

Impact of Student Loan Debt on Stock Ownership: An Analysis Based on the Survey of Consumer Finances

Jordan Coakley
Roosevelt University

Meng Li
Roosevelt University

This paper explores the effect of student loan debt on stock ownership in young people based on the Federal Reserve's Survey of Consumer Finances 2016. Consistent with the finding of a negative relationship between student loan debt and stock market participation using 1992-2013 data across all age groups by Batkeyev et al. (2016), our regression also shows a negative association between student loan debt and stock ownership. These results suggest that young people invest less in the stock market when they have more student loan debt.

Keywords: stock ownership, student loan debt, investing, personal finance

INTRODUCTION

Student loan debt is a hotly debated topic in this era, and it can have an influence on individuals' long-term wealth and financial health. When people decide to continue their education and attend a college or university, they attempt to raise their potential income ceiling. However, this rise in income can often times be offset by a decrease in their wealth because of the student loans used to achieve that education (Henager & Wilmarth, 2018). This debt causes households (HH) to see a decrease in risky asset investment and in the number of stock trades. This is because there is less disposable income in their hands to use on investments (Batkeyev et al., 2016). However, their sample from the prior Survey of Consumer Finances represented all ages groups, and there are no current studies focusing on the young population who are commonly the ones exiting college with the most debt. Conventional wisdom proves that young individuals' portfolios should include an emphasis on stocks because they have a whole lifetime to stomach risk. A study by Morin & Suarez in 1983 shows that risk aversion increases with age in healthy investment portfolios. This suggests that younger people should be the most risky investors. A study by Kumar and Goetzmann shows that investors also tend to hold under-diversified portfolios, and this level of under-diversification is greatest in the youngest age group. This would mean that young investors are overexposed to risk. However, does student loan debt affect the risk-taking behavior in young people and, in particular, their stock ownership? Our paper intends to answer the question: Do young people indeed take risk and invest in the stock market and does student debt in fact deter stock ownership as suggested by Batkeyev et al. in 2016?

This paper uses data from the most recent Survey of Consumer Finances by the Federal Reserve from 2016 to explore how student loan debt affects stock ownership of young individuals by using regression models to test the relationship between student loan debt and stock ownership along with other variables. Other variables include knowledge of personal finances, income, education level, gender, and marriage. Their impact on stock ownership is examined in the paper as well. This will help show that by increasing or decreasing certain factors, one can improve their financial wellness, and effectively increase their wealth over their lifetime.

It is widely thought that increasing education level will translate to an increase in wealth. Existing literature reveals a mixed result. One paper states that the more educated an individual is, the wealthier they tend to be (Díaz-Giménez et al., 2011). Another finds that education level is significant in stock ownership and that having a college degree is positively associated with financial wellness and that individuals with a master's degree are more likely to own stock (Henager & Wilmarth, 2018). Henager and Wilmarth find that having a doctorate degree is also positively associated with financial wellness. However, a study by Lusardi and Mitchell shows that increased education level does not always translate to increased financial literacy. Our study finds that there is only a correlation in education level to stock ownership with a master's degree. There are many other factors besides just education level that affect someone's wealth, such as what they studied in school and how they invest their money, so education level may only have an effect on stock ownership up until a certain point. This could be an effect of increasing income with further degree attainment or an effect of educated people being smarter with their money. This could also be explained by there not being many young people in our study earning a master's degree or a doctorate degree under 35 years old.

Another variable used in our study is knowledge of personal finances. This variable measures an individual's subjective knowledge. Higher confidence would seem to translate to higher amounts of money invested in the stock market. However, our study does not find a correlation between subjective knowledge and stock ownership. A study by Rooij, Lusardi, and Alessie does show that low financial literacy translates to an individual's being less likely to invest in stocks.

Previous studies have found a positive relationship between income and stock ownership. A study by Sung and Hanna finds that income has a positive relationship to risk tolerance, and higher risk tolerance means higher stock investment. Our findings are consistent with the existing research. A study by Fisher and Yao shows that one's gender is related to their individual risk tolerance by income uncertainty and net worth. They found that men do in fact tend to be riskier when investing. The study by Sung and Hanna also shows that unmarried males have the highest risk tolerance, and the tolerance decreases then on from married males to unmarried females to married females with the lowest.

