Can student debt lead to personal bankruptcy?

Thomas C. O'Malley[1]
Brian C. Payne[2]

ABSTRACT

This paper analyzes the effect of student loan debt on personal bankruptcy. While nearly impossible to discharge education debt in bankruptcy, student loans have mandatory repayments that may constrain some borrowers. The distress faced by some may reach the point where student loan borrowers seek protection for those debts that can be addressed through bankruptcy. Results suggest that student loan debt may supplement the existing credit card debt and adverse event explanations of bankruptcy. We present evidence from a nationally representative panel survey (NLSY79) that education debt is positively related to filing for bankruptcy among those with active unpaid loans. Student loan borrowers with 'some college' are 64 percent more likely to file bankruptcy than high school graduates with no further education. Associate degree holders and those with a bachelor degree or higher education are 68 percent and 43 percent more likely to seek bankruptcy protection, respectively. Separately, we estimate that the likelihood of bankruptcy increases 6.8 percent for each $10,000 of unpaid loans.

Key Words: student loans, bankruptcy, human capital, financial distress

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[1] *Contact author. Department of Management, United States Air Force Academy, CO, 80840, thomas.omalley@usafa.edu, (719) 333-9209.*
[2] *College of Business, University of Colorado Colorado Springs, 1420 Austin Bluff Pkwy, Colorado Springs, CO 80918, bpayne3@uccs.edu, (719) 255-3186.*

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1 Introduction

It is little wonder why so many Americans have pursued a college degree in recent decades. The outcomes for college degree holders are well-documented in the research literature. The wage premium that college graduates earn relative to high school graduates almost doubled in thirty years (Goldin and Katz 2008). College graduates have higher employment rates, fewer layoffs and safer work environments. Aside from higher labor market returns, higher education seems to provide other tangible benefits. Education is positively correlated with savings rates, voting, good health, life expectancies, law-abidingness, marital stability and success of children (Becker 2007).

The decision to enroll in college is the classic choice to invest in one's human capital but this investment has become quite speculative. Approximately 40 percent of those attending four-year institutions fail to graduate within six years (NCES 2017). It is clear from the data that for those with some college receive meager or even non-existent benefits from having attended college. Anecdotally, employers do not actively seek those with 'some college' experience. To make matters worse, many of these college dropouts are simultaneously burdened with student debt repayments. It is quite plausible that millions of college dropouts are in a worse financial position today as a result of their investment decision.

College graduates are exposed to risk as well. Average wages are consistently higher for those who have completed college, but averages mask wide variation in outcomes. Results vary widely given the institution attended and the degree obtained. Some find themselves in the gap between what colleges supply and employers demand. College graduates often work in entry level jobs that do not require higher education, with more than one-third of college graduates working at jobs that do not require a college degree (Vedder et. al. 2010). With time college graduates working entry level jobs often move on to more responsibility and higher pay, but for those who stagnate there may be no measurable return to their college investment.

The college decision has become more speculative in recent decades as costs have soared well beyond the ability of families to pay for college. Over a 40-year period, household income increased by a factor of 6.5, but in-state student tuition increased 15 times and out-of-state tuition rose 24-fold (Schumpeter 2010). The growth in grant and scholarship funding has simply not kept pace and students have increasingly turned to loans to finance their higher education plans. Debt now represents a ubiquitous part of the American college experience with nearly seven in ten graduating seniors having student debt and an average debt load exceeding $30,000 (Cochrane and Cheng 2016).

The resulting loan repayments consequently shape major household decisions faced by these borrowers. Most education loans are taken out under the Federal Student Loan Program (FSLP) and with a FSLP loan repayment generally begin six months after the borrower leaves school. While more repayment options have become available in recent years, repayment is generally required irrespective of the borrower's graduation or employment status. Research documents the resulting changes in some economic behavior. Debt loads may well influence the decision to enroll in professional or postgraduate degree programs (Weiler 1991; Fox 1992). Indebted lawyers may avoid low-paying public service careers, and indebted doctors may pass up specialist careers that require additional education (Chambers 1992; Spar, Pryor and Simon 1993). Student debt may discourage household formation with respect to potentially delaying homeownership and marriage (Shand 2008, Brown and Caldwell 2013; Bozick and Estacion 2014; Mezza, Ringo, Sherlund and Sommer 2016; Bleemer et. al. 2017).

Many student loan borrowers struggle to pay off their loans. College Board (2016) estimates the 5-year total default rate at 28 percent for the 2008-9 repayment cohort, with notably higher rates for those attending for-profit and public two-year institutions. One study following college graduates from the class of 2005 finds more than forty percent of borrowers have become delinquent on one or more loans within a five-year repayment period (Cunningham and Kienzl 2011). In part, the recent rise in default rates may be the result of an increase in nontraditional students attending college, as this group disproportionately comes from lower-income families and frequently attends institutions with poor outcomes (Looney and Yannelis 2015).

Repayment difficulties are likely elevated among those who fail to graduate with a four-year degree. With a smaller earnings potential, those with 'some college' or an associate degree may be more likely to get behind in their loan repayments. We pool data from the last five triannual Survey of Consumer Finances (SCF) administrations to uncover any evidence of this possibility. As seen in Figure 1, which depicts the proportion of those with some college and those with an associate degree in non-payment status versus the overall proportion of the SCF in non-payment status, there is a disproportionately high number of non-payers among those who have not completed a four-year program. Across all SCF years, sixteen percent of respondents in this survey have 'some college', but this group represents 39 percent of those reporting loans in non-payment status. Similarly, 6.4 percent of respondents have an associate degree, but this group represents more than 15 percent of non-payment loans.

