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PREDICTING CREDIT AND INSURANCE LITERACY IN UNDERGRADUATE
STUDENTS: A SURVEY

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ABSTRACT

This thesis examines financial literacy among young adults. Based on a review of the pertinent personal finance literature, it surveys the historical information on demographics and variables impacting financial literacy in undergraduate college students to predict theoretical credit and insurance literacy in that student population. The study focused on three of the most significant variable areas informed by prior research to base hypotheses: gender, socialization attributable to parental influences (i.e. factors affecting the process of learning about finances, often influenced by parents at an early age), and age/class rank. Based on our research, we concluded that gender, socialization/parents, and age/class rank would all likely retain significance in predicting financial literacy level when applied to credit and insurance literacy.

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Chapter 1

Introduction

1.1 The Problem

In a rapidly changing economic climate characterized by evolving financial instruments and high levels of consumer debt, a working understanding of personal finances is more important to consumers than ever before. Financial literacy is defined as both knowledge of financial concepts and application of such knowledge to make sound financial decisions (OECD, 2011). Despite the growing importance of financial literacy, research has found that only a minority of the world population demonstrates a competent understanding of basic financial concepts (Lusardi and Mitchell, 2011).

The United States has proven no exception to this trend. Multiple reports have found that U.S. consumers of all ages and backgrounds overwhelmingly lack a basic understanding of personal finances (Lusardi and Mitchell, 2013). The U.S. illiteracy problem continues to contribute to a number of long-standing financial woes that befall the average American.

A huge portion of the American public lacks sufficient retirement savings. 48% of older Americans have no defined contribution plan (401(k) or IRA) and over one third of workers ages 55-64 have neither a defined contribution plan or a defined benefit plan (pension). For all workers in the same age bracket, the median defined contribution account balance is a mere \$15,000. (Jeszeck, 2019; Ghilarducci, Papadopulous, and Webb, 2017). This lack of retirement preparedness means that standard of living will decline for millions of Americans when they soon enter retirement.

Figures on cash savings paint a similarly grim picture. JP Morgan Chase recommends that Americans save six weeks of take home pay as a buffer for emergencies and unexpected events (Farrell, Greig, and Yu, 2019). Unfortunately, though, most Americans fail to achieve this savings mark. The AARP reports that a staggering 53% of U.S. households have no emergency savings account (Harvey, 2019). The implications of this finding can be seen in other research. A 2020 Bankrate survey found that roughly 4 in 10 Americans would borrow to cover \$1000 in emergency expenses and the Federal Reserve found that 27% of Americans would borrow or sell something to cover an unexpected \$400 expense, with 12% not able to cover it at all (Dixon, 2020; Board of Governors of the Federal Reserve System, 2019). This means that not only are many Americans ill-equipped for retirement, but also that they are largely unprepared for even a rainy day.

Savings are not the only issue, though. U.S. consumer debt hit a record high \$14 trillion in 2019. Driven by the combination of factors such as a growing economy, low interest rates, and low unemployment, U.S. household debt saw its twenty-second consecutive quarterly increase in Q4 of 2019, when mortgage originations also hit a 14-year high (Federal Reserve Bank of New York, 2019).

These record levels also extend to student debt, which in its own crisis accounts for about \$1.6 trillion of the total debt and affects some 44 million Americans (Johnson, 2019; Friedman, 2020). Student loans also boast the highest delinquency rates of any U.S. loan type with roughly 11% of loans 90 or more days delinquent, a level almost twice that of 2004 (Federal Reserve Bank of New York, 2019). Most experts agree that the crisis is not due to improve any time soon. With debt continuing to increase coupled with high default rates and the rapidly rising cost of college, some economists predict that student debt could see one of its highest periods of

growth in the next decade (Johnson, 2019). This poses great immediate risks not only to American consumers, but also to the financial institutions, education networks, and federal agencies that support the loans (Johnson, 2019). Put simply, the student loan crisis is bad for everyone.

Given all of these factors, then, it may not come as a surprise that as of 2018, 11.8% of Americans lived below the poverty line according to the U.S. Census Bureau (Semega, Kollar, Creamer, and Mohanty, 2019). Still, critics argue that this traditional calculation, which dates back to the 1960s, largely understates the true level of poverty in the United States (Fremstad, 2019). The Organization for Economic Cooperation and Development (OECD), which uses a more updated calculation, put the U.S. poverty rate at 17.8% for 2017 (the last year the calculation was conducted), which was among the highest for developed nations (OECD, 2020).

All of these issues are also compounded by the nation's ever-expanding wealth gap. In 2018, the highest-earning 20% of U.S. households accounted for over half of the country's total income, reflecting an income inequality level higher than that of any other G7 country according to the OECD (Schaeffer, 2020; OECD, 2020).

Now in a post COVID-19 world, we see the effects of these economic crises on full display. With the unemployment rate reaching a level not seen since the great depression, many families are not able to make ends meet between federal aid packages, let alone pay off debt. Cars are literally "lined up for miles" at local food banks and essential workers are faced with choosing between supporting their families and risking their health (Kulish, 2020). Even modest retirement accounts have now seen years of gains disappear, and the poorest Americans have disproportionately seen their communities ravaged by the virus. A Columbia University study

predicts that COVID-19 could send as many as 21 million Americans into poverty, an increase that would propel U.S. poverty to its highest level since 1967 (Parolin and Wimer, 2020).

The pandemic has made the worst aspects of the U.S. economy all too evident, but the issues have always been present. This is why financial literacy is so imperative. Americans need to understand basic financial concepts in order to amass and retain wealth. This way when a major event does happen, be it a pandemic or time for retirement, they have a safety net. The fact that so many Americans demonstrate such poor financial decision making even in the best of times needs to change. This is why the present study has chosen to focus on financial literacy. A deeper understanding of what drives financial illiteracy, and more importantly, what can remedy it, is pivotal to the economic betterment of millions of Americans. While improving financial literacy will not immediately solve all of the systemic problems plaguing the U.S. economic system, it is a start.

