Is Student Debt Jeopardizing the Short-Term Financial Health of U.S. Households?

William Elliott and IlSung Nam

In this study, the authors use the Survey of Consumer Finances to determine whether student loans are associated with household net worth. They find that median 2009 net worth ($117,700) for households with no outstanding student loan debt is nearly three times higher than for households with outstanding student loan debt ($42,800). Further, multivariate statistics indicate that households with outstanding student loan debt and a median 2007 net worth of $128,828 incur a loss of about 54 percent of net worth in 2009 compared with households with similar net worth levels but no student loan debt over the same period. The main policy implication of this study is that outstanding student debt may jeopardize the short-run financial health of households. However, this topic is complex and more research is needed before suggesting policy prescriptions. (JEL I2, I22, I24)

Federal Reserve Bank of St. Louis *Review*, September/October 2013, *95*(5), pp. 405-24.

Today, more households than ever before are paying off student loan debt. Fry (2012) finds that 40 percent of all households headed by individuals younger than 35 years of age have outstanding student debt. For the 2011-12 school year, about 37 percent ($70.8 billion) of all undergraduate financial aid received was from federal loans (Baum and Payea, 2012). Federal Pell grants were the next-highest source of aid at 19 percent, with institutional grants accounting for 18 percent of financial aid. According to Fry (2012), the average total household outstanding student loan debt in 2007 was $23,349 and rose to $26,683 by 2010. Further, total borrowing for college hit $113.4 billion for the 2011-12 school year, up 24 percent from 5 years earlier (Baum and Payea, 2012).

While high-income households are more likely to have student loan debt, low-income households carry the greatest student loan debt as a share of household income. According to Fry

William Elliott is an associate professor at the University of Kansas, and IlSung Nam is an assistant professor at the Reformed Theological Seminary in Seoul, South Korea. The authors are particularly grateful for the detailed feedback provided by Bryan J. Noeth on the analysis plan for this study. They also thank William R. Emmons and Jason Lee for their helpful thoughts and Karen M. Pence for her willingness to share the Stata macro she created for use in the analysis for this paper. Finally, they thank Michael Sherraden and Jin Huang for their informative comments and Sung-Geun Kim for his assistance in conducting the analysis. This paper was prepared for presentation at the symposium, "Restoring Household Financial Stability after the Great Recession: Why Household Balance Sheets Matter," sponsored by the Federal Reserve Bank of St. Louis and Washington University in St. Louis, February 5-7, 2013.

(2012), outstanding student loan debt represented 24 percent of household income for households with income less than $21,044 in 2010, 7 percent of income for households with incomes between $97,586 and $146,791, and 2 percent for households with incomes of $146,792 or higher. Fry (2012) finds similar patterns with respect to assets, which suggests that the relative burden of student debt on households may not be equally shared. Changes in federal and state policies that have favored students and their families assuming more of the burden of college costs may disproportionately affect low-income and minority students (see Elliott and Friedline, 2013). While a growing body of literature suggests these shifts affect students' decisions about higher education, this article examines the relationship between student loan debt and family finances even after college graduation.

STUDENT LOANS AND SHORT-TERM HOUSEHOLD FINANCIAL HEALTH

Generally, student debt is considered detrimental to the financial health of households and the U.S. economy only when individuals default on their student loans. According to the U.S. Department of Education (2012), the national 2-year student loan default rate was 9.1 percent in 2010 and the 3-year default rate was 13.4 percent.[1] Not surprisingly, students from higher-income households are less likely to default (Woo, 2002). We speculate that higher-income families might be able to provide students with a safety net against fluctuations in their own personal income, while lower-income families are less able to offer such support. Further, the higher the amount of debt incurred by borrowers, the more likely they are to default on their loans (Schwartz and Finnie, 2002).

However, student loan debt can damage household balance sheets even when not in default. According to Boshara (2012), household balance sheets include the quality of financial services and credit scores, savings, assets, and consumer mortgage debts. Delinquency can also damage a household's overall financial health. Student loans become delinquent when payment is 60 to 120 days late. Delinquent accounts may be reflected in students' credit scores. According to Cunningham and Kienzl (2011), 26 percent of borrowers who began repayment in 2005 were delinquent on their loans at some point but did not default. About 21 percent of borrowers avoid delinquency by using deferment (temporary suspension of loan payments) or forbearance (temporary postponement or reduction of payments for a period of time because of financial difficulty) to temporarily alleviate the problem (Cunningham and Kienzl, 2011). In total, Cunningham and Kienzl (2011) find that nearly 41 percent of borrowers have been delinquent or have defaulted on their loans.

Student loan delinquency and default have negative consequences for the borrower and may have negative consequences for society as a whole. For example, in 2011 the U.S. Department of Education spent $1.4 billion to pay collection agencies to track down students whose loans are delinquent or in default (Martin, 2012). The high percentages of student loans in delinquency or default might have led some in the popular media to speculate whether student loans represent the next financial crisis for America (see, e.g., Cohn, 2012).

The effects of delinquency and default on student loans may extend beyond students to their families. Parents often cosign for student loans, making them equally liable for repayment and the consequences of default. According to the Federal Reserve Bank of New York, about 2.2 million Americans 60 years of age or older were liable for repayment of $43 billion in federal and private student loans in 2012, up $15 billion from 2007 (Greene, 2012). Among student loans held by Americans aged 60 or older, 9.5 percent were at least 90 days delinquent, up about 7.4 percent from 2007. Even without defaulting, cosigners' responsibility for loan repayment affects their credit, and as such may make it more difficult for cosigners to qualify for loans for homes or other major purchases.

Student loan debt can damage household financial health even when loans are not delinquent or in default (see, e.g., Gicheva, 2011; Minicozzi, 2005; Mishory and O'Sullivan, 2012). For example, Stone, Van Horn, and Zukin (2012) find that 40 percent of students who graduate from four-year colleges with student loan debt delay a major purchase such as a home or car. Evidence also suggests that students with outstanding student loans may delay marriage and earn less. For example, Gicheva (2011) finds that borrowing an additional $10,000 for education above the average student loan debt for full-time students when the respondent was 18 years old reduces the short-term likelihood of marriage. Minicozzi (2005) finds evidence that an increase in student loan debt from $5,000 to about $10,000 is associated with a 5 percent decline in wage growth four years after college graduation.

