Financial Literacy and Financial Risk Tolerance

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Introduction

In recent times, I have seen an increase in "investments" on stocks and cryptocurrency through popular websites like Robinhood, and it sparked interest in the relationship between financial literacy and the financial risk tolerance of individuals. I hypothesized that demographics would not explain financial literacy very well, as the population was attending the same university and had the same majors. I also predicted the financial literacy of the respondents would have a significant impact on their risk tolerance, and that they would be able to choose a gamble with a higher expected value at the cost of a greater standard deviation. The results show that being white, and being male, were the most important factors when looking at the regression for financial literacy. Being male increased the expected financial literacy score by 22%, while being white increased the expected financial literacy score by over 14%. For the risk tolerance models, our regressions failed to produce any statistically significant figures, so we can not confidently say there is a relationship between risk tolerance and financial literacy/demographics.

Literature Review

In this section, I will review other academic journals similar to that in which I am doing. Although there is not much research directly comparing financial literacy and financial risk tolerance, there are countless studies that mention one or the other. The financial literacy portion of the analysis was largely inspired by Annamaria Lusardi, the leading economist in this field. For the risk tolerance analysis, it is inspired by Catherine Eckel and Phillip Grossman[1], who

[1] Annamaria Lusardi is an economist currently teaching at the George Washington University School of Business, where she has specialized in financial literacy throughout her career. Catherine Eckel and Phillip Grossman have written numerous papers together on Risk Tolerance.

created the risk tolerance model used in the survey and have written numerous articles about it. Risk as a whole will also be mentioned.

Published in 2018 in the *Journal of Economic Perspectives*, Ted O'Donoghue and Jason Somerville released an article titled "Modeling Risk Aversion in Economics." They state that, in general, people do not like risk, and they are naturally risk averse. They argue this point by looking at real life scenarios, such as insurance and financial investment, where they state, "The risk-aversion intuition is a key driver in many prominent economic applications. Risk aversion creates a demand for insurance…Risk aversion plays a central role in financial investment."[2] The entire business model of insurance companies is punishing this part of human nature. The sense of security is something we value, which leads to our expected utility being greater than the expected value. For financial investment, people require compensation for taking on risks. However, they go onto mention there is a calibration problem with the expected utility model where the scaling does not match when transferring from lower to higher stakes.

Our first article acknowledging financial literacy is by Annamaria Lusardi, Olivia Mitchell and Vilsa Curto, "Financial Literacy among the Young*",* published in 2010 in *The Journal of Consumer Affairs.* Using questions from the National Longitudinal Survey of Youth, they tested the young adults to determine "(1) how well-equipped are young people to make financial decisions? (2) what are the determinants of financial literacy among young people? (3) how can this information aid policymakers seeking to devise interventions aimed at young consumers?"[3] They split the financial literacy questions into three different sections when

[2] O'Donoghue, Ted, and Jason Somerville. "Modeling Risk Aversion in Economics." *The Journal of Economic Perspectives*, vol. 32, no. 2, 2018, pp. 91–114. *JSTOR*, www.jstor.org/stable/26409426. Accessed 28 April. 2021.
[3] LUSARDI, A., MITCHELL, O., & CURTO, V. (2010). Financial Literacy among the Young. *The Journal of Consumer Affairs, 44*(2), 358-380. Retrieved 28 April 2021, from http://www.jstor.org/stable/23859796

running their regressions. The sections were interest rate, inflation, and risk diversification. This way, they can see if a certain gap of financial literacy has more impact that another. The results of this research showed that, "…financial literacy was severely lacking among young adults; only 27% knew about inflation and risk diversification and could do simple interest rate calculations. Moreover, women proved to be the least financially literate."[4] The overall lack of financial knowledge was surprisingly low, and they recommended that the government intervene to make sure that young children are getting the proper education on the subject for the future.

In this next article, I came across many of the survey questions that I used for my own survey. "Financial literacy and stock market participation", written by Maarten van Rooij, Annamaria Lusardi, and Rob Alessie was published in 2011 in *The Journal of Financial Economics.* The article attempted to study financial literacy and its relationship to stock market participation. The survey was from the De Nederlandsche Bank's Household Survey, available to the Dutch population.[5] Once again, the results showed that the population had a lack of knowledge on basic financial literacy concepts. For the regressions used, they split the financial literacy questions into both basic and advanced questions. They were also able to conclude that people with a lower financial literacy were significantly less likely to invest in the stock market. Not only this, but education levels in general served as a good measurement.