The 2016 administration of the SCF delves deeper with an additional question probing why some are not making payments on their student loans. In total, 19.45 percent of the 6,248 respondents report having one or more

student loans. Among these respondents, 11.81 percent report a loan that is in 'non-payment' status because of an inability to afford the payment. This self-reported inability is disproportionately experienced by those with 'some college' or an associate degree, as seen in Figure 2. Fourteen percent of the survey respondents have 'some college', but this group makes up 35.5 percent of those reporting an inability to afford repayment. This outcome is even more skewed among associate degree holders who are 10.4 percent of the sample but make up 33.7 percent of those reporting an inability to afford payments. By comparison, those with a bachelor degree or higher education make up 43.2 percent of those surveyed, but 30.8 percent of those reporting an inability to afford loan repayments.

For some borrowers, student loan debt may cause financial distress beyond temporary or occasional repayment difficulties. The best indicator of this may be household bankruptcy. The immediate costs of bankruptcy can be steep, with legal advice commonly costing several thousand dollars and court fees often exceeding $1,000 (U.S. Courts 2016). Bankrupt households are exposed to information costs as they invest time and effort getting familiar with the bankruptcy process. Longer-term ramifications can be dramatic with a completed bankruptcy remaining on the filer's credit report for up to ten years and affecting a spectrum of financial choices related to credit, housing, transportation, insurance, and employment. Lastly, bankruptcy may impose emotional costs related to the stigma some filers may feel.

While education debt generally is *not* dischargeable in bankruptcy, mandatory repayments of these debts may impede the borrower's ability to maintain other acquired debts. At the extreme, the presence of student debt may lead to financial distress, with some seeking bankruptcy for those debts that are dischargeable. An extensive body of work investigates personal bankruptcy, but extant studies do not explore the unique role that student loans may play in the bankruptcy decision. Also, it is plausible that the effects of education debt vary by educational level, with those failing to graduate to with a four-year degree more exposed to financial distress. To our knowledge there are no studies examining this and we attempt to address these issues in this study.

After investigating these questions, we find a link between active unpaid student loans and filing for bankruptcy, particularly for those who take loans and fail to complete a bachelor's degree program. Those with 'some college' and unpaid student loans are estimated to be 64 percent more likely to file for bankruptcy relative to those who graduate from high school but do not attend college. Borrowers who have an associate degree are 68 percent more likely to file for bankruptcy. Even those with a bachelor's degree or higher level of education and active unpaid loans have an elevated risk, with an estimated bankruptcy likelihood increasing 43 percent. Separately, we look at the

size of these unpaid loans, controlling for educational attainment. We find a link between loan balance and bankruptcy; a $10,000 increase in unpaid student loans is estimated to increase the probability of bankruptcy by 6.8 percent. All of these estimates are obtained with controls for credit card debt, income and three relevant adverse events: job loss, health shock, and divorce. These findings suggest that student loan debt offers an explanation for bankruptcy that supplements the previously documented credit card and 'adverse events' hypotheses.

2 Literature on Bankruptcy and Student Loans

Bankruptcy law provides a path by which individuals can eliminate some or all of their personal debts and obtain a financial restart. Personal bankruptcy increased dramatically from 1985 to 2005, with the number of filings in the U.S. increasing 4.75 times. As bankruptcies peaked in 2005 at more than 1.6 million filings, Congress passed the Bankruptcy Abuse Prevention and Consumer Protection Act (BAPCPA), making it more difficult for individuals to file for bankruptcy. Since 2005 bankruptcies have declined markedly, but there are still more than three-quarters of a million filings a year. Figure 3 illustrates U.S. bankruptcy trends through time for the two most common types of bankruptcy, Chapter 7 and Chapter 13. The steep Chapter 7 decline post-2005 provides clear evidence of BAPCPA's impact.

A Chapter 7 filing permits a household to completely discharge all unsecured debts, such as credit card debt, medical bills and installment loans. This is often referred to as a 'straight' bankruptcy. Filers are not subject to wage garnishment, but they are obligated to surrender assets that exceed state-specific exemption levels. Exemptions generally shield retirement assets, provide a limited homestead exemption, and provide allowances for automobiles and certain personal belongings (Gropp, Scholz and White 1997). Non-exempt assets are then sold, and the proceeds are distributed to creditors. Some debts cannot be discharged, including alimony, child support, income tax liabilities, and government-supported student loans. Chapter 7 filers are not allowed to file for bankruptcy again for eight years.

Chapter 13 bankruptcy permits reorganization of debts, permitting debtors with regular income to discharge debts after paying off a portion of their liabilities. The debtor maintains ownership of his or her assets but must propose a repayment plan acceptable to the court. A plan typically spans three to five years. Debt is not discharged if the filer does not fulfill the court-approved repayment plan. A large number of Chapter 13 filers do not successfully execute the repayment plan and many of these filings then transition to Chapter 7 (Dobbie and Song, 2015). As Figure 3 depicts, Chapter 7 is more prevalent, but the trends of these two types of bankruptcy are highly related.

Explanations for Bankruptcy

The increase in the household bankruptcies spurred academic interest starting in the early 1980s. One stream of research links financial distress to unanticipated income and expense shocks. Households exposed to certain 'adverse events' are more likely to suffer financial distress. Job loss, divorce and unpaid medical bills are the prominent events that have been studied. Two-thirds of bankruptcy filers report a job loss as the cause (Sullivan, Warren and Westbrook 2000). Bankruptcy is more likely if the head of household had been recently divorced (White 2007). Bankruptcy may also be related to uninsured medical expenses (Domowitz and Sartain 1999; Warren and Tyagi 2003).

Bankruptcy may also be the product of strategic choice. States vary in the amount of personal assets that may be legally sheltered from bankruptcy. The benefit of filing increases as the exemption level increases. Opportunistic households may consider the generosity of state bankruptcy law and respond to economic incentives to file when the financial benefit is high. White (1987) finds that state exemption levels and filing rates are positively related. Fay, Hurst and White (2002) find a $1,000 increase in the financial benefit of bankruptcy increases the probability of filing by 7 percent.

