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DETERMINANTS OF FINANCIAL LITERACY: EVIDENCE FROM THE UNITED STATES

by

DANA AKIF HAMDAN

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by

DANA AKIF HAMDAN

Approved by:

Dr. Leila Dagher, Associate Professor
Economics
First Reader

Dr. Casto Martin Montero Kuscevic, Assistant Professor
Economics
Second Reader

Date of project presentation: May 2, 2018

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AN ABSTRACT OF THE PROJECT OF

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After the global financial crisis, financial literacy has gained a noticeable position in the global policy agenda. In the period following the house market collapsed passing through the financial crisis, the Americans were reminded to open their eyes about their obsession with debt and highlighted the risks of quick access to finance for under-informed individuals. Unfortunately, only 57% of Americans in the United States are financially literate and many Americans do not have the basic financial skills necessary to develop and maintain a budget, to understand credit and meaning of investment, or to take advantage of the banking system. Because costs of financial illiteracy not only affect individuals but might spread through the society as well, trying to explain its determinants is very important to guide future policies in improving it.

In this paper, we run an ordered-probit model to find whether state-level variables such as poverty rates, unemployment, education, bankruptcy filings, income inequality and percentage of financial sector of GDP can explain differences in financial literacy in the 51 different US states. Empirical results show that in states where high poverty and unemployment rates exists, it's more likely for such states to attain lower financial scores. However, in states where there is high education and bankruptcy filings exists, it's more likely for such states to attain higher financial scores. However, income inequality and percentage of financial sector of GDP are insignificant and in turn are not able to explain financial score variations.

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CHAPTER 1

INTRODUCTION

1.1. Defining Financial Literacy

Financial literacy was introduced in the US in the early 1997 by Jumpstart Coalition for Personal Financial literacy. As any economic or financial concept, financial literacy has been defined in several manners. Financial literacy definitions range between financial literacy being a specific form of financial and economic knowledge, or being the ability to apply that knowledge, or a combination of both. Financial Industry Regulatory Authority (FINRA) defines financial literacy as the understanding of ordinary investors to market ideologies, institutes, policies, and instruments (FINRA, 2003). Similarly, the National Council on Economic Education (NCEE) explains financial literacy as acquaintance with fundamental economic principles, knowledge about the economy and understanding of some key economic relations (NCEE,2005).

However, the Jumpstart Coalition defines financial literacy as the ability to utilize such financial knowledge and skills to run resources efficiently and attain financial security (Coalition,1997). Lusardi & Mitchell (2014) emphasizes that financial literacy is not only about knowing financial concepts, but it is about applying that knowledge in the financial behavior (Lusardi & Mitchell,2014). This was also stressed by Huston who emphasized that financial literacy should always have two aspects the financial knowledge and the financial application (Huston, 2010). Applying this

knowledge ranges between taking effective decisions across a series of financial environments to improving financial well-being and participating in the economic life.

In this paper, we would argue that financial knowledge, behavior and skills, along with their mutual relationships, should all be considered in an initial conceptualization of financial savvy. Financial knowledge represents a basic form of financial literacy and at the same time this financial knowledge is echoed in perceived financial knowledge and marks financial skills that depend on knowledge. Real financial behavior as well depends on all three combined: actual knowledge, perceived knowledge, and skills. At a later stage, the experience gained through financial behavior nourishes back to actual and perceived financial knowledge. Therefore, we stick to defining financial literacy by the knowledge of few fundamental financial and economic concepts along with the ability to apply them wisely in managing resources effectively for a lifetime of financial well-being. Such financial concepts can be summarized broadly by three basic financial ideas: simple and compounded interest rates, nominal and real interest rate (understanding inflation), and basics of risk diversification. Broader measures can be taken by adding new ideas such as knowing the relationship between interest payments and maturity in mortgages, the relationship between bond prices and interest rates, or planning for future life for instance.

1.2. Costs and Benefits of Financial Literacy

Beyond defining financial literacy and determining the aspects it covers, it is important to emphasize the importance of financial literacy in our lives. Lusardi and Mitchell (2014) believes that it is not possible to successfully navigate today's world without being financially literate just as it was not achievable to contribute to and

succeed in an industrialized society without the basic literacy, the ability to read and write. We, as individuals, societies and governments, need to understand that with all the globalization along with the digital technological advancement taking place around us, basic literacy alone is not sufficient any more.

After the global financial crisis, financial literacy has gained a noticeable position in the global policy agenda since the costs of financial ignorance are manifold. The lack of financial literacy was indeed one of the aggravating factors that led to poor decisions on mortgage loans (Atkinson et al., 2011). According to Gerardi et al (2013), massive defaults on subprime mortgages in the recent financial crisis was mainly due to low numerical ability. Moreover, a study done by Hampton (2010) find that those who scored among the highest level for financial literacy were two-thirds less likely to experience foreclosure than those among the lowest group (Hampton, 2010).

