

FINANCIAL LITERACY: AN OVERLOOKED LIFE SKILL

by

Michael Byron

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FINANCIAL LITERACY: AN OVERLOOKED LIFE SKILL

Project Approved:

Supervising Professor: Jeff Moore

Department of Finance

Wendy Williams

Honors College

ABSTRACT

This paper serves to explore the performance of students at TCU as it pertains to the measurement of financial literacy. This paper further examines a subset of the American population that has not received much focus under the academic lens of financial literacy, the college student with a higher than average socioeconomic background. Finally, this study will measure the performance of TCU students versus the national average and a peer group adjusted for college education, in addition to evaluating and commenting on the high expectations for the college educated demographic.

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INTRODUCTION

The purpose of this study is to measure the financial literacy rate of students at Texas Christian University, compare those results against other surveys or the expected results of college educated individuals, and determine if there is a significant difference between the Texas Christian University sample and expectations based on education level.

Financial literacy is a very broad subject that is defined as “the ability to make informed judgments and effective decisions regarding the use and management of money and wealth” (Gale, 2012, p. 3). This field encompasses, “household financial decision making, from budgeting, credit management, and balancing checkbooks to compound interest, and other investment principles (Bernheim, Garrett, Maki, 1997, p. 1). This definition may have only changed slightly in the past decade and a half since the previous relevant topics were decided upon, due to financial complexity and increased scrutiny of financial instruments like derivatives, asset-backed securities, and other tools. However, most of the basic concepts related to credit management, financial decision making, and interest rates and inflation remain the same.

As more and more responsibility is placed on the individual to create a sound financial background, savings plan, and retirement plan, the pressure and overwhelming tendency of financial terms may discourage individuals from taking the time necessary to educate themselves or receive education in order to raise the likelihood of financial success in their future. The term financial success can also be viewed through many lenses. For some, it may mean avoiding bankruptcy, or paying off a mortgage, student loan, or other debt obligation, such as a credit card. However, without proper knowledge, a wrong approach or a few mistakes in the understanding of debt and the resulting payments may hamper an individual’s ability to become

financially independent in the future, due to a lack of knowledge regarding the concept of interest.

Focus

Instead of trying to obtain data from students regarding their own income and that of their household, I will focus on if there is a statistically significant difference between the recorded financial literacy scores of students at Texas Christian University versus collegiate aged peers elsewhere. With an appropriate sample size and random selection process, it would also be prudent to note that Texas Christian University students would be categorized as “above average” in household financial security or household net worth. Higher household income provides a basis for higher expected scores in financial literacy (Lusardi 2009).

Analytical Components

Furthermore, the financial literacy rates of students at Texas Christian University will be analyzed through their self-provided collegiate classification, their intended school of study, such as arts and sciences, engineering, education, etc. and personal confidence of their financial literacy. The results will be compared against peer data sets and will analyze the performance of the subsectors of financial literacy of students at Texas Christian University. The research will result in a declaration regarding relative financial literacy among Texas Christian University students versus collegiate peers and a discussion of a potential generational decline in financial knowledge that is larger than previously known.

LITERATURE REVIEW

What is Financial Literacy?

As the scrutiny of the cost of college and student loans, and the resulting debt from education increases, the focus of a future debt crisis shifts towards a hypothetical blame game. If such a crisis does occur, is it the fault of the university for alleged price gouging or on the student and their family for making a financial decision with improbable likelihood of paying off high levels of student debt? The family decision to allow a student to accept \$200,000 of debt for a college education leads to questioning the financial literacy of the entire family, which hints at one of the current problems: Where does someone obtain financial literacy?

First, the term “financial literacy” must be defined at a basic level to create a basic understanding of the topics being analyzed. The President’s Advisory Council defined financial literacy as “the ability to use knowledge and skills to manage financial resources effectively for a lifetime of financial well-being” (2008 Annual Report to the President, p. 10). Another source defines financial literacy as “the ability to make informed judgments and effective decisions regarding the use and management of money and wealth” (Gale, 2012, p. 3). Additionally, financially illiterate households make poor choices that affect not only the decision-makers themselves, but also their families and the public at large, making the improvement of financial literacy a first-order concern for public policy.

Over a lifetime, financial literacy ranges from having a credit card, understanding what an APR is, the concept of interest and time value of money, and calculating the total cost of a loan after interest payments. While financial literacy is broad and evolves with the stages of life to focus on wealth preservation and retirement planning, the educational foundation or lack thereof related to financial literacy is an alarming gap in the current education system.

Impact of Financial Crisis

However, due to the 2008 financial crisis and the rising cost of a college education, the importance of financial literacy has reached an elevated importance. This elevated importance may be attributed to the recent fiscal cliff that has grabbed media headlines, the recent shift towards a prolonged retirement age, or the burden placed on employees with defined contribution plans. Also, William Gale (2012) points out additional reasons for increased interest in financial literacy, such as, "...declines in housing values, financial assets, and the overall economy have heightened both the urgency and the importance of these issues." There seems to be an increased awareness of the importance of financial independence and decision making, but a lack of knowledge regarding how to appropriately and meaningfully stress or educate the general population on the topic. Previous research by Bernheim (1997) concerning high school students between 1954 and 1985 shows that there has been continued awareness and acknowledgement, at some level, that financial literacy is a necessary educational topic.

Rising College Costs

The cost of college has risen significantly over the past decade. "Average tuition, fees, and room and board at a private, non-profit, four-year college were \$42,419 for 2014-2015, up from \$30,664 in real dollars in 2000-01. At public, four-year schools, costs for the 2014-15 school year, at \$18,943, were up sharply from the \$11,635 price tag in 2000-01, according to the College Board" (Holland, 2015 p. 2).

The federal government has stepped up its lending accordingly, and so have private student lenders. The total of private student loans outstanding grew rapidly from \$55.9 billion in 2005 to \$140.2 billion in 2011. This boom in student lending can also account for the increased interest and importance of financial literacy for students of all ages and families who wish to send their students to college.

Additionally, it appears that while the importance of a college education and its cost and burden have risen rapidly in recent years, the knowledge surrounding college loans has not increased. In a 2012 report, the Consumer Financial Protection Bureau found that many student borrowers may not have understood the difference between private student loans and government loans, and default rates on private student loans "have spiked significantly since the financial crisis of 2008." (Holland, 2015 p 2).

Current Research & Demographic Filters

Most of the research on financial literacy has been conducted by Lusardi and Mitchell, yet it has focused on the demographic aspect of identifying subgroups and their differing financial aptitude. The research by Lusardi and Mitchell (2006) included survey questions such as:

- Suppose you had \$100 in a savings account and the interest rate was 2% per year. After 5 years, how much do you think you would have in the account if you left the money to grow: more than \$102, exactly \$102, less than \$102?
- Imagine that the interest rate on your savings account was 1% per year and 8 inflation was 2% per year. After 1 year, would you be able to buy more than, exactly the same as, or less than today with the money in this account?
- Do you think that the following statement is true or false? "Buying a single company stock usually provides a safer return than a stock mutual fund."

The questions above were categorized as "extremely basic financial questions" yet of the respondents over the age of 50, only 50% answered the first two questions correct and 33% answered all three questions correctly (Gale, 2012). The demographic stratification of the above questions provides additional analysis regarding what types of individuals are more likely to be

financially illiterate than others. The first question about interest had a 67% correct response rate, the second question had a 75% correct response rate, and the third question had a 52% correct response rate. However, fewer than half of the Hispanics polled correctly answered the second question (Lusardi, 2005). Also, women are 10% less likely than males to correctly answer both questions about compounding interest and inflation (questions 1 and 2). The research delves deeper into demographic breakdowns for each question and ties related research regarding demographics and a disinclination towards certain asset types, but eventually focuses on the correlation between financial literacy and schooling. Most importantly, the illiteracy rates are highest among those with less than a high school education. That being said, illiteracy rates among the current generation of college educated students may be much lower than expected or have declined from prior rates.