A reduction in the stigma associated with bankruptcy may also lead to more bankruptcy. Stigma is an emotional penalty imposed by oneself or by others in response to filing. As bankruptcy activity increases, filings may become socially acceptable. Buckley and Brinig (1998) find that changes in social norms help explain the tripling of the bankruptcy rate from 1984 to 1991. As local filing rates increase, consumers are more likely to file for bankruptcy (Fay, Hurst and White 2002). Gross and Souleles (2002) find that increasing bankruptcy rates among credit card holders are consistent with reductions in stigma.

These three hypotheses have difficulty explaining the dramatic increase in filing rates that began in the 1980s however. 'Adverse events' are positively related to individual bankruptcy decisions in cross-sectional analyses but they fail to explain the historical increase. Divorce rates actually declined during the 1980s and 1990s, when bankruptcy rates tripled (White 2009). Job loss and health shock explanations are also contentious. As filings increased, the national unemployment rate actually fell, albeit with large fluctuations. Uninsured health care costs grew during this period, but only slightly as a percent of median household income (White 2009). The 'strategic choice' alternative also seems a poor choice to explain the increase in filings. There is no evidence that state exemption levels systematically increased during this period. Lastly, the 'reductions in stigma' hypothesis has also been disputed. There is little evidence that social stigma declined during this period. Stigma may have actually increased as

bankruptcy information has become increasingly accessible online and available to the public (Sullivan, Warren and Westbrook 2006).

Debt and Bankruptcy

The dramatic rise in personal bankruptcy came after a striking increase in credit availability and levels of personal debt. Credit cards were first introduced in the mid-1960s. Credit card adoption rates were modest as state usury laws limited the maximum interest rates that could be charged and credit was extended to only the most creditworthy individuals. Deregulation in the 1980s then allowed states to loosen interest rate restrictions. Credit card lending quickly spread. The proportion of consumers with bank-type credit cards increased from 16 percent in 1970 to 67 percent by 1995, and whereas only 6 percent of households carried a balance in 1970, 37 percent carried a balance by 1995 (Durkin 2000).

Changes in the credit market created imbalances between accumulated credit and income for many households. This development may offer the best explanation for the increase in personal bankruptcy. Deregulation of consumer interest rates led to lower underwriting standards, expanded credit availability and more personal bankruptcy (Ellis 1998). Innovations in the credit market reduced transactions costs and lowered the cost of bankruptcy (Livshits, MacGee and Tertilt 2010). At least 10 percent of the increase in bankruptcy rates is explained by the expansion of credit that followed banking deregulation in the 1980s and 1990s (Dick and Lehnert 2010). An increase in the credit card debt from the population average to that of the typical filer increases the conditional probability of filing six times (Domowitz and Sartain 1999).

The expansion in credit card debt foreshadowed the rapid growth in student loan debt that took place two decades later. During the 2000s, financial aid packages transitioned from being predominantly need-based grants not requiring repayment to loans that required both principal and interest payback. More than two-thirds of college graduates now finish school with accumulated debt (Cochrane and Chang 2016). Unpaid loan balances have expanded, impacting the balance sheets of college graduates and non-graduates alike. In 2005 cumulative student debt was approximately 364 billion dollars, or 13.5 percent of all non-mortgage consumer debt. By the end of 2018, total student debt has almost quadrupled to more than $1.46 trillion, or 33 percent of all non-mortgage debt (FRBNY 2019). If trends continue, cumulative student debt will soon be double that of the credit card debt market (see Figure 4).

Some studies tangentially consider whether student loans play a role in the bankruptcy decision. Domowitz and Sartain (1999), for example, identify and compare the determinants of Chapter 7 and Chapter 13 filings and find

at that at given income levels, higher student debt promotes higher Chapter 13 filings. Chapter 13 filers have three times the amount of education debt as Chapter 7 filers, consistent with the fact that student debt cannot be directly discharged in a straight bankruptcy. Other work suggests a link between household education and bankruptcy. Filers are more likely to report having "some college" but less likely to have obtained a college or advanced degree (Sullivan, Warren and Westbrook 2000). While filers are about half as likely as non-filers to hold a bachelor degree, they are 25 percent more likely to be a high school graduate and 35 percent more likely to have attained 'some college' (Wang 2007).

Although these studies explore the role of student debt and education in the bankruptcy decision, they fail to do so jointly. This paper attempts to address this gap in literature by considering the presence of student loan debt by educational level. Insights here may be critical in evaluating debt financing and providing tailored advice to those considering the use of student loans, particularly those who have an elevated risk of not graduating.

3 Data

To identify any potential role for student debt in the bankruptcy decision we use data from the National Longitudinal Survey of Youth (NLSY79). The NLSY79 has annual information for the variables necessary to study the determinants and timing of bankruptcy. It is arguably one of the best panel datasets available to investigate personal bankruptcy. The NLSY79 is conducted for the Department of Labor's Bureau of Labor Statistics and provides a rich dataset of financial information, employment history, personal traits, family background and demographics. It is a panel dataset that captures the responses of a nationally representative sample of 12,686 men and women. The respondents were born in the years 1957-1964 and were first interviewed in 1979. Follow-up interviews were conducted annually through 1994 and biennially thereafter.

Recent administrations of the NLSY79 make studying bankruptcy possible. The 2004, 2008, 2010, 2012, 2014 and 2016 waves include bankruptcy modules that capture information about the respondent's bankruptcy experience. In these six administrations of the NLSY79, respondents are asked several bankruptcy questions. The first question asks if bankruptcy has ever been declared. Thirteen percent of 2004 respondents declared bankruptcy at some point in life. By 2016, this grows to nearly 20 percent. If the response indicates that he or she has ever filed for bankruptcy, the respondent is then asked additional questions including the date and type of bankruptcy. Bankruptcy filing dates range from 1979 to 2017, and bankruptcy types include Chapter 7, Chapter 11, Chapter 12, Chapter 13 and 'Other'. Table 1 provides a summary of the types of bankruptcy reported. Further, these survey administrations are the first to have

student loan and credit card balance information. The available data also allows us to simultaneously control for adverse events, including divorce, job loss and health shocks.