THEORETICAL FRAMEWORK

Using the traditional life cycle model in economics, Rothstein and Rouse (2011) posit that debt from student loans should have little effect on consumption throughout the life course. They further suggest that "student debt has only an income effect—proportional to the ratio of debt to the present discounted value of total lifetime earnings—on career and other post-college decisions" (p. 149). As such, students are treated as rational actors who weigh the amount of student debt they will incur in completing a college degree against their potential lifetime earnings as a college graduate. Rothstein and Rouse (2011) point out that $10,000 in student debt represents less than 1 percent of the present value of the average college graduate's potential lifetime earnings. They argue that since the amount of debt incurred by the typical student to attain a college degree is so small relative to potential lifetime earnings, student debt will have little effect on consumption at any point during the life course.

However, young adults' annual earnings upon leaving college are often much lower than during their prime earning years in middle age. Further, in most cases, young adults cannot rely on their parents to provide the money needed to purchase large-ticket, wealth-building assets. Therefore, most young adults are forced to rely on credit as a key mechanism to smooth their consumption and purchase of wealth-building assets such as a house (Oliver and Shapiro, 2006, and Keister, 2000).

The life cycle hypothesis of student debt assumes (i) there are few or no constraints on credit (a perfect credit market) and (ii) individuals, particularly those with lower incomes, are able to borrow against future earnings to purchase large-ticket items that require considerable financial

investment. In America, houses are the main source of wealth accumulation for the middle class (Mishel et al., 2012). They find that home equity represents about 64.5 percent of all U.S. wealth. There is evidence to suggest that credit constraints may actually force young adults with outstanding student debt to either delay purchasing a house or force them to purchase it at a much higher interest rate in the subprime loan market (Hiltonsmith, 2013; Mishory and O'Sullivan, 2012). The higher interest rate may make it harder to earn equity in the house. For example, Mishory and O'Sullivan (2012) find that average single student debtors would have to pay close to 50 percent of their monthly income toward student loans and mortgage payments. As a result, they would not qualify for Federal Housing Administration (FHA) or many private loans (Mishory and O'Sullivan, 2012).

Shand (2007) uses cross-sectional data in 2003 from the Survey of Consumer Finances (SCF) to find that student debt has a negative effect on homeownership rates. However, she finds little evidence to suggest that this loss is the result of credit constraints. For example, the presence of student loans on a household's balance sheet does not render a household unable to obtain a mortgage. Instead, she suggests that households with outstanding student debt might be averse to obtaining a mortgage for a home.

Hiltonsmith (2013) finds that an average student debt burden for a dual-headed household with bachelor's degrees from four-year universities leads to a lifetime wealth loss of nearly $208,000. Further, he finds that a large portion of this loss ($134,000) comes from lower assets among households with student debt and lower home equity ($70,000). Hiltonsmith (2013) uses 2010 SCF data to project potential wealth losses across the life course.

Despite evidence that student loan debt may have negative economic consequences for individuals and the households in which they live after graduation, there has been little academic research on the role of student debt in the overall financial health of households. In this study, we attempt to provide a more in-depth look at this issue. We posit that regardless of whether there are actual credit constraints or aversion to additional debt, student loan debt may represent a source of substantial debt effects on postcollege outcomes not accounted for by the traditional life cycle hypothesis in economics.

Research Questions

We explore three research questions. First, is having outstanding student loan debt associated with household net worth? Second, among households with outstanding student debt, is the amount of debt associated with household net worth? Third, regarding the equity of a college degree, is outstanding student loan debt associated with household net worth among four-year college graduates and postgraduates?[2]

METHODS

Data

We used 2007-09 panel data from the SCF, which was sponsored by the Board of Governors of the Federal Reserve System. The panel data collected observations on 3,857 families who

responded in 2007 and 2009. These panel data offer the advantage of using a true longitudinal design instead of the normal cross-sectional SCF data, thereby providing an opportunity to analyze changes in net worth. We analyzed data on survey respondents, rather than the heads of households, in part because the SCF does not provide information on such key variables as the race of the head of household. The respondent in a household is defined as "the economically dominant single individual or the financially most knowledgeable member of the economically dominant couple" (Kennickell, 2010, p. 4). Questions were focused on the primary economic unit, which "includes the core individual or couple and any other people in the household or away at school who were financially interdependent with that person or couple" (Kennickell, 2010, p. 4).

The aggregate sample for this study consisted of all 3,857 households in the SCF, from which we created two subsamples. First, we restricted the sample to include only respondents who graduated from a four-year college (n = 2,385) to test whether the effects of student loan debt on financial well-being were mitigated by college completion. Second, we restricted the sample to students with outstanding student loans (n =543) to determine whether the amount of student loans is important in determining household net worth.

Measures

We used the macro provided by the SCF (created for use with the 2007-09 survey panel) to construct the variables in this sample.[3]

Dependent Variables. Net worth in 2009 was the dependent variable of interest and was calculated by using the SCF macro for the 2007-09 survey panel. Net worth was composed of the sum of savings, checking, money market accounts, certificates of deposit, stocks, bonds, mutual funds, 401(k) plans, pension plan balances, IRAs, the cash value of whole life insurance policies, tangible assets such as real estate and cars, as well as loans against these assets minus credit card balances and other consumer loans including student loans. For a more detailed explanation of the SCF calculation of net worth, see Bucks et al. (2009).

Because student loans were a liability and we wanted to examine the effects of student loans on net worth using the net worth variable calculated from the SCF macro, we had to remove the student loan amount from the net worth variables. To remove a liability, it has to be added. Therefore, we added the student loan amount into the net worth variables. Moreover, we transformed net worth using the inverse hyperbolic sine (IHS). The IHS conversion allowed us to maintain negative net worth values without restricting the sample or distorting standard errors (Pence, 2006). The transformation can be expressed as

$$\sinh^{-1}(\theta w) = \theta^{-1}\ln\left(\theta w + (\theta^2 w^2 + 1)^{1/2}\right),$$

in which θ is a scaling parameter and w is net worth. According to Pence (2006), the IHS transformation provides a way to estimate a percentage change specification without excluding households with negative net worth.

