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## How Financial Literacy Affects Budgeting Behaviors

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### Abstract

A survey was administered at a private, liberal arts university in the Pacific Northwest to discover how financial literacy can have an impact on students budgeting behaviors. Respondents were asked different kinds of financial literacy questions to assess how much they knew about financial knowledge, and respondents were asked financial behaviors questions to analyze the relationship between financial literacy and financial behaviors. Other questions included demographics, math ability, education, and personal discernment. I find that the only factor that affects students budgeting behaviors is their year in college. When students stay at the school for a long period of time, they may begin to be aware of how to spend their money.

*Keywords: financial literacy, financial behaviors, budgeting, college students, financial survey.*

JEL codes: G00, G23, I22

**Introduction and Purpose:**

Finance is related to all of us no matter who we are or what we are doing: we need credit cards to pay bills, we use mortgages to buy our houses, and we need different kinds of insurances to hedge risks in our lives. According to Shiller (2012), “most people define finance more narrowly. Yet financing an activity really is creating the architecture for reaching a goal—and providing stewardship to protect and preserve the assets needed for the achievement and maintenance of that goal” (p. 7). Indeed, the goal of finance is to help people achieve various goals, and we can use finance as a vehicle to enhance both psychological and physical the qualities of life.

Younger generations are our future, so it would be meaningful for us to know how young people, especially college students, use finance to achieve their goals for their future lives. If understanding the relationship between financial literacy and financial behaviors in college students, we could find better approaches for some college students who have irrational financial behaviors to manage their financial lives. In other words, we could teach students to avoid making financial mistakes. We have seen tons of cases that students after graduation have financial troubles. They could not pay off their student loans or mortgage. They for apply too many credit cards but could not pay off credit cards fully. They spend too more than what they can afford. Actually, these problems could conclude as budgeting problems, which could be solved if people have good budgets and follow their budgets strictly. For this reason, I want to research the relationship between the financial literacy and college students budgeting behaviors.

**Data Overview:****Survey:**

My professor and I designed an original survey to test how much students know about financial literacy. The survey is focused on five different financial concepts: student loan payoff period, asset liquidity, the purpose of insurance, the purpose of debit cards, and the growth of investment vehicles. The data we collected for the study includes information on demographics, financial concepts, stress level, math ability, budget, credit card payoff, and risk tolerance level.

**Sample:**

The survey was administered over a three-week period during the fall of 2014. I administered the survey in three ways. The first way was that I randomly asked students at the campus dining hall to fill out the survey. The second way was that professors asked students to fill out the survey in the class. The third way was that students were asked to fill a survey out online through Survey Monkey, an online cloud survey company. A total of 449 surveys were completed. 55.01% of respondents were male and 44.99% were female. We excluded 45 international students because they have different cultures and backgrounds, which could make the result biased. The measure of race was reduced to white or non-white because the majority of respondents were white, 82.63%. Students were classified by different colleges: business, engineering, art and science, education, Christian studies, and undeclared. 29.4% were business majors, 26.5% were engineering majors, 36.97% were art & science majors, and 9% other. Furthermore, 39.20% of students were freshmen; 26.28% of students were sophomores; 14.48% of students were

juniors; and 20.04% of students were seniors, according to their number of college course credits.

The questions used to measure financial knowledge and percentages of correct responses were:

1. If you, or your spouse, doesn't consolidate your student loan and use the standard payback method how many years do you have to pay off the loan? 5, 10, 15 or 30 years? *44.77% correct*
2. The most liquid asset is: money in a certificate of deposit account, money in a checking account, a car, a computer, or a house? *71.49% correct*
3. The main reason to purchase insurance is to: protect you from a loss recently incurred, provide you with excellent investment returns, protect you from sustaining a catastrophic loss, protect you from small incidental losses, or improve your standard of living by filing fraudulent claims? *72.38% correct*
4. Sara and Joshua just had a baby. They received money as baby gifts and want to put it away for the baby's education. Which of the following tends to have the highest growth over periods of time as long as 18 years, a checking account, Stocks, a U.S. Govt. savings bond, or a savings account? *28.06% correct*
5. The purpose of a debit card is to: obtain a discount on consumer purchases, make credit card purchases, quickly obtain a cash loan, make investments with an investment company, or pay for an item or service from your checking account? *96.21% correct*

The methodology I used here is dummy variable, which means the value of the variable taken account is either 1 or 0. If the respondent answers a financial question correct this was accounted in the data as 1. Otherwise, if the respondent answers wrong, this was accounted as 0. The average score was 3.13 correct out of 5. Only 8.01% of respondents answered every question correctly. 28.06% of respondents answered 4 questions correctly. 39.20% of respondents answered 3 questions correctly. 18.49% of respondents answered 2 questions correctly. 6.01% of respondents answered 1 question correctly. 0.22% of respondents answered 0 questions correctly.

