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Higher Education: Examining the Long-Term Financial Effects of Student Debt



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HIGHER EDUCATION: EXAMINING THE LONG-TERM FINANCIAL EFFECTS OF STUDENT DEBT

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I hereby recognize and pledge to fulfill my responsibilities as defined in the Honor Code and to maintain the integrity of both myself and the College as a whole.

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Abstract:

The objective of this study, with the both theoretical and empirical analysis is to inspect the effect of student debt on a household, using the four main indicators of financial health. These indicators are; 1. Asset accumulation, 2. Net worth, 3. Retirement accounts, and 4. Total vehicle and home values. This study continues from the work done by Federal Reserve's Survey of Consumer Finances, in which they were able to find some correlation between education debt and the aforementioned indicators. Using the data taken from these surveys, the empirical results suggest that any level of student loan debt will negatively influence all four of these indicators. Across all four regressions conducted, the correlation between student loans and these signals of financial health all were statistically significant. Furthermore, these results can be used to explain a wide variety of demographic variables and there effects on these indicators as well.

Chapter One: Introduction

The American dream is defined as, “the promise that those who work equally hard will reap roughly equal rewards,” (Shapiro, 2004, P. 87). However, in our highly competitive and globalized economies this may not always hold true. Those who hold higher levels of education or special licenses are able to climb the socioeconomic ladder at a faster pace. The goal of almost all American parents today is to assure that their children’s lives are better than their own, whether that be financially, socially, or by some other means. Unless a student wants to work a trade such as an electrician or mechanic, it is nearly impossible to surpass their parents financially. For this to happen they have been told that their kid needs to attend a highly accredited university so that they can get an edge on other students.

From 2003 to 2013, college enrollment rates have increased 20% from 16.9 million to 20.4 million (U.S. Department of Education, 2013). Even President Lyndon B. Johnson spoke about the importance of college education when he enacted the Higher Education Act Reauthorization of 1968 saying, “So to thousands of young people education will be available. And it is a truism that education is no longer a luxury. Education in this day and age is a necessity.(Johnson, 1966, P. 603)” This would paint a brighter future for America at first sight.

Although having a well-educated population in theory seems like a step forward as a nation, it all comes at a price. Depending on where a student attended college, they could be swimming in tens of thousands of dollars of student loan debt or sometimes very little. Those who fall under the former rather than the latter know or will come to know

the lifelong ramifications that come with student debt. Their entire financial future could be at stake.

As the job market becomes increasingly saturated with college graduates, it is far more difficult for them to find quality jobs so that they can begin paying off these high debt loads. For the lucky ones who are able to find jobs after graduation, they still will accumulate less wealth than their parents. 75% of college graduates make more than their parents did between the ages of 30-40 (Elliot and Lewis, 2015) yet; only 35% have accumulated more wealth. This lack of wealth can have detrimental effects towards the futures of many Americans. They have less retirement savings, are less likely to purchase a home, and are less likely to have children due to their outstanding college debt. Unlike other sources of debt such as a mortgage or car loan, student debt cannot be discharged through default. These loans will loom over the indebted individual until they are either forgiven or paid off.

America's current outstanding student debt of \$1.2 trillion eclipses both car and auto debt together. Its presence is looming with more malice as more and more students burden themselves with education loans. So the question becomes: Does college debt hinder the American Dream? Is the once thought of "Golden Ticket" towards a successful career actually aid in the financial downfall of a generation? This paper seeks to answer these questions as to whether student debt has adverse effects to a household's ability to garner wealth, accumulate assets, and save for retirement.

Chapter Two: Literature Review

2.1 Introduction to Previous Literature

To further understand the topic at hand, it is best to read relevant literature to see what others in the field have been able to conclude. These articles can help unearth information, data, and theory that could impact the result of this study's attempt to understand the implications of student debt on the future of graduates. Some of these implications include; lowered aggregate debt across households, less big ticket purchases such as a home and or car, and dampened levels of wealth and retirement savings. These consequences can be immensely damaging to the long-term financial health of a household, which is why they have been chosen as criteria for this paper.

2.2 Student Debt Effects of Financial Well-Being

Elliot and Lewis (2015) believe that as a result of increased attendance, heightened costs, and the shifting of financial burden from state to individual, that student loans are causing dramatic long-term financial damage to graduates. Unlike other scholarly papers, this research is more of a case study based off data from prior economic studies. Instead of running their own surveys or regressions, the authors pulled data from national surveys conducted by government branches and from other relevant economic papers. Their purpose is to compile the current research on the topic of student debt and analyze it in an attempt to look for both trends and implications of student debt on households.

Through their research, the authors were able to find very little evidence that financing a college education through debt can be used as an economic equalizer and help

the financial well being of young adults. Colleges and universities have been around for a long time, so why has this problem arisen recently? More students are attending school than ever before and historically the United States has never seen this sort of spike in student loan debt. From a policy perspective the changing relationship between state and consumer is to blame. In the past the government would help subsidize the cost of higher education and this is still partially true today. However, the modern student bares much more risk now due to budget cuts towards college education and private institutions stepping in to fill the gap (Hacker, 2008). While from a purely economic perspective this may be seen as a natural part of capitalism in which private institutions find ways to build systems that satisfy the previously unavailable demands of consumers, it can have dire consequences.

These consequences are explored further via individual sections. The first covers career and social choices made by students post graduation. In a 2013 survey conducted by, American Student Assistance (2013), they found that 30% of students said that their debt played a role in their career choice. As a result graduates are choosing jobs that are likely to pay more and are avoiding public sector jobs. From this same survey 43% of graduates have said they have delayed having children as a result of their debt.

Next, this study observes the impact of student loan debt on the financial stress levels of young adults. Fry (2014) was able to uncover that 70% of graduates with outstanding debt from 2 or 4-year degrees are less satisfied financially than those in similar positions who do not hold student debt. Part of this may be explained through the rising default and delinquency rates. Delinquency can be defined as when the debtor is

60-120 days behind on payment. 26% of borrowers who began repayment on their loans in 2005 have been delinquent at some point (Cunningham and Kienzl, 2011).