The plan of this work is as follows. The sample and variables used in this study are defined. The graphs and statistics are then displayed. The next section defines the regression model used, the correlation of the variables, and the results. The last section draws conclusions from the results of the study.

Sample

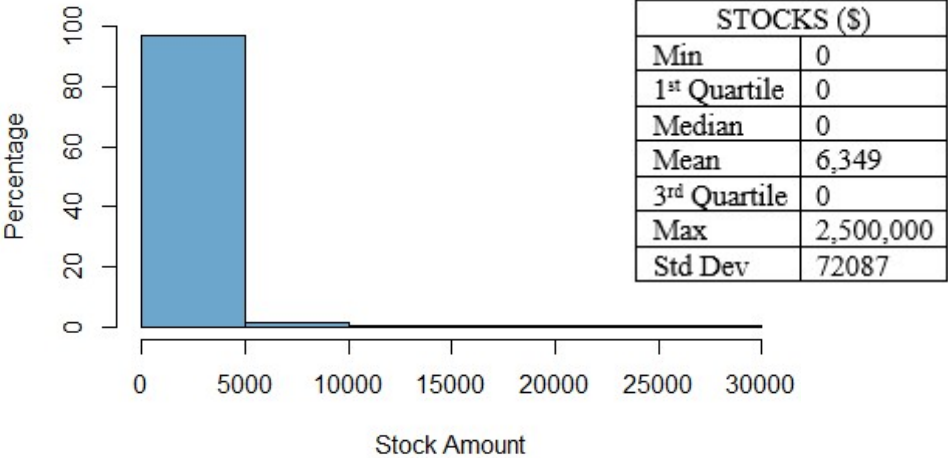
The data from this research is extracted from the Survey of Consumer Finances 2016 (SCF2016) and was provided by the Federal Reserve. The survey is a cross-sectional survey of U.S. families and includes their financial information as well as demographic information. Participation in the survey is voluntary and consists of 31,240 total observations and 348 different variables. The survey is conducted every 3 years. This paper focuses on young people under age 35, so only that sample is used. The mean age in the survey is 28.26 years old. All data, graphs, and models were manipulated in "R", a programming language for statistical computing and graphics.

Variables Used

The variables included in this survey are STOCKS (amount of stock owned in \$USD), EDN_INST (total value of education loans held by HH), KNOWL (respondents' knowledge of personal finances (subjective rating (-)1-10), INCOME (income over past 12 months in \$USD), EDUC (education level

based on 14 possible levels), HHSEX (gender represented by 1 for male and 2 for female), and MARRIED (marital status indicated by 1 is married/living with partner, 2 is not married nor living with partner).

**FIGURE 1
STOCKS HISTOGRAM**

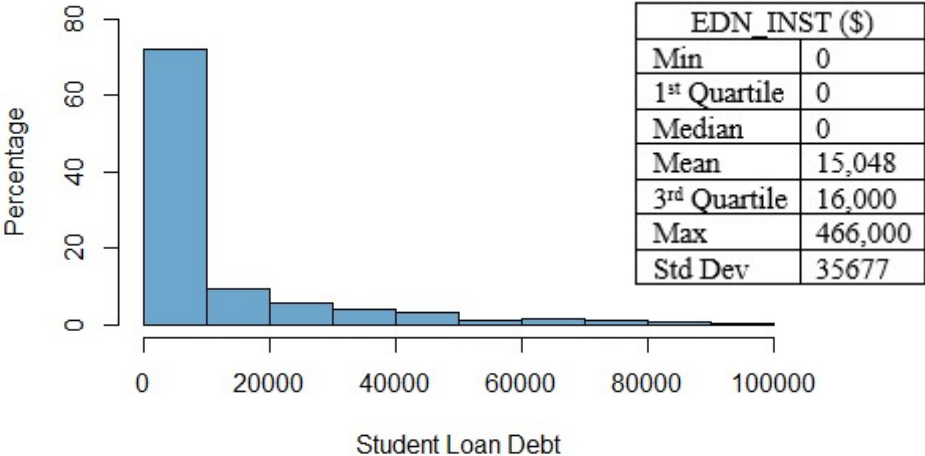


**TABLE 1
STOCKS HISTOGRAM BINS**

Amount (\$)	0-5,000	5,001-10,000	10,001-15,000	15,001-20,000	20,001-25,000	25,001-30,000
Percentage	96.66%	1.51%	0.49%	0.47%	0.67%	0.20%

96.66% of people have between \$0 and \$5,000 in stock amount. Another 3.34% of people have between \$5,001 and \$30,000 invested in stocks. The median of stock ownership is \$0, and the mean stock amount is \$6,349.