To quote former Federal Reserve chair Ben Bernanke, “In our dynamic and complex financial marketplace, financial education must be a life-long pursuit that enables consumers of all ages and economic positions to stay attuned to changes in their financial needs and circumstances and to take advantage of products and services that best meet their goals. Well-informed consumers, who can serve as their own advocates, are one of the best lines of defense against the proliferation of financial products and services that are unsuitable, unnecessarily costly, or abusive” (Bernanke, 2011). Our hope is to help American consumers on their paths to being their own best advocates.

1.2 Credit & Insurance

The early literature review for this project revealed that the inclusions of credit and insurance are largely inconsistent within the body of financial literacy work. Being inspired by the risk management discipline, this study would argue that credit and insurance knowledge are hugely important components of financial literacy.

Credit has many far-reaching applications in the United States. Consumer credit history is increasingly used in pricing and approval for not just credit cards and mortgages, but also apartment rentals, insurance policies, and even cell phone contracts. That means higher prices and less access to essential products for the millions of Americans that struggle with debt, many whom are already among the poorest in America. And while this phenomenon absolutely affects certain socioeconomic groups to a greater extent, it is by no means unique to any one area of society. Consumer debt levels were at all-time highs even before the Coronavirus epidemic. Roughly 44 million Americans are in debt from student loans (Friedman, 2020). This is something that impacts most Americans, which is why an understanding of the factors that affect credit is so important to the American public.

Unfortunately, certain research has shown that credit literacy may be going down. Business Wire's most recent annual credit survey found that credit knowledge has been steadily declining in U.S. consumers since 2012 (Gillis, 2019). This points to a possible need for urgency in addressing credit knowledge deficiencies.

Insurance is also a very important part of financial literacy. Insurance vehicles can protect consumers and their families from hundreds of exposures that can in many cases prove catastrophic to wealth. Sadly, some research indicates that insurance literacy, too, may be lacking. A Policygenius report published in 2018 found that 96% of Americans were unable to

correctly identify each of the terms deductible, coinsurance, co-pay, and out-of-pocket maximum (Policygenius, 2018).

It has also been found that insurance companies are capitalizing on new trends in big data to better differentiate consumer risk pools (Cather, 2018). One of the biggest ways companies are doing this is by using calculations derived from consumer credit history, called credit based insurance scores, or CBIS, to better predict risk of loss. Just as good grades can be used as a metric to predict how responsible a young policyholder's behavior will be, credit history is used as a metric to predict responsible behavior in older consumers, something that should, on average, lead to less losses. The calculations typically include variable categories such as performance on credit obligations, credit-seeking behavior, use of credit, length of credit history, and types of credit used (Federal Trade Commission, 2007). Given the nature of these calculations, some advocacy groups argue that this innovation in insurance pricing disproportionately affects certain socioeconomic groups within the United States (NAIC, 2020). What's more, there has been very little research focused on measuring the extent to which consumers are aware of this application of their credit history, especially in younger consumers.

1.3 Establishing Focus & The Present Study

In addition to the greater American public, U.S. college students have also been found to demonstrate poor levels of financial literacy (Chen and Volpe, 1998; Jorgensen, 2007). Chen and Volpe (1998) also found that low levels of student financial knowledge 'limit their ability to make informed decisions' (p. 122). Because undergraduate college years also mark the first steps

toward financial independence and accountability for many Americans, this study has decided to focus exclusively on the group.

The early literature review for this project also yielded a few more interesting points. Most notable was the lack of a universal instrument for measuring knowledge level, despite much focus on financial literacy research among experts in recent years. Lusardi (2019) highlights one of the frequently used survey instruments. Since dubbed the ‘big three financial literacy questions,’ the questionnaire breaks financial knowledge into three key fundamental areas: interest rates, inflation, and risk diversification. The questions are as follows:

- *Suppose you had \$100 in a savings account and the interest rate was 2% per year. After five years, how much do you think you would have in the account if you left the money to grow: more than \$102, exactly \$102 or less than \$102? {Do not know; refuse to answer}*
- *Imagine that the interest rate on your savings account was 1% per year and inflation was 2% per year. After one year, would you be able to buy more than, exactly the same as or less than today with the money in this account? {Do not know; refuse to answer}*
- *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.” {Do not know; refuse to answer}*

Figure 1. Lusardi's 'Big Three Financial Literacy Questions'

The first question is meant to measure how well respondents can do simple interest rate calculations. This is an important component of financial literacy given its relevance to savings, investment, insurance, and debt management. The question also gauges numeracy, or the ability to understand mathematical calculations.

The second question is dedicated to inflation, a topic that is also highly relevant to navigating personal finances. Investment returns can vary significantly depending on the

inflation rate over a given period, so it is very important for consumers to understand inflation as it would relate to interest rates as well as ways to hedge against it.

The final question relates to risk diversification and requires knowledge of both stocks and mutual funds to answer correctly. An understanding of risk diversification is also a central component of financial literacy and is essential to portfolio composition as well as shopping insurance and planning for retirement.

Because this is the most widely adopted model in previous research, and has been found to be effective in differentiating pools of respondents by knowledge level (Lusardi and Mitchell, 2007), this study will use the three knowledge areas as a basis for breaking down the various components of financial literacy.

Another salient theme in prior research was the existence of knowledge discrepancies between certain demographic groups. Certain factors such as age, gender, socioeconomic status, education level, parental influence, financial socialization (the process of learning about finances starting at a young age), work experience, and confidence level (how confident consumers are in their capacity to make informed financial decisions) have emerged in multiple studies as possible predictors of financial literacy level.

