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# Effects of Financial Literacy on Graduate School Attitudes Amidst COVID-19

This study examines the relationship between financial literacy and student attitudes toward graduate school. In the framework of human capital theory, we argue that graduate school is an investment in an individual's human capital that enhances future earnings capability. We hypothesize that during a weakened job market in conjunction with the COVID-19 pandemic that students who are more financially literate will demonstrate a more positive attitude toward a graduate degree as an appealing and rewarding capital investment than students with less financial literacy. Our robust results are consistent with our hypothesis. We argue that these findings have significant economic implications.

Keywords: financial literacy; graduate school; job market; economic conditions; COVID-19

## 1. Introduction

Is higher education worthwhile? Should I go on to graduate school? These questions plague students who are short on funds but view post-secondary education as a start to their bright future. Since early 2020, we have lived amidst a novel pandemic-caused recession, and students are wondering if virtual schooling is worth the cost or if going into an unemployment-ridden world is worth the risk. It has long been a question among researchers if recessions cause an increase in higher-education enrollment (Barr & Turner, 2015; Barrow & Davis, 2012; Clark, 2011; Sievertsen, 2016). Do students believe that going to school when they cannot find a job will pay off later? Will college graduates continue into graduate programs if the nation is high in cyclical unemployment?

It is important to examine students' perceptions of the opportunity cost of schooling as a function of the status of the current economy; particularly vital is how their financial literacy supports this correlation. We argue that the decision to study in graduate school is a human capital decision. Such a decision requires an individual's careful evaluation of cost and increase in future expected earnings. Hence, an individual's perception of whether graduate education is financially beneficial should play a role in such a decision. Surprisingly, to our best knowledge, no studies examine the impact of financial literacy on graduate school decisions in any setting, including the COVID-19 pandemic. We are the first to draw this connection and document its significance. It is a practical research question to ask if an individual's financial literacy contributes to his/her view on the importance of making a human capital investment, especially when he/she faces pandemic uncertainty and a soft job market.

The main objective of this study is to examine the impact of students' financial literacy on their decisions to pursue graduate schooling during the COVID-19 pandemic and apparent economic downturn. The findings carry important implications for the role of financial literacy on one's human capital investment decisions. Our robust findings suggest that an individual's higher financial literacy clearly supports his/her choice to attend graduate school amidst the COVID-19 recession. Hence, financial literacy plays a role in helping individuals make successful human capital investment decisions, especially in a challenging pandemic period and a weakened labor market.

We contribute in several ways to the existing literature. First, we advance the literature on the causal effect of financial literacy on human capital investment. Our findings supplement the literature about the impact of financial literacy on investment, financial, and corporate decisions (e.g., Calcagno & Monticone, 2015; Hsiao & Tsai, 2018; Liu et al., 2021). To the best of our knowledge, our study is the first to investigate the role of financial literacy on human capital investments in terms of schooling. Second, we strengthen the literature that has already proven the positive effects of economic downturns on higher education enrollment. Finally, our findings have clear implications for educational institutions during varying economic situations. It is vital for these institutions to make adjustments based on the external economic environment to maintain viability. Last, our findings support the notion of strengthening financial literacy education to enhance the quality of economic decisions leading to enhanced work force quality.

## 2. Literature Review

In order to support and validate our study, we first review empirical studies from several bodies of literature that are related to the questions we ask. First, we look at the future economic incentives that students consider when deciding whether to enroll in undergraduate and graduate programs as well as how those incentives change during the occurrence of an economic recession. Next, we view studies that isolate the

unique characteristics and goals of students that choose to attend graduate school and those of students who do not attend graduate school. Then, we assess the connection between financial literacy and effective economic decision-making using the vast body of literature across many different samples, locations, and industries that show similar findings. Finally, we confirm that the COVID-19 recession is comparable to past economic crises by surveying recent articles comparing and contrasting the COVID-19 recession with the Great Depression of 1930 and the Great Recession of 2008.

### *2.1 Value of Higher Education*

One of the biggest incentives to pursue higher education comes from the promised future expected economic returns that this education brings. Dillon (2017) pushes the point that a significantly greater number of high-school graduates enroll in universities at times when relative earnings for college-educated workers are higher, showing that financial return is a huge motivator in post-secondary enrollment. Specifically, a 10 percentage-point increase in average college wealth premiums corresponds to a 1 percentage-point increase in college enrollment (Dillon, 2017). However, college is not always worth the cost, especially when there are high-paying jobs for non-graduates in a prospering economy.

Emmons et al. (2019), using data from the annual Federal Reserve Board's Survey of Consumer Finances (SCF), a comprehensive national survey conducted during a time of economic prosperity, assert that while families with a white head of

family still have a positive but diminishing undergraduate wealth premium, the wealth premium from post-bachelor's education for families of any race is statistically indistinguishable from zero. The authors' findings indicate that, on average, there is no significant increase in future wealth for any individual that attends graduate school during periods of prosperity. In addition, university degrees in the humanities also provide virtually nonexistent returns for average program graduates (Webber, 2016), further narrowing the range of students that receive significant returns to post-secondary education.

On a different note, an important characteristic of a recession is the increase in unemployment, and the literature supports that this unemployment increase is correlated with an increased enrollment in higher education institutions. Since high-school and college graduates are unlikely to find a well-paying and secure job amidst a recession, they have a decreased opportunity cost for continuing their education and they are more likely to enroll in a university program to start or continue their higher education.

Barr and Turner (2015), Barrow and Davis (2012), Clark (2011), and Sievertsen (2016) all agree that there is significant evidence for an increase in college enrollment and retention in developed countries during recessions. The extensively researched correlation between enrollment and unemployment is unsurprisingly positive and statistically significant. More specifically, Barrow and Davis' (2012) pioneering study

found a 7.9-percent increase in post-secondary enrollment between 2004 and 2007, but a much higher 20.5-percent increase between 2007 and 2010 during the Great Recession. Even though many argue that there is less familial financial support for students' university education during recessions due to the job losses of family members, the greater benefit of education during recession periods is more than enough to convince students and families to make this investment together. Adamopoulou and Tanzi (2017) corroborate this evidence by documenting that unemployment rate has a negative, significant effect on university dropout rates, signaling that a higher proportion of students graduate during a recession. The findings in Adamopoulou and Tanzi (2017) confirm that not only does enrollment increase during a recession, but successful graduation rates do as well, indicating a greater motivation among enrolled students to complete their human capital investment because of the important and significant financial benefit they can attain.