Financial literacy is associated with not only bad financial decisions, but also with decreased psychological and physical well-being, a lower standard of living, and greater dependence of government support (Atkinson et al., 2011). To add, high debt accumulation, insufficient savings, and poor planning for the future are all results of financial illiteracy (Kozup and Hogarth 2008). Financially illiterate individuals pick mutual funds with higher costs (Hastings and Ashton,2008), accumulate less retirement wealth, participate less in stock markets (Van Rooij, Lusardi and Alessie, 2012), and experience higher interest rates on loans (Lusardi,2015; Moore,2003; Lusardi, Michaud and Mitchell, 2015; Disney and Gathergood, 2013). In precise figures, Lusardi and Tufano (2009a) find that financially illiterate Americans are bearing 50 percent higher fees, on average, than financially confident individuals (Lusardi and Tufano. ,2009a). Moreover, people with low financial literacy do not tend to refinance their mortgages

when interest rates are falling which results in a loss of around 50-100$ billion annually (Campbell, 2006). Financially illiterate individuals fail to take adequate decisions when borrowing so that they fail to take advantage of cheap opportunities.

In simple words, being financially literate means the ability to manage risks through saving for a rainy day, avoiding signing for an unmanageable loan, as well as overcoming insolvency and high debts. Being financially literate means the ability to know what type of credit to accept, how to perform in relationship with a credit supplier, which organization to choose, and which model of behavior to follow. To add, financially literate individuals can better absorb macroeconomic shocks and eventually are less likely to face negative income shocks during a crisis (Klapper, Lusardi and Oudheusden ,2015).

On a more advance front**,** a financially literate individual is aware of the importance of decreasing risk through diversifying investments across several ventures. Economic costs of under diversification in case of financial ignorance is captured by Calvet et al. study whereby in 2007, a median investor in Sweden faced an annual return loss of 2.9% on a risky portfolio or 0.5% of disposable income (Calvet, 2007). A study using simulations from life-cycle model that integrates financial literacy done by Lusardi et al. (2015) reveals that more than 50% of the observed wealth inequality can be explained by financial literacy alone (Lusardi et al., 2015)

Financial literacy is important for what it can help in improving the financial well-being not only of individuals, but for the whole society as well. Financial literacy is a very essential element for financial empowerment, stability and development. Effects of financial illiteracy are not only on a personal level but also involves the society as well and this was proved by Lusardi and Mitchell (2011). Their paper shows

that when people take poor financial decisions, the cost of those decisions can be transmitted to others once they depend on social safety nets demanding subsequent tax rises (Lusardi and Mitchell, 2011). Financial illiteracy not only can cause individual poverty, but it can contribute to large-scale economic decline. Poor financial decision-making and lack of financial knowledge is attributed as one of the contributing causes of the recession in the early 2000s (Atkinson and Messy,2011). The possibility that household finance may be able to improve welfare is an inspiring one. Apparently, the cost of financial illiteracy is a social problem whereby it transfers not only to the least skillful individuals, but to the society as well; the possibility that household finance may be able to improve welfare is an inspiring one.

1.3. Overview of Financial Literacy in US and Motivation

In the United States, several surveys have been customized to measure financial literacy among the American population. These surveys are: the National Longitudinal Survey of Youth for those who age between 23-28, the Health and Retirement Study (HRS) for those who aged 50 and older, the FINRA, for those aging above 60 and the RAND American Life Panel (ALP) and the National Financial Capability Study covering all ages. All research done on this topic, took one of these main surveys and added some questions depending on their own definition of financial literacy and purpose of the research. Lusardi, Mitchel & Curto, 2010, Lusardi and Tufano, 2015, Moore,2003, Lusardi, Schneider and Tufano, 2011, and Kimball and Shumway, 2006 are all papers that confirm low financial illiteracy in the US. In the HRS results precisely, only about half could answer questions related to first two questions about simple interest and inflation and only one third could answer the first two questions

with an extra question associated with stock diversification correctly (Hung, Parker, and Yoong, 2009).

In the 21st century, and over the course of their adulthood, 15-year old students in the US face instant financial decisions and most are already users of financial services. Of the financial services for individuals are credit and payments services, bank accounts, insurance, deposits, remittance facilities, pension plans and many others (Union of Arab Banks,2017). These financial services and products are not becoming widely accessible, but also increasingly complex and individuals are being offered new and ever-more-sophisticated financial products frequently. Adding to all these complex financial products, the fast economic and technological developments which lead greater global connectedness and significant changes in financial transactions (Atkinson et al., 2011).

