BUILDING A FINANCIAL CAPABILITY SCORE – AN EXPLORATORY FACTOR ANALYSIS

Abstract

The importance of financial capability and literacy in financial well-being should follow logically... in order for one to make sound financial decisions, a strong foundation of financial knowledge and ability is paramount. However, if this capability is absent, where does one start in building it? Does the answer change based upon demographic characteristics? Does it change based upon income levels? What about a specific type of financial decision making; where does one start if interested in building wealth accumulation skills or just overall financial well-being? Utilizing the 2012 FINRA National Financial Capability Study (NFCS), this analysis, through Exploratory Factor Analysis, seeks to determine which variables within the data set are the key factors determining financial capability. For this analysis I utilize Iterated Principal Axis Factoring to identify the primary factors available in the data set in determining the appropriate number of financial capability constructs that may be extracted from the FINRA study. I utilize this information to construct two indices measuring what constitutes financial capability in the NFCS data set. I then use these variables, which I term the Financial Savvy Index (FSI) and the Social, Program and Experiential Ability Financial Savvy Index (SAFSI), in the analyses in chapters 3 and 4 of this dissertation to measure their influence in wealth building, non-wealth building and wealth detrimental behaviors.
I. Background

In a review of the importance of financial understanding in the education process of the poor, the notion of social, programmatic and experiential “savvy” and financial capability go hand in hand. With the focus of social welfare policy changing from subsidizing daily living through direct cash subsidies to rewarding work through the Earned Income Tax Credit, poor people began to bear a heavier responsibility in lifting themselves above the poverty level. As such, the EITC has grown into the largest cash-assistance, means-tested social welfare programs in the United States (Congressional Budget Office, 2013). The EITC has continually expanded, and the income levels for recipients have risen; thus, by extension, poverty rates have decreased. However, the financial well-being of the working poor remains tenuous due to a lack of wealth and assets in the working poor population (Sherraden, 2008). One barrier to wealth-building and asset-accumulation is be the financial knowledge and financial capability of lower-income individuals, who may not understand the importance of wealth-building behaviors or what wealth-building and asset accumulation actually entail.

During the 21st Century, the global financial landscape has greatly fluctuated, facilitating a necessity for a different type of financial knowledge in order to successfully function in everyday society (Dixon, 2006). As such the financial benefits for working individuals in the United States have changed as well; workers have had to take a greater responsibility for ensuring their financial health and well-being. For instance, pension plans have become increasingly more scarce and, coupling that with the instability or uncertainty of future Social Security benefits for retiring workers, the importance for
individual, personal savings and retirement plans (such as Individual Retirement Accounts and 401k plans) has grown substantially. For low- to moderate-income individuals the ability to successfully save and build or maximize resources is less about efficiency and more about overall well-being. However, many low and moderate-income workers are focused on meeting day-to-day obligations, with little focus on emergency funds or long-term saving. Yet, being able to successfully navigate financial life (through managing expenses, having long-term goals and effectively utilizing financial services and products) is a critical step in establishing financial security and well-being (Center for Financial Services Innovation, 2010) and in improving financial capability (Atkinson et al., 2007). The knowledge of this shift in the way finances should be handled and the need for individual responsibility in preventing destitution or future poverty spells as a result of an income shock, life change or even ultimate retirement is lacking for most workers (Brandon, 2012).

A large portion of financial capability research has focused on financial services and education for the poor in emerging or international economies. However, research studies pinpointing financial literacy and capability are growing. Researchers such as Allgood and Walstad (2012), Lusardi (2011), Lusardi and Mitchell (2011), Lusardi, Mitchell and Curto (2010), and Lusardi and Tufano (2009) all detail financial literacy and, to some degree, the influence of financial literacy on financial behaviors. However, little is known about which areas of financial knowledge comprise the most significant areas of need in the education and building of financial capability for low- and moderate-income households. Further, there is no literature that develops a description of social, governmental programmatic knowledge or experience and the influence this sort of
knowledge has on financial well-being or behaviors. This research seeks to fill this gap by providing a definition and measurement of a householder’s financial capability, termed their financial savvy, along several dimensions or constructs. I will pinpoint the underlying financial constructs measured in the chosen financial capability data set to create two separate indices for measuring financial capability: 1) a financial savvy index (FSI) value that details the overall financial capability of the households surveyed and 2) a social and programmatic ability and experiential financial savvy index (SAFSI) score. The latter incorporates the skill and ability of a householder to bring in money or cash income from multiple sources (some conventional and some not) among low- and moderate-income households. In order to develop a scale for measurement, a clear definition of constructs is needed (DeVellis, 2003).

II. Research Question, Sample and Methodology

To begin this analysis process, a thorough review of the 2012 National Financial Capability Study State-by-State survey (the data set used in this study) is necessary to examine the questionnaire used toward measuring financial capability. A similar process to examine financial capability was conducted in research studies utilizing data sets focusing on populations in the United Kingdom (Atkinson et al., 2006; Atkinson et al., 2007; Taylor, Jenkins and Sacker, 2011; and Taylor, 2009), to examine tax payer motivation (Stephenson, 2010), and as a data reduction technique in microarray gene expression (Kastrin and Peterlin, 2010). This is a necessary process because in order to utilize scoring mechanisms developed in previous studies on financial capability, the
same constructs and survey questions need to be utilized for all future surveys on financial capability. As this concept is still being defined, numerous research study designers have utilized their own conceptual view of the types of knowledge, skill and ability necessary to measure it. This is the process undertaken in the NFCS.

Although there have been more than 44 journal articles, research papers and issues briefs written utilizing NFCS data, none of these develops an index score for financial capability, making understanding of financial capability conclusions reached less precise and generalizable. The largest proportion of research utilizing NFCS data focused on the financial literacy component of the survey (Nicolini, Cude and Chatterjee, 2013; Mottola, 2013; Allgood and Walstad, 2013; de Bassa Scheresberg, 2013; Knoll and Houts, 2012; Lusardi and Mitchell, 2011(a); Lusardi and Mitchell, 2011(b); Robb and Woodyard, 2011; Bucher-Koenen et al., 2014; Lusardi and de Bassa Scheresberg, 2013; Allgood and Walstad, 2012; Robb and Woodyard, 2012; Bumcrot et al., 2011; and Lusardi, 2013). However, several studies measured financial capability (Xiao et al., 2013; de Bassa Scheresberg and Lusardi, 2014; Conroy et al., 2014; de Bassa Scheresberg et al., 2014; Lusardi, 2011; and Lusardi, 2010). None of the financial capability studies used or developed an index measure of financial capability. My research will fill this gap.

Kastrin and Peterlin (2010), in their work to decrease dimensionality of microarray gene data, used Principal Components Analysis (PCA) to create a benchmark for data reduction. This research involves the process of reducing the very large number of variables (genes) measured for each sample (observation). PCA is most useful when the objective is to maximize the variation between constructs or data variables in
extracting a smaller set of covariates (Braun, 2013). As the component parts of any measure of financial capability are expected to pinpoint its primary elements, regardless of the variance between the items, I chose to conduct a factor analytic study rather than a PCA.\(^1\) Stephenson (2010) in the development of a four point scale to measure taxpayers’ motivation to hire a tax preparer utilized both exploratory and confirmatory factor analysis. Exploratory Factor Analysis (EFA) was used to narrow a pool of 76 questions across four separate constructs to 27 items. Confirmatory Factor Analysis (CFA) and coefficient alpha was then used to reduce the scale to 14 items. Stephenson’s study stopped at generating the scale and did not include the final step – factor scoring.