Although defaulting or declaring bankruptcy can be seen as an escape from debt, student loans do not fall under this category. With most forms of debt, there is a physical piece of collateral that can be used in case of borrower default, such as a car or home. Since college education cannot be physically repossessed, they are not cleared through bankruptcy. With 41% of total borrowers having been delinquent or defaulted on their student loans this is a troubling sign (Cunningham and Kienzl, 2011). It resembles unstable financial health among households with student debt. When someone defaults this can hurt his or her credit score dramatically. It is a signal to creditors that they are a risky investment and as a result, their future interest rates on loans, if they can get one, will be much higher. This can create an almost inescapable cycle of debt repression for the consumer.

This paper also finds that the utmost issue with increased levels of student debt is its effects on asset accumulation. They believe that asset accumulation is the fundamental tool for climbing socioeconomic classes. Asset accumulation is defined as the ability to save, invest, and purchase assets through their disposable income. It represents increasing portfolio values, net worth and savings account balances. This paper further argues that while a college degree may increase the potential earning power of an individual, financing a degree through debt may actually cause a reduction in the perceived return on investment. The example they used was two students with the same degree and income level but one has student debt while the other does not. Through this example it showed they will yield differing levels of net worth. That is, the student with debt will have to

begin paying back what they borrowed, while the student without debt can begin investing in different assets in hope of a return. A startling statistic produced by Elliot and Nam (2013) is that households with student debt may have up to 63% less net worth than those without.

The final two sections of the paper revolve around home ownership and retirement savings. Households with student loan debt delay major purchasing decisions and have less home equity (Elliot and Lewis, 2013). 40% of students with a four-year degree are more likely to delay major purchases such as a home (Stone, 2012). For some borrowers delaying of big ticket items could be due to the declining level of credit scores. Due to lower credit scores and tightening on loan underwriting, home ownership rates among 30 year olds with student debt have decreased by 5% compared to those of non-borrowers. Owning a home is a key component of the American dream. If homeownership rates continue to drop as they have been we could see further damage to the financial health and asset accumulation of individuals.

Like college education, retirement savings have shifted dependency onto the individual rather than the government. The efficacy of social security has been a widely debated topic as more and more of the “baby boomer” generation retires. In 1960 the average social security retiree had 5.1 workers supporting them (Marcus 2012). This average dropped to 2.9 workers supporting one retiree in 2010. As a result many companies have started offering sponsored 401k’s and other retirement programs to help fill this gap. 73% of young adults with outstanding student debt have said that they put off saving for retirement and other investments (American Student Assistance 2013). Furthermore, families with outstanding student debt have 52% less retirement savings

than those with none. Delaying investment into retirement and savings products can have real long-term effects on a households retirement possibilities. The terms compound interest or compound growth are synonymous when it comes to retirement income and general savings. On average, four-year college graduates with a median debt load of \$23,300 have \$115,096 less in retirement savings by age 73 than those with no student loans. No matter the amount, student loans seem to have the potential to have crippling effects on the retirement savings of borrowers.

The papers concludes that additional research must be done to help further the context of this polarizing debate, they believe that student loan debt is having dynamic effects on the financials of borrowers. They believe that policy change of some sort must come about to address this issue before it is too late. They also mention that while the effects of student loan debt cannot be seen now, they believe that will be able to further measure it down the road via the growing inequality of wealth in young adults.

2.3 Student Debt & Short Term Financial Health of U.S. Households?

Elliot and Nam (2013) explore these three essential research questions regarding student debts short-term effects on the financial health of U.S. households: 1. Is having student loan debt associated with household net worth? 2. In households with outstanding education debt, is the amount of debt associated with net worth? 3. Regarding the equity of a college degree, is outstanding student loan debt associated with net worth among four-year college graduates and postgraduates?

The data they used to run there regressions came from a 2007-2009, Survey of Consumer Finances sponsored by the Federal Reserve (Bricker, Bucks, Kennickell,

Mach, and Moore, 2011). They surveyed 3,857 families for three years compiling cross sectional data. The questions in the survey were primarily focused around income, retirement savings, outstanding debt, and where they received their diploma. With this data they were able to run regressions to find the averages across many key demographics such debt level, income, and race.

The data they found seemed to correlate with the findings of other relevant literature. About 18% of households have outstanding educational debt (Elliot and Nam, 2013). Between 2007-2010 the average outstanding student loan debt increased \$3,334 from \$23,349 to \$26,683 (Fry, 2012). The two largest sources of student debt in 2011-2012 arose from federal loans at 37% and Federal Pell Grants at 19%(College Board, 2012).

An idea previously mentioned regarding household income and student debt, was that students with higher levels of income faced less problems repaying their loans and were less burdened than those with lower household income. Students who come from higher earning households and whom earn degrees in industries with increased levels of pay are usually more prepared to face this student loan debt. More often than not the family with higher levels of come have set up a college account because they have a more expendable budget than lower income families. It should be mentioned that although lower income households have a higher debt to income percentage meaning more of their annual income must be allocated towards their student loan debt; higher income households are more likely to be afflicted by student loan debt, but have a lower debt to income percentage (Elliot and Nam, 2013). Fry (2012) claims that student loan debt was

24% of annual household incomes less than \$21,044 and 7% for households with incomes between \$97,586-\$146,791.

It should come as no surprise that the risk of default on any debt vehicle increases as the size of the loan increases. Cunningham and Kienzl (2011) found that about 41% of borrowers have suffered negative consequences from delinquency or default. Defaulting or delinquency may effect a young adults credit score making it harder for them find loans for regular wealth accumulating products such as a home or a car. The importance of having home equity should not be underestimated. 64.5% of all U.S. wealth is made up of home equity.(Misehl, Bivens, Gould, & Shierolz, forthcoming).