With these themes derived from prior research serving as inspiration, the goals of the present study began to take shape. Given the frequent omission of credit and insurance areas in financial literacy research, and the unique perspective offered by the college student demographic, we saw an opportunity. Initially, our hope was to use our own survey instrument to measure literacy levels for various groups of students in traditional areas as well as credit and insurance, specifically credit calculation factors and insurance pricing variables. Unfortunately,

due to the emergence of the 2020 COVID-19 crisis, distribution of the survey became impossible.

The study was forced to shift its scope as a result. Instead, the thesis has been refocused to provide a comprehensive literature review on three of the most predictive demographic areas affecting undergraduate financial literacy level (gender, socialization/parents, age/class rank), and to discuss the potential implications of these findings on theoretical credit and insurance knowledge in the same groups. The research goals of the literature review are as follows:

- 1) To evaluate the extent to which differences in gender have an impact on financial knowledge in college students.
- 2) To evaluate the extent to which differences in parental influence and socialization factors have an impact on financial knowledge in college students.
- 3) To evaluate the extent to which differences in age and class rank have an impact on financial knowledge in college students.
- 4) To use the findings of goals 1-3 in order to predict how these different demographic groups might exhibit differences in understandings of credit and insurance.

While this is not the quantitative study we once thought it would be, it is our hope that out of it comes a solid overview of how certain demographics impact financial understanding in college students and where increased policy attention might be focused moving forward, especially in the areas of credit and insurance.

Chapter 2

How Financial Literacy Differs Across Genders

The gender gap in financial literacy is one of the most consistent findings in previous literature, with men generally demonstrating a higher understanding of financial concepts than women (Chen and Volpe, 2002). In the adult population, it has been proposed that this gap could be a result of the delegation of financial responsibility within married couples (Fonseca, Mullen, Zamarro and Zissimopoulous, 2012). Chen and Volpe (2002) did find, however, that education level can have a significant bearing on financial knowledge for both males and females alike. This finding has also emerged in other research. For this reason, the current study finds it appropriate to control for education level by examining a single common and influential cohort, the college student, for further insight into possible drivers of the knowledge gap.

Chen and Volpe (1998) represents some of the earliest survey work focused on evaluating financial literacy levels in college students. Building off of a wealth of 1990s research citing inadequate U.S. consumer knowledge of personal finances, the study sought to further the body of work by analyzing impacts of respondent demographics on literacy level as measured by correct scores on questions, as well as the effects of these demographics on subsequent financial opinions and decisions.

The study surveyed 924 college students from 13 institutions including public, private, and community. The 40 question multiple choice quiz portion was broken into sections on general knowledge, savings and borrowing, insurance, and investments. Demographic and behavioral questions were included at the end of the survey.

The results confirmed that the deficient financial knowledge phenomenon also extended to college students with a mean of only 53% of quiz questions answered correctly. Respondents

performed the worst on the investment section of the survey with a mean of only 40% correct. Those performing poorly on the quiz section were also more likely to hold incorrect opinions and ultimately make less informed decisions. The study confirmed that the gender knowledge gap did extend to the college demographic, with men typically performing higher than women even when controlling for other demographic factors.

Lusardi, Mitchell and Curto (2009) found similar results with regard to the gender gap. Inspired by unprecedented levels of student debt and other reports that indicated that young people lack financial knowledge, the study sought to measure young Americans' competency in key financial areas as related to socioeconomic characteristics with the goal of policy recommendations.

The study utilized the 2007-2008 edition of the 1997 National Longitudinal Survey of Youth, a recurring survey that follows the lives of 8,984 American men and women born between 1980 and 1984, to base its analysis. Originally introduced in the 2004 health and retirement survey (Mitchell and Lusardi, 2015), the aforementioned 'Big Three' financial literacy questions were used to calculate knowledge measurements.

The results confirmed that financial literacy is low. Only 27% of respondents answered all three questions correctly, though 79% did answer the interest rate question correctly. The knowledge gap between genders was also confirmed with women less likely to provide correct responses on all three questions. For both the inflation and risk diversification questions, women performed roughly 11% worse than men on average. These gaps also remained significant with controls in place.

Ergün (2017) found evidence of the gender gap extending beyond the U.S. into Europe. The study surveyed university students from eight different European countries for analysis. The

20 question survey used in the study had a broad focus similar to that of the questionnaire used in Chen and Volpe (1998).

The average percentage of correct responses across all respondents was 72.2%. Again, men performed better than women on average. Male students averaged 76.2% correct responses on the survey, compared 68.5% for females.

The one exception to these findings is Jorgensen (2007). The study, which surveyed 450 undergraduate and master's students using a 25 question general knowledge survey instrument, did not find significant differences in mean correct responses between males and females. No potential explanation is offered for this finding, and it largely contradicts the conclusions of other financial literacy research focusing on college students as well as the wider body of financial literacy work.

We can thus conclude that the gender knowledge gap does likely still extend to the college student demographic. Some potential explanations for this trend have been proposed. Chen and Volpe (2002) found that women typically demonstrate “less enthusiasm for, lower confidence in, and less willingness to learn about personal finance topics than men do” (Chen and Volpe, 1998, p. 107).

Other studies have pointed to the focus of our next section, adolescent socialization, as a possible explanation to the trend. Agnew and Cameron-Agnew (2015) argue that early stages of financial socialization within the home are often subject to gender bias. The study found that males typically report having had their first financial discussion with their parents at a younger age than females. This phenomenon is significant even when controlled for socioeconomic factors. This is an appropriate bridge to our next section. As will be covered in detail, early

socialization factors and parental influences have a tremendous effect on later learning outcomes and outlooks.