Stephenson (2010) and Atkinson et al. (2006 and 2007) created the roadmap that I use to create my financial capability index scores. I follow the EFA and coefficient alpha value strategies to reduce data variables in the NFCS toward creating my FSI and SAFSI scores.\(^2\) I then use the regression score process, which in essence is similar to the non-refined weighted factor summation scoring process, to generate overall FSI and SAFSI scores, which is the same process followed by Atkinson et al. (2006).\(^3\) Using information from previous qualitative work by Kempson et al. (2005), Atkinson et al. (2006) used investigatory factor analysis to create scores from four different domains believed to constitute financial capability. These domains are:

\(^1\) Factor analysis is utilized in a wide variety of research studies and is a useful technique in determining the underlying structure of a data set (Costello and Osborne, 2005).

\(^2\) Using a coefficient alpha strategy increases the reliability of item responses by eliminating variance due to a single item. Thus, statistical power of the analysis is increased (DeVellis, 2003).

\(^3\) Factor scores obtained through regression scoring are a weighted, linear combination of observed variables, which consider what is shared between the item and the factor (the shared variance) and what is not measured (the uniqueness of the variable or the error term variance. These scores usually average zero (0) with a range from -3 to +3 (DiStephano et al., 2009). This type of weighting is necessary to reflect the relative importance of each question (Atkinson et al., 2006).
• Managing Money
• Planning Ahead
• Choosing Financial Products
• Staying Informed

These domains (previously mentioned in chapter 1 of this dissertation) represent the broad definition of categories for the type of knowledge, skill and ability necessary to measure financial capability.\(^4\) Atkinson et al. arrived at the usage of these domains through statistical analysis and conceptual review of previous qualitative work. To develop my index scores, I will utilize a similar approach, relying on the formerly noted statistical analysis, primarily, to develop the Financial Savvy Index (FSI) score and relying on both statistical analysis and my theorized conceptual review to add the skill and experiential social component to develop the Social Program Experiential Ability Financial Savvy Index (SAFSI) score.\(^5\) This concept is operationalized in the Methodology subsection.

**Sample**

No literature on low- and moderate- income families develops a specific description of financial well-being or describes how financial capability, social and programmatic knowledge and experience influence it. However, many low- and moderate-income households, to make ends meet, are able to maximize limited resources and to creatively find fund sources to improve income and meet financial obligations.

\(^4\) Kempson et al. (2005) define financial capability as elements of three areas: 1) knowledge and understanding, 2) skills, and 3) confidence and attitudes.

\(^5\) Taylor, Jenkins and Sacker (2011) and the Taylor (2009) studies utilized the same process for financial capability scoring as employed by Taylor (2011), which was described in the Literature Review subsection in chapter 1 of this dissertation. Please see that discussion for further details.
Though financial knowledge and capability is lacking in the United States overall (Lusardi, 2011), the credit and benefit maximizing behavior of means-tested-program recipients seems to conflict with the notion that there is little financial understanding or financial knowledge in low-income groups. One foundational piece of literature relevant to this theory is Edin and Lein (1997). They studied how single mothers met household budget requirements with their low-wages and welfare reliance. Edin and Lein noted that there were several methods the women used to make ends meet, including “working” the system by not reporting wages from informal or underground jobs, network strategies, using side jobs and relying on agency-based strategies. In addition to the aforementioned strategies, many individuals who receive cash benefits in means-tested programs exhibit benefit maximizing behavior, whether through misreporting of marital status, changing residences to maintain food stamp levels or working a minimum amount of hours to ensure continued assistance payments, (Fischer, 2013; Gustafson, 2011; Gustafson, 2009). Another interesting finding of the Edin and Lein (1997) study was the notion of welfare-reliant mothers as “long-term strategists” (p. 76). Many of the welfare-reliant women studied planned how they would get out of their current economic hardships and improve their financial standing in the long-run.

This type of ability and thought process will be utilized in my analysis to indicate a measured skill set for low- and moderate-income households. I will utilize this by detailing how the social, governmental program and network utilization of low- and moderate income households amounts to an experiential ability. This ability will be captured by whether or not and to what degree low- and moderate-income households...
gather money or income through these avenues. To do this, I utilize Exploratory Factor Analysis to create a connection between financial knowledge, skills and abilities and social, familial and programmatic involvement by (or better described) adding variables for a social, program and familial income back into the trimmed EFA questionnaire. This will constitute a “social program experiential ability” component to one of the given constructs to be weighted and scored. That will then be added into summation score value originally derived for the FSI variable to create the final SAFSI scores for survey respondents. The FSI and SAFSI sores will highlight the financial capability constructs that are most pertinent in the measurement of overall financial capability in this chapter.

Observations from the entire data set will be utilized in creating both the FSI and SAFSI scores. However, those reported will be for low- and moderate-income households (those with incomes $45,000 per year and below). In relation to the overall EITC population, the EITC completely phases out for all family types at income levels below the $45,000 threshold under 2011 parameters and completely phases out for all family types at income levels below $45,051 under 2012 parameters (TPC, 2014). However, the $45,000 income level is significant in terms of poverty. A large portion of the poor and near poor population in the United States is captured at that income level. Appendix 1 depicts 2012 poverty guidelines for the 48 contiguous states and the District of Columbia and details the number of the poor captured in my sample. The overall sample consists of 25,509 adults across the United States, with approximately 500 respondents per state and the District of Columbia. Respondents were drawn using non-probability quota sampling form established online panels of individuals who were recruited to join and offered incentives for participation. Quotas were set by state to
approximate U.S. Census Bureau distributions for age, by gender, ethnicity, education level and income based upon data from the American Community Survey. These quotas resulted in regional, statewide and national quotas that were comparable to U.S. Census Bureau reports. Appendix 3 details the NFCS survey data table of the sample distribution for age, gender, ethnicity and income at the national level.

Research Question

In this dissertation I theorize that the type of benefit or credit maximizing behaviors often held by those who have participated in social welfare programs constitutes a type of experiential knowledge and ability, which should be measured and credited toward those who do currently or who have within the last year received some sort of cash income from social program sources as a type of skill. This is a general know-how developed by navigating the social service system and demonstrated by the receipt benefits through such programs. This type of knowledge, skill and ability then constitutes some type of additional financial capability.

When first defining the concept of financial capability, researchers posited that a number of behaviors and types of knowledge were at its core. Those constructs essentially fit into the broad categories of keeping track of finances, planning ahead, choosing financial products, staying informed and making ends meet (Taylor, 2009; Dixon, 2006). In this chapter I accomplish three tasks: 1) identify and categorize the strongest/most significant financial constructs within the NFCS data set, 2) use those financial constructs to develop an index for financial capability (FSI), and 3) integrate how an additional construct strictly measuring the influence of social and governmental
program participation and the knowledge, skill and ability to incorporate income from those and additional network sources influence and change the index measure for financial capability, creating a separate index score (SAFSI). As discussed previously, the Atkinson et al. (2006) and Taylor (2011) indicate that financial capability should measure roughly four to five constructs. However, the NFCS asks questions that may pinpoint a greater or lesser number of capability domains with more varied descriptions than those from previous studies on financial capability. As such, the core constructs extracted from the NFCS survey, from which I build my index score, will reflect constructs that:

  (a) Are the same as those theorized to encompass financial capability from previous research studies

  – Or –

(b) Are the same as the benchmark categories for financial capability by NFCS designers

  – Or –

(c) Present a more narrow or varied view of what constitutes financial capability within the NFCS survey.