**FIGURE 2
STUDENT LOAN DEBT HISTOGRAM**

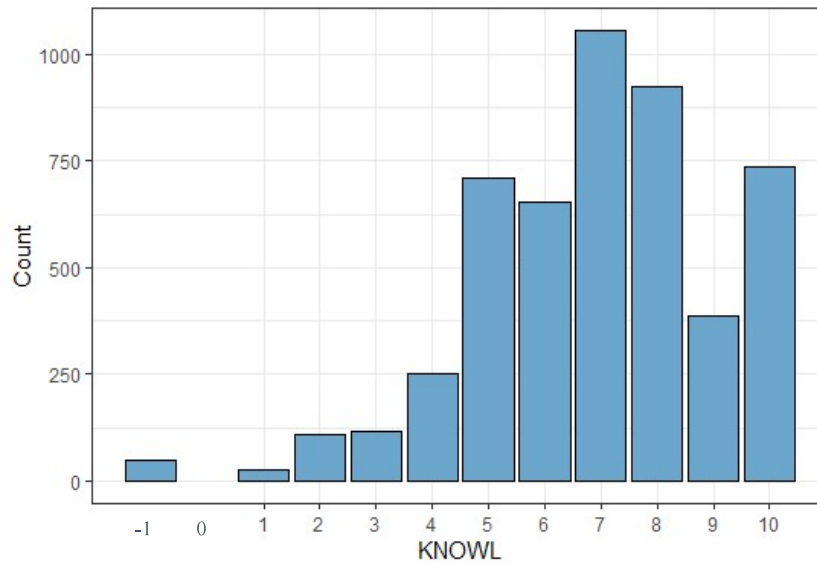


**TABLE 2
STUDENT LOAN DEBT HISTOGRAM BINS**

Range (\$)	0-10,000	10,001-20,000	20,001-30,000	30,001-40,000	40,001-50,000	50,001-100,000
Percent	72.01%	9.59%	5.63%	4.19%	3.29%	5.3 %

81.6% of people have between \$0 and \$20,000 in student loan debt. Another 13.11% of individuals have between \$20,001 and \$50,000 in student loan debt. 5.3% of people have between \$50,001 and \$100,000 in debt. The mean student loan debt is \$15,048 and the median is 0. The 3rd quartile of student loan debt is \$16,000.

**FIGURE 3
SUBJECTIVE KNOWLEDGE RANKS**

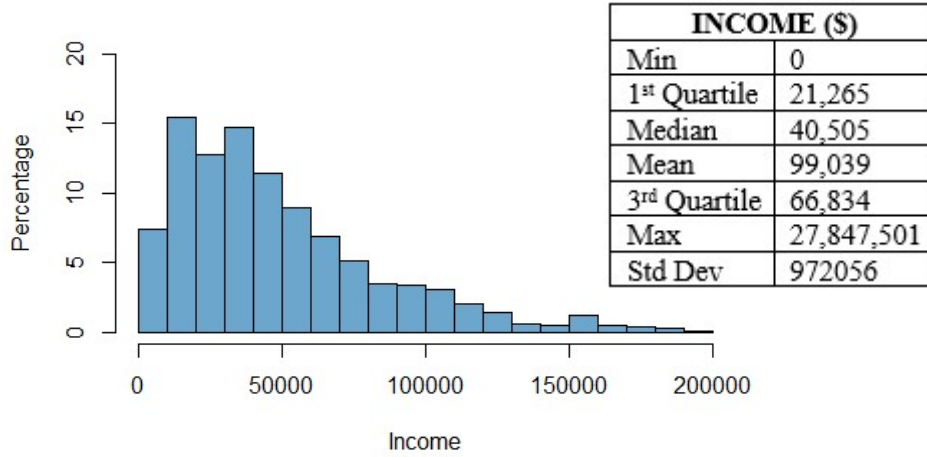


**TABLE 3
SUBJECTIVE KNOWLEDGE RANKS TOTALS**

Rank Segment	-1	0	1	2	3	4	5	6	7	8	9	10	Total
Count	50	0	25	110	115	250	710	655	1055	925	385	735	5,015

550 individuals (10.97%) subjectively rank themselves as 0-4 on their knowledge of personal finances. 4,465 people (89.03%) rank themselves as 5-10 on the survey. The median ranking is a 7, and the mean ranking is 6.9. Only 50 individuals (<1%) rank themselves as not being knowledgeable at all (-1 on the rating).