4 The Empirical Model

We hypothesize that student debt and bankruptcy are positively related for those who have not acquired a bachelor's degree. This group includes those with 'some college' and those who hold an associate degree. We control for credit card debt and adverse events previously demonstrated to be related to bankruptcy. Adverse events include unexpected job losses, divorce and health shocks. Data availability limit our ability to control for the strategic choice or reductions in stigma hypotheses. Standard demographic controls are used for gender, marital status, children in the household and race.

The bankruptcy decision, which we identify as a dichotomous variable, can be modeled as a function of student debt, dependent on educational attainment. With this in mind, a two-period model is developed in which the likelihood of a household declaring bankruptcy during period t is a function of modeled characteristics in the prior period, t-1. The predictor variable of interest jointly captures educational level and the presence of unpaid student loans. This two-period model enables us to test whether 'some college' or an associate degree, when combined with the unpaid loans, leads to higher rates of bankruptcy. Credit card debt and adverse events are included in the model, along with a vector of household demographic variables. Equation 1 provides the conceptual framework.

$$Bankruptcy_t = f\,(student\ loan\ use\ by\ highest\ degree, adverse\ \text{events, credit card debt,}\ events, credit\ card\ debt, income, demographic, postBAPCA)_{t-1} \quad (1)$$

Household characteristics related to wealth accumulation may also be associated with financial distress. These characteristics includes sex, marital status and family size. Women earn less than men, on average. Explanations for a gender pay gap include discrimination, occupational choices and division of labor theories (Blau and Kahn 2000). If women's wages are lower, then bankruptcy filings may be more likely for women. Single people and larger families have less wealth (Zagorsky 1999; Wolff 1998). Unmarried people and large households may therefore be more likely to experience financial distress.

Race is also included in the model as a potential determinant of financial distress. While some strides have been made with regard to income equality, a persistent wealth gap exists between whites and blacks. Several explanations for wealth underperformance by black Americans have been presented. Blacks earn more as they complete more education but earn substantially less than whites at similar educational levels. Black Americans suffer

from income stagnation and are not rewarded as generously as whites for labor market experience. Asset composition explains some of the wealth gap, with blacks having a much larger proportion of net worth tied up in functional assets and less in income-producing and other financial assets (Oliver and Shapiro 1995).

Finally, we factor the timing of the Bankruptcy Abuse Prevention and Consumer Protection Act (BAPCPA) into this analysis using a simple indicator variable for the post-BAPCPA phase. As seen in Figure 3, bankruptcy filings have fallen markedly since the 2005 passage of BAPCPA. A binary logistic regression is used to test Equation 1. Using data from the 2004, 2008, 2010, 2012, 2014 and 2016 waves of the NLSY79, the following model is estimated:

$$
\begin{aligned}
Bankruptcy_{it} = {} & B_0 + B_1 \text{ Some college with } loans_{i(t-1)} + B_2\, Some\ college \text{ with } no\ loans_{i(t-1)} \\
& + B_3\, Associate\ with\ loans_{i(t-1)} + B_4\, Associate\ with\ no\ loans_{\ i(t-1)} \\
& + B_5\, Bachelor'sPlus\ with\ loans_{i(t-1)} + B_6\, Bachelor'sPlus \text{ with } no\ loans_{\ i(t-1)} \\
& + B_7\, Credit\ Card\ Debt_{i(t-1)} + B_8\, Income_{i(t-1)} + B_9\, Job\ Loss_{i(t-1)} + B_{10}\, Health\ Shock_{i(t-1)} \\
& + B_{11}\, Divorce_{i(t-1)} + B_{12}\, Female_{i(t-1)} + B_{13} Married_{i(t-1)} + B_{14} Children_{i(t-1)} \\
& + B_{15} Hispanic_i + B_{16} Black_i + B_{17} PostBAPCPA + \epsilon_i
\end{aligned}
$$

Bankruptcy. The dependent variable for this study is bankruptcy. It is a dichotomous variable, coded as one if the respondent declared bankruptcy in any of the 2004-2005, 2008-2009, 2010-2011, 2012-2013, 2014-2015 or 2016-2017 windows. Again, bankruptcy is considered only in these six periods because credit card and student loan information are available only in and preceding these six time periods.

Student Loan Use and Educational Attainment. Educational attainment and student loan use are combined into six dichotomous variables. Educational attainment differentiates between those who have 'some college', those who have obtained an associate degree and those who have completed a bachelor degree or more education. These three variables are individually interacted with another dichotomous variable that captures whether the individual has one or more active student loans. The omitted reference group are those who have a high school degree and have never attended college.

Financial. It is important to control for credit card debt and income. Credit has been demonstrated to play an important role in the bankruptcy decision and an imputed variable is used that sums credit balances from individual accounts. Similarly, an imputed variable is used to measure income that sums up different sources of household income. Credit card balances and income are measured in tens of thousands of dollars.

Adverse Events. The adverse events hypothesis posits that job losses, health problems and divorce lead to personal bankruptcy. Research suggests that a period of observation longer than one year is preferable (Keyes 2009). Three

dummy variables are used to capture the presence of these events in the two-year period leading up to each of the six bankruptcy observation windows. The job loss variable considers layoffs only. Breaks in employment caused by layoffs tend to be unanticipated and more likely to lead to financial distress. Potential job loss responses not considered include responses such as: 'quit job', 'going to school', 'in the Armed Forces', or 'did not want to work'. A health shock is considered if it affects the respondent's ability to work. Breaks in employment that result from health problems are coded as a health shock. In similar fashion, divorce is also considered an 'adverse event' if it occurs at any point in the two years leading up to one of the bankruptcy observation windows.