In 2002, Catherine Eckel and Phillip Grossman created a simple risk tolerance gamble to be used in their article, "Sex differences and statistical stereotyping in attitudes toward financial risk." For their model, they had two separate test-groups, Loss-framing and No-Loss framing.

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[4] LUSARDI, A., MITCHELL, O., & CURTO, V. (2010). Financial Literacy among the Young. *The Journal of Consumer Affairs, 44*(2), 358-380. Retrieved 28 April 2021, from http://www.jstor.org/stable/23859796

[5] Van Rooij, Maarten, et al. "Financial Literacy and Stock Market Participation." *Journal of Financial Economics*, 2007, doi:10.3386/w13565.

In Loss framing, subjects were given six dollars prior to completing the choice. All of the payoffs were exactly six dollars less in the Loss-framing than the No-Loss framing. However, because of this, the Loss framing has the potential to lose the six dollars you had before the survey if you chose a riskier option. The idea behind this is that once people feel entitled to money as their own, they will act differently. However, this hypothesis proved inconclusive, and there was "no evidence that framing affected subjects' choices." What they did find, was that "women were significantly more risk averse than men. For example, less than 2% of the men, but over 8% of the women, chose the least risky gamble, whereas over one-third of the men, but only 13% of the women, selected the riskiest gamble."[6] In the review and risk model, they demonstrate women to be much more risk averse than men.

Lastly is the article that sets out to answer a question related to mine. "The impact of financial literacy and financial interest on risk tolerance", by Cecilia Hermansson and Sara Jonsson was recently published in the *Journal of Behavioral and Experimental Finance*, in March of 2021.[7] Their approach was taking six rather difficult questions for their dependent variables on financial literacy. The average person scored just 32% on all of the questions. For their variable on risk tolerance, they used three self-diagnostic survey questions, each on a scale of 1-7. The questions for this were:

1. I can accept to lose part of my saving capital if the chance of getting a good return is great.

[6] Eckel, Catherine C., and Philip J. Grossman. "Sex Differences and Statistical Stereotyping in Attitudes toward Financial Risk." *Evolution and Human Behavior*, vol. 23, no. 4, 2002, pp. 281–295., doi:10.1016/s1090-5138(02)00097-1.

[7] Hermansson, Cecilia, and Sara Jonsson. "The Impact of Financial Literacy and Financial Interest on Risk Tolerance." *Journal of Behavioral and Experimental Finance*, vol. 29, 2021, p. 100450., doi:10.1016/j.jbef.2020.100450.

2. I think one has to take risk in order to gain something

3. I would like to increase risk since return is too low.

The results of this were interesting after running the regressions. It did show that both financial literacy and financial interest were accompanied by a higher risk tolerance. This has an approach that differs from mine, but the original purpose is the same. Personally, I did not like the idea of having the risk tolerance being very subjective and felt the addition of an experimental economics choice would provide better insight.

Data and Methodology

For the data used in this research, I created a survey comprised of asking the willing participants a series of common demographics, a basic financial literacy test, and a financial risk tolerance question using the Eckel and Grossman model. The survey was estimated to be completed in approximately six minutes, while taking no longer than twenty minutes. It was distributed by email through the Martin V. Smith School of Business and Economics at CSU Channel Islands to all students whose declared majors were business or economics. To promote contribution and honest results, five random students would be chosen to enact their decision on the single Eckel and Grossman risk tolerance question in the survey via Zoom.

In the end, only 31 responses are to be used in all of the research and analysis seen in future sections. Although there were over 60 responses, it was not uncommon for people to quit without finishing the survey, so those who did not complete the final survey question on risk tolerance, had their results dropped from the analysis.