It becomes almost an impossible task to build net worth when you cannot purchase big-ticket items such as a home due to poor credit score or an excessive debt to income ratio. Living in a household with a four-year college graduate with outstanding debt has a negative effect on net worth by about 63% (Elliot and Nam, 2013). This translates to \$185,995.90 less net worth than a household does with a graduate and no student debt. Furthermore living in a household with outstanding student debt is associated with having \$43,532.79 fewer assets than those with no outstanding student debt.

Although the authors were able to point out many important findings and trends in student debt, they acknowledge that much of the data taken for their report came from the years 2005-2012. During this time period the U.S. and global economy had one of the worst recessions ever due to the housing crisis. Data during this time period may not reflect the entire economic background of student loans due to its volatile nature.

2.4 Student Debt and Declining Retirement Savings

Elliot, Grinstein-Weiss, and Nam (2011) delve deeper into the data from the Survey of Consumer Finances in an attempt to determine if student loan debt is correlated with retirement savings. Specifically their research was meant to answer the following; 1. Is having outstanding student loan debt associated with retirement savings? 2. Is the amount of outstanding student debt associated with retirement savings? 3. Do households with a college graduate and outstanding student loan debt have less retirement savings than households with a college graduate and no outstanding student loan debt?

The data used for this paper came from the 2007-2009 surveys of consumer finances (Bricker, Bucks, Kennickell, Mach, and Moore, 2011). Through this data they were able to find average retirement savings across varying demographics and income levels. The main demographics they used as variables were those such as marriage, race, age, and current occupation.

An essential part of their findings was that the median 2007 retirement savings for households with no outstanding student loan debt was twice that of those with outstanding student debt (Elliot, Grinstein-Weiss, and Nam, 2011). This structure held true for 2009, as the median retirement savings for those without student debt was \$55,000 versus \$25,000 for those with it. The authors believe that this wide gap in retirement savings could be caused by the lack of ability to leverage more of their income for wealth. It is imperative to understand the distinction between income and assets as it can lead to confusion for those who cannot differentiate them. “Assets reflect ownership, power, or control over resources stored over time and used for human development and social mobility and to pass advantage from one generation to the next. In contrast, income

represents resources earned over a week or month,” (Shapiro, Meschde, and Osoro, 2013, Page 7). In 2013, every \$1 increase in income translated to a \$5 increase in wealth for the average white college graduate. However, for an average black college graduate that \$1 only translated into \$0.70 increase in wealth (Elliot, Grinstein-Weiss, and Nam, 2013). Unfortunately, they did not have an explanation for this gap between the two races.

Even the government believes that there may be a link between student debt and wealth accumulation. The Consumer Financial Protection Bureau is a federal agency of the United States that is responsible for protecting consumers via the financial sector. The CFPB (2013) theorize that due to rising student loan debt, young adults are delaying investing in some sort of retirement plan. Only half of workers under age 30 enrolled in their employer’s 401(k). Also, they noted that having a higher amount of student debt might not actually be causing damage to retirement savings. They believe instead that all debt will cause losses in short-term retirement savings, not just student debt.

In the end, the authors conclude that they believe their work has challenged the long-standing assumption that a student with loan debt is not worse off than one without debt. They believe that although a student without loan debt will have the same earning capacity as a student with loan debt, they will have an advantage in wealth accumulation in the short term. If this assumption holds true, it would provide further evidence that financing for higher education may be cyclically disadvantageous.

2.5 Student Loan Borrowers Retreat from Housing & Auto Markets

Brown and Caldwell (2013) use their research as a means to examine trends in homeownership, auto debt, and aggregate borrowing of college graduates with and without student loan debt. Buying big-ticket items such as a car or a home are considered the first steps of transcending to adulthood. It allows individuals to begin building equity and both are reflected as vital steps prior to marrying or starting a family.

The data used in their paper comes from research done by the Federal Reserve Bank of New York's from 2003-2012. Through their data they were able to build graphs comparing home ownership, auto debt, and total debt of both college graduates and non-college graduates. They introduce each graph and then discuss its importance and why these trends are happening.

One trend they noticed was from 2003 to 2009, graduates in their 30's with student debt had more mortgages than individuals without student loan debt. This graph can be found at the end of this section of the literature review. This is due to the fact that those with student loan debt often had higher levels of education and thus had higher earning power. As a result they had more disposable income and could afford to take the risk of additional debt via a mortgage. However in the years following The Great Recession, graduates in their 30's with student loan debt began applying for mortgages at a far faster rate than those without student debt. Eventually in 2011-2012, for the first time in a decade the amount of mortgages held by individuals without student debt surpassed the amount of mortgages held by graduates in their 30's who have outstanding student debt.

Historically in the United States auto debt has preceded home purchasing. Since home ownership normally comes about in a person's thirties, Brown and Caldwell (2013) set 25 as the postgraduate age of study for auto debt participation. Similar to housing trends among individuals with and without student debt, the amount of 25 year olds with student loan debt and auto debt outpaced those who had no student loan debt. Again, the authors attribute this to a higher level of earning power due to increased levels of education. And like the housing market, in the years following the Great Recession those without student loan debt in the auto debt market surpassed consumers with student loan debt in 2012.