But what happens after the recession has passed and a student has graduated? Is the attained degree and knowledge of any help to their future salary or to the ease of finding a job after graduation? Zagade and Desai (2017) answer this question by asserting that education is an effective human capital investment during job-scarce recessions, as demonstrated by Indian individuals that went overseas to study during the Great Recession and returned to India at the forefront of the new job market, finding high-paying and secure jobs. Further substantiating these results, a similar relationship

is found in Mexico after economic recessions: Psacharopoulos and Velez (1996) use data from three Mexican household surveys in three different periods of time to document that returns to investment for those who attend school during a recession and graduate in a rising economy are much higher than those who graduate at the peak of a recession. Even though the Indian and Mexican environments are not identical to the American job market, we can see that human capital investment by attending schools, even overseas, during a recession leads to a more successful and lucrative career after the recession.

American post-recession graduates, in a similar way, benefit from higher education. Barrow and Davis (2012) explores the efficacy of education for post-recession graduates, and they find that, adjusted for inflation, one year of additional education raises earnings by 8.5%. They also discover that, assuming a 3.5% discount rate and a 20-year remaining work life, the average post-recession graduate realizes a lifetime earnings premium of $32,617 and the total net lifetime premium for all American post-recession graduates is almost $3.3 billion. Farrell (2011) starts with the striking headline, “Sure, it costs more, and technology is threatening high-paying jobs, but the Great Recession shows post-secondary education is more valuable than ever,” (p. 1) and continues to show that, even though university education returns after the Great Recession have not risen exponentially, the number of jobs requiring post-secondary education continues to rise (from 28% in 1973 to 59% in 2008) and rises

the fastest immediately after economic recessions (to a predicted 63% by 2018). Post-secondary education still puts students at the forefront of the job market, especially when the economy is still rebuilding, and jobs are still scarce.

### *2.2 Graduate School Enrollment*

A variety of studies examining the impacts of various factors on graduate school enrollment are available in the psychology and higher education literature fields. After an extensive review of the literature in this area, it is clear that a majority of the studies find a significant correlation between graduate school matriculation and either an economic factor or an indirect effect of financial literacy. Surprisingly, Millet (2003) shows that an undergraduate student's loan debt does have a negative impact on whether an individual submits graduate applications but does not show any significant impact on whether an individual actually enrolls in graduate school. Further, the author finds that individuals attending less competitive undergraduate universities are 1.8 times less likely to enroll in graduate school than individuals attending very competitive undergraduate universities. These results clearly indicate that individuals that view advanced schooling as a valuable investment (as indicated by attending a prestigious undergraduate institution) will pursue graduate schooling even if they have accumulated a large student loan debt. Another interesting finding from Arria et al. (2020) is that both excessive drinking and drug use during an individual's undergraduate experience are negatively correlated with his/her graduate school

matriculation. This is unsurprising but supports the fact that students with a higher health awareness, which Chan et al. (2020) positively correlates with financial literacy, are more likely to attend graduate school.

Several more studies present interesting results that may suggest solutions for diminishing graduate school enrollment. For example, Ro et al. (2017) indicate that math proficiency, participation in undergraduate research, and self-assessed leadership skills among undergraduates each have a positive correlation with graduate school attendance. Similarly, Merolla and Serpe (2013) find that science identity salience (which can be enhanced by STEM enrichment programs), research experience, and undergraduate GPA each have a positive correlation with graduate school attendance. Piatt et al. (2019) enhances research in this area by extending it to underprivileged students; they find that high-performing underprivileged undergraduates who participate in formalized research mentoring programs (FMPs) are 25% more likely to enroll in a graduate program than those who don't participate in FMPs. The traits explored in these three studies all largely define individuals who are motivated to make their schooling a worthy investment. Institutions promoting these behaviors, especially undergraduate research, are possibly able to encourage greater graduate school attendance among their undergraduates.

### *2.3 Financial Literacy*

The literature clearly associates an individual's financial literacy level with more effective long-term economic decisions that result in greater overall economic success. For example, Xiao and O'Neill (2016) indicate that financial education (which results in better financial literacy) has a significantly positive impact on financial capability (or effectiveness of financial decision-making); therefore, financial education is largely achieving its intended effect on consumers. As a reaffirmation that financial literacy results in greater financial competence among consumers, Xiao and O'Neill's (2016) study adds to an abundant body of supportive literature. Using a novel approach for measuring financial capability based on newspaper reading habits, Fessler et al. (2020) find results that largely agree with the studies presented above: among Austrian consumers, there is a significant causal link between financial knowledge and effective behavior with a large coefficient that emphasizes this effect on a greater scale than previous studies.

Another traditional study performed on a similar topic, Lusardi and Mitchell (2014) outlines several "important benefits of greater financial knowledge, including savvier saving and investment decisions, better debt management, more retirement planning, higher participation in the stock market, and greater wealth accumulation" (p. 34). It is clear that all these listed benefits are characteristic of, if not vital to, financial capability.

In a more recent study, Sohilauw et al. (2020) surveyed small and medium enterprise (SME) entrepreneurs in Indonesia for their financial literacy and various measures of the success of their enterprise. The findings notably support the conclusion that greater financial literacy amongst entrepreneurs greatly supports rational financial decision-making and financial capital usage in their enterprises. In addition, entrepreneurs' greater literacy levels directly and significantly affect the overall financial performance of their enterprises.

In a similar study performed amongst Pakistani stock market investors, Rasool and Ullah (2020) clearly demonstrate that greater financial literacy decreases the impacts of harmful behavioral biases in investors' decision-making practices. This allows investors to make more impartial decisions that contribute to the effectiveness of their portfolio management. These two studies extend this relationship past consumer behavior to professional and corporate behavior, indicating the broader impact of the findings.