Table 1: Summary Statistics

Variable	Observations	Mean	Std. Dev.	Min	Max
White	31	.452	.506	0	1
Male	31	.452	.506	0	1
Income	31	83.161	52.08	10	200
Age	31	25.064	6.429	18	47
Senior	31	.613	.495	0	1
Democrat	31	.484	.508	0	1
Republican	31	.355	.486	0	1
Score	31	13.032	4.151	2	19
Risk	31	2.871	1.432	1	5

In Table 1, we can see the summary statistics for all of the variables that are used in the regressions. "White" is referring to the respondents' race, where "White" is equal to 1, and 0 if other. Other races were included in the survey question, but as white was the most common, and other races were more distributed, it made sense to create this variable due to a rather low number of responses. Similar to this is "Male" variable, where "Male is equal to 1, and 0 if other. Respondents also had the opportunity to select female, non-binary, or prefer not to answer, but it should be noted that there were no responses to non-binary or prefer not to answer, so we can directly compare males to females onwards. "Senior" is another binary variable to determine the class of the student, and this variable was created this way for the same reasons as that of "White", lack of responses. "Income" and "Age" are rather straight-forward but should be noted that family income was capped at $200,000 to prevent large skews in the data. The last

question on demographics was political party. If you identify with or lean towards the democratic or republican party, you will be assigned that binary variable, respectively. Surprisingly, over 35% of the responses identified with or leaned towards the republican party, which might be considered high for a college in southern California. Neither was also an option, and that is what is in comparison to as a basis in the regressions. All these variables are strictly used as independent variables.

"Score" is a variable that was given to you based on the number of questions answered correctly on the financial literacy portion of the survey. 21 questions were asked and used for the data. In the actual data, scores ranged from 2-19, with the average participant getting slightly over 13 of 21 questions correct, or roughly 62%. This seems rather low given the targeted audience, but we can not be sure how much effort was put into the survey and dropping completed surveys did not seem appropriate. "Score" is used as a dependent variable or an independent variable, depending on the regression.

Lastly, our "Risk" variable is a number 1-5, depending on your answer to the risk tolerance question using the Eckel and Grossman model. The question reads:

Choose one gamble. The "Lowest Payoff" option represents the lowest dollar amount to win, while the "Highest Payoff" option represents the highest dollar amount to win. There is a 50% chance you will get the "Lowest Payoff", and a 50% chance you will get the "Highest Payoff."

1. Low Payoff: 16 – High Payoff: 16
2. Low Payoff: 12 – High Payoff: 24
3. Low Payoff: 8 – High Payoff: 32

4. Low Payoff: 4 – High Payoff: 40

5. Low Payoff: 0 – High Payoff: 44

Financial Literacy

In Table 2, we can see each individual financial literacy question asked, alongside the percentage of correct answers. Of the 21 questions asked, the first 16 of them were copied from De Nederlandsche Bank's Household Survey[8], with this version being from 2005. Some questions were slightly tweaked, and since the original survey was in Dutch, I changed the currency to American Dollars. The data for the original survey questions in 2005, was used in "Financial literacy and stock market participation"[9] in 2011, as mentioned in the literature review. Questions 17-21 were custom questions created. In general, people performed significantly worse on these questions in comparison to the previous questions.

There were numerous different financial concepts tested in the survey. Compounding interest was the focus in the first questions, where the results mirrored that of the overall survey, at around 62%. Basic stock questions and inflation questions were positively received and received above average scores. Questions on bonds scored below average, excluding the basic question on it. Questions revolving around personal financial growth such as mutual funds or 401k's were also well below average in comparison to the overall score. Lastly, the final questions were based off of the rule of 72, and the time it would take for money to double, where the percent return per year multiplied by the number of years should be 72. These were the most incorrectly answered questions, both with only 32% accuracy. As previously mentioned, the

[8] The DNB Household Survey studies "both psychological and economic aspects of financial behavior." It was sent out to numerous households in the greater Scandinavian area.

[9] Van Rooij, Maarten, et al. "Financial Literacy and Stock Market Participation." *Journal of Financial Economics*, 2007, doi:10.3386/w13565.