The U.S. is home to countless millionaires and billionaires, however, the average American falls behind when measuring financial concepts. According to Financial Literacy Around the World, a Standard and Poor's Rating Services Survey, the U.S. doesn't even make it to the top ten list ranking of the most financially literate countries and takes the 14th place. When tested five questions about inflation, risk diversification, simple and compound interest, only 57% of Americans received a passing score. In 2017, the highest increase since 2007 of $92.2 billion in new credit-card debt was noticed in the US. For the first time ever, total American credit card debt exceeded $1 trillion (Wallet Hub,2018).

All these costs encountered by financially illiterate individuals negatively affecting them and their societies along with all the benefits lost because of financial ignorance triggers that something should be done to improve financial literacy among

the population and limit the alarming trend. This motivated us to deeply study the current situation of high financial illiteracy by dissecting it and describing what can explain financial illiteracy. By finding what explains financial literacy, we may be able to have a better understanding of what determines financial literacy and eventually address the problem gradually.

Most of studies done about financial literacy revolves around how to essentially quantify a financial literacy score of a country, embracing what combination of questions to use in assessment, and specifying the target population along with testing correlations without proposing a well-defined model for empirical testing. To add, even studies that proposed an empirical method to test their hypotheses focus on micro data with individual related data sets. Therefore, our goal is to expand upon this research, and look at how economic indicators of a state, rather than individual factors, can affect the financial literacy rate.

In this paper, we run an ordered-probit model to find whether state-level variables such as poverty rates, unemployment rates, educational spending, lagged bankruptcy filings, income inequality and percentage of financial sector of GDP can explain differences in financial literacy across the 51 different US states. The paper is structured as follows. Section 2 provides a review of the present literature. In chapter 3 we explain the data and the methodology used followed by a demonstration and discussion of the empirical results in Section 4. Finally, in Section 5 we do further investigations to check robustness of results and eventually in section 6 we present some concluding remarks on the results jointly with proposals for future research.

CHAPTER 2

LITERATURE REVIEW

Peng et al (2017) use spatial Durbin model for 51 states in the US during 2009, 2012, and 2015, along with 5 variables which are per capita real GDP, unemployment rate, poverty rate, gini coefficient and educational attainment to study how financial literacy varies between regions and strive to find its determinants. Empirical results show that high levels of GDP per capita and low level of inequality in a specific state, not only increases financial literacy in the state itself but also increases financial literacy in the neighboring state. A troubling result for policymakers, was that lower levels of unemployment leads to lower levels of financial literacy in the state and its neighbors (Peng et al,2017).

Also using data for the 51 states in the US, Bumcrot, Lin and Lusardi (2013) try to relate the differences in the levels of financial literacy to the differences in demographic and economic characteristics. A significant negative relationship between financial literacy and the state-level poverty state was detected (Bumcrot et al.,2013). No statistically significant correlation was found between state financial literacy and each of state foreclosure rates, state unemployment, state bankruptcy rates and percentage of state population receiving public assistance.

On another hand, Lusardi et Mitchell (2014) show that different relations were observed regarding the relation between GDP per capita and financial scores. Results show that while higher GDP per capita is associated with higher financial scores, some countries with lower levels of GDP per capita perform better on financial literacy scores than higher per capita income countries (Lusardi et Mitchell, 2014).

Klapper, Lusardi and Panos (2013) also elaborate on whether income can explain differences in financial literacy or not. Klapper et al. (2013), when discovering the wealthiest 50 percent of economies, find that income, proxied by GDP per capita, tends to be positively related to financial literacy. Results show that 38% of differences in financial scores in these economies can be explained by variations in income across countries. As when considering the poorer half of the economies, no evidence exists to show that association between financial literacy and income.

A considerable contribution by Klapper et al. (2015) is that financial literacy increases with educational attainment (Klapper et al., 2015). Boisclair, Lusardi and Michaud (2017) also report that financial literacy differences are mostly due to differences in educational attainment among provinces in Canada (Boisclair et al.,2017). This is in line with the evidence that people living in a region with higher educational attainment or nearby areas with higher educational attainment can gain financial knowledge via connections with others, their colleagues for instance (Van Rooij et al. 2011).

Long (2013) shows in his paper that the financial recession has affected low-income families the most. Low income families suffered high amount of debt, high unemployment, home foreclosure and insolvencies. In 2010, 30 percent of teenagers and adults spent 30 percent of their income on repaying their debt. Conventional sources of finance, lack of access to banks, harsh creditors, credit cards and lack of saving mechanisms, which are all related to financial illiteracy, are of the main reasons discovered to explain why low-income families are the most vulnerable to financial crisis (Long,2013).