Further, Meier and Sprenger (2013) and Grinstein et al. (2015) find that there is a significant correlation between participation in financial education programs and understanding time value of money concepts. In other words, those that are highly financially literate tend to understand the importance of saving now for use later, but low financial literacy individuals act on the belief that money will not be worth as much to them in the future as it is now, so they do not save significantly. Even more

specifically, Gathergood and Weber (2017) emphasize that "young homeowners with poorer financial literacy take on larger mortgage debts and are more likely to use alternative mortgage products" (p. 62), continuing that "financial literacy affects mortgage choices of the young, which may have important longer-term effects on the financial positions of young households entering the mortgage market" (p. 73). Simply put, those with lower levels of financial literacy tend to take out larger home loans, not willing to expend a large upfront payment, and this tendency can lead to a deterioration of the family's long-term financial position. Essentially, financial literacy contributes to individuals making effective financial decisions. Overall, increased financial capability, as mentioned earlier, makes an individual more likely to save and invest money and less likely to spend it immediately, a wiser financial decision.

### *2.4 COVID-19 Recession*

Recent literature points out significant similarities and differences between past recessions, when all of the previously reviewed studies were conducted, and the COVID-19 recession. We explore a sample of new studies to confirm that our results are comparable to the current body of financial literacy and higher education literature. To begin, Wheelock (2020) justifies that trends in GDP during the first six months of the COVID-19 recession, exactly when this study was conducted, were closely aligned with those of the first six months of the Great Depression in 1930. Wheelock (2020) also finds that industrial production four months after the start of the COVID-19 recession

was at a level almost matching production amounts four months into the Great Depression. Strauss-Kahn (2020) adds that the COVID-19 recession shares three major similarities with the Great Recession in 2008: consumer and producer uncertainty, stock market collapse, and discretionary implementation of fiscal and monetary policy. These findings indicate that many of the original causes of the COVID-19 recession and ripple effects that worsened economic conditions were analogous to those of the Great Recession. Even though there are many differences, most notably the shorter duration and recovery time of the COVID-19 recession, these similarities are adequate to draw reasonable connections between past literature and our present study.

There are also many noteworthy effects that recent studies have discovered between the COVID-19 recession and economic and financial outcomes related to our study. First, since our study utilizes human capital theory, it is important to clarify how the COVID-19 pandemic has impacted human capital efficiency. Hasnaoui et al. (2021) find that, compared to pre-COVID periods, human capital efficiency was a much more significant determinant of mutual fund performance in post-COVID periods. The authors' findings support our argument that human capital is a major driving force of the relationship between financial literacy and graduate school attitudes, especially during COVID-19. Additionally, Deng et al. (2021) also establish that human capital utilized in the workforce was significantly reduced during the pandemic, leading to unprecedented economic costs. From this, we postulate that human capital

underutilization could have led to individuals seriously considering the potential increase in their worth as a worker if they possessed a graduate school degree.

Because we view human capital investment as a type of individual investment, it is interesting to see how other types of investment were impacted by the pandemic. Priem (2021) ascertain that many investors in Belgium take a contrarian strategy by increasing their equity positions during the pandemic even though the future is unclear. In fact, Naik et al. (2021) retrospectively show that the growth of COVID-19 does not significantly affect stock market volatility, which is a great indicator that investments were not adversely impacted during the pandemic. Tauseef (2021) also find that, contrary to public belief, investor behavior in Asian countries became less irrational and more efficient throughout the pandemic, which was caused by the improved informational environment. However, the results of Fu et al. (2021) indicate that the COVID-19 situation in both home and host countries impacted the amount of foreign direct investment flows between pairs of countries. We conjecture that the change in corporate investments but not individual investments may be caused by the undiversified risk corporations take on by their foreign direct investment projects. Seeing as many individual investments are not severely impacted by the pandemic, we conclude that the human capital investment behavior of individuals should be similar to the framework established in prior studies.

Finally, another important body of COVID literature to emphasize are the workforce studies that have been performed. To begin, Bennett and McWhorter (2021) discover that the pandemic has accelerated the transformation to workplaces and forced many companies to prepare for "the fourth industrial revolution". Messacar et al. (2021) find that a 2021 graduate from high-school or undergraduate earns five to twelve percent less than a similar graduate in a non-pandemic year. Heggeness (2020) uncover a potential adverse effect for the career growth of mothers and fathers to be stunted during the pandemic due to school closures and quarantines. Toniolo-Barrios (2020, p. 189) generalizes this by proving that "numerous employees have experienced lower work productivity, lessened motivation, increased stress, and poorer mental health" as a result of pandemic work conditions. The phenomena reported by these studies may prompt graduates and current employees to consider the efficacy of a human capital investment in higher education as compared to their current career or original career plan. This may be influential in their human capital decision to keep their status quo or step out on a new venture into higher education.

**3. Hypothesis Development**

The literature on financial literacy is quite clear that financially literate individuals make better economic decisions and are generally more successful in managing finances. The literature on the value of higher education also supports that

higher education is an effective investment during job-scarce recessions which can lead to a more successful and lucrative career after the recession. However, few studies connect financial literacy to more effective decision-making regarding educational pursuits. The reality is that the decision to pursue post-secondary education is largely an economic and investment decision. The fact that the return on such an investment is more pronounced while passing through a recession increases the attractiveness of the pursuit. We argue that if an individual has a high financial literacy, he or she can better comprehend and effectively make financial decisions. Given that enrolling in graduate programs in the midst of a pandemic and a recession is a major human capital investment, those with high financial literacy are able to "see through" the value of such investment. Additionally, the literature also substantiates our claim that the COVID-19 recession is an appropriate environment to extend research on the effects of economic recessions. Therefore, we hypothesize that individuals with higher financial literacy should be more inclined to pursue graduate school during the COVID-19 recession.

**Hypothesis:** Students with higher financial literacy are more inclined to pursue graduate studies during the COVID recession.