Question	Table 2: Financial Literacy Questions	% Correct
1	Suppose you had $100 in a savings account, and the interest rate was 2% year. After 5 years how much would you have in the account if you left the money to grow?	61.29
2	Suppose you had $100 in a savings account, and the interest rate is 20% per year and you never withdraw money or interest payments. After 5 years, how much would you have in this account in total?	64.52
3	Imagine that the interest rate on your savings account was 1% per year, and the inflation was 2% per year. After 1 year, how much would you be able to buy with the money in this account?	61.29
4	Assume a friend inherits $10,000 today and his sibling inherits $10,000 3 years from now. Who is richer because of this?	61.29
5	Suppose that in the year 2030, your income has doubled and prices of goods have doubled too. In 2030, how much will you be able to buy with your income?	90.32
6	Which of the following statements best describes the main function of the stock market?	54.84
7	Which of the following statements is correct? If somebody buys the stock of Firm B in the stock market:	87.10
8	Which of the following statements is correct? (Mutual Funds)	58.06
9	Which of the following statements is correct? If somebody buys a bond of Firm B,	80.65
10	Over a long period of time, say 20 years, which asset normally gives the highest return?	58.06
11	Which asset usually displays the highest fluctuations over time?	83.87
12	When an investor spreads his money among different assets, does the risk of losing money:	77.42
13	If you buy a 10-year bond, it means you cannot sell it after 5 years without incurring a major penalty. True or False?	38.71
14	Stocks are normally riskier than bonds. True or False?	83.87
15	Buying a company stock usually provides a safer return than a stock mutual fund. True or False?	77.42
16	If the Interest Rate falls, what should happen to bond prices?	51.61
17	What is the average rate of inflation in the United States in the last 20 years?	70.97
18	What is the average growth of the stock market in nominal (or year-by-year) dollars?	29.03
19	What is the main benefit of a 401k plan?	48.39
20	Jimmy invests $100,000 expecting a return of 8% per year. How long should It take for him to have doubled his money?	32.26
21	Jimmy invests $100,000 expecting a return of 12% per year. How long should it take for him to have $400,000?	32.26

custom questions lowered the overall scores, but I believe these concepts are important to the average person and their decision making.

Eckel and Grossman Model

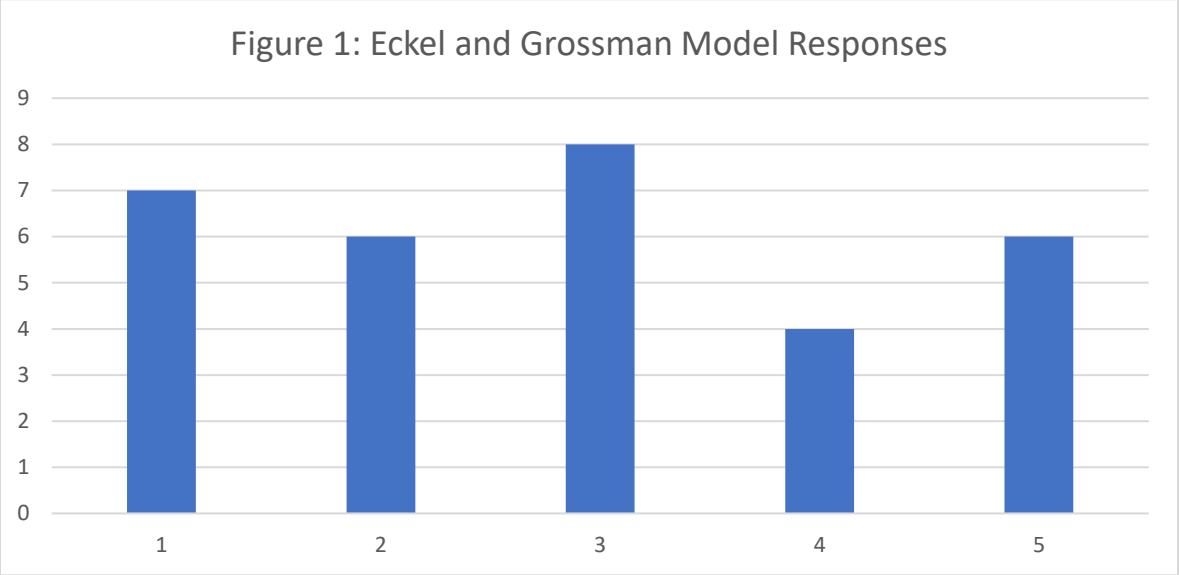
To conclude the survey, participants were asked to choose a gamble on financial risk tolerance using an Eckel and Grossman model. The model is quite simple, where your expected value will increase for the first three gambles, alongside the amount of risk you take as the standard deviation increases. As we see in Table 3, the first gamble inherits no risk, you will get a payoff of 16 regardless of what happens. But why would someone choose gamble two over gamble one or three for example? With gamble two, we could have a guaranteed payoff of 12, with a high payoff of 24. Gamble three has a minimum payoff of 8, with the potential of 32. If someone is willing to choose gamble 2, what they are essentially saying is that they value the security of the four dollars from 8 to 12 greater than benefit of the risk of the jump from 24 to 32. In other words, they value the first dollars greater than later dollars, understandably.