In essence my study is an analysis of whether the NFCS, through its operationalized construct of financial capability, measures the same constructs of financial capability as defined by previous literature (mainly Atkinson et al., 2006), or measures something else, defining financial capability through different constructs. I term the financial capability

7 Financial capability constructs are defined as Managing Money, Planning Ahead, Choosing Financial Products and Staying Informed (Atkinson et al., 2006). The benchmark categories from the NFCS are Making Ends Meet, Planning Ahead, Managing Financial Products, and Financial Knowledge and Decision Making (FINRA, 2013).
constructs extracted from the NFCS survey as “financial savvy” for the remainder of this dissertation. This is to account for the differences in the benchmark categories designed in the NFCS (construct option b) versus the financial capability domains researched and defined in the literature (construct option a) and the possibility of a completely different set of financial capability dimensions being extracted from the NFCS survey (construct option c). I will limit questionnaire items simply by the EFA process and rely on conceptual view of variables for the construction of SAFSI scores only.

Methodology

To develop the FSI and the SAFSI, I first develop the FSI. This process begins by determining the relevant underlying financial capability constructs. Based upon previous research and NFCS benchmark information, these constructs should reflect a 4-6 dimensional index path. Two different approaches exist in developing an index for measuring financial capability; both approaches involve utilization of the correlation between variables within a data set. The first approach would be to use a set of variables with a high level of correlation and sum their values in order to create an index. The second approach would be to use factor analysis to find the underlying constructs within a data set and then produce a factor score based upon a combination of the various variables. Both methods were employed by Taylor, Jenkins and Sacker (2009) in developing an index to provide a score of an individual’s/household’s financial capability and incapability from the British Household Panel Survey. In their 2009 research, Taylor, Jenkins and Sacker used their measure of financial capability to show how capability changed across individual household characteristics and to describe the link
between financial capability and psychological well-being. The creation of my FSI and SAFSI scores will follow the latter factor analytic approach. Factor analysis will present the most appropriate number of dimensions within the data set because, in analyzing variables for construct extraction, factor analysis “reveal(s) any latent variables that cause the manifest variables to co-vary,” (Costello and Osborne, 2005, p. 2). Meaning the shared variance between variables is separated from the unique and error variance, revealing the underlying factor structure.

These dimensions will constitute the total number of financial capability constructs in the survey. After factor extraction, I will then utilize those constructs to determine an index score. Positive values will represent beneficial financial behaviors and negative values will represent harmful financial behaviors and/or decision making. I will compute factor scores by numerous non-refined methods (DiStefano, Zhu and Mindrila, 2009) and compare them, ultimately relying on the Atkinson et al (2006) approach as the final method. Next, I utilize specification of the knowledge, understanding and capabilities of low- and moderate income households to create a “social, program and experiential ability” component for inclusion into the index calculation, creating the SAFSI score. This calculation will entail building back into the survey question pool the questions that relate to having income sources from one of the three sources operationally listed below. Once this is done, either be a separate construct will be added to existing constructs for scoring or these questions will load, regardless of how highly onto factor components already included in the index. Operationally, “social and program experiential ability” will be the specific questionnaire items relating to money or cash income received from various social sources. The questionnaire items for
this use specifically notes whether the household, over the last 12-months: 1) received income from social security retirement benefits, 2) received income from other federal or state benefits (e.g., unemployment, disability, SSI, TANF), or 3) received money from family members who do not live in your household. The SAFSI (as well as the FSI) will thus be a measure of the combination of variance components across constructs, allowing for specification of a respondent’s core financial abilities within factors, as well as a summation of them. In this dissertation, I focus only on the sum of construct factors for scoring. Individual financial construct scores will be a focus of future research. In addition to the creation of the SAFSI, the development of this type of ability as a correlate in a score of financial capability will allow for future approximation of financial capability for those in various social programs receiving benefits from numerous types of programs and services. As a final step, I review FSI and SAFSI scores and for those in low- and moderate-income households.

Figure 2.1 provides an example of a path diagram for a factor analytic model. The circles represent latent variables in a data set; independent variables are represented by squares, and causality is indicated by arrows. The diagram gives an example of a two-factor model, where the first factor \(F_1\) loads on or influences variables one \(X_1\) and two \(X_2\), and factor two \(F_2\) loads on variables two \(X_2\) and three \(X_3\). Generally, in common or exploratory factor analysis, each variable or measure \(X\) has two contributing sources of variation – the common factor \(F\) or factors-latent variables and a unique factor \(e\). The 2012 NFCS survey is likely to have many more constructs or factors than

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8 The survey breaks this into separate, specific questions in its numbering, so the “social and program experiential ability” influence construct will be calculated from the three sub-questions noted.
the two shown in Figure 2.1, as the NFCS survey is a measure of roughly 122-items.\textsuperscript{9} The factor structure of the measure will be determined through Kaiser’s Criterion/Eigen Value, Scree Plot and a Fixed Percentage of Variance Explained (Costello and Osborne, 2005; Rietveld and Hout, 1993). The Fixed Percentage of Variance Explained for my study will be set at a value between 50 – 65 percent.\textsuperscript{10} This three method approach will be taken in effort to utilize a majority decision approach in determining the underlying factor structure of the data set (Costello and Osborne, 2005). Factors extracted will identify the pattern of dimensions or constructs in the NFCS survey but will also determine which variables have little to no correlational variance and can then be utilized as dependent variables in future empirical models measuring influences of financial capability on various behaviors. This financial capability will be scored through the creation of the FSI and the SAFSI.

Figure 2.1: Simple Factor Analytic Path Diagram

\[
\begin{array}{ccc}
\alpha_1 & \alpha_2 & \alpha_3 \\
\beta_1 & \beta_2 & \beta_3 \\
X_1 & X_2 & X_3 \\
\end{array}
\]


\textsuperscript{9} The term “roughly” is utilized because the NFCS survey numbers and identifies some questions with sub-category answers as individual questionnaire items. Thus, one overarching question with five different types of answers is numbered as and treated as five different questions.

\textsuperscript{10} The typical “rule of thumb” is to retain the factors that account for at least 70 percent of the total variance (Stevens, 1992). However, that rule of thumb applies when considering principal component analysis, which includes more variance to explain. In EFA, lower amounts of explained variance (as little as 50 percent) are acceptable (Beavers et al., 2013).
The National Financial Capability Study was initially commissioned in 2009 by the Financial Industry Regulatory Authority (FINRA) Investor Education Foundation in collaboration with the U.S. Department of the Treasury and President Bush’s Advisory Council on Financial Literacy. It was continued in 2012 with an update of the measures found in the 2009 study and the inclusion of data on social program participation and school loan debt. The 2012 National Financial Capability Study State-by-State surveys cover nationwide online surveys of more than 25,000 U.S. adults. Though the National Financial Capability Study (NFCS) was designed to specifically measure financial capability through several mechanisms (self-assessed capability, understanding of specific financial concepts measured by quiz and financial behaviors on issues/items such as debt, investment, and usage of financial services and instruments), determining the specific underlying financial constructs or factors within the 2012 NFCS will allow me to focus on specific variables aligning with particular constructs for more specialized research on individual wealth-building behaviors in specific population groups, namely low- and moderate-income households.

This type of analysis was chosen because there is precedent for utilizing financial capability as the foundation or center of educational programs focusing on increasing financial literacy (Dixon, 2006; Taylor, 2009), yet there is no universal standard for combining given characteristics or traits to determine a final measure of financial capability. FINRA’s National Financial Capability Studies of 2009 and 2012 measure financial capability for U.S. adults through a combination of surveyed financial
behaviors, practices, abilities and literacy, but neither the studies nor subsequent research works utilizing the studies develop an index of financial capability.¹¹

The FINRA 2012 NFCS State-by-State Survey (hereafter referred to as the NFCS survey) was administered through an online survey by Applied Research and Consulting. Specifically, three sample providers sent out more than 1.1 million email invitations to potential respondents; 68,229 potential respondents reached the survey instrument; 33,866 were terminated due to quotas or because they did not provide demographic information; and another 8,854 dropped out of the survey before finishing, leaving a total sample size of 25,509 adults 18-years-old and older. That number includes roughly 500 respondents per state and the District of Columbia, where quotas were set to approximate Census distributions for age by gender, ethnicity, education level, and income based on data from the American Community Survey of the U.S. Bureau of the Census. The sample came from three different panels supplied by three different sample providers. Across the three providers 1.165 million email invitations were sent to potential respondents, whereby 68,229 respondents reached the survey to begin answering questions. Of those that started the survey, 33,866 were terminated due to quota requirements or refusal to answer demographic questions. An additional 8,854 failed to complete the survey and were counted as drop-outs. This yielded a final 25,509 completed surveys with a response rate of 2.19 percent of survey invitations sent and 39.39 percent of qualified, completed surveys.