We also asked financial behavior questions because we wanted to find relationships between financial literacy and financial behaviors. The respondents were asked how many financial literacy questions they believed they answered correctly. The average was 3.02 correct out of 5. Besides, respondents were asked how good their math ability was (on a Likert-scale with 5 being the highest and 1 being the lowest); the average response was 3.70 out of 5. Furthermore, respondents were asked whether they had a written or electronic budget that they followed each month. 34.52% of respondents had a budget and followed it each month. Additionally, respondents were asked their level of financial stress. The average was 3.30 out of 5 (on a Likert-scale with 5 being none and 1 being overwhelming). Another question we asked is whether respondents had paid off their credit card each month in last year. 34.07% answered they had not paid it off; 7.35% answered they had paid it off; and 58.57% answered they do not have credit cards. The last question we asked was how much financial risk respondents would be willing to take when they save or make investments. The average score was 2.2 out of 4

(on a Likert-scale with 4 not being willing to take any risk and 1 being willing to take substantial risk to earn substantial returns).

Even though we randomly chose our respondents, we realized that our males were a little bit overrepresented. In our school, females are more than males, but males are more than females in our sample. Also we asked five financial literacy questions, and we tried to diverse these questions to different areas. The problem is that these questions may still not be enough to evaluate how much respondents know about financial literacy. There are 8 double major students, who are difficult to fit into our model, so we chose to exclude these samples. More importantly, the samples gathered from a private, Christian university, so readers should notice that the conclusion may not be able to generalize to other different kinds of universities. While these limitations deserve being aware of and prompt future extensions to the study, the data we gathered from survey is still useful for us to discover the relationship between financial literacy and budgeting behavior.

## **Methodology**

In terms of finding the relationship between financial literacy and budgeting behaviors, the probit and logit model will be used to analyze the data. The reason is that the dependent variable is a binary interpretation of budgeting behavior (=1 if students budget, =0 if students do not budget).

Independent variables were demographics, education, financial literacy questions, and personal discernment. The demographic information includes race, sex, and year in college. Sex is set as a binary variable (=1 if female, =0 if male). Race is considered as a binary (=1 if white, =0 if non-white). The reason why the race is a binary is that 84% of

respondents are white. The variable of year in college increases as respondents are more educated (=1 if freshmen, =2 if sophomore, =3 if junior, =4 if senior). The education considered is respondents' majors. The respondents who are business majors may have already taken courses like business finance, personal finance or other business classes. In this way, majors could play an important role in how much respondents know about financial concepts. For this reason, I reduced groups to business major and non-business major (=1 if business major, =0 if non-business major).

Financial literacy questions account for the number of questions respondents answered correctly. My assumption is that the more questions answered correctly, the more possible to be financially literate, which could impact budgeting behaviors. Personal discernment is used to assess how many financial literacy questions respondents believed they answered correctly. Math is included in the equation because better math ability may relate to better ability to deal with financial issues.

I administered the surveys randomly, so the data is independent and identically distributed. The sample size is  $n=449$  from around 2,200 undergraduates population, making the sample well represented.

After choosing all the dependent and independent variables, the equation is determined:

$$\text{Pr (Budget)} = F(\beta_0 + \beta_1 \text{ Race} + \beta_2 \text{ Sex} + \beta_3 \text{ Year in college} + \beta_4 \text{ Major} + \beta_5 \text{ Number of financial questions answered correctly} + \beta_6 \text{ Math} + \beta_7 \text{ Prediction} + u_i)$$



## Results

The probit and logit models allow me to analyze the budgeting behavior from independent variables I discussed above. The dependent variable is a binary interpretation of budgeting (=1 if students are likely to budget, = 0 if students are not likely to budget).

The results from logit model are reported in Table 1. Using Likelihood ratio test, all the slope coefficients as a whole are statistically significant at 10% level, p-value=0.0718. The McFadden R-square is 0.0224, which means only 2.24% of the variance is explained by the model. The likelihood ratio and McFadden R-square are extremely low, so we have to be aware that the regression may not be statistically significant.