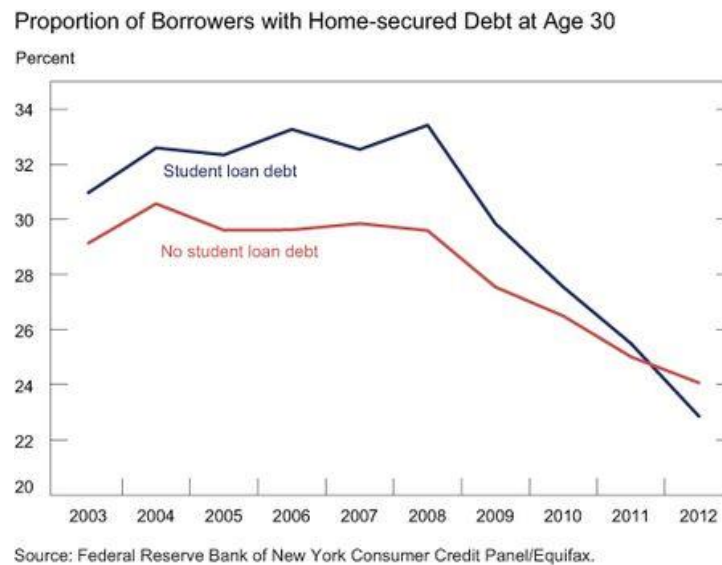
As for the average total debt of borrowers both those with and without student loan debt seemed to mirror each other. Once again those with student loan debt exceeded total debt at age 25 than those without student loan debt. As expected both rose from 2003 until peaking in 2008 due to the housing boom. Then soon after they began to decline at similar rates due to the Great Recession.

The study attributes these declines in participation in nonstudent debt markets, a result of individuals having student. The first due to the weakening labor markets and thus lowered expectations of graduates and their income levels. As a result, consumption and debt both began to retreat as consumers played it safe. The second factor they believe that could cause such similar drops was the recent regulation on access to credit. Lenders were forced across all debt markets to strengthen underwriting standards and thus limit access to credit. Due to stricter debt to income ratios, consumers with outstanding student debt found it tough to be accepted by lenders. Furthermore, delinquency and default rates among student debt holders rose significantly between 2003-2012 thus lowering

consumer credit scores and making loan applications more difficult. Consumers without student loan debt at both ages 25 and 30 had higher credit scores on average than their counterparts. Post Great Recession credit scores for individuals without student debt continued to rise while those with student debt plummeted.

In conclusion, the authors believe that the two aforementioned factors of lowered expectations on future earnings and limited access to credit as the cause of student loan debts dampened participation effect in nonstudent debt markets. Whether this will have a short or long-term effect on debt markets and young adults impact on consumption will be interesting to see, as not enough data is yet available to predict such an outcome.

Figure 2.1.1 Student Debt & Home Secured Loans



2.6 Young Adults, Student Debt, and Economic Well-Being

Fry (2014), along with the other literary sources previously cited, compares a broad base of financial health indicators between those with and without student debt. Specifically they examine the economic and demographic of households headed by people younger than 40 and owe student debt. This study uses Survey of Consumer Finances from 2007-2009 for its data (Bricker, Bucks, Kennickell, Mach, and Moore, 2011).

The most intriguing part of this paper that none of the other sources touched upon was measuring levels of financial distress. Among the college educated, those with student debt were 2% less likely to have a monthly debt to income ratio of 40% than graduates without student debt. But they were 6% likely to have late payments on debt and 36% more likely to have total debt exceed the value of their assets. To make things worse, among college-educated students, those with outstanding student debt had a 10% more chance of being underwater than their counterparts without student debt. Underwater is a term often used when the price paid for one's home exceeds the market value and thus they are said to have negative equity. These are considered indicators of financial distress because of their significance in economic mobility.

In an attempt to limit financial stress, graduates with student debt have been leaving home later, marrying less, and purchasing less homes and vehicles. (Settersten and Ray, 2010). Homes by young adults, declined more than those age 35 and older. It fell 4% from 38% in 2001, to just 34% in 2011(Fry, 2014). This drop was blamed on tighter underwriting guidelines and higher risk aversion towards other forms of debt. This relationship carried over towards vehicles as well. Since 2001 car ownership rates for

consumers age 25 or younger has dropped 6% to just 66% in 2011. This shockwave was not felt at the older ages because most student debt was paid off by then and income levels were much higher.

Although the author never singles out an exact reason as to why college graduates with student debt are more likely to be in financial distress versus graduates without student debt, it seems as though it follows many of the trends covered in the previous literature. Weakened job markets, tightened debt underwriting, and lowered income expectations seem to be wreaking havoc across the financial health of those with student debt.

Chapter Three: Theory

3.1 Introduction to Theory

In a world filled with uncertainty and risk it is understandable that in everyday life people take calculated measures to mitigate said risk. That is the average person will avoid choosing scenarios in which they are exposed to the probability of uncertainty. The quantities of risk individuals are willing to bear is known as their risk aversion level or risk preferences. In the financial services industry professionals have created intense formulas for measuring risk for their clients to help maximize profits and minimize insecurity. The student debt industry is no different. When applying for student loans, banks and credit agencies take a vigorous look through the applicants, and sometimes parents, financial history to assess the probability of the loan being paid back. The riskier an applicant is deemed the higher the interest rate assigned to the loan.

3.2 Understanding Risk

To describe risk quantitatively there are three key elements applied in the process. These three components are probability, expected value, and variability. Simply put, probability is the mathematical likelihood that an event will occur. The example that is commonly used is a coin flip where the odds of either result being 50%. The expected value of an uncertain situation is measured by using the probability weighted average of the payoffs associated with all outcomes. The equation for measuring expected value looks like this $E(X) = Pr_1X_1 + Pr_2X_2 + \dots + Pr_nX_n$ (Pindyck, & Rubinfeld, 2005). The variables Pr stands for the probability of the expected return of the variable X . An