Education Methods

According to Bernheim (2003), one of the most effective financial education tools has been workplace financial education. Data was used from a 1994 national survey and concluded that “...on average and at the 25th and 50th percentiles – employees of firms that offer financial education have significantly higher levels of 401(k) participation rates, contributions, and balances as well as higher overall saving rates.” While this may be encouraging news that financial literacy education is working, the same Bernheim (2003) article details ambiguous results for school based financial education. Bernheim, Garrett and Maki (2001) showed that reported savings rates are larger in years following an educational mandate for high school financial literacy. However, Cole and Shastry (2008) looks at the same issue with Census data and they find no impact of mandates on financial behavior. Additionally, Tennyson and Nguyen (2001) used survey data from JumpStart and concluded that specific financial education courses resulted in higher literacy scores than general mandates. Surprisingly, 42% of those surveyed in Bernheim’s 1997 survey, which means the respondents attended high school in the 1970s and 1980s, said they took a course in

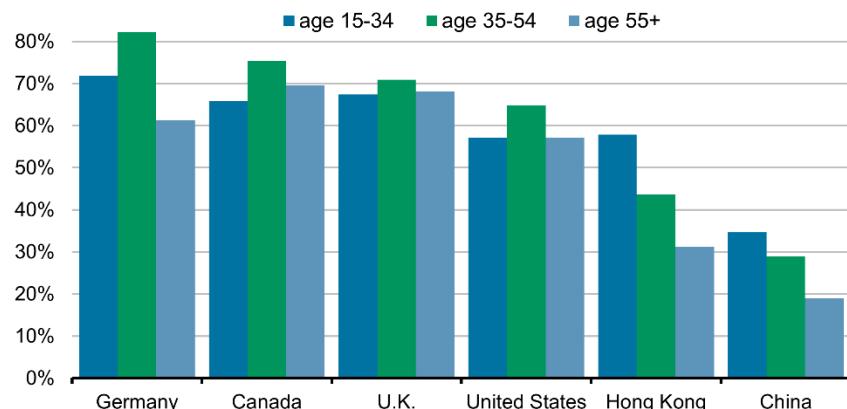
“consumer education” and that 70% of those said the financial topics discussed in the above sections were covered and that 39% of the respondents characterized the course as a requirement. Additionally, other research (Zumbrun, 2015) shows that while America ranks 14th overall for financial literacy, according to a S&P Global Financial Literacy Survey, the millennial age group ranks 21st.

The Student or the School? A Financial Chicken or the Egg

"We talked to students and asked them how much debt they had, and they didn't know how much in student loans they had out and what the repayments were going to be," says Jim

Financial Literacy by Age

Percent of people within each age group, for select countries, who could correctly answer questions on three of four topics: inflation, interest, compounding and risk diversification.



Source: Standard & Poor's Ratings Services Global Financial Literacy Survey | WSJ.com

Kennedy, director of financial aid at Indiana University. "So we thought we really have to get this information out in front of students every year." (Reeves, 2015). This approach seems to be innovative and one of the first of its kind. While the natural timeline for a study involving college debt repayment, mortgages, or financial literacy in general is quite long, due to the necessary testing of an individual at a certain age in their life and the subsequent waiting period for that student to have an appropriate amount of time to repay their debt or put their previous financial literacy knowledge to use, it does not appear that any research regarding if this

initiative by Indiana University has an impact on the likelihood of students to repay their debt or their financial literacy. This article and initiative suggests that universities may be nearing a point where they want to assume responsibility for educating their students and borrowers on financial literacy in a mutually beneficial way.

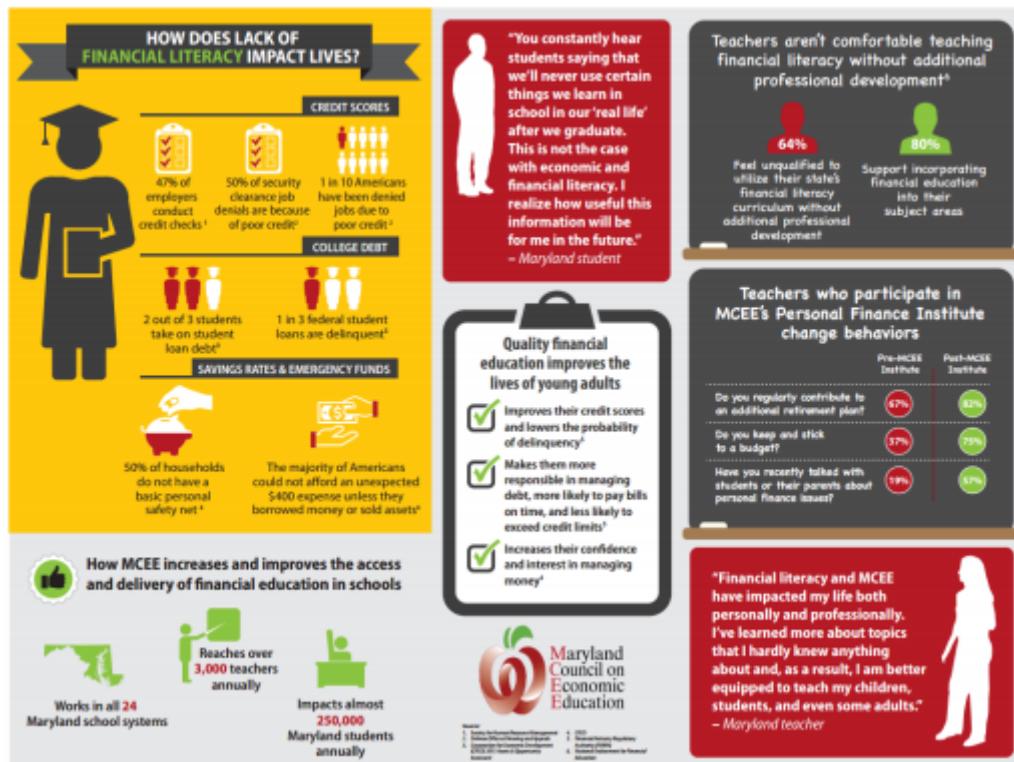
The Spark

Originally, the background for the idea that a financial literacy gap exists and is potentially larger than current estimates came from statistics and media regarding the financial position of athletes post retirement. Statistics such as “78% of former NFL players face bankruptcy or financial stress within two years of retirement” (Torre, 2009, p 5) are difficult to comprehend. ESPN released a documentary titled Broke, which focused on the financial troubles of many professional athletes. While this documentary focused on the fall of the most famous and highly paid athletes, the concepts and issues are largely similar to the general American population. If exorbitantly paid athletes (college educated or not) can spend millions of dollars and struggle to survive for a few years, then this could certainly apply to lesser paid individuals with more financial obligations and lower paying jobs or careers. Couple this with rising cost of education, high credit card APRs, and a rising cost of living can create financial havoc for the ill-informed.

State Commentary on Financial Literacy

While the best approach to financial literacy is continuous education starting at a young age, similar to what subjects such as math, science, and reading are currently accustomed to, the creation of a new curriculum or course can be challenging. In 2015, the Maryland Council on Economic Education (MCEE) found that “64% of teachers feel unqualified to teach concepts within the state of Maryland’s financial literacy standards without additional professional development” (Hewitt, 2015). While this statistic brings to light the percentage of teaching population in Maryland that may not be financially literate, it also suggests that the topic may be

declining in importance and neglected. Currently, financial literacy scores decline with age (Lusardi et al, 2010). Additionally, the MCEE found that 80% of teachers support 10 incorporating financial education into their subject area (Econed.org). The MCEE published a one page portrait below that shows a few important discussion points regarding financial literacy. For instance, 2 out of 3 students take on student loan debt and 1 in 3 federal student loans are delinquent according to the portrait shown below (Corporation for Economic Development (CFED) 2015 Assets & Opportunity Scorecard). These examples draw into question the significant difference that could be measured between a college level financial literacy course versus a high school mandated financial literacy course due to the quality of instructors. If a state such as Maryland, that appears to be committed to financial literacy, does not possess the capable instructors to teach the subject, the validity of high school financial literacy courses and



their effectiveness must be questioned. This may also explain one of the many potential reasons

that financial literacy courses in an educational setting may be less effective than seminar or corporate sponsored financial literacy courses.