To simplify interpretation of results, we converted IHS net worth values back into dollar amounts. The conversion can be expressed as

$$\frac{1}{2}\left(e^{\theta y}+e^{-\theta y}\right)\beta_X,$$

and can be considered a marginal effect of a change in independent variable X on dollars of wealth w, where $y = \sinh^{-1}(w)$, θ is a scaling parameter for IHS transformation, and β_X is a coefficient for variable X. The IHS marginal effects depend on the chosen value of θ. The regression estimates in this study were based on a θ value of 0.00011, the optimal value estimated by the maximum likelihood method.[4]

Covariates. We included 10 covariates in our analyses as follows: (i) whether any member of the household had a four-year college degree or postgraduate degree, (ii) age of the head of the household, (ii) occupational prestige, (iv) marital status, (v) welfare use, (vi) race, (vii) health insurance coverage, (viii) income, (ix) net worth, and (x) outstanding student loans.[5] With regard to our variable of interest—outstanding student loans—respondents were asked whether they or anyone in their household owed any money or had any loans for educational expenses (yes/no). We also examined the student loan amount, which was a continuous variable. All controls were drawn from the 2007 wave of the SCF using the macro provided by the SCF (see note 1). Highly skewed variables can be appropriately analyzed using median regression without transformation because median regression does not assume any distribution (Hao and Naiman, 2007).

Analysis Plan

Median Regression. Data analysis steps were conducted using Stata (version 12). The main analysis uses median regression. According to Pence (2006), median regression offers two advantages over ordinary least squares regression. First, median regression can handle extreme values in data without a major distortion in estimation because it is affected only by the order of the data. Second, the difference-in-differences estimator by median regression is an unbiased estimator of percentage change (Wooldbridge, 2002). Using a series of median regression analyses, we estimated the effect of outstanding 2007 student loan debt on 2009 net worth. The covariates such as four-year college graduation, age, income, occupational prestige, marital status, use of welfare, race, and health insurance use were used. We used four different sample groups: the aggregate sample, a sample of four-year graduates, a sample of respondents with student loans, and a sample of respondents between the ages of 30 and 60.

Missing Data and Adjustment of Standard Errors. As many respondents in the SCF dataset were reluctant to reveal the values of their assets (Kennickell, 1997), imputation was inevitable for unbiased model estimation, which introduces uncertainty into the process. Additionally, median regression standard errors were potentially inaccurate because of heteroskedasticity. Finally, the standard errors should be adjusted because of the complex stratification and clustering in the SCF sample design; the SCF data do not provide information on respondent confidentiality.

We used the same methods Pence (2006) used in her study with the tools provided by the SCF to adjust standard errors for heteroskedasticity, survey design, and imputation uncertainty. The first method we used was bootstrapping, using 999 bootstrapped sample weight replicates provided by the SCF (Kennickell, 1997, 2000; Pence, 2006). We also used the repeated-imputation inference technique to adjust the standard errors for imputation uncertainty (Pence, 2002, 2006).

Facts about U.S. Student Loan Debt

- About 18 percent of households have outstanding student loan debt, and on average they owe about $26,018.27.
- Median 2009 net worth for a household with no outstanding student debt ($117,700) is nearly three times higher than for a household with outstanding student debt ($42,800).
- Households with outstanding student loan debt and a median 2007 net worth of $128,828 incur a loss of about 54 percent of net worth in 2009 compared with households with similar net worth levels but no student loan debt.
- Living in a household with student debt and 2007 net worth of $296,802 is associated with having $185,995.90 (a loss of about 63 percent) less in 2009 net worth compared with households with no student debt.
- Outstanding student debt may reduce the short-term financial health of households by reducing net worth, but more research is needed on this topic.

Sensitivity Analysis. We also estimated models restricting the sample by (i) whether an individual with a four-year college degree or postgraduate degree lived in the household and (ii) the age of the head of the household. In the main models, we control for four-year college graduation; but, by restricting the sample to only households with individuals with a four-year degree or postgraduate degree, we were able to better account for differences that might result from having a four-year degree (see Table 6 for these results). We restricted our sample to ages 30 to 60. We used the cutoff of 60 years because at this age saving decisions might be affected by retirement options (Pence, 2006). Results remained similar to those of the aggregate sample (see Table A1).

Finally, we estimated a model using assets as the dependent variable in place of net worth. Assets are composed of the sum of savings, checking, money market accounts, certificates of deposit, stocks, bonds, mutual funds, 401(k)s, pension plan balances, IRAs, the cash value of whole life insurance policies, and tangible assets such as real estate and cars. This variable was also derived from the SCF 2007-09 macro (see note 1). Table A2 shows these results. We find that living in a household with outstanding student debt was associated with $43,532.79 less in assets compared with living in a household with no outstanding student debt.

RESULTS

Sample Characteristics

As expected, given that the SCF panel data cover the Great Recession, median 2007 net worth ($128,828) declines in 2009 ($98,000). Further, approximately 36 percent of households have a family member who has either a four-year college or postgraduate degree. About 18 percent of households have outstanding student loan debt, and on average they owe about $26,018.27 (see the boxed insert). The average respondent's age is approximately 52 (minimum age 19; maximum age 95). The median household income is $50,053.89. About 12 percent of households use welfare, and about 92 percent of households include at least one member with health insurance. For further information on the sample characteristics, see Table 1.

Table 1

Sample Characteristics*

Characteristic	No. or mean	Percent or median
Education loan use	19,891,202	17.6%
Amount of education loan (education loan users only)	$26,018.27	$15,000.00
2009 Net worth	$481,397.18	$98,000.00
2007 Net worth	$598,232.02	$128,828.35
Is a four-year college graduate	41,136,768	36%
Age (yr)	51.52	50.00
Income	$88,971.87	$50,053.89
Occupational prestige		
Professional	32,674,464	28.9%
Technical services	24,703,413	21.8%
Other	23,807,313	21.0%
Not working	31,993,600	28.3%
Married	67,511,805	59.7%
Use of welfare	13,226,579	11.7%
Race		
White	83,313,885	73.6%
Black	14,911,713	13.2%
Hispanic	10,160,730	9.0%
Asian	4,792,463	4.2%
Has health insurance	104,111,747	92.0%

NOTE: Weighted data from the SCF survey are used. SCF imputes data using multiple imputations. Column percentages are rounded to the nearest whole percent or number. *N = 113,178,790.

SOURCE: SCF.

Sample Characteristics by Student Loan Use

Table 2 provides information on student loan borrowers. Among respondents with a four-year college degree, about 49 percent live in households with outstanding student loan debt, while the average age of respondents who live in households with student loans is 39. In contrast, 33 percent of respondents with four-year college degrees live in households with no outstanding loans, and the median age of respondents living in a household with no student loans is 52. The median household income is $57,508.72 for households with student loans, while it is $47,923.46 for households with no student loans.[6] A higher percentage of black households (27.9 percent) has loans than Hispanic households (14.1 percent; see Table 2 note). For more information on characteristics of student loan use, see Table 2.