Given all of this evidence, we predict that if credit and insurance questions were routinely included in financial literacy questionnaires, the gender gap phenomenon would extend to these areas of financial knowledge as well. In Chen and Volpe (1998), male students were found to have performed 5.28% better on insurance questions than females on average. Though not including elements of credit or insurance in its survey approach directly, Lusardi, Mitchell and Curto (2009) found that on average, males perform approximately 11% better on risk diversification than females, which the present study would argue is directly related to components of credit and insurance.

With the aforementioned implications of insufficient credit and insurance knowledge in mind, it is likely wise to include credit and insurance teachings within financial literacy initiatives targeted at young women to ensure these areas of financial competency are not left out. It is also possible that in addition to overcoming the reported gender bias, parents could play a role by including credit and insurance topics into early conversations on personal finance.

Chapter 3

How Parents and Financial Socialization Affect Financial Literacy

Socialization is defined as “the process beginning during childhood by which individuals acquire values, habits, and attitudes of a society” (Merriam Webster). More specifically, financial socialization refers to “a learned process of acquiring knowledge about money and money management and developing skills in various financial practices such as banking, budgeting, saving, insurance, [and] credit card use” (Bowen, 2002; Solheim, Zuiker and Levchenko, 2011, p.98). Bowen (2002) goes on to add that young people learn financial concepts through “a combination of intentional and unintentional strategies by key adults in their lives” (p. 93). Danes (1994) also supports the large role of parents in the socialization process, adding that “much of socialization, in general (and, thus, financial socialization as well), occurs within the context of family” (p. 128).

Though ‘observational learning’ is a lifelong process, it has been found that the items learned in developmental years are those that are most often retained and utilized later in life (Bowen, 2002). Shim, Barber, Card, Xiao, and Serido (2009) extend this idea to financial socialization, adding that “the financial habits – both positive and negative – that form during the transition to adulthood are likely to persist through adulthood” (p. 1457). Thus, there is evidence that early learning mechanisms have a great bearing on later decision making outcomes and attitudes (including those pertaining to finances), and additionally that parents play a large role in these early learning mechanisms. The present study thus finds it appropriate to analyze what parent characteristics and socialization agents lead to higher levels of financial knowledge in the college student demographic.

The results from Lusardi, Mitchell, and Curto (2009), which uses the 'Big 3' model, support the role that various parent characteristics play in determining later financial literacy outcomes. In the study, young people whose parents owned stock were over 17% more likely to provide correct responses on inflation and risk diversification questions than those reporting no parent stocks. For parent retirement savings, the corresponding percentages were both over 15%. Parent banking was less significant but still yielded over 11% differences in mean correct responses for inflation and risk diversification. Interestingly, the interest rate question yielded the least significant differences among the three variables, with no difference in means greater than 6.7%.

Shim, Barber, Card, Xiao and Serido (2009) extended the body of work to evaluate financial literacy outcomes as a function of adolescent socialization factors. The study surveyed 2,098 first-year college students attending a large land-grant, public university. Using a Likert scale, students reported perceptions of parent financial behaviors, parent financial teaching, high school work experience and financial education, adopting financial role modeling, and subjective financial knowledge. These responses were compared to the results of a 15 question True/False section quizzing students on their knowledge of money management, credit, and savings.

Results indicated that influences of parents, work, and high school financial education in adolescence were all predictive of financial learning, attitude, and behaviors. The role of parents was found to be the most significant. Higher levels of direct teaching by parents was correlated with a higher tendency to adopt parent financial behaviors. More parent teaching was also associated with higher levels of knowledge. A four-level model was used to track the financial socialization process. It was concluded that financial socialization led to financial learning which was related to financial attitude and ultimately financial decision making.

Jorgensen (2007) took a similar approach to evaluating the effects of socialization factors on financial literacy. The study used survey results of 450 undergraduates and master's students to evaluate the outcomes of demographic characteristics as well as parent and peer influences on financial literacy. The survey instrument used a Likert scale to capture respondents' feelings about financial attitudes, behaviors, and influences. To measure parent influence, students were asked to rank how much they learned about managing money from parents on a five-point scale. Knowledge was evaluated using 24 question multiple choice quiz section and respondents were asked to identify demographic characteristics at the end of the survey.

The results found that respondents reporting higher levels of parental influence scored higher in financial knowledge, attitudes, and behaviors, further reinforcing the importance of parent roles in early financial education. Peer influences were also measured, but the results did not yield significance.

Building off of the reported impacts of parental socialization factors from prior research, Marchant and Harrison (2019) extended the body of work to evaluate the extent to which these socialization agents continue into adulthood. The study interviewed a number of young adults in the United Kingdom between the ages of 18-29 to evaluate how views differed among the age range on money management lifestyles and financial influences.

The interviews revealed that parental socialization agents continued well into adulthood. Across the age range, interviewees generally maintained their families as "trusted primary advisors... even where family financial capability [was] low" (p.99). The study also found that many of the young adults were 'reluctant' to gain financial knowledge through direct dealings with banks and independent research.

On balance, the results from these previous studies suggest that parental socialization agents do have a bearing on financial knowledge and behaviors, even in college students. It could be argued that in Lusardi, Mitchell, and Curto (2009), the parental behavior factors are a direct reflection of family socioeconomic level. With this in mind, it is possible that socioeconomic level has a direct bearing on early financial socialization, with children from wealthier families more likely to encounter and retain knowledge of advanced financial concepts than less wealthy children.

Both Shim, Barber, Card, Xiao and Serido (2009) and Jorgensen (2007) provide empirical support for the hypothesis that direct parental influence is associated with positive financial knowledge and behavioral outcomes. This demonstrates the importance of parents actively taking a role in the early financial education of their children. Much of this phenomenon appears to be a result of mere exposure to and discussion of financial concepts at an early age, a process generally categorized as observational learning. There also, however, appears to be some value in early experiential learning, or learning by doing, for the knowledge development of young children.