## 4. Methodology

Our study is based on an online Qualtrics® survey emailed to the entire student body at a mid-sized southern regional university during the COVID-19 recession, i.e.,

the fall semester of 2020. The university's student population consists of 88% undergraduates, 61% females, 69% full-time students, and 16% minorities (Black, Hispanic, Native American, or Pacific Islander). Of the university's first-time freshmen, the average ACT is 23 and average high-school weighted GPA is 3.42. As compared to university-wide statistics, our usable survey responses consisted of 70% females and 77% undergraduates, so we collected a fair and representative sample of the campus population. The survey provides a number of questions to determine whether students are financially literate and whether they are inclined to attend graduate school. A copy of our survey is included in Appendix 1. In addition to demographic questions, the survey tests participants' financial literacy levels and asks about their inclination and intention to attend graduate school. To encourage optional participation among the student body, we provided an incentive for participants to be entered in a drawing for small gift cards. We collected a total of 802 responses from a student body of approximately 20,000 students, constituting a 4% response rate. Out of these responses, we filter out a total of 505 usable responses for analysis, excluding any incomplete surveys. Given the monetary incentive for survey completion, responses could include more students with financial need as opposed to those financially affluent. In addition, responses could also be biased towards students with interest in graduate school due to the title of the study. However, because of the large sample size and sample statistics

comparable with those of the entire student body, we deem the effect of potential biases on our final results negligible.

Our financial literacy testing mechanism is the "Big Three" test questions developed and justified by Lusardi and Mitchell (2014) to assess general financial literacy. These test questions are widely recognized in the literature, have been used by organizations and surveys worldwide including the U.S. National Financial Capability Study, and were validated by Chan et al. (2020). The test questions are listed below:

1. Suppose you have $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?

2. Imagine that the interest rate on your savings account was 1% per year and inflation was 2% per year. After one year, assuming you do not deposit to or withdraw money from the account, how much would you be able to buy with the money in this account?

3. Is the following statement true or false: "Buying a single company's stock usually provides a safer return than stock mutual fund?"

Each participant was assigned a score out of 3 for answering the three questions correctly and this score was considered as the primary independent variable. Additionally, many questions are asked regarding an individual's attitude towards graduate school. These questions include: (1) whether the respondent is currently attending a graduate program; (2) how likely he/she is to attend graduate school in the future; (3) how much he/she perceived that graduate school would increase his/her probability of finding a future job; (4) whether and how much he/she perceived having

an advanced degree in his/her field boosts wages; (5) whether he/she perceives, overall, that graduate school is worth his/her time and money. Each of these questions was presented with 5 answer choices, ranking from not likely at all to extremely likely (certain) or an equivalent scale. The survey also included questions that could serve as additional control variables possibly correlated with financial literacy. Participants were prompted with demographic questions about their age, GPA, gender, major, employment status, whether they previously had finance course, approximate household income, and parental occupation.

After collecting the data, we conduct a multiple regression analysis to examine the relationship between financial literacy and graduate school attitudes. We use the following model:

$$GRAD_i = \beta_0 + \beta_1 \times FL_i + \Sigma\, \beta_j \times Control_i + \varepsilon_i \quad (1)$$

where $GRAD_i$ is a (0, 5) measure of how likely the respondent is to attend graduate school; $FL_i$ is a (0, 3) score of financial literacy; and $Control_i$ represents all control variables taken into account. The set of control variables include college major (*EBS, HHS, BUS, SCE, ART*), age (*AGE*), grade point average (*GPA*), gender (*FEM*), part-time job (*PART*), full-time job (*FULL*), parent occupation (*PROF*), and household income (*INC*). Definitions of all variables are offered in Appendix 2. We estimate Eq. (1) by ordinary least squares and by ordered logistic regression for robustness. We notice that the *FL* variable is not a continuous variable. Nonetheless, the range from 0 to 3 provides a

sufficient distribution to generate standard error for the estimated coefficient in statistical inference.

## 5. Results and Discussion

We present the descriptive statistics of the sample in Table 1. The average graduate school likelihood (*GRAD*) is 3.217, indicating that the average participant is between moderately and extremely likely to attend graduate school in the future. These results are quite consistent with the literature that graduate school tends to be a popular human capital investment decision for students during a widespread recession. For the financial literacy (*FL*) score out of three, we find an average of 2.479, showing that the majority of students know at least some basic financial concepts, but many students still lack a complete knowledge of all three fundamental financial principles (compound interest, inflation, and investment diversification).

Our pairwise Pearson's correlation results are presented in Table 2 along with each relevant significance level. We find a 0.076 correlation between graduate school attitude (*GRAD*) and financial literacy (*FL*), which is significant at the 10% level, indicating that the two variables are positively correlated. *GRAD* is also significantly correlated (at the 5% or 1% levels) with each of the college major variables (*EBS, HHS, BUS, SCE, ART*), indicating that all of the different categories of majors impact an individual's attitude towards graduate school. Further, we see a positive correlation

between *GRAD* and both *EBS* and *HHS*, indicating that students that study a major categorized as education and behavioral sciences (e.g., psychology, teacher education) or health and human services (e.g., social work, nursing) are more likely to attend graduate school. We see a negative correlation between *GRAD* and each of *BUS, SCE,* and *ART*, indicating that students that study a major categorized as business administration (e.g., accounting, finance, economics), science and engineering (e.g., chemistry, mechanical engineering), or liberal arts (e.g., English, music, foreign language) are less likely to attend graduate school. We also find a significant positive correlation between *FL* and both *BUS* and *SCE* and a significant negative correlation between *FL* and *HHS*. This result indicates that students majoring in business and science are more likely to be financially literate while health and human services majors are less likely to be financially literate. Finally, we see that *AGE, GPA, FEMALE,* and *PROF* are each significantly and directly correlated with *GRAD*, indicating that older students, students with higher GPAs, female students, and students with parents that hold professional jobs are each more likely to attend graduate school, which is anticipated and previously documented by literature.