Moreover, Calvet et al. (2007) evaluate Swedish investors' actions that they classified as financial errors. Results show that those with less income and less education were prone to make more financial errors (Calvet et al., 2007). These results have motivated the authors to run a new research to test if income and education can explain financial sophistication as they were able to explain committing financial mistakes. In their 2009's paper, results show that financial sophistication increases significantly with wealth and to a lesser extent with education (Calvet et al.,2009). Campbell also shows that financial literacy is strongly correlated with low income and less education (Campbell,2006). Low financial literacy levels being associated with low income is a result shown by Hastings and Mitchell (2011) and Atkinson and Messy (2011) as well.

Potrich, Vieira and Kirch (2015) show in a study done in Brazil and looking at the influence of socioeconomic and demographic variables on financial literacy that there exists a positive correlation with a person's family income and education level (Potrich et al., 2015). This means that as family income rises by one percent, an individual's financial literacy rate will rise. Donkers and van Soest (1999) assure that in the Netherlands, individuals with higher incomes were more interested in financial matters and end up eventually more financially knowledgeable.

In Monticone (2010) paper, he tries to check if wealth can determine the level of financial knowledge. Results from an instrumental variables regression propose that wealthier household are more probable to invest in financial knowledge. This validates the insights of previous studies by showing that household wealth affects financial knowledge even after removing wealth endogeneity (Monticone, 2010).

CHAPTER 3

DATA AND METHODOLOGY

Many theoretical relations have been proposed to explain the factors that influence financial literacy and rare empirical results were applied. Our purpose is to see how can different state factors explain financial scores in 51 US states. Therefore, in my empirical model my dependent variable is financial score for each state, and my independent variables are state-related explanatory variables that may help in explaining financial scores. To recognize how differences in financial literacy are linked to features of each state, the subsequent channels are considered according to the findings of previous studies.

3.1. Financial Score

In my data set, the financial score can take a range of scores between 0 and 100, 0 being the least financially literate and 100 being the most. The financial score for each state in 2016 is collected from the Wallet hub, whereby three dimensions were taken into consideration in constructing the score; these three dimensions are wallet literacy, financial planning and habits, and financial knowledge and education given the weights 25, 25 and 50 points respectively to sum up to 100 (Wallethub,2016); Table 1 in Appendix I shows details of each dimension used to construct the score. The states with the highest levels of financial literacy tend to be located across the northern half of the country, while the states with the lowest levels of financial literacy are in the eastern and southern parts of the country.

In our model, the financial scores are heterogeneous across the states. We can observe some states with poor financial literacy scores, some with fair score, others with good scores and yet other states with excellent scores. Normalizing financial scores, my ordinal dependent variable now takes discrete codes from 0 to 4, 0 being least financially literate or having "Poor Financial Literacy Scores" and 4 being the most financially literate or having "Excellent Financial Literacy Scores". Therefore, we think of the normalized financial scores as a variable ordered with four different types of states: those with poor, fair, good and excellent financial scores.

3.2. Poverty rate

Financial literacy in each state may be associated with the level of poverty or wealth of the state. Finding high correlations between the wealth of a state, proxied by the median income of households, and poverty rates proxied by individuals below poverty line in each state, we had to eliminate one variable to avoid collinearity between our independent variables (a negative 80% correlation). The chosen variable was individuals below poverty line which is the percentage of the state population below poverty line and obtained from the US Census Bureau. Using this proxy, we will be able to find the relation between the poverty in the state and the level of financial scores in it.

3.3. Unemployment Rate

Financial literacy may also depend on the labor market status, and most of the previous literature focus on individual unemployment status. Unemployment rate is the percentage of unemployed from the labor force and obtained from the US Bureau of

Labor Statistics. Most of previous research show that financial literacy is lowest among the unemployed. However, two different channels can explain the relation between unemployment and financial literacy. First, it can be thought of as the unemployed are less interested in investing in financial knowledge so eventually are less financially knowledgeable. Another channel is that unemployment may pressure the individuals to learn more financial concepts to benefit from its consequences and manage their current wealth properly. Therefore, our results will support one of the two channels that has caused a controversial debate.

3.4. Education

The idea that relates education to financial literacy is the fact that people living in states with higher educational attainment for instance, can either learn some financial concepts through education or through interactions with others as Van Rooij finds in his research (Van Rooii,2011). In our paper, the proxy used for education is the ratio of public educational spending to GDP in 2015; educational spending obtained from the US government spending of fiscal year 2015 and GDP data from Bureau of Economic Analysis.

3.5. Gini Coefficient

Gini Coefficient may have some power in explaining variations in financial scores since it measures income inequality among states. This measure is widely used to assess income inequality and ranges from 0 to 1; 0 reflecting total income equality and 1 being total income inequality. This means states with higher Gini coefficients have higher income inequalities. Some studies show that higher income inequality results in

lower levels of financial literacy because of comparison of income that create a negative behavior arising from having less than others while others find it insignificant in explaining differences in financial scores.