Household. The sex of the respondent is included as dichotomous variable. 'Male' is the excluded reference group. The marital status of the respondent is also treated dichotomously and coded one for those respondents who were married at the time of survey administration. Lastly, the number of children in the respondent's household is included.

Race. Two dummy variables are used to identify the respondent's race. One identifies those who are black and one is used for those reporting a 'Hispanic' status. Non-black, non-Hispanic responses are the excluded reference group.

BAPCPA. A dichotomous variable is used to account for the 2005 Bankruptcy Abuse Prevention and Consumer Protection Act. One intent of this legislation was to make it more difficult to file for bankruptcy and filings dropped significantly after 2005 (See Figure 3). Observations that occur in the year 2005 or after are coded as one, zero otherwise.

5 Estimation Results

A descriptive summary of the NLSY79 sample used in this study is provided in Table 2. For each variable, mean values are provided for bankruptcy filers and non-filers. Filers are more than seventy percent more likely than non-filers to have an active student loan. Filers are more likely to have 'some college' or an associate degree and less likely to have a bachelor degree or higher education. The typical filer has 80 percent more credit card debt and 24 percent less income than the typical non-filer. With respect to adverse events, bankruptcy filers experience 43 percent more layoffs, nearly twice as many health shocks and 53 percent more divorces than non-filers.

We use a logistic regression to estimate the likelihood of declaring bankruptcy. Odds ratios and standard errors are provided in Table 3, which documents the results of three different model specifications. Regression results in specification 3 indicate that active unpaid student loans are related to personal bankruptcy. Other variables appear stable across the three model specifications. Individuals who enroll in college but who do not obtain a four-year degree

are more likely to file for bankruptcy at conventional significance levels. Specifically, those with 'some college' who have active student loans are 64 percent more likely to file than the reference population of high school graduates who never attended college.[1] Associate degree holders with student loans are 68 percent more likely to file. Surprisingly, those with a bachelor's degree or a higher level of attainment have an elevated risk and are estimated to be 43 percent more likely to seek bankruptcy protection. In contrast, those with a bachelor's degree or higher education and no student loans are estimated 41 percent less likely to declare bankruptcy. Interestingly, those completing an associate degree without loans are not at an elevated risk of bankruptcy. But, those with loans who complete a bachelor's are still more likely to file than high school graduates. These results suggest completion is key, but so is taking on little debt.

Table 4 displays the results when we consider the size of unpaid student debt balances. Results indicate that the likelihood of bankruptcy increases 6.8 percent for each 10,000 dollars of student debt. Similar effects are seen in this regression with respect to the control variables. These results support intuition: taking on greater amounts of student debt leads to a non-trivial increase in bankruptcy probability, all else equal.

As expected, credit card debt is positively related to bankruptcy. Along with student loans and many types of revolving credit, credit cards are unsecured forms of debt. After controlling for income, it appears that large balances can lead to financial distress. All else equal, a ten thousand dollar increase in credit card debt is estimated to result in a 27.5 percent higher likelihood of declaring bankruptcy.

Mixed results are seen with respect to testing the adverse events hypothesis. As previously documented in the literature, divorce and health shocks each appear related to bankruptcy. Individuals who experience a health shock resulting in unemployment are estimated to be 79 percent more likely to declare bankruptcy. A recent divorce increases the chances of filing by 51 percent. Interestingly, we do not find evidence linking job losses to bankruptcy.

6 Conclusion

[1] An odds ratio is a relative measure of a potential effect, allowing for comparison of the variable considered to that of a reference group. An odds ratio of 1 means that there is no estimated effect. An odds ratio of 1.5 means the variable considered is estimated to result in a 50 percent increase in the likelihood of the dependent variable occurring; an odds ratio of 0.5 is associated with a 50 percent decrease in the likelihood.

The student debt explanation for bankruptcy appears to complement the existing 'adverse events' and credit card debt hypotheses. We provide evidence that student loan financing is an additional channel through which some households experience extreme financial distress. These findings supplement current studies documenting the college decision as a risky investment. A surprising finding is that bankruptcy risk is elevated for those who have unpaid student loans at all levels of postsecondary education.

The growth in accumulated student debt has been unchecked by any ascertainable standard of loan underwriting. Factors associated with successful loan repayment are generally not considered during the loan origination process. For instance, lenders typically do not consider the borrower's ability or choice of academic major, institutional quality or other factors predictive of successful repayment. Recognizing this potential mispricing, some private lenders (investors) are stepping in to fund those students they deem most creditworthy.[2] Further, lenders impose few constraints on how loan proceeds are spent. Some commentators refer to student loans as 'standard-of-living' loans, pointing out that some borrowers use too much of the loan proceeds to pay non-education living expenses. Policy makers may want to introduce some reasonable underwriting standards and institute loan disbursement constraints that do not excessively curtail opportunities student loans provide to promising students who lack financial resources.

Legislators may want to enact paternalistic measures for another reason. The typical student loan borrower is younger and therefore more predisposed to make poor financial choices. Young consumers tend to make poor financial decisions relative to those made by older, more experienced households (Agarwal, Driscoll, Gabaix and Laibson 2007). While student debt has grown significantly among older households in recent years, the bulk of new debt is acquired by young adults who typically lack experience making financial decisions. In some cases, borrowers are shockingly unaware of their personal indebtedness. Nearly ten percent of students underestimate their student loans by at least $10,000, and one-in-eight students who had a student loan report no debt (Andruska, Hogarth, Fletcher, Forbes and Wohlgemuth 2014).