¹¹ Other research studies completing this process (Atkinson et al., 2006, Taylor, Jenkins and Sacker, 2009, Capellari and Jenkins, 2007, and Taylor et al., 2004) utilized data sets focusing on populations in other countries. However, none of those studies specifically focused on the low- to moderate-income population or included a variable measuring social program participation, where as those issues are central to this study.
To begin my analysis, a review of the NFCS survey questionnaire items is warranted. Appendix 2 provides an overview of the construction of NFCS variables. The NFCS survey instrument poses a number demographic questions as well as financial questions, with the questionnaire beginning with demographic information and then moving directly into individual/household financial questions. The NFCS survey lists general headings for its financial questions; I regard these as the conceptual benchmark variables for financial capability. However, EFA will determine if those headings truly represent survey constructs or not. The headings include: Financial Attitudes and Behaviors, Financial Advisors, Money Management, Retirement Accounts, Sources of Income, Home and Mortgages, Credit Cards, Other Debt, Insurance and Self-Assessment and Literacy. To begin factor extraction, the overall question pool for analysis must be determined. Of the 119 questionnaire items reviewed in the NFCS survey, 66 of them were excluded at the outset due to simply being a demographic question, not relating to financial behaviors, the respondent being ineligible to answer the question because it applied to military veterans only and due to being of a different type (continuous or otherwise) than the type (rescaled categorical) of all others to be analyzed. That left a total of 53 questionnaire items, which corresponded to 84 different variables. Items within parentheses note the generic variable number for the question within the data set. Dividing sample size by number of scaling questionnaire items gives a ratio of just over 303: 1. This number is significant in determining number of questionnaire items to include or exclude based upon factor loadings. This concept will be discussed in the Analysis/Results section.
Table 2.1: Initial Index Development Questions (Variable No.)

1. Overall, how do you rate your knowledge of saving, investing and debt? (v25)
2. Overall, thinking of your assets, debts and savings, how satisfied are you with your current financial position? (v26)
3. When thinking of your financial investments, how willing are you to take risks? (v27)
4. Over the past year, would you say your household’s spending was less than, more than, or about equal to your household’s income? Please do not include the purchase of a new house or car, or other big investments you may have made. (v28)
5. In a typical month, how difficult is it for you to cover your expenses and pay all your bills? (v29)
6. Have you set aside emergency or rainy day funds that would cover your expenses for 3 months in case of sickness, job loss, economic downturns, or other emergencies? (v30)
7. Have you ever tried to figure out how much you need to save for retirement? (v32)
8. In the past 12 months has your household experienced a large drop in income which you did not expect? (v34)
9. How confident are you that you could come up with $2,000 if an unexpected need arose within the next month? (v35)
10. In the past 12 months have you obtained a copy of your credit report? (v36)
11. In the past 12 months have you checked your credit score? (v37)
12. In the last 5 years have you asked for any advice from a financial professional outside of the military about any of the following: debt counseling, savings and investments, taking out a mortgage loan, insurance of any type, tax planning? (v38, v39, v40, v41 & v42)
13. In a typical month does your household receive income in any of the following ways: cash, checks, direct deposit to a checking or a savings account, prepaid debit cards? (v43, v44, v45 & v46)
14. Do you or your spouse/partner sometimes go to a check cashing store to cash checks? (v47)
15. How did you receive most of your income in the past 12 months? (v48)
16. How does your household pay expenses/bills: cash, check, credit card, bank debit card, prepaid debit card, online payment, money order or cell phone censor swipe? (v49, v50, v51, v52, v53, v54, v55 & v56)
17. Does your household have a checking account? (v57)
18. Does your household have a savings account, money market account, or CDs? (v58)
19. Do you or your spouse/partner overdraw your checking account occasionally? (v59)
20. Not including retirement accounts, does your household have any investments in stocks, bonds, mutual funds, or other securities? (v61)
21. Do you or your spouse/partner have any retirement plans through a current or previous employer, like a pension plan, a Thrift Savings plan or a 401(k)? (v62)
22. Were these plans provided by your employer, your spouse/partner’s employer or both? (v63)
23. Are any of these retirement plans the kind where you or your spouse/partner get to choose how the money is invested? (64)
24. Do you or your spouse/partner have any retirement plans NOT through an employer, like an IRA, Keogh, SEP or any other type of retirement account that you have set up yourself? (v65)
25. Do you or your spouse/partner regularly contribute to a retirement account like a Thrift Savings Plan, 401(k) or IRA? (v66)
26. In the last 12 months have you or your spouse/partner taken a loan from your retirement account(s)? (v67)
27. In the last 12 months have you or your spouse/partner taken a hardship withdrawal from your retirement account(s)? (v68)
28. Over the past 12 months, did your household receive any of the following types of income: salary, wages, freelance pay or tips; payments from a pension plan; withdrawals from retirement accounts; social security retirement benefits; other federal or state benefits, like unemployment, disability, SSI, TANF; income from a business; money from family members who do not live in your household? (v69, v70, v71, v72, v73, v74 & v75)
29. Do you or your spouse/partner currently own any of the following: your home, other real estate (like a second home, investment property or a farm)? (v76 & v77)
30. Do you currently have any mortgages on your home? (v80)
31. Do you have any home equity loans? (v81)
32. Do you currently owe more on your home than you think you could sell it for today? (v82)
33. Have you been involved in a foreclosure process on your home in the last 2 years? (v84)
34. How many credit cards do you have, including store and gas station credit cards, but NOT debit cards? (v85)
35. In the past 12 months which of the following describes your experience with credit cards: I always paid my cards in full; in some months, I carried over a balance and was charged interest; in some months, I paid the minimum payment only; in some months, I was charged a late fee for late payment; in some months, I was charged an over the limit fee for exceeding my credit line; in some months, I used the cards for a cash advance? (v86, v87, v88, v89, v90 & v91)
36. Thinking about when you obtained your most recent credit card, did you collect information about different cards from more than one company in order to compare them? (v92)
37. Does your household currently have an auto loan, not referring to an auto lease? (v93)
38. Do you currently have any unpaid bills from a health care or medical service provider (like a hospital, a doctor’s office, or a testing lab) that are past due? (v94)
39. Do you currently have any student loans? (v95)
40. Have you declared bankruptcy in the last 2 years? (v97)
41. In the past 5 years, how many times have you done the following: taken out an auto title loan; taken out a short term “payday” loan; gotten an advance on your tax refund (sometimes called a “refund anticipation check” or “Rapid Refund”); used a pawn shop; use a rent-to-own store? (v98, v99, v100, v101 & v102)
42. How much do you agree or disagree with the following statement: I have too much debt right now? (v103)
43. Are you covered by health insurance? (v104)
44. Do you have a life insurance policy? (v105)
45. How strongly do you agree or disagree with the following statements: I am good at dealing with day-to-day financial matters, such as checking accounts, credit and debit cards, and tracking expenses; I am pretty good at math? (v106 & v107)
46. On a scale from 1 to 7, where 1 means very low and 7 means very high, how would you assess your overall financial knowledge? (v108)
47. Was financial education offered by a school or college you attended, or a workplace where you were employed? (v109)
48. Do you think financial education should be taught in schools? (v114)
49. Suppose you had $100 in a savings account and the interest rate was 2% per year. After 5 years, how much do you think you would have in the account if you left the money to grow? (v115)
50. Imagine that the interest rate on your savings account was 1% per year and inflation was 2% per year. After 1 year, how much would you be able to buy with the money in this account? (v116)
51. If interest rates rise, what will typically happen to bond prices? (v117)
52. A 15-year mortgage typically requires higher monthly payments than a 30-year mortgage, but the total interest paid over the life of the loan will be less. (v118)
53. Buying a single company’s stock usually provides a safer return than a stock mutual fund. (v119)
IV. Analysis/Results