**FIGURE 4
INCOME HISTOGRAM**

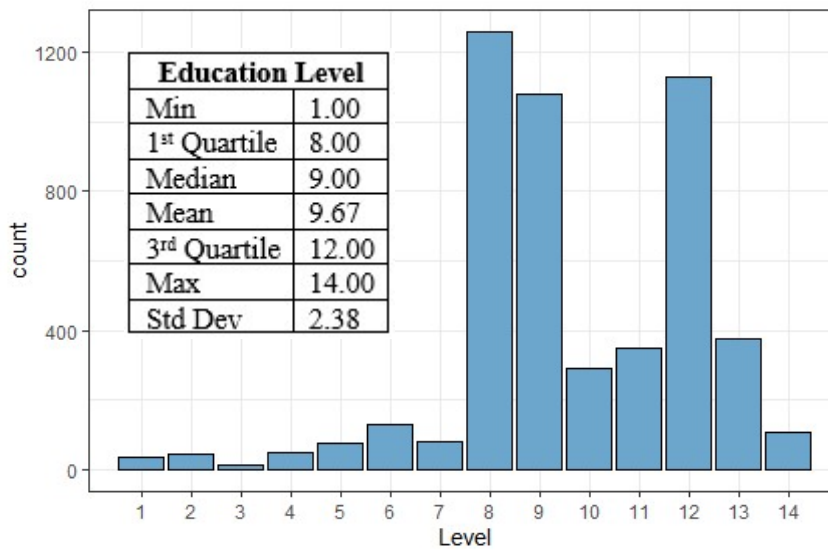


**TABLE 4
INCOME HISTOGRAM BINS**

Range (\$)	0-20,000	20,001-40,000	40,001-60,000	60,001-80,000	80,001-100,000	100,001-200,000
Percent	22.87%	27.49%	20.42%	12.00%	6.91%	10.32%

70.78% of people made between \$0 and \$60,000 in the past 12 months prior to the survey. 89.69% of individuals made between \$0 and \$100,000. 10.32% of people made between \$100,001 and \$200,000. The mean income is \$99,039 and the median income is \$40,505.