One limitation of this study is that it does not capture the experiences of later cohorts. As such, we contend our results may understate the current risk of financial distress among these households. The data used here are from the NLSY79 survey in which participants were 13 to 17 years old when first interviewed in 1979. Most of the survey

[2] "Banks Want a Bigger Piece of Your Student Loan," Wall Street Journal, March 7, 2018, accessed at: https://www.wsj.com/articles/banks-look-to-break-governments-hold-on-student-loan-market-1520418600?ns=prod/accounts-wsj.

respondents who attended college did so in the 1980s or early 1990s. By our calculations, 87 percent of those with a bachelor's degree completed their college schooling by the year 2000. Since then, tuition has greatly outpaced general inflation (see Figure 5), and today cumulative education debt is more than five time higher than in the year 2000 (FRBNY 2019).

While college attendance can positively affect the trajectory of one's life and broadly promote social mobility, the idea that college is a certain, risk-free path to professional and financial success is not true. An assumption that the college experience is worth any cost is faulty. Over-emphasizing the higher earnings that college graduates typically experience can be misleading and can mask significant variation in outcomes. Undoubtedly, some students overestimate the earnings potential of a degree from a given academic institution or in a given academic discipline. Still others overestimate the likelihood of program completion. A large and growing population of adults are now paying the costs for these miscalculations. One of these costs, as evidenced by this paper, is the elevated risk of financial distress.

It is critical that those considering college make an informed decision about using student loans. In addition to evaluating potential earnings gains, a sober assessment of both direct and indirect costs should be undertaken. The proposed field of study should be carefully considered. Future employment opportunities need to be realistically evaluated and alternative paths such as trade school certifications should be weighed. Critically, the probability of completing a bachelor degree program should be a key consideration based on the findings presented in this study. A wise decision about taking on student debt can only be made after comparing all of the costs and benefits and identifying all of the relevant risks.

Compliance with Ethical Standards

Conflict of Interest: The authors declare that they have no conflict of interest.

Research involving Human Participants and/or Animals: This article does not contain any studies with human participants or animals performed by any of the authors.

Informed Consent: For this type of study formal consent is not required. This study uses publicly available data from the National Longitudinal Survey of Youth 1979 (NLSY79).

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Figure 1 - Some College and Associate Degree holders' 'non-payment'
source: authors calculations using 2004-2016 Survey of Consumer Finances (SCF)

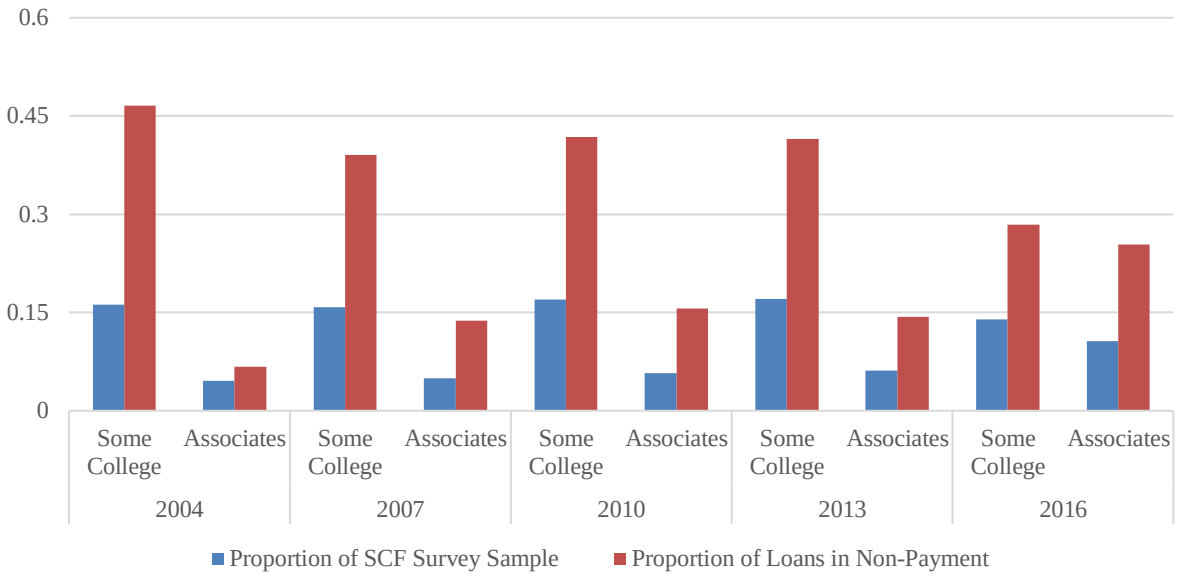

Figure 2 - 'Inability to Afford' Student Loan Payments
Source: Author's calculations using 2016 Survey of Consumer Finances

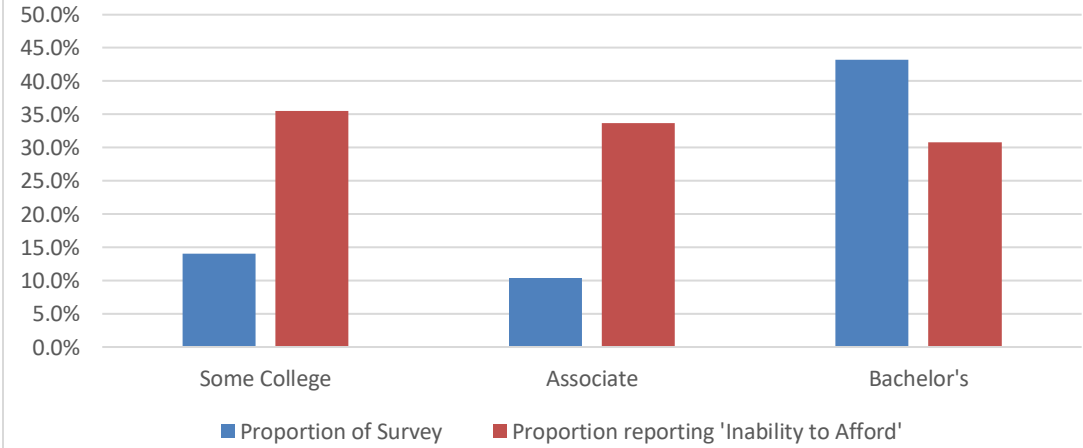

Figure 3 - U.S. Personal Bankruptcy Filings (1981-2018)
source: http://www.uscourts.gov/statistics-reports/caseload-statistics-data-tables