Net Worth by Student Loan Use

Table 3 provides information on net worth by student loan use. Median 2009 net worth for households with no outstanding student debt is nearly three times higher than for households

Table 2

Sample Characteristics by Student Loan Use*

	Student loans		No student loans	
Characteristic	**No. or mean**	**Percent or median**	**No. or mean**	**Percent or median**
Income	$75,443.42	$57,508.72	$91,856.47	$47,923.46
Is a four-year college graduate	9,819,552	49.4%	31,065,119	33.3%
Is not a four-year college graduate	10,071,649	50.6%	62,222,470	66.7%
Age (yr)	40.67	39.00	53.83	52.00
Occupational prestige				
Professional	7,587,411	38.1%	25,087,053	26.9%
Technical services	5,459,732	27.4%	19,243,681	20.6%
Other	4,402,555	22.1%	19,404,758	20.8%
Not working	2,441,503	12.3%	29,552,097	31.7%
Married	13,035,998	65.5%	54,475,807	58.4%
Not married	6,855,204	34.5%	38,811,782	41.6%
Use of welfare	2,289,349	11.5%	10,937,230	11.7%
No use of welfare	17,601,853	88.5%	82,350,359	88.3%
Race[†]				
White	13,241,607	66.6%	70,072,278	75.1%
Black	4,167,678	21.0%	10,744,035	11.5%
Hispanic	1,426,037	7.2%	8,734,693	9.4%
Asian	1,055,880	5.3%	3,736,582	4.0%
Has health insurance	18,600,050	93.5%	85,511,697	91.7%
Does not have health insurance	1,291,151	6.5%	7,775,892	8.3%

NOTE: Percentages are rounded to the nearest whole percent. *N = 113,178,790. †In the case of race/ethnicity, within-group percentages may also be important. The following percentages of households have outstanding student loan debt: white, 15.9; black, 27.9; Hispanic, 14.1; Asian, 22.1.

SOURCE: SCF. Data are weighted.

Table 3

Net Worth by Student Loan Use*

	Student loans		No student loans	
Characteristic	**No. or mean**	**Percent or median**	**No. or mean**	**Percent or median**
2009 Net worth ($)	190,945.80	42,800.00	543,328.54	117,700.00
2007 Net worth ($)	284,324.81	68,427.14	665,164.74	149,022.50
Change net worth ($)	–76,917.45	–5,410.03	–122,778	–10,957.34
Change in net worth/ 2009 net worth (%)	40.28	12.4	22.6	9.31

NOTE: *N = 113,178,790.

SOURCE: SCF. Data are weighted.

Table 4

Median Regression Results Predicting 2009 Net Worth (Using 2007 Net Worth Percentiles)*

	15th Percentile ($1,761†)		30th Percentile ($33,780†)		50th Percentile ($128,828†)		
Characteristic	**Coefficients**	**SE**	**Coefficients**	**SE**	**Coefficients**	**SE**	***p*-Value**
Student loan use	–$5,017.26	740.60	–$18,954.12	2,797.84	–$69,976.00	10,329.25	<.000
Income	$0.01	0.00	$0.04	0.01	$0.14	0.05	0.010
2007 Net worth	$0.00	0.00	$0.01	0.00	$0.04	0.00	<0.000
Four-year college graduate	$6,379.97	616.11	$24,102.13	2,327.55	$88,981.78	8,592.98	<0.000
Age	$362.72	17.40	$1,370.29	65.74	$5,058.93	242.70	<0.000
Occupational prestige (ref. professional)							
Technical/services	–$3,330.62	735.55	–$12,582.36	2,778.75	–$46,452.37	10,258.76	<0.000
Other	–$4,973.97	898.68	–$18,790.56	3,395.03	–$69,372.18	12,533.97	<0.000
Not working	–$7,134.36	591.35	–$26,952.07	2,234.00	–$99,503.35	8,247.62	<0.000
Married	$6,495.43	584.62	$24,538.34	2,208.55	$90,592.20	8,153.67	<0.000
Use of welfare	–$14,650.37	971.47	–$55,345.92	3,670.02	–$204,329.60	13,549.21	<0.000
Race (ref. white)							
Black	–$4,983.58	934.56	–$18,826.89	3,530.57	–$69,506.29	13,034.38	<0.000
Hispanic	–$5,687.63	856.06	–$21,486.61	3,234.01	–$79,325.63	11,939.53	<0.000
Asian	$41.96	1,082.96	$158.52	4,091.17	$585.24	15,104.03	0.044
Has health insurance	$6,999.12	1,583.09	$26,441.17	5,980.59	$97,617.16	22,079.51	<0.000

NOTE: Standard errors are bootstrapped with 999 replications and are adjusted for imputation uncertainty (Pence, 2002, 2006). Coefficients are marginal effects evaluated at median net worth in 2007. Net worths in 2009 are calculated using the IHS transformation (Pence, 2006).
*N = 113,178,790. †2007 net worth for this percentile group. ref., reference; SE, standard error.

SOURCE: SCF. Data are weighted.

with outstanding student debt ($117,700 vs. $42,800.00, respectively). Though slightly smaller, this pattern also holds true for 2007 net worth data ($149,022.50 vs. $68,427.14). Households with no outstanding student loans have a bigger decrease in the median change in net worth from 2007 to 2009 than do households with outstanding student loans (–$10,957.34 vs. –$5,410.03, respectively). However, regardless of whether we examine the mean or median change in net worth, the change in net worth represents a higher percentage of 2009 total net worth for households with outstanding student debt (mean 40.28 percent; median 12.4 percent) than for households with no outstanding student debt (mean 22.6 percent; median 9.31 percent).[7]

Predicting 2009 Net Worth by Percentiles (15th, 30th, and 50th) of 2007 Net Worth

In the next series of analyses, we evaluate the marginal effects of coefficients at the 15th, 30th, and 50th percentiles of net worth. With regard to our variable of interest, student loans are an important predictor of net worth after holding all other factors constant. Regardless of the percentile of net worth in 2007, the association between student loans and net worth in 2009 remains

consistently negative (Table 4). Living in a household at the 15th percentile with outstanding student debt and 2007 net worth of $1,761 is associated with a $5,017 decrease in 2009 net worth (a loss of about 285 percent) compared with a similar household with no student debt. Living in a household at the 30th percentile with outstanding student debt and 2007 net worth of $33,780 is associated with a $18,954 decrease in 2009 net worth (a loss of about 56 percent) compared with a similar household with no student debt. Living in a household at the 50th percentile with outstanding student debt and 2007 net worth of $128,828 is associated with a $69,976 decrease in 2009 net worth (a loss of about 54 percent) compared with a similar household with no student debt.