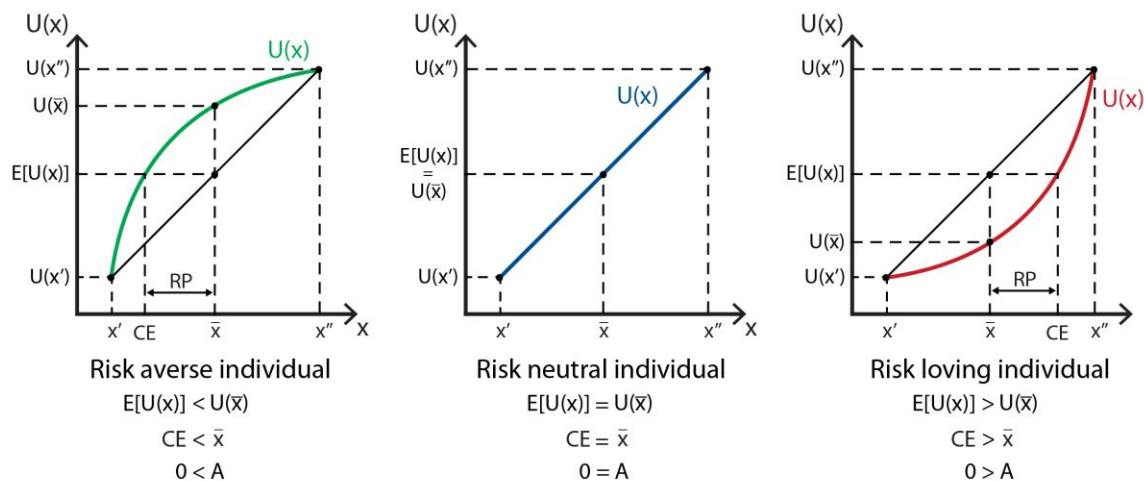
example of such would be the expected value between two stock portfolios; one that is full of bonds while the other is full of risky stocks. The expected value of the riskier portfolio should be higher due the fact that the investor is taking a heightened level of risk, while the bond portfolio may yield less; it causes the investor to bare no risk. The final component when assessing risk is variability. Variability is defined as the “extent to which possible outcomes of an uncertain event differ.” In this case the variability being measured would be the differences in expected wealth obtained by individuals with and without student debt. To measure this quantitatively the standard deviation of all possible scenarios are calculated to find the “spread” or the possible payoffs for each outcome. When the spread is greater it signifies higher standard deviation and thus a higher level of risk. These concepts will be vital as the topic of uncertainty and consumer behavior is applied to student loans.

3.3 Risk Preferences

Just as companies are able to quantify the level of risk and its expected payoffs, consumers are also able to quantify the level of risk they are willing to take on. In economics there are three different preferences among consumers. The first is an individual who is risk averse. Someone who is risk averse prefers a certain level of income to a risky income with the same expected value. Among the three viewpoints this is the most conservative. The second preference towards risk is someone who is risk neutral. A risk neutral individual is someone who is indifferent between a certain income and an uncertain income with the same expected value. The final consumer perspective towards risk is someone who is risk loving. Risk loving is when a person prefers a risky

income to a certain income with the same expected value. This type of individual is the most daring and is someone who would prefer a sales job where income is based off commission rather than a position with a salary.

Figure 3.1.1 Risk Preferences



To help better explain the differences between these three risk preferences the graphs above will be used. For each of these graphs the X-axis is the standard deviation of income and the Y-axis is the expected utility that they would gain from that level of income. With the risk averse individual in the first graph on the left it can be seen that although income rises, the utility they get in return from it slowly begins to diminish. This is because as noted earlier, for a risk averse individual they are more focused on losses when considering utility. And as the standard deviation for income increases, the consumer will perceive each additional unit of money as less pertinent than the previous. For a risk neutral individual they are indifferent between a certain income and an uncertain income so thus their utility is held constant as income increases. As for the risk loving individual we can see that as income increases so does utility at an exponential

rate, thus the reason for its concave shaping of the graph. When talking about risk, it is also important to mention how individuals try and mitigate risk.

3.4 Understanding Risk Premium

One such tactic for alleviating risk is through a risk premium. A risk premium is defined as, “The maximum amount of money that a risk averse person will pay to avoid taking risk.” The risk premium that a person is willing to pay varies depending on their risk preferences. The degree or the magnitude of the risk premium will depend on the risky alternatives that the individual faces.

3.5 Understanding Risky Assets

A risky asset is also something vital that needs to be both discussed and defined in this section. A risky asset is defined as, “An asset that provides an uncertain flow of money or services to its owner.” The most common form a risky asset in everyday life is the ownership of a stock. Since there is no way to know whether a stock will rise, fall, or consistently pay the same dividend, it is considered a risky asset. When considering a risky asset, it is imperative to note the difference between expected return and actual return. The expected return is the yield that the asset should return on average. While the actual return is the amount exactly that the asset yields. Although the actual return level will differ and may be higher or lower than the expected return from year to year, the average return should be closer to the expected return.

3.6 Application of Theory to Student Debt

One could argue that taking a loan out to achieve a college degree could be considered an example of a risky asset. In this case the asset is the college degree and the risk premium would be the loan or the amount of debt a student would incur to help finance that degree. The graduate would expect that the college degree would pay dividends in the form of a lucrative level of income versus a person without a college degree. However, if the degree is financed through debt they take the risk of credit default, which could thus hinder their future wealth. Having a college degree does not guarantee a job. Some degrees are in higher demand than others and certain fields are more saturated making it difficult to find any entry-level positions for a recent graduate.

In this case, the risk premium for student debt would be acknowledged, as the maximum amount a student is willing to pay for their education. Again, the point of the risk premium is to help mitigate risk for an uncertain future. In this case it could be implied that all college graduates are in some way risk averse since they are willing to pay some amount or spend their time attending a college or university so that their future is less risky.

Even though all students are automatically considered risk averse since they are attending an institution of higher education, it can be argued that those who have higher debt loads are more risk averse than those without. This is because they are willing to pay more, or a higher risk premium, to secure their future. Now at the same time it could be argued that these individuals are actually the least risk averse because they are willing to have higher levels of debt, which as discussed earlier, can be extremely dangerous towards their financial future. However, in this case it will be assumed that those with

higher student loan debt are more risk averse due to their desire to attend a more expensive institution since they are being compared to non-college educated individuals.