In all independent variables, only major and year in college are statistically significant. The major is statistically significant at 10% level, p-value=0.0745. The sign of major shows students who are business majors are more likely to budget than non-business majors. The business classes can impact on budgeting behaviors. The year in college is statistically significant at 5% level, p-value=0.0407. The sign of the year in college indicates that more years in college are more likely to budget. The number of cases correctly predicted is 294 (65.5%), which is larger than 50%. The model is correct if probability of being correct is 50% to 100%.

Race, Gender, Self-Prediction, Math and the number of financial questions answered correctly are not statistically significant based on the results. In other words, these independent variables do not impact on students budgeting behaviors.

From economic significance perspective, if the year in college increases 1 year, the probability of budgeting behaviors will increase 4.17%, using mean for other independent variables. In other words, if students are freshmen, the probability of budgeting will increase 4.17%. If students are sophomores, the probability of budgeting will increase 8.34%. If students are juniors, the probability of budgeting will increase 12.51%. If students are seniors, the probability of budgeting will increase 16.68%. These are big influences in real sense. In this way, the year in college is economic significance. We do not talk about other economic significance of other independent variables because other independent variables are not statistically significant.

Table 1

Regression Model Regressors	LPM	Logit	Probit	Logit	Probit	Logit	Probit
<b>Major</b>	0.107**	0.472**	0.291**	0.456**	0.281**	0.401*	0.248*
	(0.051)	(0.220)	(0.136)	(0.221)	(0.136)	(0.225)	(0.138)
<b>Race</b>	0.006	0.029	0.023	0.014	0.014	0.002	0.008
	(0.059)	(0.270)	(0.165)	(0.271)	(0.165)	(0.270)	(0.165)
<b>Gender</b>	0.013	0.059	0.039	0.035	0.025	0.091	0.059
	(0.046)	(0.207)	(0.126)	(0.210)	(0.128)	(0.213)	(0.130)
<b>Year</b>	0.044**	0.198**	0.122**	0.196**	0.120**	0.186**	0.114**
	(0.020)	(0.091)	(0.055)	(0.091)	(0.055)	(0.091)	(0.055)
<b>Actual correct</b>	-0.033	-0.150	-0.093	-0.142	-0.087	-0.167	0.090
	(0.023)	(0.104)	(0.064)	(0.105)	(0.064)	(0.105)	(0.061)
<b>Math</b>				-0.069	-0.041	-0.071	-0.043
				(0.097)	(0.060)	(0.097)	(0.060)
<b>Self-prediction</b>						0.148	-0.104
						(0.100)	(0.064)
<b>Constant</b>	0.310***	-0.802**	-0.500**	-0.543	-0.346	-1.028	-0.639
	(0.090)	(0.406)	(0.249)	(0.550)	(0.338)	(0.651)	(0.395)
<b>R-squared</b>	0.029	0.018	0.018	0.019	0.019	0.022	0.023
<b>Adjusted R-squared</b>	0.013	-0.003	-0.003	-0.006	-0.005	-0.005	-0.005
<b>F statistics</b>	2.191	10.322	10.382	10.813	10.845	13.011	13.057
<b>P-value(F)</b>	0.054	0.067	0.065	0.094	0.093	0.072	0.071

What readers have to notice is that my sample only comes from George Fox University, a small private, Christian university. I cannot apply this data to public schools or other different kinds of schools. Some financial questions like investment and student loans pay off may not be thought by students because they do not have income to pay students or invest at this period.

### **Conclusion**

I assumed that financial literacy and budgeting behaviors were related, but the results show that there is no direct relationship between the two of them. Also, gender, race, prediction and math are not related to budgeting behaviors. Only the year in college is statistically significant and indicates that students are more likely to budget when they are older. When students stay at the school for a long period of time, they may begin to be aware of how to spend their money. In this way, juniors and seniors are more willing to budget. One possible reason is that juniors and seniors are seeking for jobs or preparing marriage, so they start to know how important budgeting is for their futures.

From this finding, I suggest that we can help young college students increase their awareness of budgeting as early as possible. For example, we can ask students to enroll in an introduction class of budgeting, helping them prepare for their college lives financially. Even though major affects budgeting behaviors at 10% level of significance, we are not confident enough to conclude that major affects budgeting behaviors. Major could affect financial literacy because business students learned some financial

knowledge from finance classes. However, neither major nor financial literacy affects budgeting behaviors.