In addition to student loans, occupational prestige, welfare use, and black or Hispanic race have a significant negative association with 2009 net worth. Several of these covariates stand out. For example, a household that uses welfare and with 2007 net worth at the 15th, 30th, or 50th percentiles has a lower 2009 net worth (–$14,650.37, loss of 832 percent at the 15th percentile; –$55,345.92, loss of 164 percent at the 30th percentile; or –$204,329.60, loss of 159 percent at the 50th percentile) than a household that does not use welfare and has similar levels of 2007 net worth. It is also worth noting that black households and households with 2007 net worth at the 15th, 30th, or 50th percentiles also have lower 2009 net worth (–$4,983.58, loss of 283 percent at the 15th percentile; –$18,826.89, loss of 56 percent at the 30th percentile; –$69,506.29, loss of 54 percent at the 50 percentile) than white households with similar levels of 2007 net worth. For Hispanic households, households with 2007 net worth at the 15th, 30th, or the 50th percentile also have lower 2009 net worth (–$5,687.63, loss of 323 percent at the 15th percentile; –$21,486.61, loss of 64 percent at the 30th percentile; –$79,325.63, loss of 17 percent at the 50th percentile) than white households with similar levels of 2007 net worth.

In contrast, higher income, higher 2007 net worth, a four-year college graduate living in the household, being older, being married, Asian race, and having health insurance are all associated with an increase in 2009 net worth. In particular, two of these covariates stand out: households with a four-year college graduate and those with health insurance. Living in a household with a four-year college graduate and 2007 net worth at the 15th ($6,379.97, gain of 362 percent), 30th ($24,102.13, gain of 71 percent), or the 50th ($88,981.78, gain of 69 percent) percentiles is associated with higher 2009 net worth compared with living in a household without a four-year college graduate and similar 2007 net worth levels. Living in a household with health insurance and 2007 net worth at the 15th, 30th, or the 50th percentiles is associated with higher 2009 net worth ($6,999.12, gain of 397 percent at the 15th percentile; $26,441.17, gain of 78 percent at the 30th percentile; $97,617.16, gain of 76 percent at the 50th percentile) compared with living in a household without health insurance and similar 2007 net worth levels.

Predicting 2009 Net Worth Among Students with Loans

In addition to student loan use (loans vs. no loans), the student loan amount has a significant negative association with 2009 net worth (Table 5). For each one-dollar increase in student loans, living in a household with median 2007 net worth is associated with $0.87 less in 2009 net worth. Marital status, use of welfare, and race remain significant negative predictors of net worth. Interestingly, Hispanic households do not differ significantly from white households. However, for

Table 5

Median Regression Results Predicting 2009 IHS Net Worth Using Median 2007 Net Worth: Households with Outstanding Student Loans*

Characteristic	Coefficients	SE	*p*-Value
Student loan amount	–$0.87	0.33	0.009
Income	$0.18	0.18	0.072
Net worth 2007	$0.06	0.02	<0.000
Four-year college graduate	$38,259.48	11,152.98	0.003
Age	$4,032.32	437.01	<0.000
Occupational prestige (ref. professional)			
Technical/services	–$19,530.33	10,431.50	0.082
Other	–$23,042.92	17,500.74	0.072
Not working	–$18,548.50	16,852.29	0.102
Married	$60,418.50	10,443.99	<0.000
Use of welfare	–$126,617.30	22,370.60	<0.000
Race (ref. white)			
Black	–$57,015.09	16,321.80	<0.000
Hispanic	–$21,195.40	21,076.65	0.091
Asian	–$14,612.86	15,456.11	0.147
Has health insurance	$40,816.01	28,974.29	0.093

NOTE: Standard errors are bootstrapped with 999 replications and are adjusted for imputation uncertainty (Pence, 2002, 2006). Coefficients are marginal effects evaluated at median net worth in 2007 ($68,427) among households with outstanding student loans. Net worths in 2009 are calculated using the IHS transformation (Pence, 2006). *N = 19,891,202. ref., reference; SE, standard error.

SOURCE: SCF. Data are weighted.

black households, living in a household with median 2007 net worth is associated with $21,195.40 less 2009 net worth (a loss of about 31 percent) compared with white households.

Higher 2007 net worth, a four-year college graduate living in the household, being older, and being married have a significant positive association with 2009 net worth. Living in a household with a four-year college graduate and 2007 net worth at the 50th percentile is associated with a $38,259.48 increase in 2009 net worth (a gain of 56 percent) compared with a household with a four-year college graduate and similar 2007 net worth levels.

Predicting 2009 Net Worth Among Four-Year College Graduates

Student loans continue to have a significant association with 2009 net worth when the sample is restricted to households with a four-year college graduate (Table 6). Living in a household with student debt and 2007 net worth of $296,802.00 (50th percentile) is associated with having $185,995.90 less in 2009 net worth (a loss of about 63 percent) compared with households with no student debt. Other factors contributing to low net worth are occupational prestige, use of welfare, and race. Again, the biggest predictor associated with a reduction in net worth is use of welfare. Living in a household that uses welfare and has median 2007 net worth of $296,802.00

Table 6

Median Regression Results Predicting IHS 2009 Net Worth Using Median 2007 Net Worth: Four-Year College Graduates*

Characteristic	Coefficients	SE	*p*-Value
Student loan use	–$185,995.90	35,752.15	<0.000
Income	$0.16	0.08	0.032
2007 Net worth	$0.07	0.01	<0.000
Age	$12,738.37	846.78	<0.000
Occupational prestige (ref. professional)			
Technical/services	–$60,808.44	31,530.04	0.083
Other	–$250,533.70	54,494.68	<0.000
Not working	–$239,295.00	43,235.00	<0.000
Married	$205,331.70	25,240.04	<0.000
Use of welfare	–$576,623.00	175,315.10	0.008
Race (ref. white)			
Black	–$183,868.30	70,415.51	0.002
Hispanic	–$208,177.90	73,475.10	0.007
Asian	–$18,733.47	35,071.55	0.091
Has health insurance	$357,010.60	116,803.90	0.032

NOTE. Standard errors are bootstrapped with 999 replications and are adjusted for imputation uncertainty (Pence, 2002, 2006). Coefficients are marginal effects evaluated at median 2007 net worth ($296,802) among households with four-year college graduates. Net worths in 2009 are calculated using the IHS transformation (Pence, 2006). *N = 41,136,768. ref., reference; SE, standard error.