3.6. Bankruptcy filings Statistics

State Bankruptcy Filings rates for 2015 shows the rate of bankruptcies filed in that year and is obtained from the American Bankruptcy Institute. Bumcrot (2013) found that bankruptcy filing is insignificant in explaining financial scores however, our results show the opposite (Bumcrot,2013). Bankruptcy is a legal procedure directed by federal bankruptcy courts. It's planned to help people and corporations remove all or part of their debt or to help them repay a portion of their liabilities. We use such variable to assess whether individuals learn from bankruptcies in the coming year.

3.7. Financial Sector as Percentage of GDP in each state

Thinking about how individuals may learn some financial concepts due to peer effect, it was of an interest to introduce a variable that relates the ratio of financial and services industry in each state as a percentage of state's GDP. In other words, we would like to assess whether having Federal Reserve banks, credit services or insurance industry as the biggest contributor to GDP in a state influences financial scores or not. This can be justified in a sense that if people are more in contact with such institutions, their interest in learning financial concepts to participate grows, as well as the possibility of learning from peer interaction. Out of 11 states having poor financial literacy, non-is dominated by a financial services industry and only one out of the best four performing states (Maine, Minnesota, New Hamphshire and North Dakota) is

dominated with financial services industry. The relationship is not clear and the empirical results will be testing it. A statistical description about the data is presented in table 2 (Appendix I).

3.8. Econometric Modeling

According to the *"Economic Theory"* book by William Green (2003), if the dependent variable can be categorized into more than two categories, possible regressions used can be the multinomial probit or the multinomial logit models, which are the general forms of the binary probit or logit models(Green,2003). However, in my case, financial scores are not only a categorized into two categories but into four as well, so a multinomial probit or logit model is needed. To add, the dependent variable is not only categorized but as well ordinal, meaning that the order of the scores does matter and this implies that the method used should take into consideration the order of the scores.

According to Green, the multinomial probit or logit model assumes that no order exists in the various categories that the dependent variable can take so it mis-specifies the data generating process and lead to in-efficient results (Green,2003). For instance, differences between 1 and 2 is considered the same as the difference between 2 and 3 losing the idea behind the ordering of scores (higher order, higher financial literacy). Therefore, the most suitable method to be used in my empirical part is the Ordered-Probit model whereby it controls for heterogeneity across states (Arellano et al. 1990). It takes order into consideration and the difference between two adjacent data points doesn't matter for the rest of the analysis (Cheung,1996). In other words, ordered probit analysis is a generalization of the linear regression model to cases where the dependent

variable is discrete (Hausman, Lo and Mackinlay, 1992). In this approach, ordered-probit may be the only design that can basically capture the effect of the explanatory variables on financial scores while also accounting for financial score discreteness.

My ordered probit cross-section data model may be denoted as follows:

$$y_i* = X_i\beta + \varepsilon_i$$

where i=1, 2, .. , 51.

The observation rule is as follows:

y = the financial score y* = unobserved financial scores

$$y^* \begin{cases} y^*=1 & \text{If } y^* \leq 0.25; & \text{Poor} \\ y^*=2 & \text{If } 0.25 < y^* \leq 0.5; & \text{Fair} \\ y^*=3 & \text{If } 0.5 < y^* \leq 0.75; & \text{Good} \\ y^*=4 & \text{If } y^* > 0.75; & \text{Excellent} \end{cases}$$

The labelling of the 51 states in the data is arbitrary, however, the ordered-probit model takes care of the natural ordering of the states (Hausman et al.,1992).

The model used in our empirical part is:

$$\textit{Score\_Categories}_i = \alpha_0 + \alpha_1 (\textit{individuals\_below\_poverty\_line}_i) + \alpha_2 (\textit{unemployment}_i) + \alpha_3 (\textit{ratio of public educational spending to GDP}) + \alpha_4 \log(\textit{bankruptcy\_filings}_i) + \alpha_5 (\textit{gini coefficient}_i) + \alpha_6 (\textit{financial sector as percentage of GDP}_i)$$

Where: Score_Categories belongs to J = {1,2,3,4} where each number in J represents one of the categories for the financial score variable and i=1,2 .. , 51 representing the 51 states in the US.

Before running our model, we plotted our main variables against financial scores in each state to check the correlation. Individuals below poverty line and unemployment variables with state financial score, had a negative and steep slope hinting on a strong negative relationship between each of the variables and state financial scores (figures 1 and 2). As for the ratio of public current spending of GDP with State Financial Scores, it had a positive slope, hinting on a positive relationship between education and state financial scores (figure 3); all figures are summarized in Appendix II.