We conduct a pairwise t-test comparison of all variables by the level financial literacy of respondents (high vs. low); where high financial literacy is defined by answering all "Big 3" questions correctly and the low financial literacy is the remaining respondents. We present the findings in Table 3. We see that our financial literacy

dummy variable causes a significant positive variation in values of the *EBS* and *HHS* major variables as well as a significant negative variation in values of the *BUS* and *SCE* major variables at either the 5% or 1% levels. This indicates that there are a greater number of education and behavioral science and health and human services majors but a lesser number of business and science and engineering majors that are financially illiterate. In addition, other variables that show a significant negative change at the 10% or 1% levels are *AGE, GPA,* and *INC*, which indicates that there are a greater number of younger, low-GPA, low-income students that are financially illiterate. Finally, *FEM* shows a significant positive change at the 1% level, which indicates that there are a greater number of female students that are financially illiterate. The remainder of the variables differ insignificantly between financially literate and illiterate groups.

Our multiple regression analysis of Eq. (1) is presented in Table 4. We find that the coefficient of *FL* is 0.217 with a p-value of 0.027, clearly suggesting that when an individual is more financially literate, he/she tends to possess a more positive attitude towards attending graduate school. The results are consistent with our hypothesis. In addition, when *FL* increases by one standard deviation (0.671), we see an increase of 0.146 in *GRAD* which is large relative to the *GRAD* standard deviation of 1.517, indicating economic significance.

Turning to our control variables, the only ones that show positive and significant coefficients at the 1% or 5% levels are *EBS, HHS, GPA,* and *PROF*, indicating that an

individual that majors in education and behavioral sciences (e.g. psychology, teacher education) or health and human services (e.g. social work, nursing), has a high GPA, or has parent(s) who possess professional job(s) is more likely to attend graduate school. These findings substantiate the results for the *FL* variable. For example, when a student has a high GPA, he/she is more likely to succeed in graduate school and obtain the future economic benefits associated with a graduate degree, so he/she regards graduate school as more valuable to his/her future career. Also, when a student has parents who possess professional jobs, he/she is able to see the benefits his/her parents reaped from attending graduate school, so this parental experience encourages a positive attitude toward graduate school. A similar explanation can be applied to other variables.

To gauge the relative importance of control variables in explaining graduate school attitudes, we compute the standardized coefficients (β) of all variables. Using standardized coefficients allows us to compare the relative importance of financial literacy and other control variables in explaining the decision to attend graduate school. The most impactful variables match the ones we found above that are positive and significant. The variables *FL, EBS, HHS, GPA,* and *PROF* have standardized coefficients of 0.096, 0.270, 0.183, 0.089, and 0.098, respectively. Hence, while *FL* is not as important as *EBS* and *HHS*, it is comparable to *GPA* and *PROF* to contribute to one's decision to go to graduate school. Because respondents are unlikely to change their major due to their

sincere academic interests and are unable to change the profession of their parents, the two major policy variables are *FL* and *GPA*. This shows that if respondents are financially literate or have a high GPA, they are more likely to attend graduate school. Therefore, universities should find it beneficial to promote financial literacy among students, possibly by requiring a personal finance course, or enhance academic performance, possibly through tutoring services, in order to increase graduate enrollment both during and immediately after a widespread recession.

Our dependent variable has six possible values in the range (0, 5), so we reexamine Eq. (1) by an ordered logistic regression, presented in Table 5. All estimated coefficients carry identical signs and similar significance levels, with a few changes both up and down. Also corroborating our hypothesis, the coefficient of *FL* is 0.297 and it is significant at the 5% level, suggesting that a respondent is more likely to attend graduate school if he/she is more financially literate.

## 6. Conclusion and Recommendations

Using data taken from a survey of students at a regional university, we examine the impact of financial literacy on attitudes towards graduate school during the COVID-19 pandemic and consequent recession. We posit that graduate school attendance is a human capital investment in an individual's future career success and financial wellbeing, and financial literacy has a varied impact on graduate school attitudes

depending on job market conditions. We hypothesize that during the pandemic, in a weakened job market, attending graduate school is a beneficial human capital investment to an individual's employment and economic return, so individuals with high financial literacy should have a positive attitude toward graduate school. Our robust findings are consistent with our hypothesis. That is, financial literacy has a statistically and economically significant impact on an individual's attitude and inclination toward graduate school. This is the first study in the literature to explicitly draw a connection between financial literacy and graduate school attitudes. These findings have significant economic implications for higher education institutions, especially during economic downturns.

In addition to focusing on the novel connection we draw between financial literacy and graduate school attitudes, we also consider it very likely that the COVID-19 pandemic and resulting recession directly impacted that relationship. We conjecture that, without the influence of the pandemic and recession, our results may not have significantly supported our hypothesis or may even have been opposite to our hypothesis. Because financial literacy is often correlated with how well an individual can differentiate between financially beneficial and detrimental investments, we should find that financially literate individuals are more likely to attend graduate school when it is worthwhile (as analyzed by human capital theory) and less likely to attend when it is not worthwhile. Due to the positive impacts of recessions on the efficacy and value of

higher education (Barr & Turner, 2015; Barrow & Davis, 2012; Clark, 2011; Sievertsen, 2016), we find it probable that financially literate students amidst a recession would be more likely to attend graduate school while financially literate students in a non-recession environment would be less likely to attend graduate school. Even though we do not have data to support this relationship due to the nature of this study, this would be a viable research topic for future studies conducted during non-recession periods.

Our study demonstrates several other limitations, which should be the focus of future research in this field. First, the scope of our study only extends to the perceived value of graduate education among surveyed American undergraduate students. Similar studies should be conducted in environments including secondary schools in order to explore potential similar results for the perceived value of undergraduate or trade education. Future studies can also extend the applicability of these results internationally by replicating our research in overseas environments. Second, the "big-three" financial literacy questions may not be perfect indicators of students' financial decision-making ability and certainly favor business school students who have learned similar content in core classes. Future research may explore the potential of other questions or measures to capture the financial literacy of participants. Third, the control variables we use are not exclusive or exhaustive in controlling all additional variation in graduate school attitudes. Future studies can examine other control variables that influence this relationship, resulting in a stronger or weaker causal link

between financial literacy and graduate school attitudes. Finally, there are many other human capital decisions that individuals make throughout their academic and professional career that have the potential to be influenced by their financial literacy levels and macroeconomic situations such as recessions. Future studies can draw connections between our independent variable (financial literacy) and other decision-related dependent variables (e.g., relocation to larger city, switch to higher-paying job, change of employer, etc.), subject to the external economic environment. This area of research has the potential to bring about changes in the way human capital theory is utilized in strategic policymaking and financial literacy education.