SOURCE: SCF. Data are weighted.

is associated with $576,623.00 less in 2009 net worth compared with living in a household that does not use welfare (a loss of about 194 percent). For black households, living in a household with median 2007 net worth is associated with $183,868.30 less in 2009 net worth compared with living in a white household with median 2007 net worth (a loss of about 62 percent). Further, living in a Hispanic household with median 2007 net worth is associated with $208,177.90 less in 2009 net worth compared with living in a white household with median net worth in 2007 (a loss of about 70 percent).

Income, 2007 net worth, being older, being married, and having health insurance all are significantly related to increases in 2009 net worth. It is worth noting that both 2007 net worth and income, while significant, have a weak association with 2009 net worth. Somewhat surprisingly, living in a household with median net worth and having health insurance in 2007 are associated with an increase of $357,010.60 in 2009 net worth compared with living in a household with no health insurance (a 120 percent difference). Findings also suggest that being married is related to relatively strong gains in net worth. The combination of living in a household with median net worth and a married respondent in 2007 is associated with an increase of $205,331.70 in 2009 net worth compared with living in a household with an unmarried respondent (a gain of 69 percent).

DISCUSSION

About 18 percent of households in our sample have outstanding student loans. Further, the average family in 2007 has about $26,018 in student loans. This figure is slightly higher than amounts found in past research. Fry (2012) finds that the average household in 2007 has about $23,349.00 of outstanding debt, though Fry uses 2011 dollars. Not surprisingly, we also see a sharp decrease in median net worth from 2007 to 2009 ($128,828 to $98,000). This decrease may be explained by the 2007-09 Great Recession when a large number of households experienced a drop in their net worth, largely as a result of declining home values (Fry, 2012).

Our first main research question in this study is whether student loan debt is associated with 2009 household wealth. We find that median 2009 net worth for a household with no outstanding student debt ($117,700) is nearly three times (275 percent) higher than for a household with outstanding student debt ($42,800). Moreover, when we consider the change in net worth, the relative burden appears to be much greater for households with student debt. Regardless of whether we examine the mean or median change in net worth, the change in net worth represents a higher percentage of total 2009 net worth (12.4 percent) for households with outstanding student debt than it does for households with no outstanding student debt (9.31 percent). This difference might suggest that households with outstanding student debt are more burdened by the negative change in net worth from 2007 to 2009 than households with no student loans.

After controlling for demographic factors, we find the pattern suggested by the descriptive data remains: Outstanding student loans are associated with lower household net worth. A hypothetical household with exactly median 2007 net worth ($128,828) with outstanding student loans is associated with a loss of about 54 percent in 2009 net worth compared with a household with similar levels of net worth but no student debt. The idea that student debt might negatively affect adults' post-graduation outcomes is consistent with previous research. For example, findings suggest that graduates of a four-year college delay purchasing major assets such as a car or a home (Stone, Van Horn, and Zukin, 2012), delay marriage (Gicheva, 2011), and earn lower wages after the first year after graduation (Minicozzi, 2005).

Our findings might also suggest that outstanding student debt has a consistent negative association with 2009 net worth among households at the 15th, 30th, and the 50th percentiles of 2007 net worth. However, we find that households with less net worth might be more burdened by outstanding student debt than those with higher levels of net worth. While households at the 15th percentile with outstanding student debt lost less net worth ($5,017.26) than similar households at the 50th percentile ($69,976) from 2007 to 2009, the loss for households at the 15th percentile represents 285 percent of their 2009 net worth but only 54 percent for households at the 50th percentile. This outcome is in line with the findings of Elliott and Friedline (2013) that suggest the increasing student debt burden on households may not be equally shared at different income levels.

In addition, it is important to highlight that a four-year college graduate living in the household is associated with higher net worth compared with households without a four-year college graduate. However, the size of the effect of college graduates in the household is larger when the household has higher levels of net worth. Therefore, while all households appear to benefit from

a four-year college graduate living in the household, wealthier households appear to benefit even more. Income and net worth in 2007 are also significantly associated with higher 2009 net worth but they appear to have a weak association controlling for all other factors. However, more research into this association is needed.

Our second question is whether the amount of outstanding student loan debt is associated with net worth. We find that higher amounts of debt result in greater net worth losses. This finding is consistent with previous research in other areas. For example, the findings of Dwyer, McCloud, and Hodson (2011) suggest that student loans totaling more than $10,000 actually reduce the chance that a student will graduate from college. Similarly, Minicozzi (2005) finds evidence that the positive effects of student loans on earnings diminish at debt levels above about $10,000, and Gicheva (2011) finds that borrowing an additional $10,000 for education above the average student loan debt for full-time students when the respondent was 18 years old reduces the short-term likelihood of marriage.

Our third question is whether student loans are associated with the financial health of four-year college graduates compared with their counterparts with no student debt. We find that living in a household with a four-year college graduate with outstanding student debt is associated with a net worth loss of $185,995.90 (about 63 percent less) compared with living in a household with a four-year college graduate with no outstanding debt.

Limitations

A number of notable limitations should be considered. Importantly, we cannot rule out that student loan debt may be a marker for larger but unobserved household economic challenges. In other words, student loan debt may not be the cause of the decline in net worth. This possibility is mitigated somewhat by controlling for a number of factors considered important in predicting household net worth. Further, this possibility is less problematic for the sample of households that all have outstanding student debt. Even if households with student loans face unobserved household economic challenges, findings from the all-student-loan sample would lessen these concerns. However, findings from this study can be interpreted only as suggesting the possibility of an association between student loans and household net worth. We cannot completely rule out the possibility that some other factor—not the student loans—is causing the decline in net worth.

Another important limitation is the short time frame: 2007-09. This restriction makes it difficult to fully account for the fact that human capital is created by student debt. Conventional net worth does not include the value of human capital. As a result, conventional net worth is biased to show that student debtors have less wealth because the debt is counted as a liability but human capital is not included as an asset. We address this problem in two ways. First, we drop student loan debt from the net worth variable as discussed earlier. Second, we estimate a model using assets only. The asset variable does not include debt, so the problem of including debt but not human capital is removed. We find that student loans also have a significant negative association with household assets (see Table A2).

Moreover, the problem of including student debt but not accounting for human capital as an asset seems less problematic in the sample including only households with a college graduate.