Table 3: Eckel and Grossman Model

Choice (50/50 Gamble)	Low Payoff	High Payoff	Expected Return	Standard Dev.
1	16	16	16	0
2	12	24	18	6
3	8	32	20	12
4	4	40	22	18
5	0	44	22	22

This is risk aversion, and the Eckel and Grossman model does an excellent job in portraying this. The first gamble would be very risk averse and would become less risk averse as

you go down the list of gambles to select. Risk neutral individuals will select the option with the highest expected return, in this case gambles 4 and 5. However, because the standard deviation is increased on the fifth gamble, we consider this option to represent our risk-loving population. This is the largest drawback of the Eckel and Grossman model, as it "cannot differentiate between different degrees of risk-seeking behavior."[10]



Above in Figure 1, we see our results to our Eckel and Grossman Model. It is somewhat randomly distributed, but the main focus of interest here is that not many people were truly risk neutral, with only four respondents choosing the fourth gamble. It seems some people did not want to take any risks, some people were risk-seeking and selected the fifth gamble, but nearly half of the recorded responses were willing to take some risk with gambles two or three.

[10] O'Donoghue, Ted, and Jason Somerville. "Modeling Risk Aversion in Economics." *The Journal of Economic Perspectives*, vol. 32, no. 2, 2018, pp. 91–114. *JSTOR*, www.jstor.org/stable/26409426. Accessed 28 April. 2021.

Analysis

For this paper, four regressions were run. The first has "Score" as the dependent variable, and all our demographics as independent variables. This regression will be called "ScoreR." The second regression is simply running the results of Eckel and Grossman model, "Risk" with the "Score", to be called "RiskS". The third regression is running "Risk" with our demographics, "RiskD". These two regressions will not be mentioned thoroughly, but there are minor points of interest. Lastly, we take a look "Risk" with both "Score" and our demographics, "RiskF" In all regressions, a linear probability model is the type of analysis used. Many variables are binary, and age and income did not show significant meaning in the results. β_0 represents our constants in the regression, while β_1- β_8 are the coefficients to their respected variables. Finally, E_1 will describe the error.

$$ScoreR_1 = \beta_0 + \beta_1 (White) + \beta_2 (Male) + \beta_3 (Income) + \beta_4 (Age) + \beta_5 (Senior) + \beta_6 (Democrat) + \beta_7 (Republican) + E_1$$

$$RiskS_1 = \beta_0 + \beta_1 (Score) + E_1$$

$$RiskD_1 = \beta_0 + \beta_1 (White) + \beta_2 (Male) + \beta_3 (Income) + \beta_4 (Age) + \beta_5 (Senior) + \beta_6 (Democrat) + \beta_7 (Republican) + E_1$$

$$RiskF_1 = \beta_0 + \beta_1 (Score) + \beta_2 (White) + \beta_3 (Male) + \beta_4 (Income) + \beta_5 (Age) + \beta_6 (Senior) + \beta_7 (Democrat) + \beta_8 (Republican) + E_1$$

Results

Of the four regressions run, ScoreR was the most successful in terms of explaining the relationship between our dependent and corresponding independent variables. In Table 4, we see

our regression table for ScoreR, showing the coefficients, robust standard errors, and associated p-values.

Table 4: Financial Literacy Regression Table

	ScoreR	
Variables	Coefficients	Robust SE (P-Value)
White	3.070	1.384 (.037) *
Male	4.710	1.481 (.004) *
Income	-.004	.015 (.794)
Age	-.007	.112 (.953)
Senior	2.085	1.298 (.122)
Democrat	-.158	1.439 (.914)
Republican	-.404	1.341 (.766)
Constant	8.967	3.434 (.016)
R-Squared	.4311	

*Statistically Significant

Plugging our coefficients into our linear analysis model gives us:

$ScoreR_1 = 8.967 + (3.070)\,(White) + (4.710)(Male) + (-0.004)\,(Income) + (-0.007)(Age) + (2.085)\,(Senior) + (-0.158)(Democrat) + (-0.404)(Republican) + E_1$

What we notice immediately is the stand out coefficients of the binary variables White and Male. Both of these are statistically significant at the 95% confidence level, with p-values of 0.037 and 0.004, respectively. What we can interpret from this is that being male increases your expected score on the financial literacy survey by 4.71 points, which is over 20% given the 21 total questions. Being white also held a major impact, as this increases the expected score by just 3.07 points, over 14%.