Though I expected some general trends to develop related to the types of questions that would load onto one factor or another, I held no true hypothesis of what factors and constructs might be extracted, which is a necessary criterion for exploratory factor analyses (Dawes, 1987; Stephenson, 2010). To determine the initial number of factors to retain, I utilized a majority decision approach, reviewing Kaiser’s Criterion/Eigenvalues, Scree Plot, and a Fixed Percentage (here I will focus on roughly 50-60 percent) of Variance Explained. To begin, various variable/question transformations were conducted to put all questions into the same format with five possible response options – “not ascertained” (0), “no/wrong answer/or someone else in my household is better” (1), “I don’t know” (2), “I prefer not to say” (3), and “yes/correct answer/or I’m the best in my household” (4). These slight variable manipulations were necessary to make the data set conformable for matrix manipulation. Missing values were recoded to “not ascertained,” as a review of some of the missing information showed that requested information was on questions that may not have or did not always pertain to the respondent. Additionally, some of the questions and responses analyzed had been slightly transformed from those listed by creating a possibility of more variables from within one questionnaire item, as indicated by the (v#) following each questionnaire item, as shown in Table 2.1.

12 Parallel Analysis can be utilized to determine number of factors as well. However, I chose not to use it here to limit factors because the analysis did not limit factors, instead returning more than 80 factors, which, when paired with the scree plot, pointed to an over extraction problem. Over extraction can occur when factors split and there is a general/overall factor and few to no unique variables in the data set (Wood, Tataryn and Gorsuch, 1996). Upon preliminary review, it appeared that the over extraction problem was due to factor splitting, where few variables loaded onto specific factors, making the data set appear more complex than it really is.
After ensuring all questions were in the same format, I then reviewed the correlation matrix. With 84 variables/items, the correlation matrix was quite complex, showing high, moderate and low correlations across numerous pairs of variables, but most correlations were in the moderate and low range. High correlations were across obviously related items. For instance, owning a home was highly correlated with having a mortgage. In addition to reviewing correlations, I reviewed the headings or sections of the questionnaire; this review showed that there was a possibility that there were a high number of constructs or factors within the data set, as there were ten distinct sections of questions. The EFA process will show which variables or questionnaire items to maintain due to high loading values for specific factors. I conducted pre-factor analysis diagnostic tests (the Bartlett test of sphericity and the Kaiser-Meyer-Olkin test of sampling adequacy). These tests produced large positive values of the test statistics (Bartlett’s test revealed a Chi-square of 7.72e+05 with a p-value of 0.00, and the Kaiser-Meyer-Olkin test produced a measure of sampling adequacy of 0.910), which showed that a good proportion of the variance amongst the variables within the data set might be caused by underlying factors, thus the factor analysis would be useful. In my review of the questionnaire’s headings, I found ten sections, as mentioned previously. I believed that number would be the high limit of factors found in the data set if survey designers were measuring a more contextualized view of what financial capability really was. However, since my goal was to discover the true structure of the data first, I ran my initial exploratory factor analysis without limiting factors to any particular number.\textsuperscript{13} 

\textsuperscript{13} It should be noted that some exploratory factor analyses begin with a hypothesis of how many factors will be extracted or measured. The primary reason for this is the statistical software package utilized in analysis, some of which ask the researcher to specify the number of factors to extract. Additionally, Tabachnick and Fidell (2007) note that in planning a factor analytic study there should be some hypothesis
Upon completing the first factor analysis, with an iterated principal factors option, the exploratory factor analysis returned eleven (11) factors with eigenvalues greater than 1.0, the determining criterion for factor retention through that method. The Scree Plot approach (shown in Exhibit 2.1) showed that though some 80 plus factors (a construct measured for each question in the survey) were possible, a much smaller number should be retained because factors 20 and beyond held eigenvalues very near zero. In the next step, my review of the proportion of variance for which each factor accounted showed that ten factors accounted for nearly 70 percent (69.37 percent, specifically) of the variance, six factors accounted for 57.49 percent, and only four factors accounted for 49 percent. These percentages suggested that limiting factors to a number smaller than the eleven with eigenvalues greater than 1.0 would account for the majority of the variance in the data set. Limiting factors to five (accounting for 53.49 percent of the variance) would include all factors with eigenvalues of 2.0 and above; retaining seven factors (accounting for 57.49 percent of the variance for six factors or 61.20 percent of the variance for seven) would include the only additional factors whose eigenvalues (1.88 and 1.75, respectively) would round to a value of 2.0.
Exhibit 2.1: Initial Question List Eigenvalues

Combining the three approaches (eigenvalue approach, scree plot and percentage of variance explained), I determined that, for my study in the creation of a scale for social and financial savvy, I should retain fewer factors than the eleven with eigenvalues of one or greater. Specifically, the eigenvalues for the first four factors were 11.316, 5.360, 3.591, and 2.760, respectively. The eigenvalues for the next three factors were 2.107, 1.880, and 1.746; each subsequent eigenvalue thereafter held less than a 0.3 difference from the previous factor. My review of these decision criteria and my desire to be thorough led me to limit factors to seven, and rerun the factor analysis to review factor loadings. This limitation resulted in four factors having eigenvalues greater than 2.0 and two additional factors having eigenvalues rounding to 2.0 (1.910 and 1.563, respectively). The remaining factor had an eigenvalue below 1.50. Furthermore, the amount of variance explained was not greatly enhanced adding an additional factor. Four factors accounted for 81.72 percent of variance, or 50.01 percent total; five factors explained
88.76 percent of variance, or 54.32 percent total; and six factors accounted for 94.52 percent of variance, or 57.85 percent total. Thus, I determined that I should probably retain six factors, but I maintained the seven factors and rotated the factor loads to get a clearer picture and to determine my final factors and factor loadings.

After orthogonal\textsuperscript{14} rotation, I then began to eliminate variables with low factor loadings, multiple high factor loadings and variables for factors with few high loadings. Factor 7 had a total of only four loadings above 0.4. These values excluded factor 7 from being reliable enough to warrant inclusion in my scale, as reliable factors have a number of variables with loads of a specific or particular strength.\textsuperscript{15} For a factor to be counted as reliable with loadings in the 0.4 range, it must have ten (10) variables with at least the 0.4 minimum; for a factor to be counted as reliable with factor loads of at least 0.6, it must have four (4) or more variables with at least the 0.6 minimum; for a factor to be counted as reliable with loadings of 0.8 and above, it must have at least three (3) variables with the 0.8 minimum (Stevens, 2002).\textsuperscript{16} Factors 1 through 6 each had variables with loadings adhering to the aforementioned guidelines. Based upon factor loading value limitations, I eliminated a total of 39 items (keeping 50) and retained six factors; I then ran another factor analysis; the scree plot for such is shown in Exhibit 2.2.