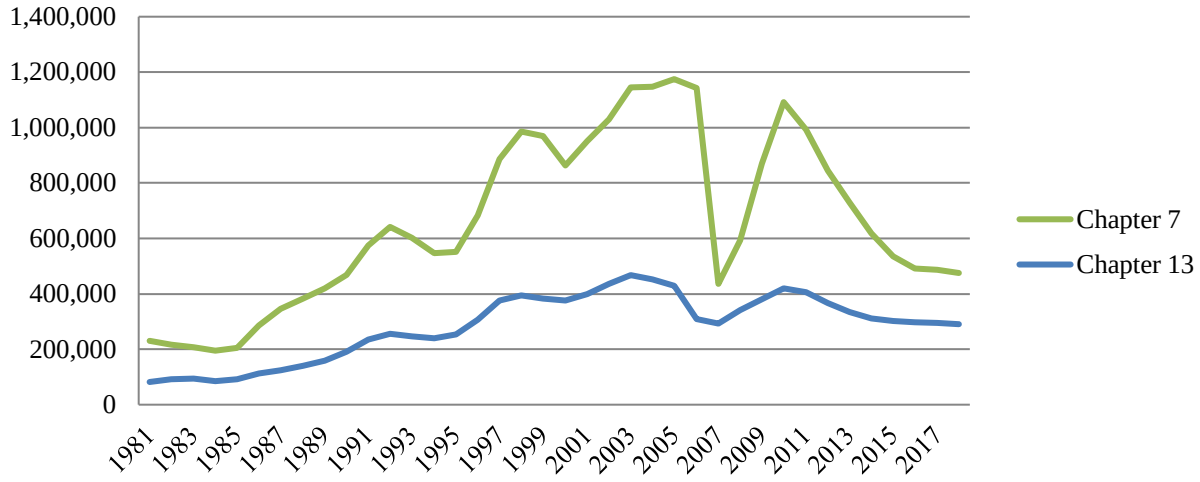

Figure 4 - Non-mortgage Debt Balances (2005-2018)
source: FRBNY, Quarterly Report on Household Debt and Credit, Q4 2018

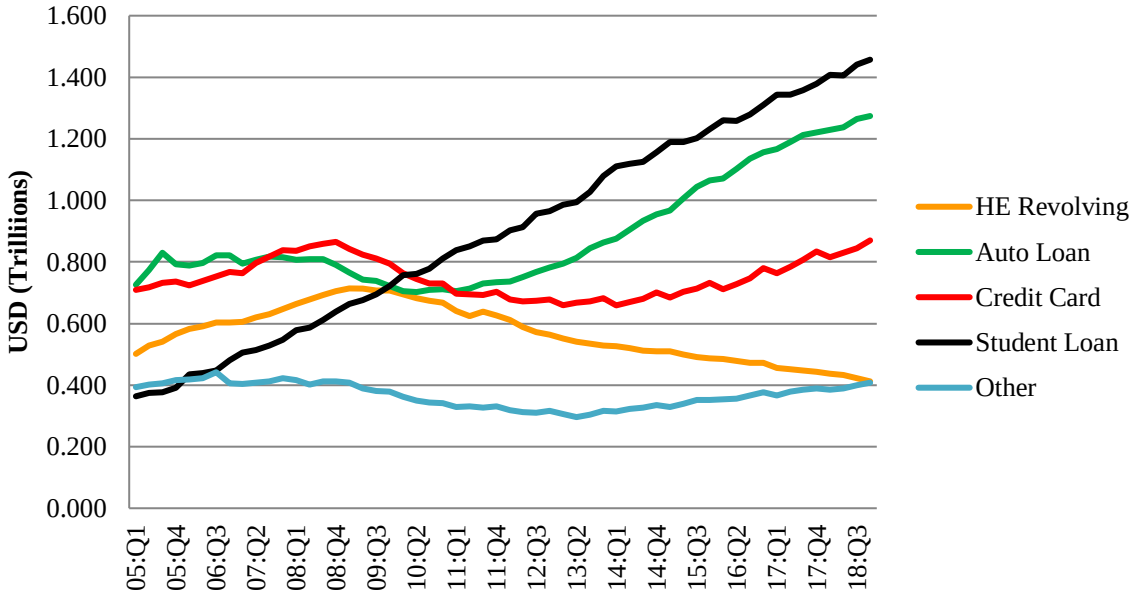

Figure 5 - CPI: All Items vs. Tuition, School Fees, Childcare
January 1978-January 2019