In the modern era, as graduate school attendance is at an all-time low and many master and doctoral programs are in jeopardy, universities can find various ways to boost their graduate enrollment. From our results, universities may expand the general graduate student body by ensuring that their undergraduate students are financially literate and are able to see the financial benefits of attending graduate school, especially during economic downturns. Ultimately, many students sacrifice an exceptional opportunity to invest their time and money in an applicable graduate degree that can advance their future economic and societal success because they are unable to understand these benefits and consider the long horizon when making career choices. Universities and public education officials should work in collaboration to engage the student body, both secondary and post-secondary, in timely financial education to

educate students in the long-term benefits of attending graduate school. Our research validly argues that public and institutional investment in financial literacy programs within our current education system could provide increased motivation for students to advance their education through graduate school programs.

Oftentimes, institutional leaders do not realize the lack of understanding that undergraduate students have for graduate education. This is especially a concern at small, regional campuses such as the one associated with our study due to students' limited exposure to industry professionals. Academic counselors at both secondary and collegiate institutions can expand awareness of the financial value, expanded career prospects, and financial security that attending graduate school during a recessionary period can bring through direct contact with students or campus-wide seminars that explore these benefits. Furthermore, because we argue that graduate education is a human capital investment, greater policy emphasis on graduate scholarships and funding should be a large catalyst for students to pursue this investment. As with any financial investment, a lower initial cost leading to a similar lifetime benefit always leads to a higher net present value. Besides, many students are unwilling or unable to bear the additional burden of graduate school debt in addition to their undergraduate loans, causing them to give up on a beneficial investment. Because many students are not provided with adequate graduate school funding or they are not aware of potential funding opportunities, they are not able to take the decreased cost into account when

making their decision. Institutions may remedy this by expanding graduate scholarship initiatives and emphasizing these during recruitment procedures. Finally, external recruiters and firms unable to find highly educated employees may consider pre-recruiting employees at the conclusion of their undergraduate degree but requiring the successful completion of a one- or two-year graduate program before employment. This would give students the encouragement to pursue a graduate degree and ensure that they are able to appreciate the full benefit of the degree for their future career. They would also feel more comfortable with taking out additional debt because they have the security of a stable job immediately after graduation. Our study makes it clear that institutions, governments, and employers can all play a vital role in promoting the effective investment of graduate school for undergraduate students.

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## Appendix 1. Financial Literacy Survey

Appendix 1 presents the contents of the financial literacy survey given to participants, the results of which we analyze in this study.

You are receiving this email because you are being invited to participate in a survey for a student research project. This project studies the alignment between financial literacy and perceptions of the value of an advanced degree. Researchers have no way of identifying how you answer the survey questions. Participation is completely voluntary, and there are no negative consequences for not taking part in this survey. Completing the survey should take less than 2 minutes.

By submitting your answers, you agree that your responses can be used for the research project.

After completing and submitting the survey, you will be provided a link where you can provide contact information for a chance to win a $25 gift card. You will be asked to provide contact information which will only be used for notifying winners. There is no way to connect your contact information with your survey answers. Contact information will never be shared with anyone. There will be 10 gift cards awarded.

The survey link will open, and you will have a chance to respond through midnight October 15. Thank you for your consideration.

If you have any questions about this survey or research, contact Dr. XXX: xxx.yyy@zzz.edu.

Use the following link to begin the survey: (link to survey)

Please answer questions 1 through 3 to the best of your ability.

1. Suppose you have $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?
    a. More than $102
    b. Exactly $102
    c. Less than $102
2. Imagine that the interest rate on your savings account was 1% per year and inflation was 2% per year. After one year, assuming you do not deposit to or

withdraw money from the account, 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

3. Is the following statement true or false: "Buying a single company's stock usually provides a safer return than stock mutual fund."
   a. True
   b. False

Please answer questions 4 through 14 about your personal details.

4. What is your gender?
   a. Male
   b. Female
   c. Non-binary/other
5. What is your college major?
6. What is your age?
7. What is your current GPA?
8. Are you employed?
   a. Yes, part-time
   b. Yes, full-time
   c. No
9. If yes, how many hours a week do you work?
   a. Less than 10 hours
   b. 10 to 20 hours
   c. 20 to 30 hours
   d. 30 to 40 hours
   e. 40 hours or more
10. Have you ever taken a Personal Finance course (e.g. FIN 161 or high school equivalent)?
   a. Yes, at the high school level.
   b. Yes, at the college level.
   c. Yes, at both high school and college levels.
   d. No

11. If yes, did that cause a change in your major?
    a. Yes
    b. No
12. Estimate your annual household income:
    a. Less than $25,000
    b. $25,000 to $50,000
    c. $50,000 to $100,000
    d. $100,000 to $200,000
    e. $200,000 or more
13. Parent/Guardian 1 Occupation:
14. Parent/Guardian 2 Occupation:

Please answer questions 15 through 20 about your attitudes towards graduate school.