For the other variables, Senior also held a somewhat large coefficient of 2.085, while having a p-value of 0.122, but this is not statistically significant. As for age, income, and

political party, these all held very small coefficients and carried p-values above 0.750. Unexpectedly, household income had a negative coefficient. We can have little to no confidence in these variables. The entire regression had an R-Squared value of .4311. This means the model captures 43.11% of the variance in the data, which is higher than the other regressions run, which we will see later.

Using dummy models, we can create the estimated scores of the extremities in our data, within the given constraints. For example, we predict to maximize score an individual would be white, male, have no household income, be 18 years old, a senior, and be neither democratic nor republican. Inserting this into our model, the estimated score would be roughly 18.7. On the opposite spectrum, to predict the lowest score an individual would be non-white, non-male, a household income of $200,000, a non-senior, and be a republican. The expected score of this individual would be roughly 7.4. As we see from our summary statistics, the maximum questions answered correctly was 19, and the lowest was 2, which happened twice. Deviating to the lower scores is difficult to predict in this model, and getting to the higher end is largely dependent on being both white and male.

Now, we can take a look at our risk regressions from our Eckel and Grossman model. The regression tables are seen below in Table 5. For our first regression, "RiskS", we take the results of our risk model and run them with the sole independent variable Score. A main goal of this research was to interpret the relationship between financial literacy and financial risk tolerance, so this basic regression attempted to target that. Unfortunately, it seems rather inconclusive. With a constant of 2.237 and a positive coefficient on our only dependent variable, we can never predict that someone will ever respond with the first option, which is very risk averse. Sure enough, score is not statistically significant, and this model fails to produce any

meaningful output. We can see, though very unconfidently, that increasing financial literacy may increase risk tolerance, which increase expected values in this case. Lastly, this model has an R-Squared value of .019, meaning this regression only accounts for less than two percent of the variance of our model.

Table 5: Eckel and Grossman Model Regression Table

	RiskS		RiskD		RiskF	
Variables	Coefficients	RSE (P-Value)	Coefficients	RSE (P-Value)	Coefficients	RSE (P-Value)
Score	.0486	.050 (.334)			.047	.076 (.544)
White			.688	.835 (.418)	.545	.932 (.565)
Male			.631	.710 (.385)	.411	.853 (.635)
Income			-.004	.007 (.562)	-.004	.007 (.576)
Age			-.005	.053 (.920)	-.005	.055 (.927)
Senior			-.359	.788 (.653)	-.456	.798 (.574)
Democrat			.537	.871 (.544)	.544	.880 (.542)
Republican			.922	.883 (.307)	.941	.926 (.321)
Constant	2.237	.662 (.002)	2.390	1.361 (.093)	1.971	1.359 (.161)
R-Squared	.019		.1538		.1642	

Next, we can look at "RiskD" which is the regression of our Eckel and Grossman model and our demographics as independent variables. Once again, we have no statistically significant variables at the 95% confidence level. The three variables with the lowest p-values are Republican (.307), Male (.385), and White (.418). The coefficients responding to these binary variables are 0.922, 0.631, and 0.688, respectively. Surprisingly, being republican has a meaningful impact on risk tolerance, where your expected response to the Eckel and Grossman model will jump nearly a point on a five-point scale. Another interesting observation is that being both White and Male were among the most significant variables, though not very much in this case, in both this model and our ScoreR regression, where we ran the financial literacy test score with the demographics. This model had an R-Squared value of .1538, accounting for 15.38% of the variance. This is a significant increase from the last regression, but this is different variables and is still relatively low. The ScoreR regression had a R-Squared value of .4311 when we ran these same demographics on financial literacy. Therefore, we can say that demographics better explain financial literacy over financial risk tolerance using this model.

For the final regression of this analysis, we look at "RiskF" and run the Eckel and Grossman model with both demographics and financial literacy score. There are no statistically significant variables in this regression either. Interestingly, as we combined everything into one regression, the new regression had little to no change on the coefficients and p-values of Income, Age, Democrat, Republican, and Score. The introduction of Score into the full regression sees a decrease of 0.419 in the constant coefficient, and decreased coefficients in both White and Male variables. Our R-Squared value is .1642, which explains 16.42% of our variance.