**FIGURE 5
EDUCATION LEVEL RANKS**

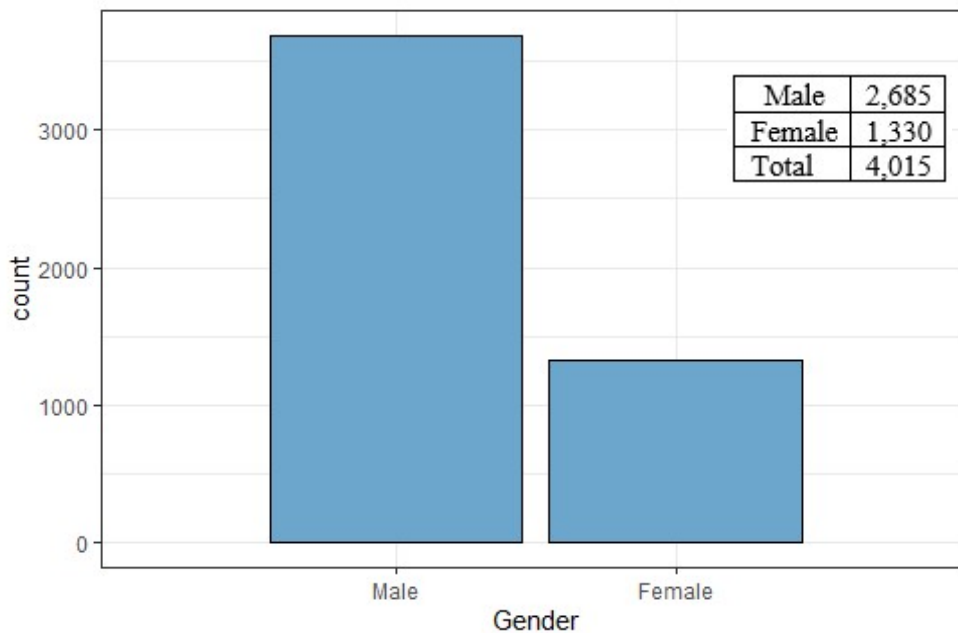


**TABLE 5
EDUCATION LEVEL RANKS TOALS**

(1) 1ST, 2ND, 3RD, OR 4TH GRADE	35
(2) 5TH OR 6TH GRADE	45
(3) 7TH OR 8TH GRADE	15
(4) 9TH GRADE	50
(5) 10TH GRADE	75
(6) 11TH GRADE	130
(7) 12TH GRADE, NO DIPLOMA	82
(8) HIGH SCHOOL GRADUATE - HIGH SCHOOL DIPLOMA OR EQUIVALENT	1257
(9) SOME COLLEGE BUT NO DEGREE	1080
(10) ASSOCIATE DEGREE IN COLLEGE - OCCUPATION/VOCATION PROGRAM	290
(11) ASSOCIATE DEGREE IN COLLEGE - ACADEMIC PROGRAM	350
(12) BACHELOR'S DEGREE	1126
(13) MASTER'S DEGREE	375
(14) DOCTORATE OR PROFESSIONAL SCHOOL DEGREE	105
Total: 5,015	

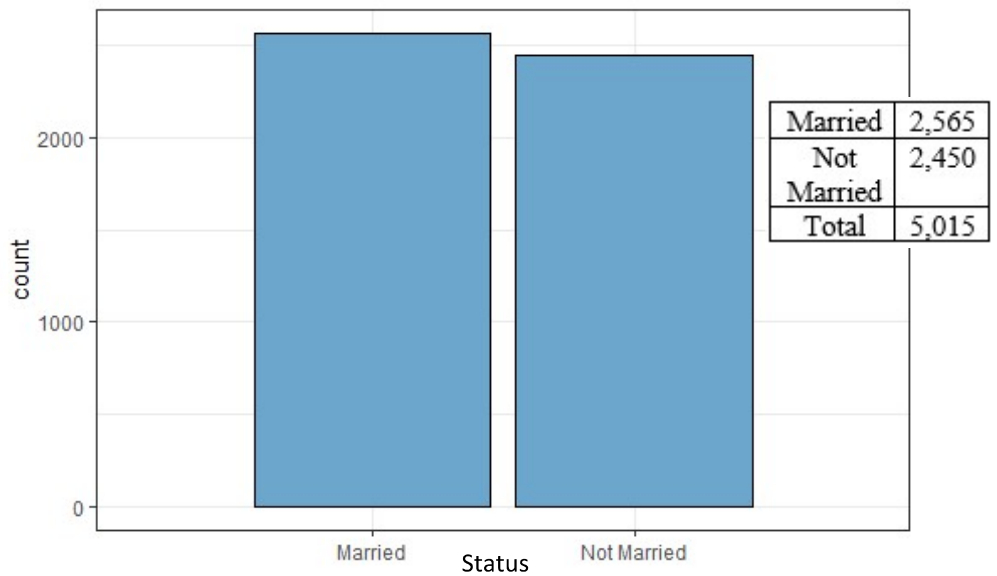
432 people (8.6%) of people did not graduate high school. 1,257 people (25.06%) of individuals graduated high school but have no further college or equivalent degrees. 3,326 people (66.32%) of people have at least some college experience. 1,126 people (22.45%) obtained a bachelor's degree and 480 people (9.57%) have a master's or doctorate degree. The median education level is 9 and the mean education level is 9.67.

**FIGURE 6
GENDER BREAKDOWN**



There are 2,685 male heads of household in the survey, consisting of 66.87% of the sample. There are 1,330 female heads of household in the survey, making up 33.13% of the data sample.

**FIGURE 7
MARRIAGE BREAKDOWN**



There are 2,565 married heads of household in the survey, consisting of 51.15% of the sample. There are 2,450 not married nor living with partner in the survey, consisting of 48.85% of the data.