\textsuperscript{14}I utilized varimax orthogonal rotation to produce factors that were not correlated with one another in order to identify variables for my new FSI and SAFSI variables that did not have inter-correlated components, which is useful in future analysis with the same variables. Additionally, Atkinson et al. (2006) utilized varimax orthogonal factor rotation as well, and my analysis followed their EFA processes. However, in developing index scores for my SAFSI variable, I utilized promax oblique rotation as well, which allowed correlation between the factors.

\textsuperscript{15}Factor 7 had five variables with marginal loading values (above 0.4) high enough to warrant retention based upon sample size; however, as my goal was to create a scale measuring financial savvy, the questions related to the items with high factor loadings did not contribute information related to any specific knowledge, instead only measuring income diversity. I therefore dropped the factor and eliminated the variables that loaded on it somewhat/highly.

\textsuperscript{16}Stevens (2002) utilized simulation data to determine reliability. He noted that factors may still be reliable with only a few loadings if the data come from a large number of observations (sample sizes of \(n \geq 300\)), which this sample has, but I chose to follow more strict guidelines, keeping factors with loadings between 0.3 – 0.4 only if there were eight (8) loadings or more.
Exhibit 2.2: Secondary Question List Eigenvalues

The number of factors to retain was confirmed by the scree test of the list of secondary questions, shown in Exhibit 2.2.\textsuperscript{17} Thus, my analysis resulted in retaining 50 items/variables in six categories. To measure or test scale construction, I then conducted an alpha (\(\alpha\)) test to define Cronbach’s Alpha. The results produced an \(\alpha\) value of 0.8761, which indicated that the scale was pretty well defined when compared to all other possible 50-item scales measuring the same thing, which here is a measure of financial savvy. I went further in this analysis and tested the individual questionnaire items to see if taking out any particular question would improve the scale reliability coefficient. A few items showed that by removing them individually, I could improve \(\alpha\) value slightly,

\textsuperscript{17} Examining the factor loadings for the 50 variables/items analyzed, yielded three variables with factor loadings that had shifted (two downward slightly from roughly 0.310 to 0.284 and one with two loadings above 0.308). Rather than change the scale again, I kept all items for Alpha Test comparison.
from between 0.0001 to 0.0021 points; due to the small difference in α value, I decided to retain all items, leaving a final scale result of 50 items in six categories.\textsuperscript{18}

It should be noted, however, that high α values can be a sign of multiple scales measuring different things combining to form one long scale with high α values, even though the shorter scales measure different things, which is suggested by this factor analysis. This must be tempered with the redundancy of questionnaire items, however, which is also present in the NFCS. Therefore, I conducted alpha tests for each factor in order to facilitate a weighting value for each individual factor for comparison and possible index creation. I defined the six categories of behavior or constructs as long-term wealth/building assets (F1), sinking/predatory financial vulnerability (F2), staying afloat/budget management (F3), credit card debt management (F4), personal daily financial awareness (F5), and long-term debt (F6), which I will use to make up my overall financial savvy index. Table 2.2 outlines the resulting values of Cronbach’s Alpha for the given factors. As shown, no individual factor had a higher α value than the overall scale alpha of 0.8761. This suggests that scoring of the individual/particular constructs through factor weighting may provide a slightly less precise measure for my FSI score than an overall score on the 50-item scale might.

\textsuperscript{18} A few other items showed that very small, marginal differences could be made by deleting variables. However, I chose to retain them in order to keep the number of variables required with high factor loadings for each factor.
Table 2.2: Factor Cronbach’s Alpha Values

<table>
<thead>
<tr>
<th>F#</th>
<th>Factor Title</th>
<th>Number of Items</th>
<th>Scale Reliability Coefficient</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Long-Term Financial Planning</td>
<td>7</td>
<td>0.8656</td>
</tr>
<tr>
<td>2</td>
<td>Positive Financing</td>
<td>15</td>
<td>0.7804</td>
</tr>
<tr>
<td>3</td>
<td>Making Ends Meet</td>
<td>11</td>
<td>0.8070</td>
</tr>
<tr>
<td>4</td>
<td>Credit Card Debt Management</td>
<td>6</td>
<td>0.8461</td>
</tr>
<tr>
<td>5</td>
<td>Personal Daily Financial Awareness</td>
<td>8</td>
<td>0.6794</td>
</tr>
<tr>
<td>6</td>
<td>Long-Term Debt</td>
<td>3</td>
<td>0.7842</td>
</tr>
</tbody>
</table>

Resulting items retained for index development, along with factor designation and factor loading value, are shown in Tables 2.3 – 2.8. Most items were practically significant (holding a value of plus or minus 0.5, which is middling). Those items that were not practically significant were statistically significant, however, as there were several loadings on the given factors. Therefore, I retained factors as previously noted, based upon Eigenvalue review, scree plot and percentage of variance retained and by statistical significance. Factor loadings helped to determine if a factor was reliable and significant. According to Habing (2003), a factor is reliable if it has:

- 3 or more variables with loadings of 0.8 and any $n$ sample size
- 4 or more variables with loadings of 0.6 and any $n$ sample size
- 10 or more variables with loadings of 0.4 and $n \geq 150$
Factors with fewer loadings and less than meritorious values may be reliable as well with larger sample sizes greater than 300.\textsuperscript{19} This led me to maintain the factor structure described, even with some lower factor loadings. Given the sample size and following the aforementioned guidelines, I deemed the six factors retained to be in the reliable range, with significant factor loading values being as low as 0.30 and as high as 0.90, when loading values were rounded (Habing, 2003; Stevens, 1992).

Of the six factors retained, two of them seem to correlate highly with one of the four foundational financial capability constructs defined by the Financial Services Authority’s (FSA) baseline survey (Atkinson et al., 2006). In that study the first dimension of financial capability that they discovered was Managing Money. This construct relates to keeping track of finances and making ends meet. People with high levels of money management capability are able to ensure that they do not run out of money and live within their means. This dimension highly relates to factors three (Making Ends Meet) and five (Personal Daily Financial Awareness), as those constructs reflect the essence of managing money. Tables 2.5 and 2.7 detail the questionnaire items that make up this dimension of capability in the NFCS survey. For most scoring variables in the Making Ends Meet construct, respondents with affirmative answers and decision-making patterns within that domain will raise their overall FSI and SAFSI scores. The highest scores in this domain directly reflect whether a survey respondent can come up with or find a way to get income in an emergency.

\textsuperscript{19} This notion may account for the overall high number of factors with Eigenvalues greater than one within the overall data set.
Table 2.3: Long-Term Financial Planning – Factor Elements and Loadings

<table>
<thead>
<tr>
<th>Factor # – KMO Value</th>
<th>Item #</th>
<th>Item Description</th>
<th>Loading</th>
</tr>
</thead>
<tbody>
<tr>
<td>F1 – KMO=0.87</td>
<td>v62</td>
<td>Do you or your spouse/partner have any retirement plans through a current or previous employer, like a pension plan, a Thrift Savings plan or a 401(k)?</td>
<td>0.7230</td>
</tr>
<tr>
<td></td>
<td>v63</td>
<td>Were these plans provided by your employer, your spouse/partner’s employer or both?</td>
<td>0.5752</td>
</tr>
<tr>
<td></td>
<td>v64</td>
<td>Are any of these retirement plans the kind where you or your spouse/partner get to choose how the money is invested?</td>
<td>0.8882</td>
</tr>
<tr>
<td></td>
<td>v66</td>
<td>Do you or your spouse/partner regularly contribute to a retirement account like a Thrift Savings Plan, 401(k) or IRA?</td>
<td>0.7515</td>
</tr>
<tr>
<td></td>
<td>v67</td>
<td>In the last 12 months have you or your spouse/partner taken a loan from your retirement account(s)?</td>
<td>0.6627</td>
</tr>
<tr>
<td></td>
<td>v68</td>
<td>In the last 12 months have you or your spouse/partner taken a hardship withdrawal from your retirement account(s)?</td>
<td>0.6482</td>
</tr>
<tr>
<td></td>
<td>v105</td>
<td>Do you have a life insurance policy?</td>
<td>0.3233</td>
</tr>
</tbody>
</table>

This is a positive attribute for everyone, but for low- and moderate-income households, who may not have access to special savings and fund accounts. This is an important area to measure to improve financial capability and stability. However, events outside a respondent’s control, such as a large drop in income, will negatively impact a respondent’s ability to make ends meet. Responses to questions relating to Personal Daily Financial Awareness follow a similar pattern. Most of the questionnaire items that comprise this dimension of financial capability relate to active choices in personal financing. Though not high in factor loading value, whether a respondent knows his or
her credit score and/or has obtained a copy of his/her credit report reflects positively on this domain. Having direct deposit income is the most important element. This may relate to respondents having higher paying jobs or more stable forms of employment, but more analysis is needed to explore how method of receiving income benefits respondents.