Unless there is reason to assume that households with student debt and a college graduate will earn more in the future than households with no student debt and a college graduate, losses in the short term that are most likely the result of credit constraints will be hard to make up over the long term. That is, there is little reason to believe that households with student debt will be able to better leverage (i.e., earn more) their college degree at some point in the future than households with no student debt. This rationale is in line with our hypothesis that short-term credit constraints after college might be a source of substantial debt effects on the financial health of households.

We also acknowledge that using the change in net worth instead of net worth would lead to different results. However, the change in net worth does not account for the fact that change in net worth makes up more of the total net worth of households with outstanding student debt than for those with no outstanding student debt.

Policy Implication

The main policy implication of this study is that outstanding student debt may threaten the short-term financial health of households. However, our findings should be viewed as a first look at this question; more research will be required to refute or substantiate these findings. Moreover, the policy issues are complex and must be considered within the broader context of educational finance.

Future Research

More research should be undertaken on the effects of student loans on household financial health generally, and particularly in different time periods. The period between 2007 and 2009 is unusual because of the Great Recession. Research across longer periods is also desirable. Researchers may also want to determine whether similar effects exist when different assets are examined (e.g., home equity, savings, stocks, or more generally, financial assets and nonfinancial assets). Another important area of inquiry will be determining whether households with outstanding loans are also highly leveraged and whether this explains the lower net worth of these households. Researchers might also want to investigate whether a threshold amount exists above which student loans become more harmful to the financial health of households. While this body of research has barely begun, the findings in our study signal that it may be important to continue the inquiry.

CONCLUSION

Overall findings from this study suggest that a four-year college graduate who has outstanding student debt will be in worse financial health (i.e., have less net worth) than a four-year college graduate with no outstanding student debt, at least in the short term. This does not mean, however, that a college degree no longer pays off. In fact, we find evidence indicating that households with a four-year college graduate have higher amounts of household net worth than households without a four-year college graduate even while controlling for student debt. But according

to the ethos of the American dream, people with the same level of ability and effort should have similar financial outcomes. That is, it is not enough that a college graduate who needed to use loans to pay for college is better off than if he or she did not graduate from college. A graduate with loans must have an equal chance to achieve a similar level of financial health as his or her peers, the college graduates who do did need to use student loans. Given this, our findings begin to raise questions, but are not definitive, about whether our higher education system, which increasingly relies on student loans to finance college, can retain its position as one of the greatest equalizing forces in the American economy.

APPENDIX

Table A1

Median Regression Results Predicting 2009 Net Worth Using Median 2007 Net Worth: Heads of Households 30 to 60 Years of Age*

Characteristic	Coefficients	SE	*p*-Value
Student loan use	–$60,022.04	10,409.91	<0.000
Income	$0.12	0.05	<0.000
2007 Net worth	$0.04	0.01	0.041
Four-year college graduate	$68,931.93	8,997.32	<0.000
Age	$5,899.91	560.25	<0.000
Occupational prestige (ref. professional)			
Technical/services	–$37,502.71	11,266.58	0.002
Other	–$53,214.87	10,364.55	<0.000
Not working	–$73,154.08	11,911.44	<0.000
Married	$95,308.15	9,498.26	<0.000
Use of welfare	–$221,796.60	11,437.75	<0.000
Race (ref. white)			
Black	–$75,448.15	11,288.89	<0.000
Hispanic	–$46,812.08	12,752.02	<0.000
Asian	$9,282.56	14,527.14	0.197
Has health insurance	$92,396.30	16,350.69	<0.000

NOTE: Standard errors are bootstrapped with 999 replications and are adjusted for imputation uncertainty (Pence, 2002, 2006). Coefficients are marginal effects evaluated at 2007 median net worth ($116,691) among heads of households 30 to 60 years of age. Net worths in 2009 are calculated using the IHS transformation (Pence, 2006). *N = 69,638,811. ref., reference; SE, standard error.

SOURCE: SCF. Data are weighted.

Table A2

Median Regression Results Predicting 2009 Assets Using 2007 Median Assets*

Characteristic	Coefficients	SE	*p*-Value
Student loan use	–$43,532.79	10,557.75	<0.000
Income	$0.17	0.07	0.041
2007 Assets	$0.07	0.01	<0.000
Four-year college graduate	$117,758.70	11,657.11	<.0000
Age	$5,175.66	357.98	<0.000
Occupational prestige (ref. professional)			
Technical/services	–$51,534.02	10,168.48	<0.000
Other	–$78,348.94	14,806.69	<.0000
Not working	–$158,919.60	14,629.30	<0.000
Married	$155,967.30	12,707.21	<0.000
Use of welfare	–$345,849.20	21,962.50	<0.000
Race (ref. white)			
Black	–$79,816.08	12,534.73	<0.000
Hispanic	–$113,068.40	20,226.29	<0.000
Asian	$5,192.62	16,580.95	0.191
Has health insurance	$211,597.90	26,436.26	<0.000

NOTE: Standard errors are bootstrapped with 999 replications and are adjusted for imputation uncertainty (Pence, 2002, 2006). Coefficients are marginal effects evaluated at median 2007 net worth of $225,035. Assets in 2009 are calculated using the IHS transformation (Pence, 2006).
*N = 113,178,790. ref, reference; SE, standard error.

SOURCE: SCF. Data are weighted.

NOTES

1 These default rates refer to the time (2 or 3 years) between when the loan repayments start and when the borrower enters into default.

2 In this article, "college graduate" is defined as anyone with a bachelor's or postgraduate college degree.

3 The macro can be found at http://www.federalreserve.gov/econresdata/scf/files/fedstables.macro.txt.

4 We used a macro created by Pence (2006) to calculate the optimal values. The macro can be found at http://works.bepress.com/karen_pence/16/.

5 Welfare use was measured by asking respondents whether they or anyone else in the household had income from Temporary Assistance for Needy Families (TANF), Supplemental Nutrition Assistance Program (SNAP), or other forms of welfare or assistance such as Supplemental Security Income from Social Security (SSI).

6 All households with student loans have a member with at least some college, while households with no student loans may or may not have a member with some college, which might explain income differences.

7 We also investigated change in net worth as the dependent variable. However, this table suggests that change in net worth might not be the correct dependent variable to use because even though households with no outstanding student loans on average experience larger declines in net worth than households with outstanding student loans, these losses make up considerably less of their total net worth holdings.

REFERENCES

Baum, Sandy and Payea, Kathleen. *Trends in Student Aid 2012* (Trends in Higher Education Series). New York: College Board, 2012; http://advocacy.collegeboard.org/sites/default/files/student-aid-2012-full-report.pdf.