Overall, the Eckel and Grossman model failed to explain a meaningful relationship between financial risk tolerance and financial literacy and demographics. Each regression

explained very little variance, and we saw no statistically significant independent variables. However, in our ScoreR regression, we can say with 95% confidence that the variables White and Male increase an individual's score on the financial literacy test given in the survey.

Shortcomings and Future Improvements

One of the biggest shortcomings off this survey is the low number of recorded observations. Having an increased sample size never hurts, and in this case, having only 31 responses is not enough to accurately portray the general population of business and economics students at Channel Islands.

Effort on the survey was also not measured and could have proved issues. Two of the responses had correctly answered 2 of the 21 questions, which is half of what you would have expected from someone randomly selecting answers. It is possible that these people deliberately answered incorrectly. Looking back, it would have been useful to ask the participants how much effort was put into this essay and dropped those who willingly admitted they exerted little to no effort. We also cannot be sure if peoples' responses to the Eckel and Grossman model would have been replicated the same if it were done in person. Financial compensation was not guaranteed, so it is an unanswered question we have in terms of honest answers.

As previously mentioned, the Eckel and Grossman model has difficulty in accurately measuring different levels of risk-seeking behavior. If this were done in person, it would be interesting to see if we could add more options, potentially with negative payoffs in the "Low Payoffs." This may be a way to differentiate types of risk-lovers.

Another change that could be done is creating multiple financial literacy variables that revolve around the type of questions. For example, instead of only having "Score", we could

have split this into variables such as “Stocks”, “Bonds”, “Compounding Interest”, and others. An example of this was seen in “Financial literacy and stock market participation”[11], which was previously talked about in the literature review section.

Conclusion

After getting these results, we can look back to our literature review to compare results. In “Financial Literacy among the Young*”*[12], they found that young adults scored only 27% knew about common financial concepts. On our survey, we observed a much more respectable 62% on average. They also found that women were much less financially literate than men. We can confidently say that our results mimic this, as “Male” was a statistically significant variable in our ScoreR regression.

In Eckel and Grossman’s article with the original risk tolerance model, “Sex differences and statistical stereotyping in attitudes toward financial risk”[13], they found that women were much more risk averse than men. We did not see these results when running our regression, as none of our demographics proved to be statistically significant. However, the coefficient was still positive, but we cannot confidently say that this is the case.

Finally, in “The impact of financial literacy and financial interest on risk tolerance”[14], they concluded that a higher financial literacy resulted in an increased expected financial risk

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[11] Van Rooij, Maarten, et al. “Financial Literacy and Stock Market Participation.” *Journal of Financial Economics*, 2007, doi:10.3386/w13565.

[12] LUSARDI, A., MITCHELL, O., & CURTO, V. (2010). Financial Literacy among the Young. *The Journal of Consumer Affairs, 44*(2), 358-380. Retrieved 28 April 2021, from http://www.jstor.org/stable/23859796

[13] Eckel, Catherine C., and Philip J. Grossman. “Sex Differences and Statistical Stereotyping in Attitudes toward Financial Risk.” *Evolution and Human Behavior*, vol. 23, no. 4, 2002, pp. 281–295., doi:10.1016/s1090-5138(02)00097-1.

[14] Hermansson, Cecilia, and Sara Jonsson. “The Impact of Financial Literacy and Financial Interest on Risk Tolerance.” *Journal of Behavioral and Experimental Finance*, vol. 29, 2021, p. 100450., doi:10.1016/j.jbef.2020.100450.

tolerance. Once again, we cannot make the same conclusion confidently, but can say that our coefficient was positive. They also had a subjective form of risk tolerance, while we had an experimental design to it.

The biggest takeaway of this research is that a white person was expected to score significantly higher on the financial literacy test in comparison to a non-white person, and that a male was expected to score significantly higher on the same test in comparison to a non-male. Being male was the most important, and increased your expected questions correct by roughly 4.7, while being white increased it by just over 3. Our risk tolerance model failed to produce a meaningful comparison, as none of the variables were statistically significant in all three regressions ran. There is no confidently observed relationship between risk tolerance and financial literacy and demographics.

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