Another of the financial capability constructs defined by the FSA is reflected in my Long-Term Financial Planning factor. This factor seems to key in on only one aspect of the FSA’s Planning Ahead financial capability dimension, which may relate to its low scale reliability coefficient of 0.68. For the FSA planning ahead encompassed an awareness of the need to be financially prepared for various types of income shocks, including being able to sustain the household for a period of time with a total income loss. It also involved anticipating and being prepared for major expenses, retirement planning, attitudes about such. Various questionnaire items address preparing for income shocks and being prepared for expenses, but those items were more significantly related to Making Ends Meet in the NFCS study. The only questionnaire items with significant factor loading values for the planning ahead construct related to retirement. The final two financial capability dimensions from the FSA study were Choosing Products and Staying Informed. The factor from the NFCS survey that most closely reflected elements of choosing products is the Positive Financing factor. This factor had the most elements with negative factor loadings. This was due to the number of high cost financial products that survey respondents utilized. Overall, factor scores can be negative for this dimension if respondents’ usage of high cost services to the ratio of more mainstream financial products is more negatively out of balance. There was no particular factor extracted from the NFCS survey that reflected measurement of the Staying Informed dimension of
financial capability. This capability or skill relates to keeping abreast of the financial world and changes to the economy and the availability of various types of financial products.

Table 2.4: Positive Financing – Factor Elements and Loadings

<table>
<thead>
<tr>
<th>Factor # – KMO Value</th>
<th>Item #</th>
<th>Item Description</th>
<th>Loading</th>
</tr>
</thead>
<tbody>
<tr>
<td>F2 – KMO= 0.78</td>
<td>v38</td>
<td>In the last 5 years have you asked for any advice from a professional outside of the military about debt counseling?</td>
<td>0.3802</td>
</tr>
<tr>
<td></td>
<td>v43</td>
<td>In a typical month does your household receive income in any of the following ways: cash?</td>
<td>0.3696</td>
</tr>
<tr>
<td></td>
<td>v46</td>
<td>In a typical month does your household receive income in any of the following ways: prepaid debit cards?</td>
<td>0.4843</td>
</tr>
<tr>
<td></td>
<td>v47</td>
<td>Do you or your spouse/partner sometimes go to a check cashing store to cash checks?</td>
<td>0.373</td>
</tr>
<tr>
<td></td>
<td>v47</td>
<td>Does your household pay expenses/bills by prepaid debit card?</td>
<td>0.4638</td>
</tr>
<tr>
<td></td>
<td>v53</td>
<td>Does your household pay expenses/bills by money order?</td>
<td>0.4521</td>
</tr>
<tr>
<td></td>
<td>v56</td>
<td>Does your household pay expenses/bills by cell phone censor swipe?</td>
<td>0.4951</td>
</tr>
<tr>
<td></td>
<td>v56</td>
<td>Over the past 12 months, did your household receive any of the following types of income: money from family members who do not live in your household?</td>
<td>0.3263</td>
</tr>
<tr>
<td></td>
<td>v75</td>
<td>Have you been involved in a foreclosure process on your home in the last 2 years?</td>
<td>0.3542</td>
</tr>
<tr>
<td></td>
<td>v84</td>
<td>Have you declared bankruptcy in the last 2 years?</td>
<td>0.3266</td>
</tr>
<tr>
<td></td>
<td>v97</td>
<td>In the past 5 years, have you taken out an auto title loan?</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>v98</td>
<td>In the past 5 years, have you taken out a short term “payday” loan?</td>
<td>0.4728</td>
</tr>
<tr>
<td></td>
<td>v99</td>
<td>In the past 5 years, have you gotten an advance on your tax refund (sometimes called a “refund anticipation check” or “Rapid Refund”)?</td>
<td>0.5276</td>
</tr>
<tr>
<td></td>
<td>v100</td>
<td>In the past 5 years, have you used a pawn shop?</td>
<td>0.5543</td>
</tr>
<tr>
<td></td>
<td>v101</td>
<td>In the past 5 years, have you used a rent-to-own store?</td>
<td>0.5227</td>
</tr>
<tr>
<td></td>
<td>v102</td>
<td>In the past 5 years, have you used a rent-to-own store?</td>
<td>0.5413</td>
</tr>
</tbody>
</table>
Table 2.5: Making Ends Meet – Factor Elements and Loadings

<table>
<thead>
<tr>
<th>Factor (F#)</th>
<th>Item #</th>
<th>Item Description</th>
<th>Loading</th>
</tr>
</thead>
<tbody>
<tr>
<td>F3 –</td>
<td>v26</td>
<td>Overall, thinking of your assets, debts and savings, how satisfied are you with your current financial position?</td>
<td>0.6162</td>
</tr>
<tr>
<td>KMO=0.81</td>
<td>v29</td>
<td>In a typical month how difficult is it for you to cover your expenses and pay all your bills?</td>
<td>0.6130</td>
</tr>
<tr>
<td></td>
<td>v30</td>
<td>Have you set aside emergency or rainy day funds that would cover your expenses for 3 months in case of sickness, job loss, economic downturns or other emergencies?</td>
<td>0.7166</td>
</tr>
<tr>
<td></td>
<td>v34</td>
<td>In the past 12 months has your household experienced a large drop in income which you did not expect?</td>
<td>-0.2950</td>
</tr>
<tr>
<td></td>
<td>v35</td>
<td>How confident are you that you could come up with $2,000 if an unexpected need arose within the next month?</td>
<td>0.6405</td>
</tr>
<tr>
<td></td>
<td>v39</td>
<td>In the last 5 years have you asked for any advice from a professional outside of the military about savings and investments?</td>
<td>0.4287</td>
</tr>
<tr>
<td></td>
<td>v42</td>
<td>In the last 5 years have you asked for any advice from a professional outside of the military about tax planning?</td>
<td>0.3347</td>
</tr>
<tr>
<td></td>
<td>v58</td>
<td>Does your household have a savings account, money market account, or CDs?</td>
<td>0.3440</td>
</tr>
<tr>
<td></td>
<td>v61</td>
<td>Not including retirement accounts, does your household have any investments in stocks, bonds, mutual funds, or other securities?</td>
<td>0.5356</td>
</tr>
<tr>
<td></td>
<td>v77</td>
<td>Do you or your spouse/partner currently own any of the following: other real estate (like a second home, investment property or a farm)?</td>
<td>0.3221</td>
</tr>
<tr>
<td></td>
<td>v103</td>
<td>How much do you agree or disagree with the following statement: I have too much debt right now?</td>
<td>0.5213</td>
</tr>
</tbody>
</table>
Table 2.6: Credit Card Debt Management - Variable Elements and Loadings