CHAPTER 4

RESULTS

A certain scope should be followed once analyzing any coefficient using this kind of statistical model. In this essence, a positive sign implies a higher probability of fitting to the highest category expressing “Excellent Financial Score” or the “best” while a negative sign implies a higher probability of fitting to the “Poor Financial Score” or the “worst”.

Precisely, a positive value implies a higher probability of realizing a more extreme positive state. In the OLS regression model, the ß represents the amount of change in the observed value of the dependent variable which is brought about by a unit change in the independent variable. However, in the ordered probit model coefficients differ by a scale factor therefore we cannot interpret the magnitude of the coefficients (McKelvey and Zavoina, 1975).

Results of the nine models summarized in table 3 (Appendix I) show that poverty, education, lagged bankruptcies and unemployment are significant with different combination of variables with same sign in all models. Similarly, gini coefficient and financial Sector as percentage of GDP in each state are insignificant in all models. This indicates that unlike gini coefficient and financial Sector as percentage of GDP in each stat poverty, education, lagged bankruptcies, unemployment and poverty can explain difference in financial scores.

Results in table 3 show that individuals below poverty line, which is a proxy for the poverty level in each state, is the dominant explanatory variable and is significant at the one percent level. The beta coefficient for this variable is negative and following the

procedure of analysis related to the ordered probit model, this indicates that in poorer states the probability of attaining higher levels of financial scores is lower. In simple words, the poorer the state the lower the financial literacy. Recall that the coefficients in this model has no direct implications but are used to calculate the probabilities of the marginal effect of poverty on financial scores which is beyond the scope of this research.

Another important explanatory variable was for unemployment. It has a negative value and is significant at the 1 percent level indicating that the higher the unemployment rate in the state, the lower the probability to attain excellent financial scores. In brief, financial literacy is worse with higher unemployment rates. For our results, we can agree with one of two thoughts regarding unemployment which supports that unemployment decreases the interest in learning financial concepts.

One more important explanatory variable was the ratio of public educational spending to GDP that was significant in all models as well. The coefficient is positive indicating that the more educational spending in a state the higher probability to attain excellent state financial scores. This result may be considered as a guide for policy makers and governments willing to improve financial literacy in the states.

The Bankruptcy filings variable, opposing to previous literature, appears to be significant in explaining variations in financial scores. The coefficient of bankruptcy filings is positive showing that when bankruptcy filings in the previous year increases, there exists a higher probability to attain higher financial scores the next year. Bankruptcy help eliminate the debt the moment it is filed, however it will affect the credit history of the individual or corporations for around 7-10 years. Before filing bankruptcy, the individual or corporation search for options to manage their

unmanageable debt one of which is learning about debt consolidation that can combine several high-interest, costlier debt into a separate solo, or lower-interest loan.

Even if out of court efforts didn't work, a meeting with a government-approved credit counselor is done to prove that debt can't be paid. The counselor will assist in measuring the finances, examining possible alternatives to bankruptcy, and creating a personal budget plan. If none on these work, before filing for bankruptcy, an individual or group meeting with a nonprofit budget and credit counseling agency is a must. Once bankruptcy is filed, completing a course in personal financial management is required before the insolvency is settled. Even after bankruptcy where the credit reputation is negative, the individual or corporation will have to start building good credit reputation again and therefore more attention will be given to repaying bills on time, knowing more about how loans and compound interests work to avoid bankruptcies and not to fall back into bad habits that contribute to debt problems initially (American bankruptcy institute,2015).

All these procedures taking place before, during and after bankruptcy, increases financial literacy of the individuals or corporations and their close circle eventually. It is the domino effect whereby people learn from mistakes of others and try to avoid them later.

CHAPTER 5

ROBUSTNESS CHECK

To check for robustness check, we run further investigation by running an LPM – Linear Probability Model and Solving for heteroscedasticity by White procedure. Results summarized in table 4 (Appendix I) are in line with our results earlies. Poverty, Unemployment, and lagged bankruptcy filings are significant in all models with same signs. Analysis of results also show that states with more poverty and unemployment have lower financial scores. The higher the lagged bankruptcy filings in a state, the higher probability to attain excellent state financial scores. As for education, gini coefficient, and financial sector as percentage of GDP in each state all were insignificant failing to have explanatory abilities.

CHAPTER 6

CONCLUSION

In this paper, we run an ordered-probit model to find whether state-level variables such as poverty rates, unemployment, education, bankruptcy filings, income inequality and percentage of financial sector of GDP can explain differences in financial literacy in the 51 different US states. Empirical results show that in states where high poverty and unemployment rates exists, it's more likely for such states to attain lower financial scores. However, in states where high education and bankruptcy filings exists, it's more likely for such states to attain higher financial scores. However, income inequality and percentage of financial sector of GDP are insignificant and in turn are not able to explain financial score variations.