REGRESSION MODEL

Regression Equation

$$Y(\text{STOCKS}) = a + bX1(\text{EDN_INST}) + cX2(\text{KNOWL}) + cX3(\text{INCOME}) + cX4(\text{EDUC}) + cX5(\text{HHSEX}) + cX6(\text{MARRIED})$$

Variables

The variables used in this model are STOCKS (amount of stock owned in \$USD), EDN_INST (total value of education loans held by HH), KNOWL (respondents' subjective rating (-)1-10 of knowledge of personal finances), INCOME (income over past 12 months in \$USD), EDUC (education level based on 14 possible levels), HHSEX (gender represented by 1 for male and 2 for female), and MARRIED (marital status indicated by 1 is married/living with partner, 2 is not married nor living with partner).

**TABLE 6
CORRELATION TABLE**

	EDUC	KNOWL	EDN_INST	INCOME	HHSEX	STOCKS	MARRIED
EDUC	1	0.18	0.33	0	0.01	0.04	0.11
KNOWL	0.18	1	0.02	-0.02	-0.1	0	-0.1
EDN_INST	0.33	0.02	1	-0.01	0.05	-0.03	0
INCOME	0	-0.02	-0.01	1	-0.04	0.22	-0.06
HHSEX	0.01	-0.1	0.05	-0.04	1	-0.03	0.57
STOCKS	0.04	0	-0.03	0.22	-0.03	1	0.01
MARRIED	0.11	-0.1	0	-0.06	0.57	0.01	1

The correlation table shows correlation values from negatively correlated at -1, to positively correlated at 1, and no correlation at 0.

**TABLE 7
REGRESSION MODEL RESULTS**

OLS Regression Model Results for Stock Ownership for Individuals Age <35			
Predictors	Coefficient	T-value	P-value
(Intercept)	-6376.34	-0.454	0.650
EDN INST	-0.10	-3.181	0.001 ***
KNOWL [1]	-617.78	-0.035	0.972
KNOWL [2]	-2266.38	-0.184	0.854
KNOWL [3]	22708.71	1.852	0.064
KNOWL [4]	-4159.60	-0.367	0.714
KNOWL [5]	2903.84	0.271	0.786
KNOWL [6]	-7811.08	-0.725	0.468
KNOWL [7]	3305.05	0.312	0.755
KNOWL [8]	-756.70	-0.071	0.944
KNOWL [9]	-2405.48	-0.218	0.828
KNOWL [10]	3516.99	0.328	0.743
INCOME	0.02	16.131	<0.001***
EDUC [2]	1331.97	0.082	0.934
EDUC [3]	6261.80	0.288	0.774
EDUC [4]	4870.54	0.308	0.758
EDUC [5]	4471.71	0.304	0.761
EDUC [6]	3252.25	0.237	0.813
EDUC [7]	5120.10	0.351	0.726

EDUC [8]	6494.92	0.524	0.600
EDUC [9]	11752.83	0.944	0.345
EDUC [10]	6546.78	0.507	0.612
EDUC [11]	6165.02	0.480	0.632
EDUC [12]	11331.32	0.909	0.363
EDUC [13]	33159.80	2.572	0.010*
EDUC [14]	19252.51	1.342	0.180
HHSEX [2]	-8763.45	-3.158	0.002**
MARRIED [2]	7470.17	3.016	0.003**
Observations	5015		
R2 / R2 adjusted	0.064 / 0.059		

* significance at 0.05, **significance at .01, ***significance at .001

STOCKS: Amount of stock owned in \$USD.

EDN_INST: Total value of education loans held by HH.

KNOWL: Subjective (-)1-10 rating of respondent's knowledge of personal finances.

INCOME: Income over past 12 months in \$USD.

EDUC: 1-14 ranking of highest completed grade by head of household (8 is high school graduate, 9 is some college, 10 is associate degree in occupation, 11 is associate degree in academic program, 12 is bachelor's degree, 13 is master's degree, and 14 is doctorate degree).

HHSEX: Gender (represented by 1 for male and 2 for female).

MARRIED: Marital status (1 is married/living with partner, 2 is not married nor living with partner).

REGRESSION ANALYSIS

If student loan debt goes up \$1, \$0.10 is lost in stock ownership as shown by the -0.10 coefficient. That result is significant with a p-value of 0.001. This result fits with the notion that student loan debt leads to less stock ownership in young people. A decrease in student loan debt would increase individuals' ability to invest their money in the stock market.

When comparing knowledge and stock ownership, knowledge level 1-10 have no significance on stock ownership. This result shows that subjective knowledge of personal finances does not automatically translate into greater stock ownership. It could just be that some individuals are bolder in their own assertion of their financial knowledge.

