otherwise	0.18	0.39
HEALTH	= 1 if student graduated from a college of health = 0 Otherwise	0.14	0.35

Mean for dummy variables is calculated as the proportion of successes (number of observations that fall into the particular category) in the sample. The standard deviation for dummy variables is calculated as the square root of the sample proportion of successes times the sample proportion of failures.

The most surprising result of our study is that high income households end up with the highest amount of debt at graduation. In fact, families making above the median income of our sample (\$44,100) are more likely to take out student loans and have higher levels of debt upon graduation than those making between \$21,900 and \$44,100 (the second quartile of income, which is the omitted category). Students in the lowest income quartile (below \$21,900) are less likely than students in the second quartile to take out a loan; however, when they do take out a loan, they graduate with similar levels of debt. These results may be due to the fact that Pell Grants are available only to families with very low incomes. It is hard to specify an income maximum for Pell Grant recipients because the eligibility formula depends on factors other than income such as assets and number of children in college, but in 2008, the median adjusted gross income of all Pell Grant recipients was only \$15,223³. In addition, much of the institutional aid offered from the university also targets students with low incomes.

Interestingly, GPA at graduation and college major are key indicators of loan debt at graduation. Students with high

GPA's are both less likely to take out student loans and their student loan debt burdens are lower when they do borrow, all else equal. Of course, this may be due to reverse causation since students with more family financial support have less need to work while they are in college, and this may contribute to their better grades.

Students with majors in the business college are less likely to take out loans and end up with lower total debt than students in the omitted categories (College of Education, College of Arts and Sciences, and the College of Engineering). Could this be because they are more financially savvy and therefore are debt averse? We can only speculate, but they are the only students in any of the five colleges that show any significant difference in their student loan behavior.

³This number was obtained from
<http://www.finaid.org/educators/ProfileofPellGrantRecipients.pdf>.

TABLE II
Estimates of Propensity to Take Out Student Loans and Amount of Loan Debt at Graduation

Truncated Tobit			Probit		
Variable	Marginal Effects	Pvalue	Variable	Marginal Effects	Pvalue
Constant	15408.4	0.000	Constant	0.328	0.000
FEMALE	-79.57	0.799	FEMALE* **	0.031	0.006
BLACK	520.18	0.208	BLACK** *	0.056	0.000
HISP*	-1001.70	0.074	HISP	0.015	0.408
ASIAN***	-3702.19	0.000	ASIAN** *	-0.147	0.000
MARRIED	412.52	0.388	MARRIED***	-0.069	0.002
KIDS***	-23.87	0.000	KIDS*	0.002	0.076
INDEPT***	4580.25	0.000	INDEPT* **	0.093	0.000
INC1	-56.16	0.897	INC1***	-0.064	0.000
INC3**	1024.54	0.016	INC3***	0.076	0.000
INC4***	2572.29	0.000	INC4***	0.060	0.000
TRANSFER***	-2594.1	0.000	TRANSFER***	0.081	0.000
AGE***	208.45	0.000	AGE***	0.019	0.000
CCB***	-1238.14	0.002	CCB***	-0.071	0.000
HEALTH	-595.52	0.171	HEALTH	0.022	0.117
GPA***	-3784.40	0.000	GPA***	-0.229	0.000
N = 7054			N = 5208		

Asterisks indicate level of significance (*10%, **5%, ***1%)

These results, although illuminating, lead us to ask more questions. For example, are there differences in the debt burdens of families in the top half of the income distribution of our sample? These results show that students with family incomes above the median are more likely to have student debt, and they will have a greater accumulated debt at graduation than students with family incomes below the median, but does a family with \$100,000 of family income have more debt than a family with \$50,000 of income? Also, we would like to know if income and demographic variables interact in determining family debt burdens. For example, do African American students with family incomes in the lower half of the income distribution have less debt than White students in families with incomes above the median? These are the types of questions that we will explore in future iterations of this research. However, we believe that this study makes a good start at understanding which students are

most affected by the increased levels of student debt made necessary by state governments' retrenchment of their support for higher education.

V. CONCLUSION

Our statistical results show that there are significant socioeconomic differences in student debt burdens. For example, students from families with incomes above the median (\$44,100) are more likely to take out student loans, and when they do, they have higher amounts of accumulated debt at graduation than students from families with incomes below the median.

In addition to income differences, we find that there are racial and ethnic differences in the burden of student debt. African American students are more likely to take out a student loan than White students and students of 'Other' races, but their total debt burdens are not significantly different than those students. Hispanic students are no more likely to take out loans than other students, but when they do borrow, they

accumulate less total debt than non-Hispanic students. On the other hand, Asian students are both less likely to borrow and when they do borrow, they accumulate less total student debt than students of 'Other' races.

We also find that students who we identify as non-traditional (older, independent, and having children) had higher debt burdens than more traditional college students, although being married tends to neutralize this effect.

Although the main focus of this research is on socioeconomic and demographic differences in the burden of student debt, we also find that other factors affect student debt burdens. For example, the debt burden is lower for students with high GPAs, transfers from other colleges, and those with majors in the College of Business.

The policy implications of our results fall into line with the same concerns about student debt that we raised in the introduction. As state and federal aid to higher education have dwindled and tuition rates have increased much faster than overall inflation rates in the last 30 years, students in the middle and upper middle income groups have been financially squeezed. They are too "rich" to qualify for Pell grants, but their family resources have not grown in line with increases in college costs. As our results clearly show, they have increasingly taken on higher levels of debt in an effort to continue to afford college. These results, coupled with Congress's hostile attitude toward repayment of student debt⁴, have placed many middle income students in a precarious position that threatens to affect their financial status for decades to come. Congress and state legislatures need to increase financial support for these students now if they want to prevent this generation of college graduates from being unable to send their own children to college. If not, we could be witnessing the unraveling of the American Dream.

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⁴ Student debt is the only form of debt that is not able to be reduced or forgiven in bankruptcy settlements, and in June 2014, Congress refused to allow holders of student debt issued before 2007 to reduce their payments through the Pay As You Earn income-based repayment option, which began in December 2012.