Based off this theory, one could argue that if students expected utility or compensation from receiving a college degree is greater than their student debt, or risk premium, then they should attend said institution. However, if the students expected utility is less than their risk premium then they should not attend college. Calculating said expected utility would not be an easy task. It would have to include important variables such as; university attended, degree received, and average income in their field. An individual with a finance degree from Harvard will have a much higher expected utility on average compared to someone with a community college degree in finance.

This theory will be applied in an attempt to discover whether the cost, in this case the student debt level an individual takes out, yields any long-term benefits or hindrance to the graduate. In this case, the expected utility of an undergraduate degree would be greater than the expected utility of not attending higher education, or so the individual thinks.

Variable	Mean	Minimum Value	Maximum Value
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Chapter Four: Empirical Results

4.1 Survey of Consumer Finances

4.1.1 Description of Data Source

Having laid the foundation of previous academic literature and relevant economic theory, this section of the paper will seek to explain the data set used in this study. The data in this empirical analysis comes from the United States Federal Reserve. The Federal Reserve, since 1989, has been conducting a survey of American Citizens balance sheets, retirement funds, and overall asset exposure in an attempt to identify financial trends. This survey is known as, The Survey of Consumer Finances. Participants are chosen randomly and with wide ranges of demographic and socioeconomic factors. Participation in the survey is strictly voluntary and 6,500 families were involved in the most recent survey. The data from this survey was collected between the years of 2010-2013. Some variables are not original to the data set and were created to produce results that are more accurate.

4.1.2 Summary of Selected Variables

Although the original Survey of Consumer Finances dataset came with over 100 variables, not all 100 were used. The variables chosen were thought to be the most pertinent to the study. A table with the summary statistics can be found below.

Assets	\$65,477	-\$21,309	\$4,995,555
Net worth	\$63,784.52	-\$2,270,000	\$4,995,555
Retire	\$132,783.90	\$0	\$4,980,000
Vehicle & Home Value	\$185,146.4	\$0	\$999,800
Total Education Loans Outstanding	\$5,400.498	\$0	\$464,000
Age	51.75	18	95
Income	\$59,054	\$0	\$180,000,000
Male	76.34%	0	1
Marriage	62.66%	0	1
White Race	73.55%	0	1
Black Race	12.40%	0	1
Hispanic Race	9.24%	0	1
All other races	4.78%	0	1
No Highschool Education	10.13%	0	1
Highschool Education	31.56%	0	1
Associates Degree	15.66%	0	1
Bachelor's Degree	22.96%	0	1
Graduate Degree	19.46%	0	1
Kids	0.84	0	8

To prevent any confusion regarding the variables, they will all be briefly discussed and defined. Beginning with the dependent variables, *assets*, is a dollar measure of household's total financial and nonfinancial assets. Net worth is also measured in terms of dollars; however, the only difference being is that it is the total value of financial and nonfinancial assets – outstanding liabilities. “Retire” is a combination of the pension and IRA/Keogh variables, because they are the only two retirement account variables that came with the original data set. The final dependent variable, *vhouse*, is a combined dollar value of a household's total home(s) and vehicle(s).

Next, looking at the independent variables, *edn_inst* is simply a dollar value of the total amount of education loans held by a household. This variable is imperative to explaining any possible trends tested by the hypothesis at hand. Ensuing are some basic demographic variables such as, age, income, marital status, gender, and race. It must be noted that when looking at race, the values of the coefficients are in comparison to the omitted independent variable “*race_other*.” After these basic demographic variables, are estimates regarding the effect of education levels of the head of household. The omitted variable in this case is, “*educ_hs*”, or high school level education level. This means that the coefficients that result from the regressions will compare how not having a high school degree, having an associate's degree, having a bachelor's degree, or having a graduate degree effect the four previously discussed dependent variables.

4.1.3 Empirical Model

In order to test the four hypotheses regarding the effect of student loans on the long-term financial health of American Households, a model must be built around the data. These multiple regression models will be used to explore the relationship between the selected dependent and independent variables. All four of the regressions will share the exact the same independent variables, the only difference being the dependent variables. The models will appear as follows:

$$\begin{aligned} \mathbf{Assets} = & \beta_0 + \beta_1 \text{edn_inst} + \beta_2 \text{race_white} + \beta_3 \text{race_black} + \beta_4 \text{race_hispanic} + \\ & \beta_5 \text{male} + \beta_6 \text{marriage} + \beta_7 \text{educ_nohs} + \beta_8 \text{educ_assoc} + \beta_{10} \text{educ_bach} + \beta_{11} \text{educ_grad} + \\ & \beta_{12} \text{age} + \beta_{13} \text{income} + \beta_{14} \text{kids} \end{aligned}$$

$$\begin{aligned} \mathbf{Net\ worth} = & \beta_0 + \beta_1 \text{edn_inst} + \beta_2 \text{race_white} + \beta_3 \text{race_black} + \beta_4 \text{race_hispanic} + \\ & \beta_5 \text{male} + \beta_6 \text{marriage} + \beta_7 \text{educ_nohs} + \beta_8 \text{educ_assoc} + \beta_{10} \text{educ_bach} + \beta_{11} \text{educ_grad} + \\ & \beta_{12} \text{age} + \beta_{13} \text{income} + \beta_{14} \text{kids} \end{aligned}$$

$$\begin{aligned} \mathbf{Retire} = & \beta_0 + \beta_1 \text{edn_inst} + \beta_2 \text{race_white} + \beta_3 \text{race_black} + \beta_4 \text{race_hispanic} + \\ & \beta_5 \text{male} + \beta_6 \text{marriage} + \beta_7 \text{educ_nohs} + \beta_8 \text{educ_assoc} + \beta_{10} \text{educ_bach} + \beta_{11} \text{educ_grad} + \\ & \beta_{12} \text{age} + \beta_{13} \text{income} + \beta_{14} \text{kids} \end{aligned}$$

$$\begin{aligned} \mathbf{VHouse} = & \beta_0 + \beta_1 \text{edn_inst} + \beta_2 \text{race_white} + \beta_3 \text{race_black} + \beta_4 \text{race_hispanic} + \\ & \beta_5 \text{male} + \beta_6 \text{marriage} + \beta_7 \text{educ_nohs} + \beta_8 \text{educ_assoc} + \beta_{10} \text{educ_bach} + \beta_{11} \text{educ_grad} + \\ & \beta_{12} \text{age} + \beta_{13} \text{income} + \beta_{14} \text{kids} \end{aligned}$$

The independent variables are primarily basic demographic indicators, such as marital status, race, education level, and gender. The β in front of each independent variable is the coefficient that will be estimated once the regressions have been run. β_0 is the constant, or the expected value of the dependent variable with all independent variables at zero.