The results from the survey are not what I assumed and expected, and even gender, race, math ability and prediction do not affect budgeting behaviors. Budgeting behaviors maybe more related to other factors, such as personal financial situation, family financial education and so on. For instance, students who are under financial pressure may be more likely to budgeting because they have to use every dollar efficiently. Also parents may teach their children to develop budgeting behaviors. More research is needed to discover what factors can impact budgeting behaviors. Even though financial literacy is not related to budgeting behavior, this research is useful because we know we should go to a different direction to analyze budgeting behaviors.

## References

Shiller, Robert J. 2012 *Finance and the Good Society*. Princeton, N.J.: Princeton UP, Print.

*Thank you for taking a few moments to complete this survey. Please do not complete the survey if you have so already. Please circle your answer.*

<p><b>1. My major is in the:</b></p> <p>a) College of Business  b) College of Engineering  c) College of Arts &amp; Sciences  d) College of Education  e) College of Christian Studies  f) I am undeclared.</p> <p><b>2. I would describe myself as:</b></p> <p>a) White or Caucasian  b) Black or African-American  c) Hispanic American  d) American Indian, Alaska Native or Native Hawaiian  e) Other.</p> <p><b>3. Gender:</b></p> <p>a) Female  b) Male</p> <p><b>4. Year in college by credits:</b></p> <p>a) First Year  b) Sophomore  c) Junior  d) Senior</p> <p><b>5. If you, or your spouse, doesn't consolidate your student loan and use the standard payback method how many years do you have to pay off the loan?</b></p> <p>a) 5  b) 10  c) 15  d) 30</p>	<p><b>6. The most liquid asset is:</b></p> <p>a) money in a certificate of deposit account  b) money in a checking account  c) a car  d) a computer  e) a house</p> <p><b>7. The main reason to purchase insurance is:</b></p> <p>a) protect you from a loss recently incurred  b) provide you with excellent investment returns  c) protect you from sustaining a catastrophic loss  d) protect you from small incidental losses  e) improve your standard of living by filing fraudulent claims</p> <p><b>8. Sara and Joshua just had a baby. They received money as baby gifts and want to put it away for the baby's education. Which of the following tends to have the highest growth over periods of time as long as 18 years?</b></p> <p>a) A checking account  b) Stocks  c) A U.S. Govt. savings bond  d) A savings account</p> <p><b>9. The purpose of a debit card is to:</b></p> <p>a) obtain a discount on consumer purchases  b) make credit card purchases  c) quickly obtain a cash loan  d) make investments with an investment company  e) pay for an item or service from your checking account</p>
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<p><b>10. With respect to questions 5 – 8, I believe I answered _____ correctly.</b></p> <ul style="list-style-type: none"><li>a) 0</li><li>b) 1</li><li>c) 2</li><li>d) 3</li><li>e) 4</li><li>f) 5</li></ul> <p><b>11. I am pretty good at math:</b></p> <ul style="list-style-type: none"><li>a) Strongly Disagree</li><li>b) Disagree</li><li>c) Neither Agree nor Disagree</li><li>d) Agree</li><li>e) Strongly Agree</li></ul> <p><b>12. Do you have a written, or electronic budget that you follow each month?</b></p> <ul style="list-style-type: none"><li>a) Yes</li><li>b) No</li></ul> <p><b>13. In general, my level of financial stress is:</b></p> <ul style="list-style-type: none"><li>a) Overwhelming</li><li>b) Severe</li><li>c) Moderate</li><li>d) Low</li><li>e) None</li></ul> <p><b>14. When you compare the expense to the quality of your education. How satisfied are you with the value of the investment you have made in your GFU education?</b></p> <ul style="list-style-type: none"><li>a) Very Dissatisfied</li><li>b) Dissatisfied</li><li>c) Neither Dissatisfied nor Satisfied</li><li>d) Satisfied</li><li>e) Very Satisfied</li></ul>	<p><b>15. In the last year, has there been any month where you have had a credit card balance that you have not paid off in full?</b></p> <ul style="list-style-type: none"><li>a) Yes</li><li>b) No</li><li>c) I don't have a credit card</li></ul> <p><b>16. Which of the statements comes closest to the amount of financial risk that you would be willing to take when you save or make investments?</b></p> <ul style="list-style-type: none"><li>a) I would take substantial financial risk expecting to earn substantial returns</li><li>b) I would take above average financial risks expecting to earn above average returns</li><li>c) I would take average financial risks expecting to earn average returns</li><li>d) I am not willing to take any financial risk</li></ul> <p><b>17. I am a citizen of the United States</b></p> <ul style="list-style-type: none"><li>a) Yes</li><li>b) No</li></ul>
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