The Desire to Learn

Much of the academic research on financial literacy has focused on the skill assessment of individuals according to various demographics and their responses regarding willingness to learn about the topic. In a 2009 survey on credit card use among undergraduate students, Federal research has indicated that “84% of students said they needed more education on financial management topics, 64% would have liked to receive information about financial management topics in high school, and 40% would have liked to receive such information as college freshmen” (Sallie Mae 2009). While the recent research related to financial literacy has resulted in refined questions to more accurately measure financial literacy and the categorical scores within sections of finance, there has been minimal conclusive research on the appropriate way to start financial literacy courses or education in an effective manner.

Recently, a 2014 survey from the Council for Economic Education showed that 19 states require a course in personal finance to be offered (Council for Economic Education 2014). 17 of the 19 states require the course to be taken and 6 of the 19 require student testing. This further illustrates the varying levels of implementation that applies to financial literacy education. The states in America are recognizing the need and impact that financial literacy can have, but the debate centers around funding and at what stage to begin the curriculum. At the university level, the benefits are immediate and logical. A more financially literate student body would result in higher likelihood of student debt repayment and the potential for more frequent and larger alumni donations due to the increased financial literacy of students. With students acknowledging their financial illiteracy and desire to learn these important concepts, which are

essential life skills, the universities that these students attend can further enhance their educational experience with financial literacy programs or courses. Currently, Texas Christian **12** University does not have an all-encompassing course dedicated to financial literacy that is available to all students. This knowledge can be obtained through various courses within the finance department, but would require a finance major. The Neeley School of Business at Texas Christian University accounts for 23.7% of students, who should be more likely to be financially literate due to their economics core requirement than non-business majors.

METHODS AND RESULTS

Methods

Data was collected for the topic of financial literacy as it relates to the TCU student population compared to research (Lusardi, 2009) used in FINRA findings and methods originally established in 2006 previously referenced. The questions include the previously listed research questions that are listed as the following:

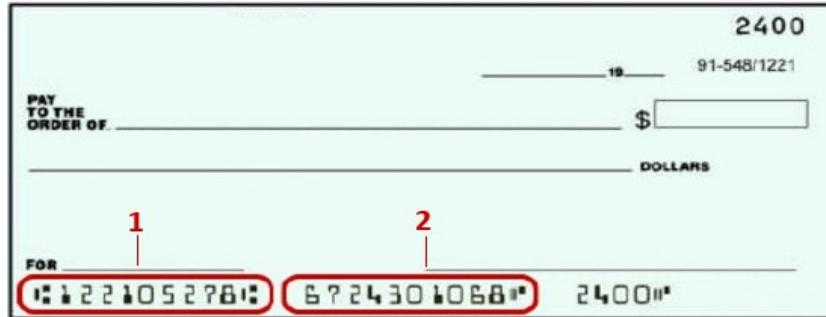
- Suppose you had \$100 in a savings account and the interest rate was 2% per year. After 5 years, how much do you think you would have in the account if you left the money to grow: more than \$102, exactly \$102, less than \$102?
- Imagine that the interest rate on your savings account was 1% per year and 8 inflation was 2% per year. After 1 year, would you be able to buy more than, exactly the same as, or less than today with the money in this account? 6
- Do you think that the following statement is true or false? “Buying a single company stock usually provides a safer return than a stock mutual fund.”

Survey Questions

The answers were provided in multiple choice format as Lusardi listed them to replicate the testing procedures and minimize any unintentional bias. Data was collected solely through a paper survey. The survey contains questions that ask the following:

- What is your biological sex?
- What ethnicity do you identify with most?
- What is your classification as a student?
- What is your major?
- What school/college do you belong to?
- Are you in the John V. Roach Honors College?
- How would you classify your socioeconomic background?
- Do you feel prepared to manage your own finances after graduation?
- On a scale from 1 to 7, where 1 means very low and 7 means very high, how would you assess your overall financial knowledge?
- Suppose you had \$100 in a savings account and the interest rate was 2% per year. After 5 years, how much do you think you would have in the account if you left the money to grow:
more than \$102, exactly \$102, less than \$102?
- Imagine that the interest rate on your savings account was 1% per year and 8 inflation was 2% per year. After 1 year, would you be able to buy more than, exactly the same as, or less than today with the money in this account?
- Do you think that the following statement is true or false? “Buying a single company stock usually provides a safer return than a stock mutual fund.”
- What is an APR?

- What is the average APR on a credit card?



Refer to the image above for the following questions

- What is represented by the group of numbers with the number 1 above it?
- What is represented by the group of numbers with the number 2 above it?

Courses Surveyed

I distributed the survey to a variety of classes that would, based on my knowledge, qualify as a general core class with a variety of TCU students among classification and major or courses that were required for each school at TCU. The courses surveyed include:

- General Psychology (Psychology)
- Elementary Statistics (2 classes – Math)
- Theatre History II (Theatre)
- Survey of Marketing (Marketing – Business Minors)
- Campaigns and Elections (Political Science)
- Financial Management (Finance – Business Core)
- Child Welfare (Social Work)
- American Short Story (English)
- Nature of Values – Empathy (Honors College)

Control Group

Additionally, I created a control group of two upper division finance courses to specifically measure the results of finance majors versus the general TCU population. The control group courses surveyed were Advanced Financial Management and Investments I.

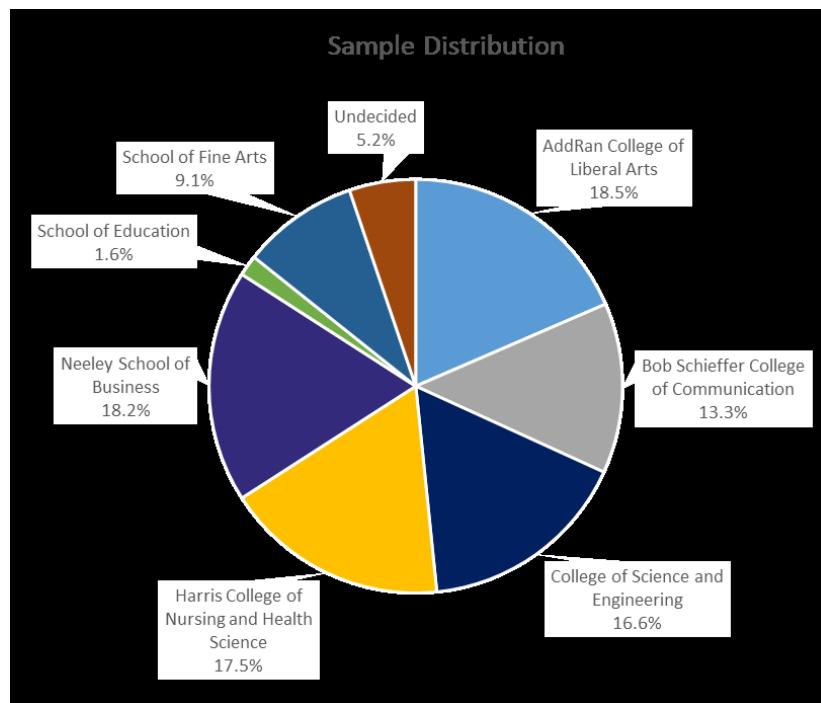
The Investments I course predominantly consists of junior finance majors. The Advanced Financial Management Course predominantly consists of senior finance majors.

Upon preliminary examination of the data, my data appears to accurately reflect the actual distribution of TCU students among gender, ethnicity, classification, school, and participation in the Honors College. The following discussion of the results will examine the merits and flaws of the data.