4.1.4 Results

With the models now set and the dependent and independent variables chosen the regressions can now be estimated in an attempt to unearth any interesting trends. All regressions were tested using a confidence level of 95% to ensure the results are significant. The regression results can be found below on the following page.

4.2 Regression Results

Table 4.2.1 Regression Results, Assets

Variable	Coefficient	P-Value	Significant at 95%?
Total Education Loans outstanding	-\$0.4392	0.00	Yes
Age	\$1,771.479	0.00	Yes
Income	\$0.0341	0.00	Yes
Male	\$21,251.13	0.00	Yes
Marriage	\$19,017.89	0.00	Yes
White Race	\$22,476.23	0.00	Yes
Black Race	\$11,546.40	0.102	No
Hispanic Race	\$11,110.71	0.133	No
No High school Education	\$59.190	0.990	No
Associates Degree	\$15,222.42	0.00	Yes
Bachelor's Degree	\$54,090.93	0.00	Yes
Graduate Degree	\$80,649.35	0.00	Yes
Kids	\$3,625.367	0.03	Yes
Constant	-\$128,051.2	0.00	Yes

Through the first regression with the dependent variable being, assets, for every additional dollar in student loans, total assets in a household decreases by \$-0.4392. This relationship proved to be statistically significant at the 95% threshold, which shows a strong connection between student loans and asset accumulation. As for the demographic independent variables, compared to, other races, White, Black, and Hispanic individuals all were estimated to have at least \$10,000 more in assets. If an individual is male, they were estimated to have \$21,251 more in assets than their female counterparts. The

marriage and age variables both yielded positive coefficients of \$19,017 and \$1,771 respectively. This suggests that, as someone gets older or if they are married, that they are more likely to have a higher level of asset accumulation than young and single households. When comparing education levels, there was an unmistakable trend that showed how higher levels of education yielded increased levels of assets. Even though the regression coefficient for not having a high school degree was greater than someone who had a high school degree, its p-value showed it was extremely insignificant. Unsurprisingly, for every additional dollar in income earned, translated to an additional \$0.0341 in total assets. For every additional child within a household, there asset totals increase by \$3,625. The possible reason behind this relationship is with more individuals in a household, they need more necessities to cater to their needs.

Table 4.2.2 Regression Results, Net worth

Variable	Coefficient	P-Value	95% Significant?
Total Education Loans Outstanding	-\$0.4439	0.00	Yes
White Race	\$17,021.73	0.094	No
Black Race	\$4,900.814	0.677	No
Hispanic Race	\$6,588.202	0.593	No
Male	\$32,940.22	0.00	Yes
Married	\$9,696.483	0.133	No
No High school Education	-\$1,567.851	0.842	No
Associates Degree	\$19,773.45	0.03	Yes
Bachelor's Degree	\$69,890.67	0.00	Yes
Graduate Degree	\$72,333.45	0.00	Yes
Age	\$2,210.951	0.00	Yes
Income	\$0.0499	0.00	Yes
Kids	\$5,120.074	0.013	Yes
Constant	-\$150,596.6	0.00	YES

The second estimated regression revolved around a households' total net worth.

Although there is some overlap when looking at assets versus net worth, it should be noted that the key difference lies in the fact that net worth is a measure of total assets minus outstanding liabilities. Meaning, potential expenses such as educational loans, mortgages, or vehicle loans could reduce a household's total net worth. With that in mind, it is understandable that the education loans have a statistically significant negative coefficient of -0.4439. Every additional dollar in student debt causes a household's net worth to decrease by \$0.4439. Similar to the previous model, Blacks, Whites, and Hispanics, all comparatively had higher net worth's than other races. There is no logical explanation for this trend. If the head of household was male or married, they are

estimated to have \$32,940 and \$9,696 more in net worth than their single and female colleagues. Although the net worth value difference between male and female households cannot be explained, the married versus single net worth can be through dual levels of income and individual ownership of assets prior to marriage. As noted from the asset model, heightened levels of education tend to favor an increase in wealth and it was proven again with this model. Both age and income followed suit with positive coefficients. The variable for kids also had a positive coefficient; again, this is believed to be due to increased level of assets to meet additional needs.

Table 4.2.3 Regression Results, Retirement Account Value

Variable	Coefficient	P-Value	95% Significant?
Total Education Loans Outstanding	-1.2465	0.00	Yes
White Race	90,241.87	0.00	Yes
Black Race	59,939.29	0.00	Yes
Hispanic Race	65,264.10	0.00	Yes
Male	13,304.75	0.089	No
Married	90,581.74	0.00	Yes
No High school Education	-23,451.84	0.007	Yes
Associates Degree	40,153.16	0.00	Yes
Bachelor's Degree	125,473.30	0.00	Yes
Graduate Degree	311,174.50	0.00	Yes
Age	4,477.387	0.00	Yes
Income	0.0094	0.00	Yes
Kids	-14,872.35	0.00	Yes
Constant	-326,082.20	0.00	Yes

Staying in line with the previous two regressions, the retirement model shows once more that student debt has a negative trend with retirement accounts. Similar to the asset model, this shows that heads of household, who are Black, White, or Hispanic, tend to have greater retirement account values than other races. In addition, gender, marital status, and education follow the same trend from the previous two models, showing that achieving a higher level of education, being male, and being married can cause households to have superior retirement account values. Age and income, follow

this trend as well, both yielding positive coefficients. Again, this can be explained through higher levels of income from increased age, and from having fewer liabilities to pay off as time goes on. A key difference in this model from the rest is that for each additional child in a household, a family loses \$14,872 from their retirement accounts. This variance can be explained by the fact that instead of spending money on financial assets for retirement, the household spent more money on assets for the family or house. As a result, less money was flowing into their retirement accounts, accounting for less compound growth.