“Although parents may believe that they are protecting their young from financial vulnerability by sheltering them from financial decision making (or not trusting them with their own finances), their actions may be inhibiting crucial financial capability development” (Marchant and Harrison, 2019, p. 106). This notion is supported by the findings of Marchant and Harrison (2019), where an “over-riding trust and reliance on family was strong” even among interviewees well into their early adulthoods (Marchant and Harrison, 2019, p.106).

Thus, parents must play a role in the early financial education of children by not only exposing them to financial concepts and having financial discussions, but also by allowing them

to take on a rational level of financial responsibility at an early age. Given these findings, the present study believes there is enough evidence of the impacts of these practices to make three informed predictions as to the potential influences of these factors on credit and insurance knowledge.

First, in terms of behaviors that lead to observational learning, it is likely that students whose parents own credit cards and insurance products will be more likely to exhibit proficient credit and insurance knowledge. While this may vary with socioeconomic status, it is likely that these financial instruments are more common among less wealthy citizens than stocks and retirement vehicles, potentially indicating a less pronounced effect than was measured in Lusardi, Mitchell, and Curto (2009). To further this point, compulsory insurance laws require low income consumers to buy insurance which is likely to increase insurance knowledge, whereas there are no requirements to invest.

It is also likely that students whose parents actively coached them on financial concepts and acted as financial role models will be more literate in credit and insurance concepts. Pinto, Parente, and Mansfield (2009) found that on average, students who receive more credit advice from parents carry lower outstanding balances on their credit cards. It is thus supported that this direct, observational learning effect does extend to credit knowledge, and, given the evidence, would likely extend to insurance knowledge as well.

Finally, it is possible that students who were delegated some level of financial responsibility at an early age will exhibit higher levels of credit and insurance knowledge as a result of their experiential learning. Though this area of financial socialization has been subject to less analysis, the effects of such 'learning by doing' come up frequently throughout the literature and should thus be considered a component of the larger financial socialization process.

This socialization process, as effective as it is, will likely be difficult to address from a policy perspective. Because so much occurs within the scope of the home, coordinated initiatives aimed at young people may only be able to achieve so much. It is possible that the shortcomings of financial socialization might be indicative of a larger, systemic problem. It is difficult for parents to act as positive financial role models when they, themselves have insufficient access to financial instruments or bear the institutional implications of poverty.

It is perhaps advisable then, that educational initiatives be aimed at parents in the meantime. In doing so, it is possible that parents might gain useful financial knowledge that they can use for themselves while also imparting it on their children. The effects of such an initiative could also be the subject of future research. While such efforts will not solve the present financial illiteracy crisis, they might be a step toward improving the literacy outcomes of future generations.

Chapter 4

How Financial Literacy Varies by Age and Class Rank

The final demographic variables we will analyze in the college student population are class rank and age. Overwhelmingly, the previous literature has revealed that consumers of all ages typically lack a sufficient understanding of personal finances (Lusardi and Mitchell, 2011). What the present study hopes to analyze, however, is the extent to which financial knowledge may vary among different age groups or class ranks (i.e., freshman, sophomore, junior, senior, and in some studies master's students) within the college student demographic. In doing so, our hope is to measure the level to which the undergraduate college years are generally useful for gaining financial knowledge.

Chen and Volpe (1998) did find significant differences in questionnaire performance between upperclassmen (juniors and seniors) and lowerclassmen (freshman and sophomores), with upperclassmen typically performing better on all four sections (general knowledge, savings and borrowing, insurance, and investments). Mean performance was found to increase steadily from freshman to sophomore to junior year for the sample, with differences between 4% and 6% for each jump. Interestingly, though, juniors were found to perform better than seniors, with a roughly 3% better mean score for the entire sample. No explanation is offered for this result. Less surprisingly, graduate students were found to perform better across each section than undergraduates.

In terms of age differences, results also yielded some significance. Students between the ages of 23 and 29 performed roughly 8% better across the sample than students ages 18 to 22. It should be noted, however, that the study did not separate undergraduate and graduate students

within these age groups, thus these results should not be used as definitive evidence of knowledge differences between age groups within undergraduates.

Jorgensen (2007) also found significant differences with respect to class rank. In the study, knowledge was found to increase with each class rank. On the 24 question general knowledge survey, the average number of correct responses was 13.09 for freshman, 15.32 for sophomores, 17.65 for juniors, and 18.24 for seniors. Ages were not recorded. Again, graduate students were found to perform better than undergraduates. This phenomenon was also supported by Ergün (2017).

More evidence of differences between class ranks can be found in Sarigül (2017). The study used a survey approach similar to that of Chen and Volpe (1998) to evaluate literacy levels of 1099 undergraduates at a Turkish university. Survey sections were broken up into general knowledge, saving and spending, banking, risk and insurance, and investing. In the study, seniors performed roughly 4% higher on the questionnaire than freshman on average.

Chen and Volpe (2008) explained its findings by offering that the longer students stay in college, the more likely they will be to “naturally pick up more about personal finance.” It went further to add that students do not gain financial knowledge just by being in college, but rather by “a business course, seminars, or their own mistakes” (Chen and Volpe, 1998, p. 116). A similar explanation was offered for age differences, pointing to higher levels of exposure to personal finances as the reason for differences. “They [students] are not more literate just because they are older,” the paper concluded (Chen and Volpe, 1998, p. 116).

Jorgensen (2007) offered similar reasoning for its findings, pointing to a combination of education as well as more experience with ‘trial and error.’ Going one step further, the report suggested that higher levels of literacy with higher class ranks could be born out of necessity.

“Older students may be motivated to learn more because they have more financial decisions to make as they get older (e.g., changing apartments, acquiring more credit cards or loans, getting married)” (Jorgensen, 2007, p. 45).