Results

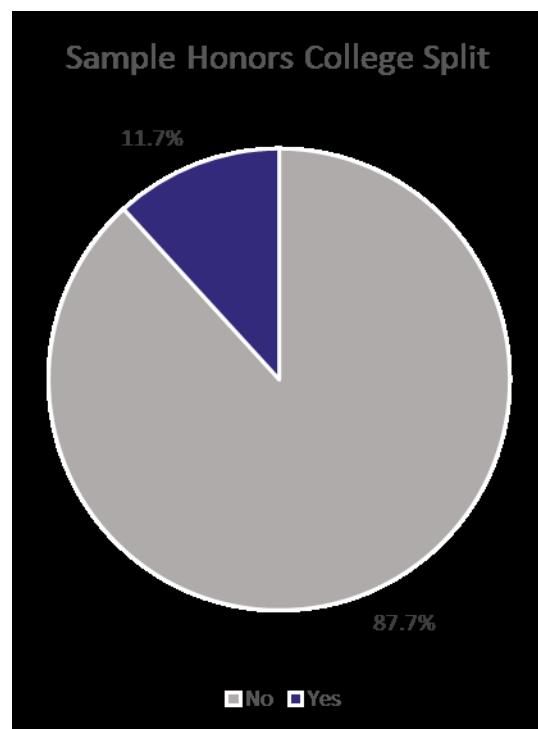
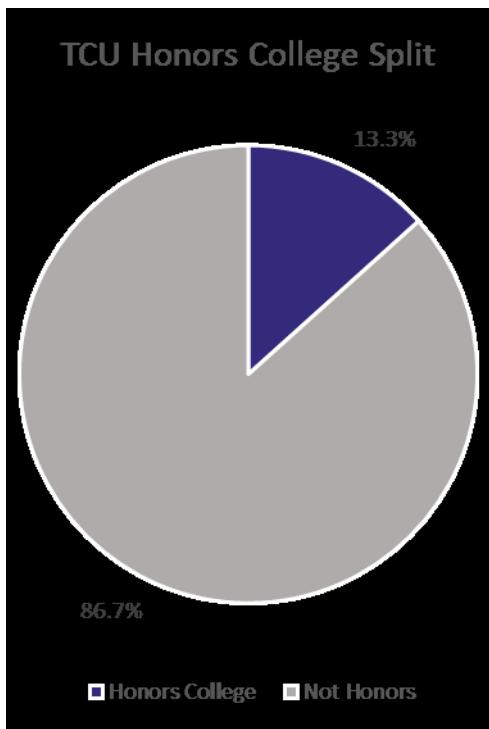
Of the students that participated in the survey, there were a total of 316 responses (n=316). Of those 316 students, 114 (36.1%) were male, while 202 (63.9%) were female. Regarding student classification at TCU, there were 100 (31.7%) freshmen, 66 (20.9%) sophomores, 105 (33.2%) juniors, and 45 (14.2%) senior participants.

Of the total sample survey, 56 (17.7%) of the students belonged to the Neeley School of Business, 51 (16.1%) belonged to the College of Science and Engineering, 5 (1.6%) belonged to the School of Education, 28 (8.9%) belonged to the School of Fine Arts, 57 (18.5%) belonged to the AddRan College of Liberal Arts, 54 (17.5%) belonged to the Harris College of Nursing and Health Sciences, 41 (13.3%) belonged to the Bob Schieffer College of Communication and 16 (5.1%) answered “Undecided”.

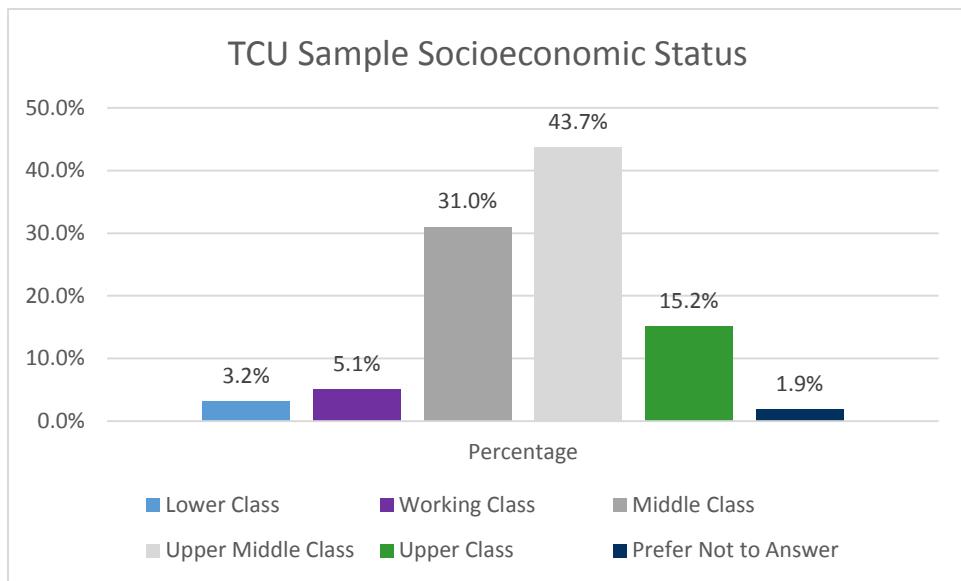


The rate of students in the sample participating in the Honors College was close to the actual TCU distribution, with 37 (11.7%) of the sample claiming membership to the Honors College, while 279 (88.3%) responding that they were not a member of the Honors College. The

actual TCU Honors College participation rate is shown below on the left, while the sample data is shown below on the right.



The reported socioeconomic status of students meets the hypothesized expectations, with 10 student identifying as lower class, 16 identifying as working class, 98 identifying as middle class, 138 identifying as upper middle class, 48 identifying as upper class, and 6 choosing the response “prefer not to answer.”



This socioeconomic status distribution can be partially explained by the respondent's peer group, their perceived wealth status, and the lack of knowledge pertaining to the monetary definitions of each socioeconomic status. A quick glance through a student parking lot may reveal a high number of student cars worth more than the middle income bucket, according to the Pew Research Center, illustrated below. A lack of familiarity with the national average household income level for each socioeconomic group may have resulted in understated socioeconomic selection for the survey. In simple terms, students may have identified as middle class when they are actually part of an upper middle class or upper class background.

Who is “middle income” and “upper income”?

Minimum 2014 household income needed to qualify for middle- and upper-income tiers, by household size

	1	2	3	4	5
UPPER INCOME	\$72,521	102,560	125,609	145,041	162,161
MIDDLE INCOME	\$24,173	34,186	41,869	48,347	54,053

Note: Middle-income Americans are adults whose annual size-adjusted household income is two-thirds to double the national median size-adjusted household income. Lower-income households have incomes less than two-thirds of the median and upper-income households have incomes that are more than double the median.

Source: Pew Research Center analysis of the 2015 Current Population Survey, Annual Social and Economic Supplement

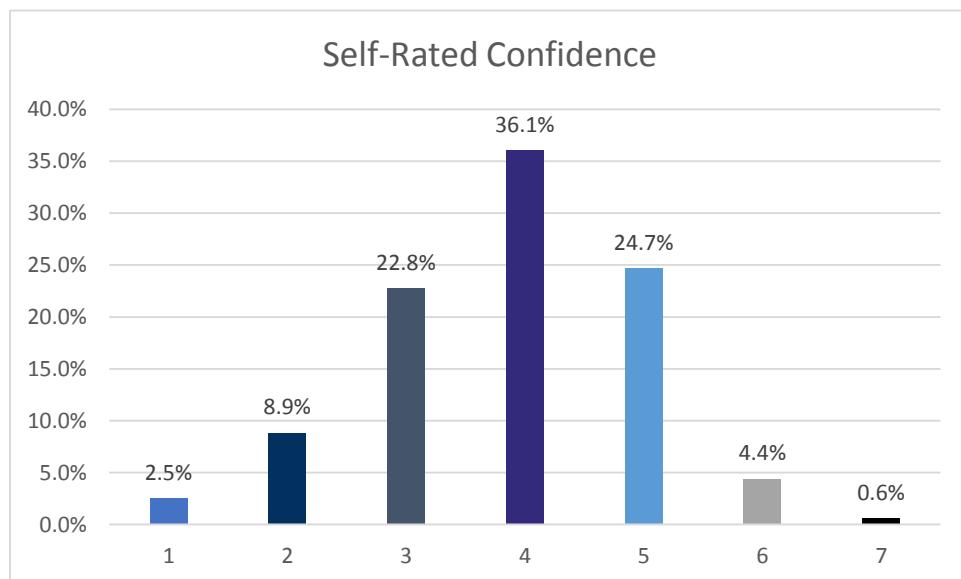
PEW RESEARCH CENTER

When students were asked if they felt prepared to manage their own finances 141 (44.6%) responded with “Yes”, 138 (43.7%) responded “No”, and 37 (11.7%) responded “Do not know.”