Because this is a new area of economic research, we conclude with thoughts on policies to help fill these gaps. "One of the reasons the rich get richer and the poor get poorer and the middle class struggles in debt is because the subject of money is taught at home not at school" (Robert Kiyosaki, Educational entrepreneur). This highlight on one of our main findings that education positively affects financial scores. The findings indicate directions for policy makers and practitioners interested in targeting areas where financial literacy is low. One direction for public policy could be to better understand the benefits of having more spending on education on enhancing financial scores. Supporting financial education can be perceived by public, private and civil investors as long-term investment in human capital (Bumcrot et al.,2013).

Moreover, recently a lot of research has been conducted on enhancing financial inclusion to boost economic growth, however, a very important element has been disregarded (Gourène, G. A. Z., & Mendy, P.,2017). Financial literacy is a key concept and a pre-requisite for any form of financial inclusion (Union of Arab Banks,2017). Financial inclusion without financial literacy among the population has minimal effects. People who lack the knowledge to effectively use such services can face financial disaster, such as high debt or bankruptcy. It is, therefore, worth exploring the link between financial services and financial literacy in future studies.

APPENDICES

APPENDIX I

TABLES

Financial planning and habits include	-Median Credit Score -Stake of Adults spending more than their income - Share of Adults Paying Only Minimum on Credit Card(s) -Share of Adults with Rainy-Day Monies -Share of Adults Who Save for Their Children's College Education -Share of Adults Who Try to Achieve Long Term - Share of Adults whose Household has a Budget - Share of Unbanked Households - Share of Adults Borrowing from Nonbank Lenders - Share of Adults Who compare Credit Cards Before Applying.
Financial Knowledge and Education	-High-School Financial Literacy Grade -Public High-School Graduation Rate -Share of Adults Who Attended Financial-Education Classes -Counseling Sessions in Past 12 Months -Share of Adults with at Least a Bachelor's Degree.
Wallet Literacy	- Credit inquiries and amounts owed - Types of credit in use - Know dates of paying interest when buying from credit card - Know what type of interest being paid if individual borrows against collateral (like a house or a car) compared to a loan not secured by collateral (like a credit card). - Which type of car insurance coverage will pay to replace a stolen car?

Table 1 - Financial Score Components

	Categories	Poverty	Unemployment	Education	Log(bankruptcy)	Fin	Gini
Mean	2.23	0.13	4.63	0.036	8.88	20.04	0.45
Median	2	0.13	4.80	0.04	9.12	19.59	0.45
Maximum	4	0.20	6.70	0.04	11.1	45.90	0.53
Minimum	1	0.07	2.90	0.01	5.91	12.81	0.41
St Deviation	0.89	0.03	0.95	0.008	1.33	5.40	0.02
Sample	51	51	51	51	51	51	51

Table 1 - Descriptive Analysis of Data Set

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8	Model 9
Individuals below Poverty Line	-19.64* (7.26)	-18.86* (7.26)	-22.49* (7.64)	-18.72* (7.60)	-23.43* (7.83)	-22.98* (8.23)	-19.55* (7.57)	-21.66* (8.00)	-19.47** (8.6)
Unemployment	-0.47** (0.22)	-0.52** (0.22)	-0.62* (0.23)	-0.47** (0.22)	-0.81* (0.26)	-0.81* (0.26)	-0.46** (0.23)	-0.78* (0.26)	-0.77* (0.26)
Ratio of Education Spending to GDP		30.5 (21.2)			54.4** (0.9)	54.59** (24.6)		61.7* (25.41)	63.7* (25.6)
Log (Bankruptcy filings)			0.3** (0.14)		0.42* (0.15)	0.42* (0.16)		0.52* (0.18)	0.55* (0.18)
Financial Sector as % of GDP				0.01 (0.03)		0.0057 (0.03)			0.02 (0.03)
Gini Coefficient							-0.38 (9.83)	-16.48 (12.8)	-19.85 (13.8)
Pseudo R-Squared	0.20	0.225	0.244	0.209	0.284	0.284	0.208	0.297	0.301
Schawrz Criterion	2.382	2.417	2.3675	2.4561	2.349200	2.420	2.459	2.388	2.457

*1%, **5%,*** 10% level of significance. Between parentheses are the standard error.