What should be noted, though, are the differences with which the various papers separate or combine the age and class rank variables. Though in undergraduates it may be safe to assume that students in higher class ranks will generally be older, this may not always be the case. With the exception of Chen and Volpe (1998), however, none of these reports record both variables; and, even in Chen and Volpe (1998), distinctions between age groups within the undergraduate population are not made. For this reason, the current paper finds the research question on age and literacy in undergraduates to be less conclusive, as compared to the more robust data on class rank.

There is enough information, though, to make some predictions on credit and insurance outcomes. In Chen and Volpe (1998), upperclassmen typically performed 4.655% better than lowerclassmen on the survey’s insurance section. This can possibly be attributed to some of the earlier explanations, such as a higher chance of coming across insurance concepts with more schooling, and a higher likelihood that students will engage with insurance instruments as they age. Though we only cautiously use the age results, respondents aged 23-29 performed 6.89% better than respondents in the 18 to 22 age category on the insurance section. While this may not be of great insight for analysis within the undergraduate population, it does support the notion that individuals will be more likely to engage with insurance products, likely out of necessity, as they age.

Sarigül (2017), which also included a risk and insurance section in its survey instrument, found similar results. On the section, seniors were found to perform 6% better than freshman on average. More broadly, upperclassmen performed 3% better than lowerclassmen on average.

While none of these studies included a credit section, it is likely that many of the same trends would hold true. Just as students will be more likely to learn about and engage with insurance tools as time goes on, they will also be more likely to do this with credit concepts. This can happen as a result of increasingly dealing with credit cards, tenant approval processes, or loan applications. Again, learning about these topics would likely at some point become a necessity on a student's road to financial independence. Thus, given the logic, it may be a safe assumption that on average, older undergraduate students would be more likely to understand credit and insurance concepts than younger undergraduate students.

The age and class rank variables are probably the most intuitive of our three sections. As college students progress through their undergraduate educational curriculums, they will be more likely to learn about financial concepts and engage more deeply with financial instruments. The college years are crucial for establishing credit, which can have lasting implications both in general financial applications as well insurance. For this reason, it is important that younger students and lowerclassmen be exposed to these concepts early and often.

While some students may not get their own credit card until they are close to graduation, some, more financially independent students, undoubtedly will have credit cards and other credit tools earlier into college. With the findings of financial socialization in mind, it is probably advisable for students to progressively take on more responsibility with regard to credit and insurance as they age. Policy initiatives could also be targeted at younger students that stress the importance of good credit practices.

Chapter 5

Pre-COVID Study Revisited

5.1 Background

At this point, it is appropriate to revisit our goals for the study before it was derailed by COVID-19, and to evaluate the extent to which we have still managed to satisfy these goals through the literature review.

In the beginning, we knew we wanted to evaluate the level that college-aged consumers were aware of the broad applications of their credit. This endeavor felt especially appropriate given the consumer debt crisis as well as the rising popularity of credit based insurance scoring (CBIS). As we got into the literature, it quickly became evident that credit questions were rarely included in survey instruments, especially those focusing on college students, and that virtually no studies had focused on the extent to which college students were aware of the CBIS phenomenon. We felt that this was necessary to explore given the fact that many students would be first establishing credit and purchasing insurance during or immediately after their college years.

Our early research also yielded a few other salient themes that provided us further inspiration. The biggest point supported by the research was that college students, like the rest of Americans, are largely financially illiterate. There were, however, certain demographic variables that were found to be statistically useful in differentiating students based on their literacy level, including comparisons based on gender, class rank, major, socioeconomic status, work experience, prior financial education, and parent/socialization factors.

From here, we felt an opportunity emerged to see if some of these historically significant demographic variables still retained significance with respect to credit and insurance knowledge. This was the impetus for us to start forming a survey instrument.

5.2 Inclusion of ‘Big 3’

We knew that we would need a benchmark to compare the credit and insurance findings to, which is how we landed at Lusardi’s ‘Big 3 financial literacy questions.’ The questions have appeared in a number of studies and proven effective at separating knowledge pools (Lusardi and Mitchell, 2007). The three question instrument breaks knowledge into three basic but essential financial knowledge areas: interest, inflation, and risk diversification. After reviewing Lusardi’s rationale for including each of the areas, we concluded that credit, and, especially insurance, have direct ties to all three key areas.

The most obvious link to the ‘Big 3’ is risk diversification. The very principal upon which insurance was founded is risk diversification, and a consumer’s understanding of risk aversion, and more importantly, their own risk appetite, is essential to shopping insurance and navigating the greater financial landscape, including matters of credit.

Compound interest also relates to insurance and credit in a number of ways. One of the most fundamental connections is in insurance annuities. Annuities can be very powerful investment vehicles when utilized properly, but the products also necessitate a fundamental understanding of interest and the time value of capital. Compound interest is also a large component of managing debt, and a lack of consumer understanding in the matter can be linked directly to the current U.S. debt crisis.

Inflation can also be connected to the present discussion. Hedges against inflation can be an important part of an investment portfolio. In insurance, two such examples of this are variable annuities and variable universal life insurance. These investment options, which share many characteristics with mutual funds, invest in stocks and bonds to provide variable returns, offering a riskier alternative to their fixed counterparts. While common stock can provide a hedge against inflation in stable economic periods, it is not as effective during inflationary periods, which brings us back to why understandings of risk diversification and interest, as well as inflation, are pivotal to smart investing.

5.3 Survey Design

With these connections serving as added context for our study, we went on to identify our target audience for the survey. Our plan was to target students in two upper-level courses, one a risk management course made up of business students, and the other an energy business and finance (EBF) course comprised of EBF students as well as actuarial science and business students. The two courses combined for roughly 120 students. Next we began working with the university's institutional review board (IRB) to ensure that we were taking every precaution to assure our subjects' privacy in each of our planned research steps.