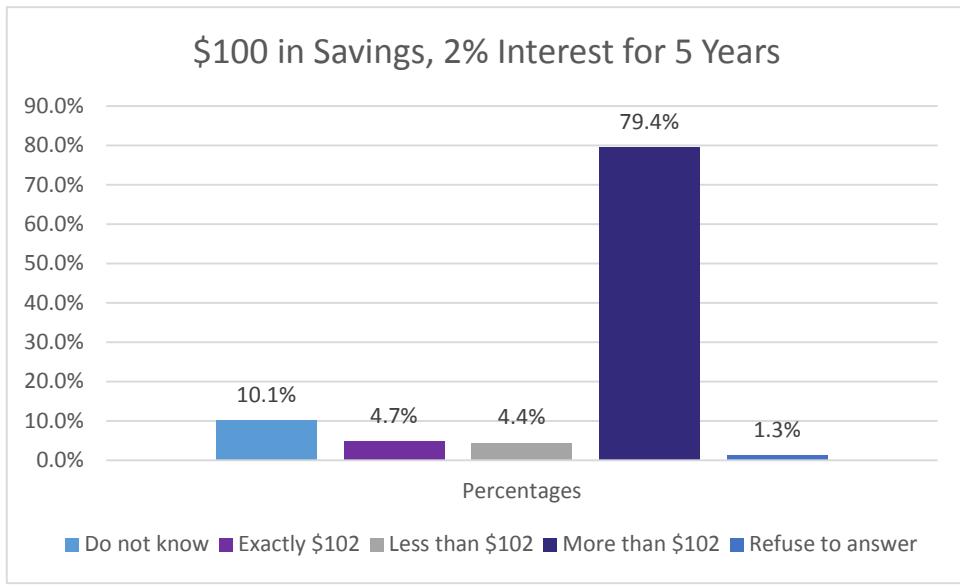
The number of students who displayed interest in a financial literacy course at TCU was very high, with 265 (83.9%) students responding that they are interested, 28 (8.9%) claiming they are not interested, and 23 (7.3%) responding with “do not know.”

The next 4 questions were taken directly from Lusardi’s 2009 study to measure financial literacy.

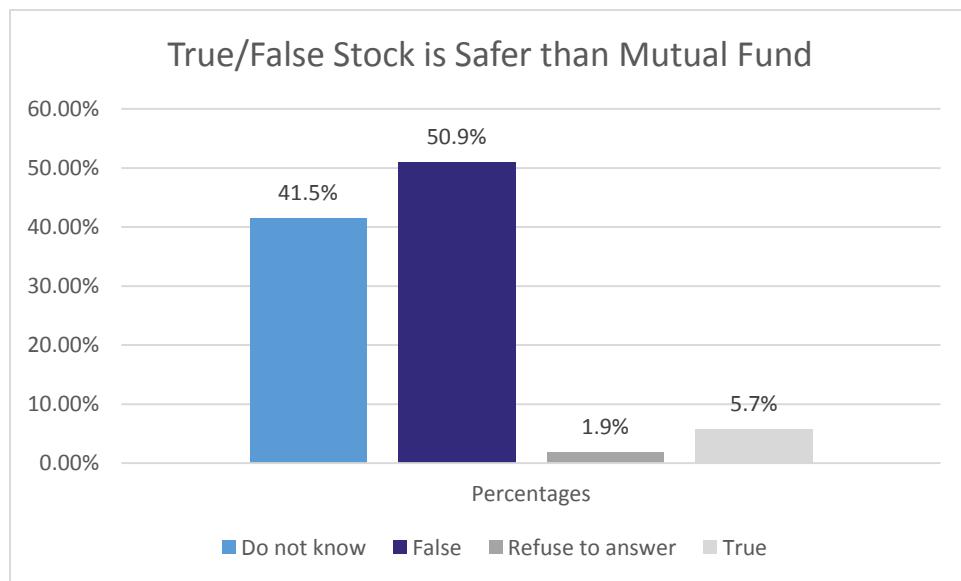
Students were asked “On a scale from 1 to 7, where 1 means very low and 7 means very high, how would you assess your overall financial knowledge?” Interestingly, the results were very similar on both sides of the mean response (4). Two students answered “1”, six students answered “2”, 22 (students answered “3”, forty-three (37.1%) students answered “4”, twenty-six (22.4%) students answered “5”, thirteen (11.2%) students answered “6”, and four (3.4%) students answered “7”.



Students were then asked, “Suppose you had \$100 in a savings account and the rate was 2% per year. After 5 years, how much do you think you would have in the account if you left the money to grow?” 251 (79.4%) students responded “More than \$102”, 15 (4.8%) students responded “Exactly \$102”, 14 (4.4%) students responded “Less than \$102”, 32 (10.0%) students responded with “Do not know” and 4 (1.3%) students responded with “refuse to answer”.

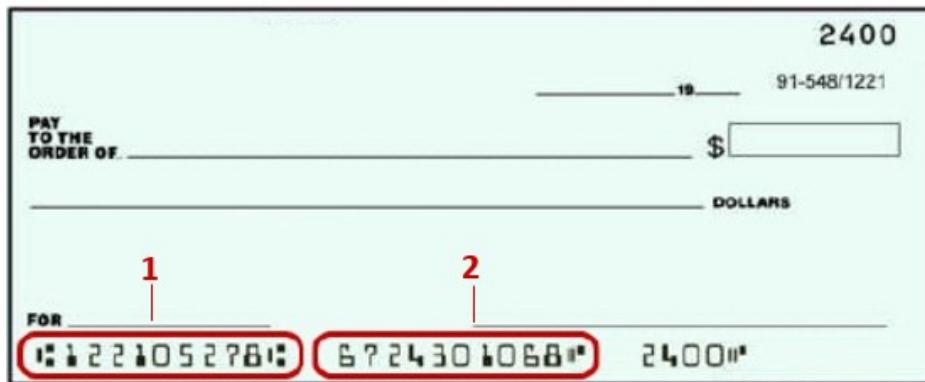


The final question from the 2009 sample was “True or false? Buying a single company’s stock usually is safer than a mutual fund.” 18 students responded “True”, 161 students correctly responded false, 131 responded “do not know” and 6 students refused to answer.

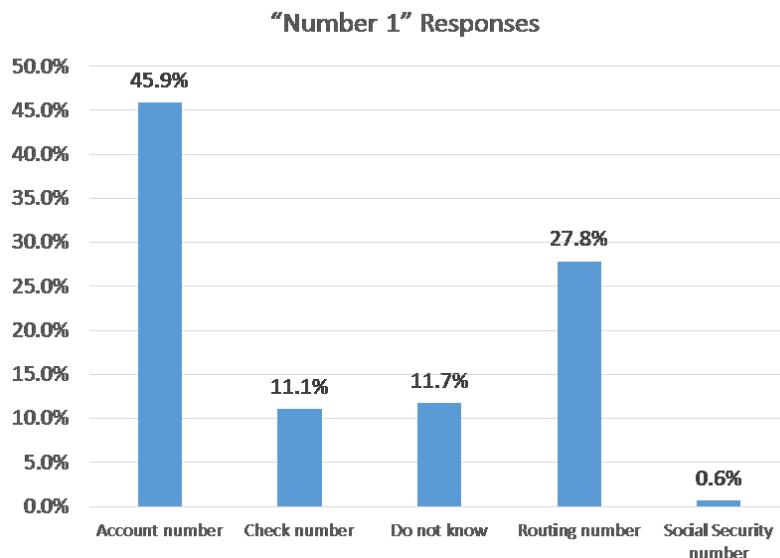


Additionally, respondents answered four questions that I developed to gauge other personal finance topics. Two of the questions regarding identifying certain numbers on a check and two of the questions were related to APR (average percentage rates).