For every \$1 increase in income, there is a \$0.02 increase in stock ownership. This result is significant at 0.001 p-value. It makes sense that the more money in your pocket, the more disposable income will be available for investing in stocks. One would not expect that having less money would give more opportunity to invest in stocks.

For education level, 2-12 show to be insignificant in the regression model. EDUC (13) returns a p-value of 0.010. Obtaining a master's degree after a bachelor's degree is worth \$33,158.80 in stock ownership than having a 2nd, 3rd, or 4th grade education. EDUC (14), which is having a doctorate degree, does not show significance. This dispels the notion that gaining more education directly increases wealth. Income has been shown to increase when education level rises; however, student loan debt also rises, thus decreasing wealth and ability to invest in stocks.

HHSEX (2), which is females, shows moderately large significant value at 0.002. Females are disproportionately represented in stock ownership by \$-8,763.45. This finding shows evidence of the notion that men are more likely to have more stock ownership. It is important that this finding be utilized so that action can be taken to even out the gap between stock ownership in men and women.

MARRIED (2) shows to be of moderately large significance at 0.003 p-value. Young, not married individuals have \$7,470.17 more in stock ownership than married individuals in this study. This contradicts the thinking that married people have larger investment portfolios. This could be explained by the combining of student debt when young people marry, which would decrease the possibility of their being able to invest their dollars in stocks.

CONCLUSIONS

This study proves that student loan debt negatively affects stock ownership in young people. Young people need to realize that taking on large amount of student loan debt at a young age can have drastic effects on their net worth and potential earnings. It is so important that individuals invest young in high-risk assets like stocks because they have more time to handle portfolio risk compared to older folks. We are not understating the value of a college education. A college education can help individuals escape poverty and climb the economic ladder, and finding solutions for the student loan debt crisis will help alleviate many college graduates from drowning in debt. Calling on policymakers to pass legislation that allows financial justice and financial freedom for young people will be a benefit for all Americans, not just young people. Forgiving all student loan debt is not practical and is not fair to those who paid theirs off. But finding ways to reduce the cost of college certainly is a practical solution so that young people can graduate with a clean slate, ready to join the workforce and create their own healthy investment portfolios with an emphasis on high-risk assets such as stocks.

REFERENCES

- Batkeyev, B., Krishnan, K., & Nandy, D. (2016, May 9). *Student Debt and Stock Market Participation*. Retrieved from https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2777062
- Díaz-Giménez, J., Glover, A., & Rios-Rull, J-V. (2011). Facts on the Distributions of Earnings, Income, and Wealth in the United States: 2007 Update. *Quarterly Review*, 34(1).
<https://doi.org/10.21034/qr.3411>
- Fisher, P.J., & Yao, R. (2017). Gender differences in financial risk tolerance. *Journal of Economic Psychology*, 61, 191–202. doi: 10.1016/j.joep.2017.03.006
- Guiso, L., Sapienza, P., & Zingales, L. (2008). Trusting the Stock Market. *Journal of Finance*, 62(6).
<https://doi.org/10.1111/j.1540-6261.2008.01408.x>
- Henager, R., & Wilmarth, M.J. (2018). The Relationship Between Student Loan Debt and Financial Wellness. *Family and Consumer Sciences Research Journal*, 46(4), 381–395.
<https://doi.org/10.1111/fcsr.12263>
- Kumar, A., & Goetzmann, W.N. (2004). *Equity Portfolio Diversification*. Retrieved from <https://ssrn.com/abstract=627321> or <http://dx.doi.org/10.2139/ssrn.627321>
- Lusardi, A., & Mitchell, O. (2007). Baby Boomer Retirement Security: The Roles of Planning, Financial Literacy, and Housing Wealth. *Journal of Monetary Economics*, 54(1), 205–224.
<https://doi.org/10.3386/w12585>
- Morin, R-A., & Suarez, A.F. (1983). Risk Aversion Revisited. *The Journal of Finance*, 38(4), 1201–1216. doi: 10.1111/j.1540-6261.1983.tb02291.x
- Rooij, M.V., Lusardi, A., & Alessie, R. (2007). *Financial literacy and stock market participation*. Cambridge, MA: National Bureau of Economic Research.
- Sung, J., & Hanna, S. (1997). Factors Related to Risk Tolerance. *SSRN Electronic Journal*.
10.2139/ssrn.2234