Our subject pool and privacy assurance plan in some ways dictated the demographic questions we decided to include and omit. For example, we did not include race and socioeconomic status as they might conceivably be used to identify individual students. There was also little use in including major as both classes were essentially within the scope of business.

From here we continued to narrow the scope of our study and define statistical expectations. We knew we wanted to include gender given its historical significance. Because approximately a third of the respondents were international students, it was important to control for cultural background by testing for differences in literacy across nationalities. Additionally, given the high volume of significant findings on parental influences and socialization factors, we thought a number of variables in this area would be appropriate such as parents owning stock, parents as advisors, and parents as role models. We were also interested in financial confidence level – i.e., how confident students were in their ability to draw from their own knowledge to make informed financial decisions – a metric that has been tied to the way individuals approach financial decision making as well as a possible driver of the gender knowledge gap (Chen and Volpe, 1998). We additionally thought it would be interesting to measure the extent to which students knew their own credit scores, given the focus of the study. Finally, we wanted to compare juniors and seniors, the only two class ranks in our upper-level courses, given the findings of differences across class ranks in Chen and Volpe (1998), Jorgensen (2007), and Sarigül (2017).

We expected most of these variables to yield some level of significance. Gender as well as socialization and parent factors, given their significance in prior findings, were among the areas we were most confident would be correlated with each of our financial knowledge areas. We also expected U.S. students to perform slightly better than international students in each area given their higher level of familiarity with U.S. financial concepts and terms. We anticipated that confidence level might vary between different demographic groups, but we predicted that it would be associated with each knowledge area as well. Knowing credit scores was likely to be associated with higher credit knowledge, but we were not sure how it would relate to more

general knowledge. And finally, we predicted that seniors would likely perform better across the survey than juniors on average due to their higher levels of exposure and financial responsibility.

Next we began constructing our core survey questions, beginning with credit. Though we toyed with the idea of a multiple choice questionnaire, we concluded that true/false results would work better with our plan of analysis. Given that students might be inclined to guess when they did not know a true/false answer, we decided to include a 1-7 Likert scale to gauge how confident they were in their answers. We felt this would give us an added metric for analysis and could lend further insight into knowledge discrepancies between our demographic groups.

In the area of credit, we knew we wanted to focus on credit scoring variables as well as credit applications. When we came across Business Wire's 2019 credit survey, we found that the survey's questions aligned very closely with the ones we hoped to use, so we derived ours directly from the instrument, dedicating three to scoring variables and two to applications. We also felt that using these questions would give us another benchmark in the spirit of robustness.

Next we added our general knowledge and opinions section. This was the hardest section to refine given the wide range of question types used in previous literature. We considered only using Lusardi's 'Big 3,' but felt it would be best to provide added questions in addition to the 'Big 3,' once more for robustness. Admittedly, we were still refining this section when we had to abort the survey, but the model can be seen in Appendix A.

The first question in the general knowledge section (question #6) was derived directly from Chen and Volpe (1998), and was meant to gauge students' knowledge of liquidity and investment vehicles, two concepts that we feel are very important to financial knowledge, especially given the common lack of savings in the American public. Question #7 is adapted directly from Jorgensen (2007) and surrounds stocks and bonds as they would relate to simple

portfolio composition. We felt that this question would also be a helpful savings and investment benchmark.

Questions 8,9, and 10 in the section provide a different take on Lusardi's 'Big 3.' We felt since this was the most widely adopted model, it might be telling to provide three different questions focused on the same three core knowledge areas. Question #8 relates to interest and is based on the iron law of bonds, one of the most fundamental rules of investing. Question #9 is designed to see if students have a rough handle on what the true rate of inflation actually is. And, question #10 is meant to measure whether students understand the workings of the mutual fund, an important tool in accomplishing a diversified portfolio. Finally, our sole opinion question lies in question #11, which was meant to give us an added metric for evaluating parent influence using the Likert scale. We understand that this section could probably use further refining before being given students, but we thought it was important to include and explain in its preserved state.

Next, we added our insurance section to the questionnaire. This was meant to be our main contribution and was created completely for this study, which is why it is placed last of the three main sections. Inspired by the rising use of credit based insurance scoring (CBIS), our main goal for the section was to gauge the extent to which students understand what variables conceivably can, and cannot, be factored into their insurance prices. If students were to perform very poorly on this section, it could possibly be indicative of an unfair pricing advantage on the part of the insurance companies. Questions 13-16 are aimed at accomplishing this goal. Question #12, a simple deductible question, is meant to serve as a basic insurance literacy reference point.

Finally, we added Lusardi's 'Big 3' in a separate section, and finished the questionnaire with an 'About You' section to record the demographic variables discussed earlier in the section. Again, the survey instrument can be found in Appendix A.

Chapter 6

Summary

Our study initially hoped to use the survey instrument to compare general financial knowledge in undergraduate students to the results from previous financial literacy studies, as well as to expand this literature to include questions about the students' understanding of credit and insurance applications. The aforementioned demographics informed by previous research were to be used as a basis for multivariate analysis and T-tests.

We hoped to determine whether a student who exhibits higher scores on financial literacy questions is also more likely to exhibit greater knowledge in credit and insurance. If not, what type of student, if any, would be more or least likely to exhibit advanced credit and insurance understanding? Or, more simply stated, how much do students actually know about credit scores and where do they stand in the credit development process? These were the questions we hoped to answer in administering our survey.

Though we were obviously limited in the level of analysis we could conduct absent the survey results, we still believe that we have provided a theoretical framework for answering the questions that we proposed before we were forced to shift scope. In providing detailed literature reviews for three of the most significant student variables in predicting literacy levels, and focusing on prior findings pertaining to credit and insurance in each of these variable areas, we believe that we have absolutely paved the way for future research.