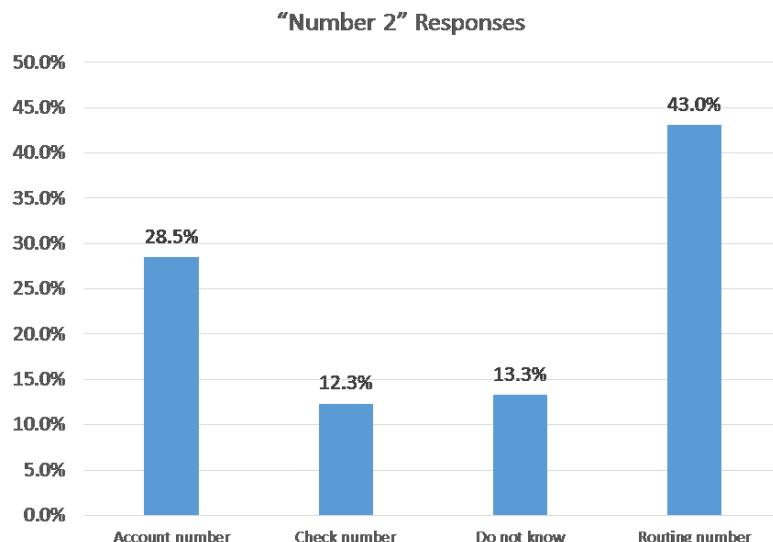
The first two questions showed the image below and asked participants to correctly identify the group of numbers referred to as “1” and the group of numbers referred to as “2”. The answers for both these questions were identical and included: account number, check number, routing number, and “do not know”.



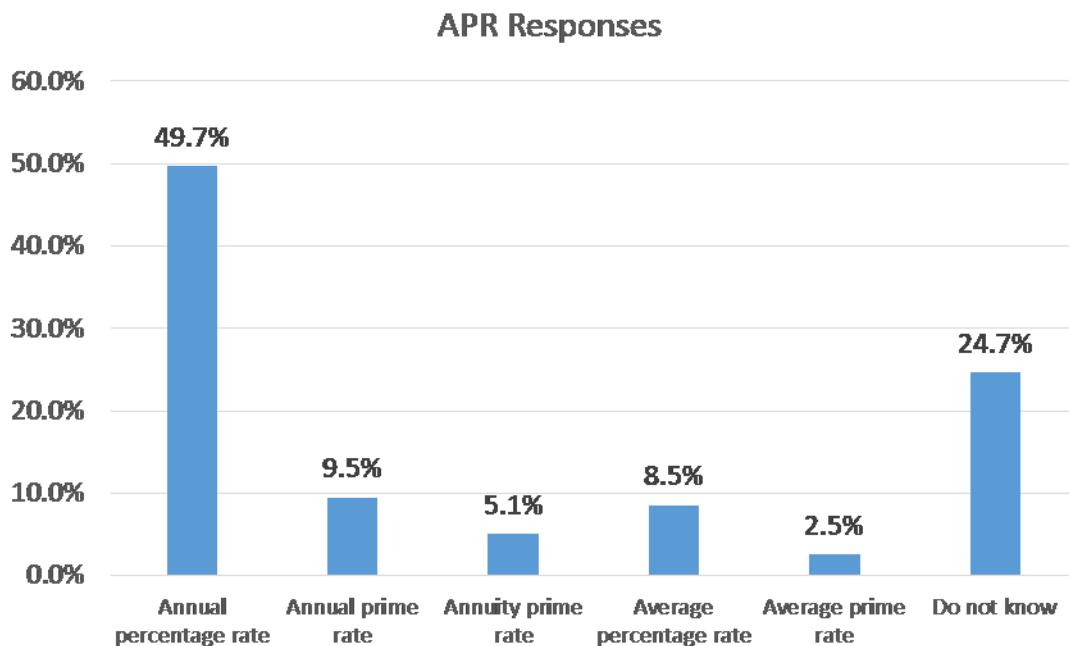
For the “group 1” question, 145 students responded that the group of numbers referred to an account number, 35 students responded that the group of numbers referred to a check number, 88 students correctly responded that it was a routing number, 2 students responded that it was social security number, and 46 responded “do not know.”



For the “group 2” question, 90 students correctly identified the numbers as an account number, 39 students responded that it was a check number, 136 responded that it was a routing number, and 51 responded “do not know”.



The next question simply asked “What is an APR?” The listed choices include: annual percentage rate, annual prime rate, annuity prime rate, average percentage rate, and “do not know”. Eighty-one students correctly responded that an APR was an annual percentage rate, while six believed it was an annual prime rate, four believed it was an annuity prime rate, six believed it was an average percentage rate, and nineteen students responded “do not know.” This question was not meant to be difficult, so I was shocked how low the correct response rate was. This question and the response can illustrate how financial terminology is the foundation of financial literacy. Without the necessary vocabulary skills, finance can appear to be a foreign language.

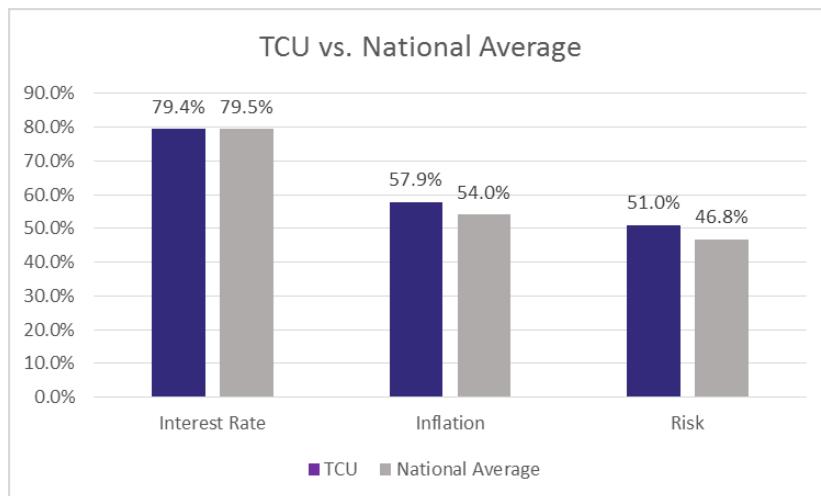


Hypothesis: My hypothesis is that despite the higher socioeconomic and educational status of TCU students, they would not score significantly higher than the average on Lusardi’s polls that were conducted at a national level.