Table 3 - Ordered-Probit Regression

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8	Model 9
Individuals below Poverty Line	-11.15** (4.66)	-10.51** (4.89)	-11.65* (4.10)	-10.5** (5.1)	-10.99* (4.38)	-10.77** (4.65)	-11.1* (4.59)	-10.94* (4.45)	-10.65** (4.74)
Unemployment	-0.29*** (0.16)	-0.31*** (0.16)	-0.34** (0.15)	-0.29*** (0.16)	-0.37** (0.15)	-0.37** (0.16)	-0.28*** (0.16)	-0.37** (0.16)	-0.36* (0.16)
Ratio of Education Spending to GDP		16.5 (11.34)			19.07 (12.2)	19.1 (12.3)		18.97 (11.86)	18.89 (11.95)
Log(Bankruptcy filings)			0.14*** (0.08)		0.15** (0.08)	0.15*** (0.08)		0.15*** (0.08)	0.15*** (0.08)
Financial Sector as % of GDP				0.008 (0.02)		0.002 (0.016)			0.003 (0.01)
Gini_Coefficient							-0.09 (5.9)	-0.23 (5.47)	-0.47 (5.5)
R-Squared	0.40	0.42	0.44	0.40	0.47	0.47	0.40	0.47	0.47
Schawrz Criterion	2.30	2.38	2.30	2.377	2.33	2.40	2.22	2.40	2.48

1%, **5%, *** 10% level of significance. Between parenthesis are the standard error.

Table 4 - Linear Probability Model OLS model

APPENDIX II

SCATTER PLOT OF VARIABLES AND FINANCIAL SCORES

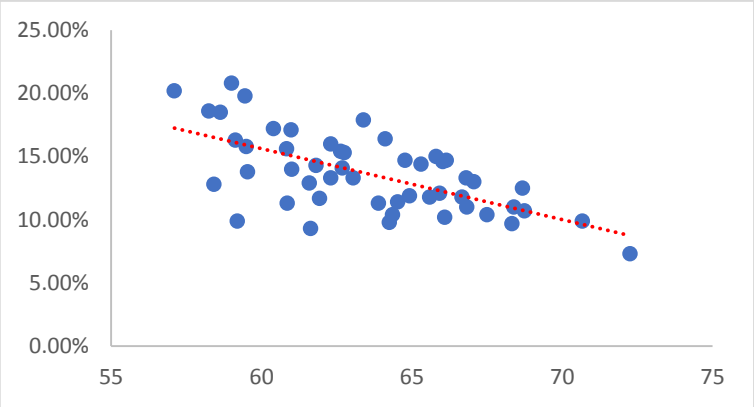

Figure 1 - Individuals below poverty line and State Financial Scores

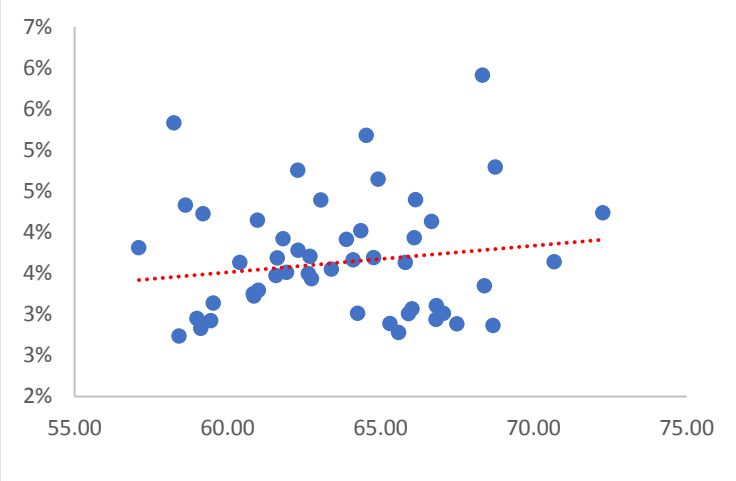

Figure 2 - Ratio of Public Current Spending/GDP with State Financial Scores

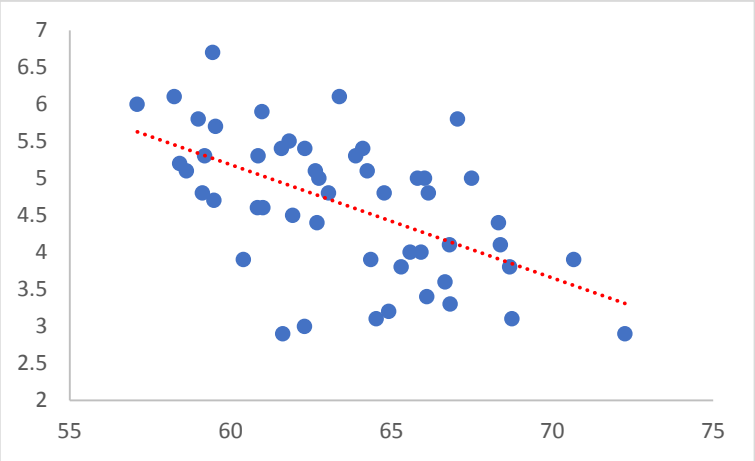

Figure 3 - Unemployment and State Financial Score

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