In our sections on gender, socialization/parents, and age/class rank, we provided real, empirical evidence of the drivers of knowledge discrepancies between these subsets of students. From there, using this evidence and what data existed on credit and insurance knowledge, we

developed informed hypotheses on how likely these student groups would be to understand key credit concepts as well as insurance pricing.

In conducting our literature review analysis, we came to the determination that gender, socialization/ parent influences, and age/ class rank are all likely to be predictive of credit and insurance knowledge. What we were not able to answer directly, however, is the extent to which students who exhibit superior general financial knowledge will also exhibit superior credit and insurance knowledge. Additionally, we were not able to get a concrete measure on one of our earliest research questions, the extent to which college students are aware of credit based insurance scoring.

We believe that both of these research questions would absolutely serve as great areas for the exploration of future studies. We hope that in our framework, we provide logical explanations for why certain demographic factors are predictive of financial literacy outcomes as well as possible ways to address future knowledge deficits.

The consumer debt crisis coupled the COVID-19 pandemic has made clear both the shortcomings of our current credit system and the perpetual importance of risk management. Graduating college students will be entering into a precarious economic climate, and their financial preparedness, especially in credit and insurance knowledge, will prove invaluable as they move into the next phases of their lives.

Appendix A

Survey Instrument

Please indicate whether you think the following statements are true or false.

Next, indicate how certain you are in your answer by circling a number from 1 to 7.

1 indicates a complete guess while a 4 indicates you are somewhat sure and 7 indicates very certain.

1 (No idea) --- (2) --- (3) --- 4 (Somewhat Certain) --- (5) --- (6) --- 7 (Very Certain)

CREDIT

T F 1) Keeping credit card balance above 25% will generally increase credit score

1 ---- 2 ---- 3 ---- 4 ---- 5 ---- 6 ---- 7

T F 2) Opening several accounts at once will improve credit score

1 ---- 2 ---- 3 ---- 4 ---- 5 ---- 6 ---- 7

T F 3) Cell phone companies access credit scores before approving contracts

1 ---- 2 ---- 3 ---- 4 ---- 5 ---- 6 ---- 7

T F 4) Landlords are not permitted to access credit scores in tenant approval process

1 ---- 2 ---- 3 ---- 4 ---- 5 ---- 6 ---- 7

T F 5) Mortgage lenders consider credit scores in pricing

1 ---- 2 ---- 3 ---- 4 ---- 5 ---- 6 ---- 7

GENERAL KNOWLEDGE / OPINIONS

T F 6) Money in a certificate of deposit account is less liquid than money in a checking account

1 ---- 2 ---- 3 ---- 4 ---- 5 ---- 6 ---- 7

T F 7) An 80% bond and 20% stock portfolio is riskier than an 80% stock and 20% bond portfolio

1 ---- 2 ---- 3 ---- 4 ---- 5 ---- 6 ---- 7

- T F 8) If interest rates rise, the price of a Treasury bond will also rise
1 ---- 2 ---- 3 ---- 4 ---- 5 ---- 6 ---- 7
- T F 9) The 2019 U.S. rate of inflation was above 1.5%
1 ---- 2 ---- 3 ---- 4 ---- 5 ---- 6 ---- 7
- T F 10) A mutual fund can be bought or sold at any point during a trading day, like a stock
1 ---- 2 ---- 3 ---- 4 ---- 5 ---- 6 ---- 7
- T F 11) My parent/s have had a positive influence on my financial knowledge and opinions
1 ---- 2 ---- 3 ---- 4 ---- 5 ---- 6 ---- 7

INSURANCE

- T F 12) Insurers charge a higher price for insurance when consumers increase their insurance deductibles
1 ---- 2 ---- 3 ---- 4 ---- 5 ---- 6 ---- 7
- T F 13) Insurers use credit scores to set the price of auto insurance
1 ---- 2 ---- 3 ---- 4 ---- 5 ---- 6 ---- 7
- T F 14) Insurers consider the income of a customer in setting the auto insurance premium for that customer
1 ---- 2 ---- 3 ---- 4 ---- 5 ---- 6 ---- 7
- T F 15) Insurers consider the gender of a customer in setting the auto insurance premium for that customer
1 ---- 2 ---- 3 ---- 4 ---- 5 ---- 6 ---- 7
- T F 16) Insurers consider the race of a customer in setting the auto insurance premium for that customer
1 ---- 2 ---- 3 ---- 4 ---- 5 ---- 6 ---- 7

Big 3:

17) Suppose you had \$100 in a savings account and the interest rate was 2% per year. After five years, how much do you think you would have in the account if you left the money to grow?

- a) More than \$102
- b) Exactly \$102
- c) Less than \$102
- d) Do not know
- e) Refuse to answer

18) Imagine that the interest rate on your savings account was 1% per year and inflation was 2% per year. After one year, how much would you be able to buy with the money in this account?

- a) More than today
- b) Exactly the same
- c) Less than today
- d) Do not know
- e) Refuse to answer

19) Please tell me whether the following statement is true or false. "Buying a single company's stock usually provides a safer return than a stock mutual fund."

- a) True
- b) False
- c) Do not know
- d) Refuse to answer

ABOUT YOU

20) Gender

Male / Female

21) Are you from the U.S.?

Yes / No

22) Did you take a personal finance course in high school?

Yes / No

23) Do your parents own stock?

Yes / No

24) Do your parents frequently advise you on financial matters?

Yes / No

25) Do you believe your parents exhibit positive financial behavior?

Yes / No

26) Do you believe you have an advanced understanding of personal finances?

Yes / No

27) Do you know your own credit score?

Yes / No

28) Class standing

Jun. / Sen.

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