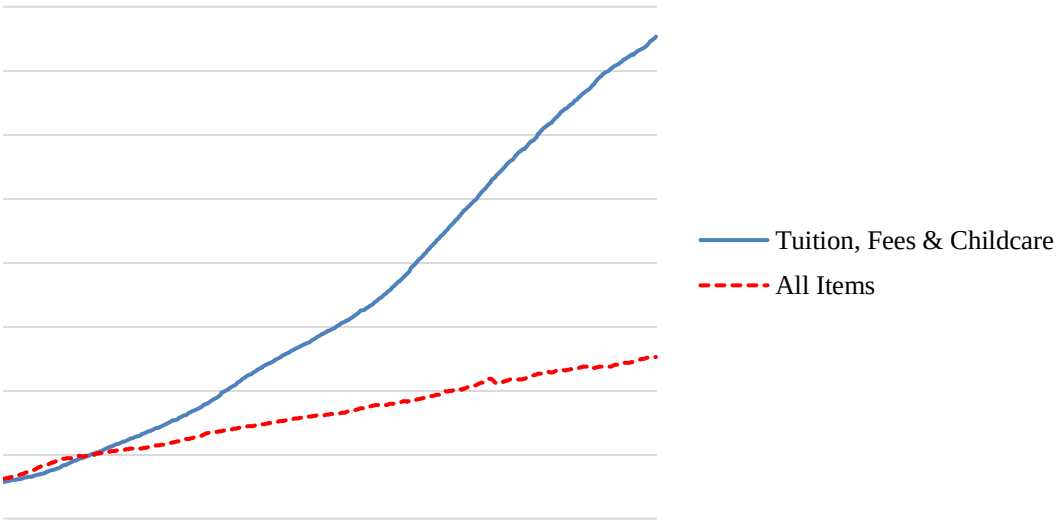

Table 1 - Type of Bankruptcy Declared

	Year of Bankruptcy					
	2004	2008	2010	2012	2014	2016
Chapter 7 - Straight Bankruptcy	30.8%	35.6%	40.8%	45.2%	52.7%	63.0%
Chapter 11 - Business Reorganization	5.0%	6.1%	4.1%	2.4%	1.1%	2.2%
Chapter 12 - Family Farmer Reorganization	0.3%	0.0%	0.8%	0.0%	0.0%	0.0%
Chapter 13 - Personal Debt Reorganization	62.6%	56.3%	53.1%	52.4%	46.2%	34.8%
Other	1.3%	1.9%	1.2%	0.0%	0.0%	0.0%

Note: Calculations are taken from NLSY79 biannual administrations

Table 2 - Descriptive Statistics of the Sample

	Bankruptcy	
	Filers	**Non-Filers**
Education loans		
Active student loans	12.46%	7.17%
Education		
College dropout	30.63%	24.59%
Associate degrees	12.29%	11.65%
Bachelor's or higher	18.15%	27.05%
Income and Credit		
Credit card balance (000's USD)	5.53	3.06
Income (000's USD)	30.67	40.35
Adverse Events		
Job loss	3.06%	2.14%
Health shock	8.49%	4.42%
Divorce	5.98%	3.91%
Household Demographic		
Female	56.05%	50.60%
Married	55.53%	55.12%
Number children in household	1.09	0.89
Hispanic	17.74%	19.54%
Black	38.56%	30.80%

note: adverse events are measured in the 2 years leading up to the respective '04-05, '08-09, '10-11, '12-13, '14-15 and '16-17 bankruptcy observation period

Table 3 - Logistic Regression - Likelihood of Bankruptcy by loan status

This table presents logistic regression results for various specifications of model (x).

Bankruptcy= *f* (active student loans by highest degree, adverse events, credit card debt, income, household demographic, post-BAPCPA)

Control variables are described in the Method section. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively.

Specification:	(1)			(2)			(3)		
Variable	Odds Ratio	Stnd Err		Odds Ratio	Stnd Err		Odds Ratio	Stnd Err	
Some College w/ Loans							1.639	0.319	**
Some College							1.178	0.103	*
Associates Degree w/ Loans							1.680	0.382	**
Associates Degree							0.984	0.122	
Bachelor's Degree+ w/ Loans							1.430	0.217	**
Bachelor's Degree+							0.590	0.070	***
Job Loss				1.275	0.246		1.041	0.241	
Health Shock				1.929	0.224	***	1.787	0.225	***
Divorce				1.584	0.222	***	1.511	0.230	***
Credit Card (10,000's USD)	1.267	0.034	***	1.264	0.037	***	1.275	0.040	***
Income (10,000's USD)	0.949	0.008	***	0.942	0.009	***	0.947	0.010	***
Female	1.061	0.067		1.040	0.069		1.051	0.077	
Married	1.005	0.069		1.063	0.077		1.033	0.081	
Children in Household	1.129	0.031	***	1.150	0.032	***	1.175	0.036	***
Hispanic	0.985	0.086		1.082	0.098		1.003	0.103	
Black	1.424	0.101	***	1.542	0.114	***	1.484	0.118	***
Post-BAPCPA	0.475	0.032	***	0.457	0.033	***	0.456	0.036	***
Constant	0.039	0.004	***	0.036	0.004	***	0.036	0.004	***
Psuedo R^2	0.0288			0.0363			0.0457		
N=	42642			38245			33694		

Table 4 - Logistic Regression - Likelihood of Bankruptcy by loan amount

This table presents logistic regression results for various specifications of model (x).

Bankruptcy= *f* (active student loans by highest degree, adverse events, credit card debt, income, household demographic, post-BAPCPA)

Control variables are described in the Method section. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively.

Specification:	(1)			(2)			(3)		
Variable	Odds Ratio	Stnd Err		Odds Ratio	Stnd Err		Odds Ratio	Stnd Err	
Student Loan Amount (10,000's USD)							1.068	0.021	***
Some College							1.220	0.103	**
Associate Degree							1.072	0.122	
Bachelor's Degree							0.714	0.076	***
Job Loss				1.275	0.246		1.064	0.246	
Health Shock				1.929	0.224	***	1.828	0.230	***
Divorce				1.584	0.222	***	1.523	0.232	***
Credit Card (10,000's USD)	1.267	0.034	***	1.264	0.037	***	1.285	0.040	***
Income (10,000's USD)	0.949	0.008	***	0.942	0.009	***	0.946	0.010	***
Female	1.061	0.067		1.040	0.069		1.046	0.077	
Married	1.005	0.069		1.063	0.077		1.016	0.080	
Children in Household	1.129	0.031	***	1.150	0.032	***	1.178	0.036	***
Hispanic	0.985	0.086		1.082	0.098		1.027	0.106	
Black	1.424	0.101	***	1.542	0.114	***	1.540	0.123	***
Post-BAPCPA	0.475	0.032	***	0.457	0.033	***	0.450	0.035	***
Constant	0.039	0.004	***	0.036	0.004	***	0.036	0.004	***
Psuedo R^2	0.0288			0.0363			0.0434		
N=	42642			38245			33529		