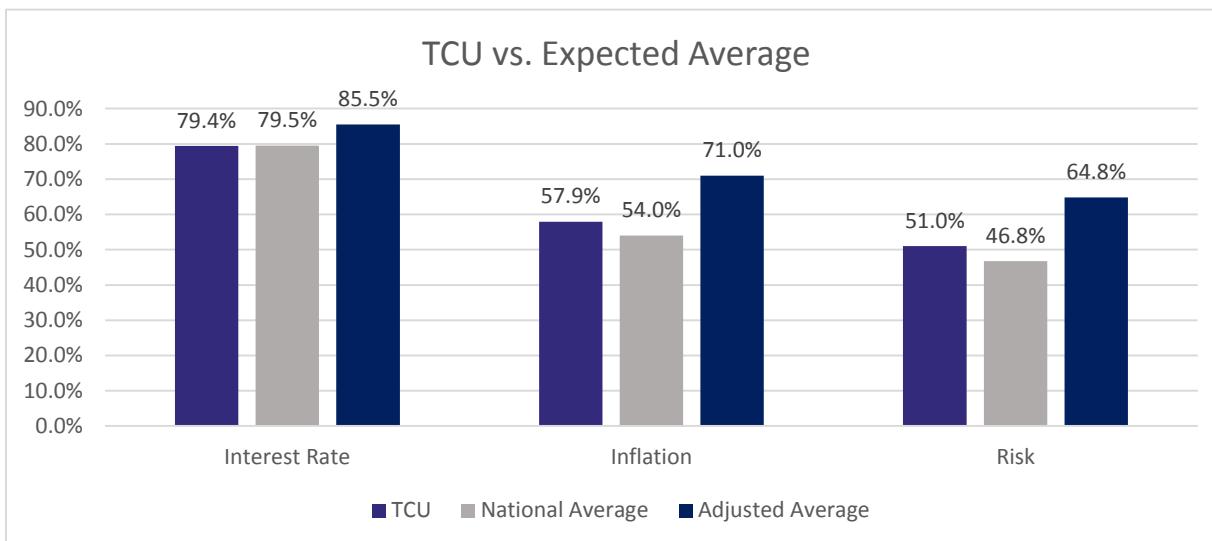
DISCUSSION

On the surface level, my results do not appear to be significantly different than the national averages reported by Lusardi for financial literacy among younger Americans. However, Lusardi provided multivariable analysis in her research that assigns a quantitative value to each demographic variable surveyed and its implications on the results. General intelligence has been shown to be a statistically significant factor in financial literacy rates (Lusardi 2008b). This general intelligence factor can be applied to the honors college as they select most of the students with the highest GPAs and SAT scores when they enter TCU, thus reasonably creating a generally more intelligent student sample vs the non-honors students. Lusardi's research included an aptitude test provided by the United States Army, but this could not be reasonably converted to make any assumptions about the scores of honors students at TCU.

Initially, the correct response rates for the TCU sample versus the national average is very similar and would appear to indicate that TCU students perform as expected.



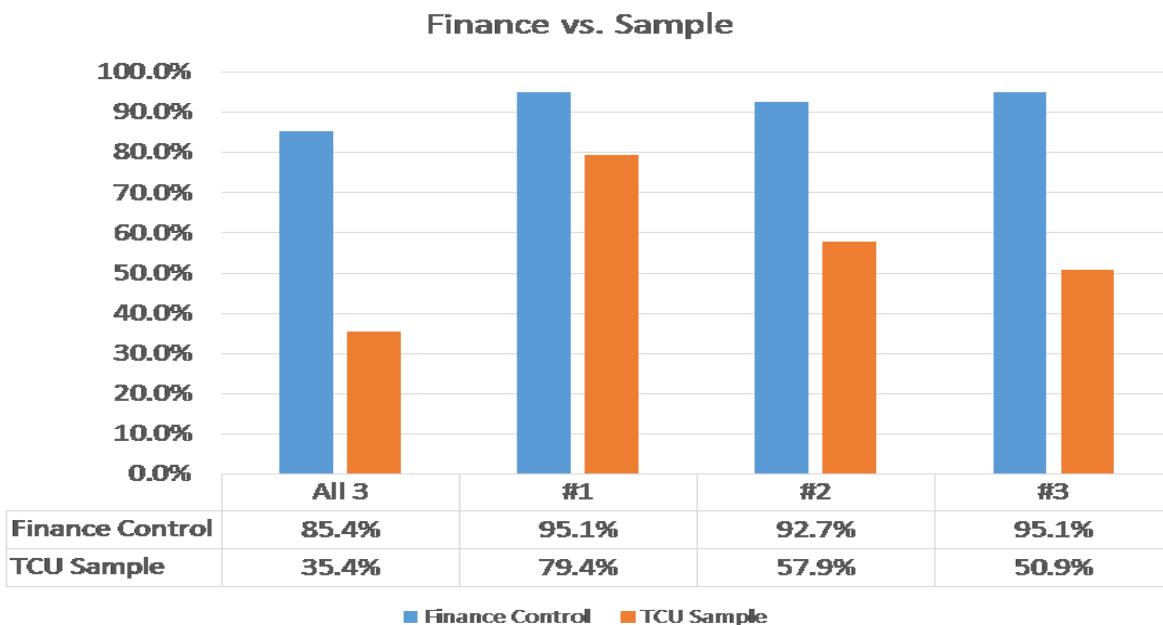
However, the national sample includes similarly aged respondents without a college degree, essentially rendering the national average as a less than ideal peer group. I used Lusardi's multivariable analysis to create an expected peer group ("Expected Average" in the graph) that more closely matches the respondents at TCU. Because each student is currently enrolled at TCU, they are considered to have "Some college" education, which raises the expected correct response rates.



Trends in Data

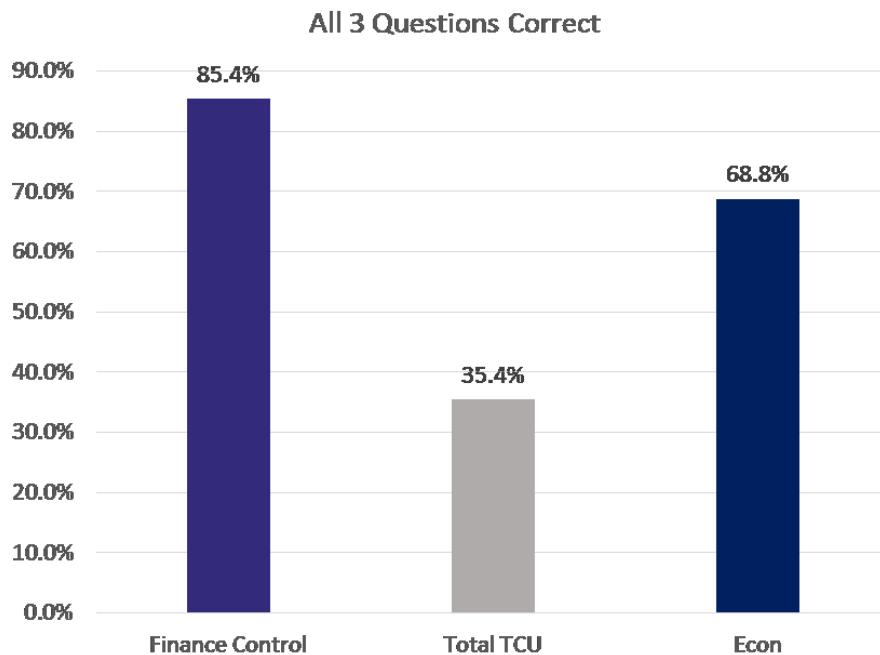
With this adjustment, two clear trends can be identified regarding the TCU student population versus an adjusted national peer group. First, TCU students significantly underperform their peer group, when adjusting for education levels. Second, the gap in knowledge, which is the difference in the expected correct response rate for the adjusted peer group versus the TCU sample response rate, expands as the questions become more difficult in terms of complexity and financial knowledge necessary to correctly answer.

The comparison of the finance control group versus the TCU sample group illustrates the effect that background knowledge has in regards to correctly answering the questions, as evidenced by Hilgert's 2003 research. The control group illustrates the significantly higher correct response rate for finance majors across the board, including answering all 3 questions correctly and each individual question.