Boshara, R. "From Asset Building to Balance Sheets: A Reflection on the First and Next 20 Years of Federal Assets Policy." CSD Perspective No. 12-24. Washington University in St. Louis, Center for Social Development, 2012; http://csd.wustl.edu/Publications/Documents/P12-24.pdf.

Bucks, Brian K.; Kennickell, Arthur B.; Mach, Traci L. and Moore, Kevin, B. "Changes in U.S. Family Finances from 2004 to 2007: Evidence from the Survey of Consumer Finances." *Federal Reserve Bulletin*, February 2009, *95*, pp. A1-A55; http://www.federalreserve.gov/econresdata/scf/files/2007_scf09.pdf.

Cohn, M. "Student Loan Debts Could Trigger Next Financial Crisis." *Accounting Today*, February 9, 2012; http://www.accountingtoday.com/debits_credits/Student-Loan-Debts-Trigger-Financial-Crisis-61700-1.html.

Cunningham, Alisa F. and Kienzl, Gregory S. "Delinquency: The Untold Story of Student Loan Borrowing." Washington, DC: Institute for Higher Education Policy, March 2011; http://www.asa.org/pdfs/corporate/delinquency_the_untold_story.pdf.

Dwyer, Rachel, E.; McCloud, Laura and Hodson, Randy. "Youth Debt, Mastery, and Self-Esteem: Class-Stratified Effects of Indebtedness on Self-Concept." *Social Science Research*, May 2011, *40*(3), pp. 727-41.

Elliott, William and Friedline, Terri. "'You Pay Your Share, We'll Pay Our Share': The College Cost Burden and the Role of Race, Income, and College Assets." *Economics of Education Review*, April 2013, *33*, pp. 134-53.

Fry, Richard. "A Record One-in-Five Households Now Owe Student Loan Debt." Pew Research Center, September 26, 2012; http://www.pewsocialtrends.org/2012/09/26/a-record-one-in-five-households-now-owe-student-loan-debt/.

Gicheva, D. "Does the Student-Loan Burden Weigh into the Decision to Start a Family?" Department of Economics, University of North Carolina at Greensboro, March 2011; http://www.uncg.edu/bae/people/gicheva/Student_loans_marriageMarch11.pdf.

Greene, Kelly. "New Peril for Parents: Their Kids' Student Loans." *Wall Street Journal*, October 26, 2012; http://online.wsj.com/article/SB10000872396390444024204578044622648516106.html.

Hao, Lingxin and Naiman, Daniel Q. *Quantile Regression*. Thousand Oaks, CA: Sage Publications, 2007.

Hiltonsmith, Robert. "At What Cost? How Student Debt Reduces Lifetime Wealth." New York: Demos, August 2013; http://www.demos.org/sites/default/files/publications/AtWhatCostFinal_Demos.pdf.

Keister, Lisa A. *Wealth in America: Trends in Wealth Inequality*. Cambridge, MA: Cambridge University Press, 2000.

Kennickell, Arthur B. "Multiple Imputation and Disclosure Protection: The Case of the 1995 Survey of Consumer Finances." Board of Governors of the Federal Reserve System, November 26, 1997; http://www.federalreserve.gov/econresdata/scf/files/expers95.pdf.

Kennickell, Arthur B. "Try, Try Again: Response and Nonresponse in the 2009 SCF Panel." Board of Governors of the Federal Reserve System, September 2010; http://www.federalreserve.gov/econresdata/scf/files/2009p_asa2010.final.pdf.

Martin, Andrew. "Debt Collectors Cashing In on Student Loans. *New York Times*, September 8, 2012; http://www.nytimes.com/2012/09/09/business/once-a-student-now-dogged-by-collection-agencies.html?hp.

Minicozzi, Alexandra. "The Short Term Effect of Educational Debt on Job Decisions." *Economics of Education Review*, August 2005, *24*(4), pp. 417-30.

Mishel, Lawrence; Bivens, Josh; Gould, Elise and Shierholz, Heidi. *The State of Working America*. Twelfth Edition. Ithaca, NY: Cornell University Press, 2012.

Mishory, Jen and O'Sullivan, Rory. "Denied? The Impact of Student Debt on the Ability To Buy a House." Policy Briefs and Reports, Young Invincibles, August 15, 2012; http://younginvincibles.org/wp-content/uploads/2012/08/Denied-The-Impact-of-Student-Debt-on-the-Ability-to-Buy-a-House-8.14.12.pdf.

Oliver, Melvin L. and Shapiro, Thomas M. *Black Wealth/White Wealth: A New Perspective on Racial Inequality*. Tenth-Anniversary Edition. New York: Routledge, 2006.

Pence, Karen M. "401(k)s and Household Saving: New Evidence from the Survey of Consumer Finances." Finance and Economics Discussion Series 2002-6; Board of Governors of the Federal Reserve System, January 2002; http://www.federalreserve.gov/pubs/feds/2002/200206/200206abs.html.

Pence, Karen M. "The Role of Wealth Transformation: An Application to Estimating the Effect of Tax Incentives on Saving." *Contribution to Economic Analysis & Policy*, 2006, *5*(1), pp. 1-24.

Schwartz, Saul and Finnie, Ross. "Student Loans in Canada: An Analysis of Borrowing and Repayment." *Economics of Education Review*, October 2002, *21*(5), pp. 497-513.

Shand, Jennifer M. "The Impact of Early-Life Debt on the Homeownership Rates of Young Households: An Empirical Investigation." Federal Deposit Insurance Corporation Center for Financial Research, November 2007; http://www.fdic.gov/bank/analytical/cfr/2008/jan/CFR_SS_2008Shand.pdf.

Stone, C.; Van Horn, C. and Zukin, C. "Chasing the American Dream: Recent College Graduates and the Great Recession." John J. Heldrich Center for Workforce Development, Rutgers University, May 2012; http://www.heldrich.rutgers.edu/sites/default/files/content/Chasing_American_Dream_Report.pdf.

U.S. Department of Education. "First Official Three-Year Student Loan Default Rates Published." Press release, September 28, 2012; http://www.ed.gov/news/press-releases/first-official-three-year-student-loan-default-rates-published.

Woo, Jennie H. "Factors Affecting the Probability of Default: Student Loans in California." *Journal of Student Financial Aid*, 2002, 32(2), pp. 5-23.

Wooldridge, Jeffrey M. *Econometric Analysis of Cross Section and Panel Data*. Boston, MA: MIT Press, 2002.