15. Are you currently in a professional, master's, or doctorate program?
    a. Yes
    b. No
16. If no, how likely are you to attend graduate school in the future?
    a. Not likely at all
    b. Unlikely
    c. Somewhat likely
    d. Moderately likely
    e. Extremely likely (certain)
17. In your opinion, how likely is attending graduate school to increase your probability of finding a job?
    a. Not likely at all
    b. Unlikely
    c. Somewhat likely
    d. Moderately likely
    e. Extremely likely (certain)
18. Do you believe having an advanced degree (beyond bachelor's) in your field results in higher wages?
    a. Yes
    b. No
19. If yes, how much higher per year?
    a. Less than $5,000

b. $5,000 to $10,000
c. $10,000 to $15,000
d. $15,000 to $20,000
e. $20,000 or more

20. Overall, how much do you agree that any level of graduate school is worth your time and money?
    a. Completely disagree
    b. Somewhat disagree
    c. Neither disagree nor agree
    d. Somewhat agree
    e. Completely agree

If you want to be entered in a drawing for one of the ten $25 gift cards available for completing this survey, please provide your contact information.

## Appendix 2. Variable Definitions

Appendix 2 presents abbreviations and definitions of all dependent, independent, and control variables utilized throughout the study and referred to in the methodology and tables.

| Variable | Definitions |
|---|---|
| *GRAD* | Graduate school attitude measure. Based on survey questions 15 and 16 (appendix 1). Possible values are 0 to 4, from question 16 answers (a) to (e), respectively, or 5 if student is currently in graduate school as indicated in question 15. |
| *FL* | Financial literacy measure. Based on survey questions 1 to 3 (appendix 1). Possible values are 0 to 3, one point is given for each of the Big Three questions answered correctly. |
| *EBS* | If the respondent's major is in the college of education and behavioral sciences, it is 1; otherwise, 0. |
| *HHS* | If the respondent's major is in the college of health and human services, it is 1; otherwise, 0. |
| *BUS* | If the respondent's major is in the college of business, it is 1; otherwise, 0. |
| *SCE* | If the respondent's major is in the college of science and engineering, it is 1; otherwise, 0. |
| *ART* | If the respondent's major is in the college of arts and letters, it is 1; otherwise, 0. |
| *AGE* | Respondent's age. |
| *GPA* | Respondent's grade point average for their current degree. |
| *FEM* | If the respondent is female, it is 1; otherwise, 0. |
| *PART* | If the respondent has a part-time job, then it is 1; otherwise, 0. |
| *FULL* | If the respondent has a full-time job, then it is 1; otherwise, 0. |
| *PROF* | If the respondent has two parents with professional jobs, then it is 2; if the respondent has only one parent with a professional job, then it is 1; otherwise, 0. A professional job is defined as one that requires post-secondary education. |

| | |
|---|---|
| *INC* | Respondent's approximate parental household income (individual household income if independent). |

**Table 1. Descriptive Statistics (N = 505)**

Table 1 presents the summary statistics of the respondents. Definitions of variables are presented in Appendix 2.

| Variable | Mean | Std. Dev. | Minimum | Maximum |
|---|---|---|---|---|
| *GRAD* | 3.217 | 1.517 | 0 | 5 |
| *FL* | 2.479 | .671 | 0 | 3 |
| *EBS* | .198 | .399 | 0 | 1 |
| *HHS* | .181 | .386 | 0 | 1 |
| *BUS* | .158 | .365 | 0 | 1 |
| *SCE* | .232 | .423 | 0 | 1 |
| *ART* | .196 | .397 | 0 | 1 |
| *AGE* | 23.38 | 8.466 | 12 | 70 |
| *GPA* | 3.589 | .498 | 0 | 4 |
| *FEM* | .702 | .458 | 0 | 1 |
| *PART* | .457 | .499 | 0 | 1 |
| *FULL* | .169 | .375 | 0 | 1 |
| *PROF* | .924 | .776 | 0 | 2 |
| *INC* | 61630.037 | 45908.75 | 0 | 200000 |

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## Table 2. Pairwise Correlations

Table 2 presents the pairwise correlations of the variables. Definitions of variables are presented in Appendix 2. ***, **, and * indicate 1%, 5%, and 10% significance, respectively.

| Variable | *GRAD* | *FL* | *EBS* | *HHS* | *BUS* | *SCE* | *ART* | *AGE* | *GPA* | *FEM* | *PART* | *FULL* | *PROF* | *INC* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| *GRAD* | 1.000 | | | | | | | | | | | | | |
| *FL* | 0.076* | 1.000 | | | | | | | | | | | | |
| *EBS* | 0.244*** | -0.063 | 1.000 | | | | | | | | | | | |
| *HHS* | 0.135*** | -0.119*** | -0.234*** | 1.000 | | | | | | | | | | |
| *BUS* | -0.128*** | 0.091** | -0.203*** | -0.204*** | 1.000 | | | | | | | | | |
| *SCE* | -0.085** | 0.133*** | -0.262*** | -0.259*** | -0.238*** | 1.000 | | | | | | | | |
| *ART* | -0.131*** | -0.032 | -0.211*** | -0.232*** | -0.189*** | -0.261*** | 1.000 | | | | | | | |
| *AGE* | 0.069* | 0.126*** | 0.042 | 0.136*** | -0.003 | -0.106** | -0.047 | 1.000 | | | | | | |
| *GPA* | 0.127*** | 0.192*** | 0.014 | -0.018 | -0.032 | 0.076* | -0.038 | -0.045 | 1.000 | | | | | |
| *FEM* | 0.099** | -0.187*** | 0.135*** | 0.163*** | -0.175*** | -0.102** | -0.038 | -0.026 | 0.052 | 1.000 | | | | |
| *PART* | -0.004 | 0.007 | -0.072* | -0.026 | 0.072* | 0.030 | 0.051 | -0.226*** | 0.124*** | 0.009 | 1.000 | | | |
| *FULL* | 0.036 | 0.003 | 0.129*** | 0.090** | -0.009 | -0.133*** | -0.052 | 0.498*** | -0.126*** | 0.029 | -0.414*** | 1.000 | | |
| *PROF* | 0.082* | 0.042 | -0.069* | -0.045 | 0.062 | 0.087** | 0.013 | -0.165*** | 0.140*** | -0.037 | 0.029 | -0.137*** | 1.000 | |

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| *INC* | 0.044 | 0.070* | -0.117*** | -0.001 | 0.121*** | 0.047 | -0.025 | -0.074* | 0.057 | -0.025 | 0.021 | -0.092** | 0.398*** | 1.000 |