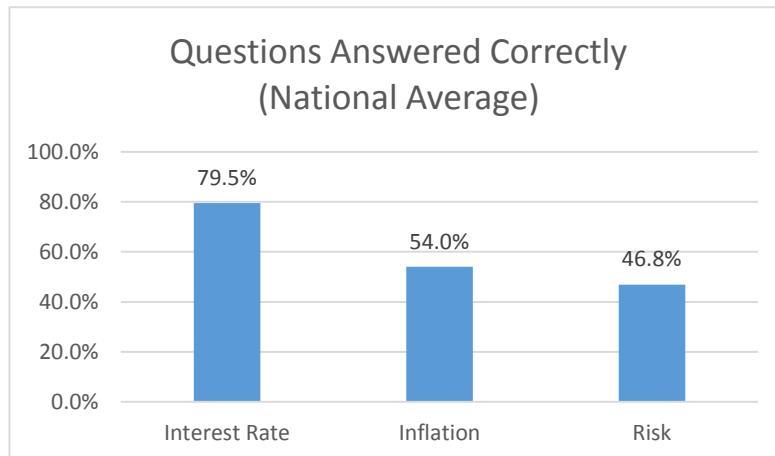


There is a noticeable trend regarding the declining ability of the TCU sample to correctly answer each question as it progresses from #1 through #3, which is expected as the national average correct response rate also declines. This is evidence that the TCU sample struggles with financial literacy topics as the questions become more complicated in nature and cannot be answered through general quantitative knowledge.

Additionally, I included economics majors as a comparison because the selected financial literacy questions used in the survey may have been covered in various economics courses. The results show that economics majors outperformed the average TCU student in terms of answering all 3 questions correctly.



According to the trends in the percentages of people who can answer each of the 3 questions correctly, there is a noticeable difference in the ability of the general American population in terms of correctly answering each question. This is graphically shown below and may indicate that the interest rate question is the most basic form of financial literacy assessment. It may also show that the lack of difficulty for this question can negate the finance topic it is trying to measure and simply assess basic math skills, which are fundamental to finance.



Creating the Adjusted Peer Group

Additionally, when analyzing the Lusardi data and the demographic variables, there is also evidence linked that shows quantitatively how much each variable can increase the expected correct response rate. Lusardi's analysis shows that participants with some college education can be expected to answer 4 percentage points better on the interest rate question, 11 percentage points better on the inflation risk, and 15 percentage points higher on the risk question (Lusardi 2009). This essentially creates an expected peer group for TCU, where all respondents have at least some college education and most likely will receive at least a college degree. The original sample for Lusardi includes students of lower educational levels than "some college" and lower socioeconomic status than the average TCU student, but this can effectively create an expected correct response rate for students with some college education.

With the adjustment for education level, the original TCU sample becomes relatively less impressive and more representative of the true relative underperformance of TCU students versus the expected results.

The widening knowledge gap comparing TCU versus the national average as the questions progress in difficulty may signal a few things. First, this data may indicate that TCU students have the general intelligence to correctly answer the first two questions about interest rates and inflation through core curriculum, but when slightly advanced personal finance topics are introduced, they lose their edge compared to the general population. Additionally, finance and economics majors may have both dedicated coursework and genuine personal experience or interest in the field to provide additional knowledge that would explain their outperformance of the general TCU population and national average. TCU finance majors were the only group to

outperform the adjusted peer group, but that should come as no surprise as the topics tested are very elementary in a university level finance curriculum.

IMPLICATIONS

The results of this paper demonstrate a significant finding regarding a neglected demographic of financial literacy studies, college students with a higher than average socioeconomic background. The results show that the TCU student population underperforms versus the expectations of a peer group of college educated participants. A majority of the research regarding demographics and financial literacy has focused on the factors of underperformance for women, minorities, and those with lower educational levels. While the previous findings can attribute higher socioeconomic status and education with higher financial literacy scores, my research has demonstrated that the higher scores of college educated individuals may be declining and that financial illiteracy is a growing issue across all socioeconomic backgrounds in the United States.

CONCLUSION

The data I collected from a sample of TCU students is significant enough to support the hypothesis that TCU students underperform in terms of financial literacy knowledge versus an educational peer group. While TCU students may have performed on par with the national average, the data shows that they should be performing at a higher rate in terms of financial literacy. It is my belief that this underperformance is not specific to the TCU community and can be adequately replicated at any college in the United States. While it is most likely due to a variety of factors, I believe that there is a relative declining familiarity regarding college students (“millennials”) and personal finance life skills prior to entry into the post-graduate world. It may be logical to think this is counterintuitive due to the increasing media popularity of discussions regarding a student loan bubble, the experience of living through the 2008-2009 recession, and the increased popularity of credit and debit cards, but my research shows a stark trend of financial illiteracy among college students.

REFERENCES

- Bernheim, Douglas. 1998. "Financial Illiteracy, Education and Retirement Saving." *In Living with Defined Contribution Pensions*, edited by Olivia Mitchell and Sylvester Schieber. Philadelphia: University of Pennsylvania Press: 36-86.
- Bernheim, B. Douglas and Daniel M. Garrett. (1996). "The Determinants and Consequences of Financial Education in the Workplace: Evidence from a Survey of Households," *NBER Working Paper No. 5667*, 31
- Bernheim, B. Douglas and Daniel M. Garrett. (2003). "The Effects of Financial Education in the Workplace: Evidence from a Survey of Households," *Journal of Public Economics* 87 (7- 8), pp. 1487- 1519.
- Bernheim, B. Douglas, Daniel M. Garrett and Dean Maki. (1997). "The Long-Term Effects of High School Financial Curriculum Mandates," *NBER Working Paper No. 6085*,
- Financial Industry Regulatory Authority. (FINRA; 2010). Financial capability in the United States: National survey, executive summary. Washington, D.C.
<http://www.finrafoundation.org/resources/research/p120478>
- Gale, William, Benjamin H. Harris, and Ruth Levine. (2012). Raising Household Saving: Does Financial Education Work? *Social Security Bulletin*, Vol. 72, No. 2.
- Hastings, Justine, and Olivia S. Mitchell. (2010). "How Financial Literacy and Impatience Shape Retirement Wealth and Investment Behaviors." *MRRC Report*.
- Hogarth, Jeanne and Marianne Hilgert. (2002). "Financial Knowledge, Experience and Learning Preferences: Preliminary Results from a New Survey on Financial Literacy." *Consumer Interest Annual*, 48.
- Holland, Kelley. (2015). The High Economic and Social Costs of Student Loan Debt. *CNBC*. Retrieved from <http://www.cnbc.com/2015/06/15/the-high-economic-and-social-costs-of-student-loan-debt.html>
- Hilgert, Marianne, Jeanne Hogarth, and Sondra Beverly. (2003). "Household Financial Management: The Connection between Knowledge and Behavior," *Federal Reserve 14x Bulletin*, 309-32.

- Lusardi, Annamaria, Olivia S. Mitchell, and Vilsa Curto. (2009). "Financial Literacy and Financial Sophistication among Older Americans." *NBER Working Paper 15469*.
- Lusardi, Annamaria, Olivia Mitchell, and Vilsa Curto. (2009). "Financial Literacy Among the Young: Evidence and Implications for Consumer Policy," *NBER Working Paper* n. 15352.
- Lusardi, Annamaria, and Olivia Mitchell. (2007b). "Financial Literacy and Retirement Preparedness: Evidence and Implications for Financial Education," *Business Economics*, pp. 35-44.
- Lusardi, Annamaria, and Olivia Mitchell. (2008b), "How Much Do People Know About Economics and Finance? Financial Illiteracy and the Importance of Financial Education," Policy Brief n. 5, MRRC, March.
- Lusardi, Annamaria. 2004. "Savings and the Effectiveness of Financial Education." *In Pension Design and Structure: New Lessons from Behavioral Finance*, edited by Olivia Mitchell and Stephen Utkus. Oxford: Oxford University Press: 157-184.
- Mandell, Lewis. 2008. "Financial Education in High School," in Annamaria Lusardi (ed.), Overcoming the Saving Slump: How to Increase the Effectiveness of Financial Education and Saving Programs, Chicago: University of Chicago Press, pp. 257-279.
- Torre, Pablo. (2009). How (and Why) Athletes Go Broke. *Sports Illustrated, March 23, 2009 Issue*, 1-10.
- Zumbrun, Josh. (2015). The U.S. May Be the World's Richest Country, But It Ranks 14th in Financial Literacy. *Wall Street Journal*. Retrieved from <http://blogs.wsj.com/economics/2015/11/18/the-u-s-may-be-the-worlds-richest-country-but-it-ranks-14th-in-financial-literacy/>