Variable	Coefficient	P-Value	95% Significant?
Total Education Loans Outstanding	-\$0.6190	0.00	Yes
White Race	-\$2,476.995	0.636	No
Black Race	-\$70,137.25	0.00	Yes
Hispanic Race	-\$42,358.71	0.00	No
Male	\$18,815.89	0.00	Yes
Married	\$94,537.45	0.00	Yes
No High school Education	-\$48,670.21	0.00	No
Associates Degree	\$46,745.91	0.00	Yes
Bachelor's Degree	\$128,740.60	0.00	Yes
Graduate Degree	\$187,533.70	0.00	Yes
Age	\$3,553.651	0.00	Yes
Income	\$0.0345	0.00	Yes
Kids	\$17,455	0.00	No
Constant	-\$123,692	0.00	Yes

Table 4.2.4 Regression Results, Vehicle & Home Value

The fourth and final model measures a household's vehicle and home values. This model produced similar results to the preceding three. Student loans are estimated to diminish total vehicle and home values by \$0.6190 for every additional dollar owed in student loans. Unlike the net worth model, all other races have comparatively higher vehicle and home values, compared to Blacks, Whites, and Hispanics. Again, there is no explanation for this discrepancy. Age, male gender, marital status, and income, once more showed a positive trend. Being older, having a greater level of income, being married, and being a man, amplified a household's vehicle and home values. With a larger family, it is logical that a household will require a larger home and more vehicles. This notion is supported by the fact that for every additional child in a household, vehicle and home values jump by \$17,455

4.3 Statistical Post Estimation Tests

The value of statistical post estimation tests should not be undervalued. These tests are imperative when checking the validity of the regression models and the data sets. If a model suffers from collinearity or heteroscedasticity, the model could be deemed less valuable and void of any argument. Fortunately, none of these models suffered from either of these. All four models passed both the Breusch-Pagan test and the estat tests.

Chapter Five: Conclusion

5.1 Summary of Project and Results

Long seen as the path to financial and personal success, higher education has been praised as a necessity towards survival in our current era. Currently 20.5 million American students are enrolled in some form of higher education and that number is only expected to grow (National Center for Education Statistics, 2015). While one could argue the significance of a college degree, the damage caused by student debt burdens on American households should not be overlooked. Education loans have been the fastest growing source of consumer debt in the past decade, eclipsing both auto and consumer credit card debt at a value of roughly \$1.2 trillion. However, one problematic difference between student debt and all other types is its inability to be discharged during bankruptcy or default. Student loans will follow a person to the grave if not paid off or forgiven. Wreaking havoc on their future credit scores and financial health.

Through my regression estimates and thorough review of relevant literature and economic theory, I believe that there is a robust correlation between educational debt and weakened household financial health. Again, the four measurements of financial health being: 1. Assets, 2. Net Worth, 3. Retirement Savings, and 4. Vehicle and Home Values. When estimated via multiple regression, all four showed an inverse relationship with student debt. Meaning for every additional dollar of student debt accumulated by a household, there level of assets, net worth, retirement savings, and vehicle and home values, were worse off. This is a logically sound argument because for every dollar a

household is forced to pay for this intangible asset, its one less dollar that could be spent on tangible asset such as a home or vehicle.

These results should not be taken to say achieving higher education through student loan debt is a mistake. That is by no means, what this paper is trying to prove. In fact, looking at all four regressions, it can be seen that when comparing individuals with bachelors or graduate degrees, to those with only a high school degree, those with higher levels of education tend to be better off in terms of financial health. No literature that I have reviewed regarding this topic has ever suggested that attending an institution of higher education is a poor decision. Purely, the point of this research paper was to expose the adverse consequences that student debt has on the long-term financial health of households.

5.1.1 Empirical Weaknesses and Further Research

Like all other academic papers, mine was not faultless when it came to errors or possible mishaps. One such potential issue that I encountered with my data was the amount of outliers in the data set. When I initially estimated the multiple regressions, the wealthier households in the survey data skewed the coefficients severely. To adjust for this error, I was forced to put a maximum values on all four of the dependent variables. These maximum values helped create far more accurate coefficient values respective to the average household in the survey. This was one of the only errors I encountered; however, I do have suggestions for future research on this topic.

One such suggestion would be the separation of student debt between public and private forms of college. It is no surprise that private colleges such as Allegheny College

are more expensive on average than your local state colleges. As a result, students who attend these private institutions have increased odds of taking out student loans to help pay for their education. Essentially the next research question I would like to see focused on is whether graduates who have debt from private institutions are better off in the long-term financially than graduates who have student debt and attended a public institution. There has been a long raging debate whether attending private or liberal arts universities is worth the excessive price tag. By comparing them to their state school counterpart, I believe it would be beneficial to a consumer who is trying to choose between a private and public university. In addition, it may be used to expose disproportionate pricing issues for private schools.

Despite these limitations, the results indicated by my regression estimates prove a solid trend regarding the negative consequences of student debt on a household's financial health. My results and those of studies similar to mine should not be ignored in the political realm. With the level of US student loans continuing to default at a rapid rate, our society should maintain a watchful eye over this industry.

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