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## Table 3. Two Sample T-Tests with Equal Variances

Table 3 presents the results of two-sample t-tests with equal variances on each control variable by a dummy variable representing whether or not an individual received a perfect score on financial literacy questions (FL = 3). Definitions of all variables are presented in Appendix 2. ***, **, and * indicate 1%, 5%, and 10% significance, respectively.

| | Independent Variable (*FL = (0, 1, 2) OR (3)*) | | | | | | |
|---|---|---|---|---|---|---|---|
| | | | | | | 95% Confidence | |
| **Variable** | **t-statistic** | **df** | **Pr ≠ \|t\|** | **Mean Dif.** | **Std. Error** | **Lower** | **Upper** |
| ***Majors:*** | | | | | | | |
| *EBS* | 2.40 | 549 | 0.016 | 0.083** | 0.035 | 0.015 | 0.150 |
| *HHS* | 2.45 | 549 | 0.015 | 0.081** | 0.033 | 0.016 | 0.146 |
| *BUS* | -2.30 | 549 | 0.022 | -0.072** | 0.032 | -0.133 | -0.010 |
| *SCE* | -3.05 | 549 | 0.003 | -0.111*** | 0.036 | -0.182 | -0.040 |
| *ART* | -0.10 | 549 | 0.918 | -0.004 | 0.035 | -0.071 | 0.064 |
| *AGE* | -3.30 | 546 | 0.001 | -2.408*** | 0.726 | -3.834 | -0.981 |
| *GPA* | -4.40 | 508 | 0.000 | -0.193*** | 0.044 | -0.279 | -0.107 |
| *FEM* | 5.45 | 548 | 0.000 | 0.210*** | 0.038 | 0.134 | 0.286 |
| *PART* | -0.70 | 549 | 0.478 | -0.030 | 0.043 | -0.155 | 0.054 |
| *FULL* | -0.25 | 549 | 0.790 | -0.009 | 0.033 | -0.072 | 0.055 |
| *PROF* | -1.05 | 549 | 0.300 | -0.070 | 0.067 | -0.201 | 0.062 |
| *INC* | -1.90 | 544 | 0.056 | -7590.188* | 3967.099 | -15382.9 | 202.521 |

## Table 4. Multiple Regression Analysis

Table 4 presents the results of a multiple regression analysis on the impact of financial literacy on graduate school attitudes by ordinary least squares. Definitions of all variables are presented in Appendix 2. ***, **, and * indicate 1%, 5%, and 10% significance, respectively.

| | Dependent variable (*GRAD*) | | | | |
|---|---|---|---|---|---|
| **Variable** | **Coefficient** | **Robust Std. Error** | **t-statistic** | **Pr > \|t\|** | **Std. Coeff. (β)** |
| *FL* | 0.217** | 0.098 | 2.22 | 0.027 | 0.096 |
| ***Majors:*** | | | | | |
| *EBS* | 1.045*** | 0.267 | 3.91 | 0.000 | 0.270 |
| *HHS* | 0.711** | 0.289 | 2.46 | 0.014 | 0.183 |
| *BUS* | -0.267 | 0.305 | -0.88 | 0.381 | -0.064 |
| *SCE* | -0.091 | 0.275 | -0.33 | 0.741 | -0.025 |
| *ART* | -0.015 | 0.291 | -0.05 | 0.959 | -0.004 |
| *AGE* | 0.010 | 0.011 | 0.95 | 0.345 | 0.055 |
| *GPA* | 0.271** | 0.132 | 2.05 | 0.041 | 0.089 |
| *FEM* | 0.149 | 0.151 | 0.99 | 0.322 | 0.045 |
| *PART* | 0.028 | 0.140 | 0.20 | 0.839 | 0.009 |
| *FULL* | -0.031 | 0.223 | -0.14 | 0.888 | -0.008 |
| *PROF* | 0.191** | 0.086 | 2.23 | 0.027 | 0.098 |
| *INC* | 0.000 | 0.000 | 0.60 | 0.552 | 0.028 |
| *Intercept* | 0.874 | 0.599 | 1.46 | 0.145 | 0.000 |
| *N* | 505 | | | | |
| *R-squared* | 0.137 | | | | |
| *F-statistic* | 8.68 | | | | |

## Table 5. Ordered Logistic Regression Analysis

Table 5 presents the results of an ordered logit regression analysis on the impact of financial literacy on graduate school attitudes by ordinary least squares. Definitions of all variables are presented in Appendix 2. ***, **, and * indicate 1%, 5%, and 10% significance, respectively.

| | **Dependent Variable (*GRAD = 0, 1, 2, 3, 4, 5*)** | | | |
|---|---|---|---|---|
| **Variable** | **Coefficient** | **Robust Std. Error** | **z-statistic** | **Pr > \|z\|** |
| *FL* | 0.297** | 0.120 | 2.48 | 0.013 |
| ***Majors:*** | | | | |
| *EBS* | 1.473*** | 0.350 | 4.21 | 0.000 |
| *HHS* | 1.213*** | 0.387 | 3.13 | 0.002 |
| *BUS* | -0.187 | 0.377 | -0.50 | 0.621 |
| *SCE* | 0.040 | 0.335 | 0.12 | 0.906 |
| *ART* | 0.202 | 0.364 | 0.56 | 0.579 |
| *AGE* | 0.029 | 0.019 | 1.53 | 0.127 |
| *GPA* | 0.447** | 0.183 | 2.44 | 0.015 |
| *FEM* | 0.241 | 0.192 | 1.25 | 0.210 |
| *PART* | 0.061 | 0.172 | 0.36 | 0.722 |
| *FULL* | 0.072 | 0.350 | 0.21 | 0.837 |
| *PROF* | 0.197* | 0.109 | 1.80 | 0.072 |
| *INC* | 0.000 | 0.000 | 0.96 | 0.335 |
| *Intercept* | various | | | |
| *N* | 505 | | | |
| *R-squared* | 0.055 | | | |
| $\chi^2$*-statistic* | 97.16 | | | |