<table>
<thead>
<tr>
<th>Factor # – KMO</th>
<th>Item #</th>
<th>Item Description</th>
<th>Loading</th>
</tr>
</thead>
<tbody>
<tr>
<td>F4 – KMO=0.85</td>
<td>v87</td>
<td>In the past 12 months, which of the following describes your experience with credit cards: In some months I carried over a balance and was charged interest?</td>
<td>0.7269</td>
</tr>
<tr>
<td></td>
<td>v88</td>
<td>In the past 12 months, which of the following describes your experience with credit cards: In some months, I paid the minimum payment only?</td>
<td>0.7778</td>
</tr>
<tr>
<td></td>
<td>v89</td>
<td>In the past 12 months, which of the following describes your experience with credit cards: In some months, I was charged a late fee for late payment?</td>
<td>0.764</td>
</tr>
<tr>
<td></td>
<td>v90</td>
<td>In the past 12 months, which of the following describes your experience with credit cards: In some months I was charged an over the limit fee for exceeding my credit line?</td>
<td>0.7554</td>
</tr>
<tr>
<td></td>
<td>v91</td>
<td>Thinking about when you obtained your most recent credit card, did you collect information about different cards from more than one company in order to compare them?</td>
<td>0.6769</td>
</tr>
<tr>
<td></td>
<td>v92</td>
<td>Thinking about when you obtained your most recent credit card, did you collect information about different cards from more than one company in order to compare them?</td>
<td>0.4602</td>
</tr>
</tbody>
</table>

One final piece of the FSA survey that directly paralleled the NFCS survey was the financial quiz. This was a part of the survey that was separately scored for right and wrong answers. Both survey instruments provided this information, but I did not include the questionnaire items relating to such in my analysis because those items already had a specific scoring process – whether the response was right or wrong. This portion of the questionnaire has been utilized in direct measure of financial literacy (Bucher-Koenen et al., 2014; Lusardi and Scheresberg, 2013; and Allgood and Walstad, 2012). Two other dimensions were extracted from the NFCS survey as critical elements; both related to
Credit Card Debt Management and Long Term Debt had fewer factor loadings for each but were, nonetheless, significant in measuring financial capabilities from the NFCS survey. Neither of these factors corresponded neatly to FSA financial capability dimensions.

Table 2.7: Personal Daily Financial Awareness – Variable Elements and Loadings

<table>
<thead>
<tr>
<th>Factor # – KMO</th>
<th>Item #</th>
<th>Item Description</th>
<th>Loading</th>
</tr>
</thead>
<tbody>
<tr>
<td>F5 – KMO=0.68</td>
<td>v36</td>
<td>In the past 12 months have you obtained a copy of your credit report?</td>
<td>0.4235</td>
</tr>
<tr>
<td></td>
<td>v37</td>
<td>In the past 12 months have you checked your credit score?</td>
<td>0.4238</td>
</tr>
<tr>
<td></td>
<td>v45</td>
<td>In a typical month does your household receive income in any of the following ways: direct deposit into checking or savings account?</td>
<td>0.5325</td>
</tr>
<tr>
<td></td>
<td>v48</td>
<td>How did you receive most of your income in the past 12 months?</td>
<td>0.5210</td>
</tr>
<tr>
<td></td>
<td>v50</td>
<td>Does your household pay expenses/bills by check?</td>
<td>0.2835</td>
</tr>
<tr>
<td></td>
<td>v52</td>
<td>Does your household pay expenses/bills by bank debit card?</td>
<td>0.3687</td>
</tr>
<tr>
<td></td>
<td>v54</td>
<td>Does your household pay expenses/bills by online payment?</td>
<td>0.4211</td>
</tr>
<tr>
<td></td>
<td>v57</td>
<td>Does your household have a checking account?</td>
<td>0.5139</td>
</tr>
<tr>
<td></td>
<td>v58</td>
<td>Does your household have a savings account, money market account, or CDs?</td>
<td>0.3080</td>
</tr>
</tbody>
</table>

Overall, the higher the score a respondent receives on a particular factor or construct, the higher his or her measured FSI score will be, with negative factor loadings.
having the opposite effect, lowering FSI score. As such, “high” enough negative values can result in a respondent having a negative FSI score. The same scoring analysis is true for the construction of my SAFSI score. Table 2.9 shows summary values for both FSI and SAFSI. Both Regression and Bartlett scoring are given for comparison of FSI construction, but only regression scoring was utilized for SAFSI calculation. SAFSI values are listed showing differences in scoring, based upon type of rotation (varimax orthogonal or promax oblique).

Table 2.8: Long-Term Debt – Variable Elements and Loadings

<table>
<thead>
<tr>
<th>Factor # – KMO</th>
<th>Item #</th>
<th>Item Description</th>
<th>Loading</th>
</tr>
</thead>
<tbody>
<tr>
<td>F6 – KMO=0.78</td>
<td>v80</td>
<td>Do you currently have any mortgages on your home?</td>
<td>0.7968</td>
</tr>
<tr>
<td></td>
<td>v81</td>
<td>Do you have any home equity loans?</td>
<td>0.5639</td>
</tr>
<tr>
<td></td>
<td>v82</td>
<td>Do you currently owe more on your home than you could sell it for today?</td>
<td>0.7726</td>
</tr>
</tbody>
</table>

First, for the FSI scores the differences between the computations are evident. The Bartlett scoring method produces larger coefficients, but these estimates are less accurate in general in terms of mean squared error. The regression scoring estimates are biased. These issues occur because neither estimator follows the assumption that scaled factors have unit variance. However, the bias in regression scoring can be corrected through scaling and shifting the regression scoring estimates to have a mean and standard deviation of a “true” scale, whatever those values may be (from stata.com, factor post
estimation page). This means that were I to rescale regression estimated FSI scores to reflect financial capability scores from a known scale, they would also become true and unbiased. Since there is no such scale, I left scores as is and used regression scoring.\textsuperscript{20} FSI and SAFSI values are generally the same, when comparing values by rotation methods. Thus, my construction of the “social, program and experiential ability” component for the index made very little difference in value.

Table 2.9: Index Score Values

<table>
<thead>
<tr>
<th>Index (Scoring or Rotation Method)</th>
<th>n</th>
<th>Mean</th>
<th>Std. Dev.</th>
<th>Min</th>
<th>Max</th>
</tr>
</thead>
<tbody>
<tr>
<td>FSI (Bartlett with Orthogonal Rotation)</td>
<td>25509</td>
<td>1.74e-09</td>
<td>2.597</td>
<td>-6.326</td>
<td>15.320</td>
</tr>
<tr>
<td>FSI (Regression with Orthogonal Rotation)</td>
<td>25509</td>
<td>5.76e-10</td>
<td>2.322</td>
<td>-5.366</td>
<td>13.331</td>
</tr>
<tr>
<td>FSI (Regression with Oblique Rotation)</td>
<td>25509</td>
<td>-9.43e-11</td>
<td>3.316</td>
<td>-7.734</td>
<td>16.069</td>
</tr>
<tr>
<td>SAFSI (Orthogonal)</td>
<td>25509</td>
<td>1.02e-09</td>
<td>2.319</td>
<td>-5.478</td>
<td>13610</td>
</tr>
<tr>
<td>SAFSI (Oblique)</td>
<td>25509</td>
<td>1.34e-10</td>
<td>3.287</td>
<td>-7.786</td>
<td>16.193</td>
</tr>
</tbody>
</table>

Table 2.10 shows summary values for FSI and SAFSI by income level. Only values for low- and moderate-income households are shown in the table, with observations totaling 12,999 out of the 25,509. When constructing the SAFSI, there were two survey items to add back into the analysis model (please refer to the operational definition in the methodology section). Questionnaire item #73, which is “Over the past

---

\textsuperscript{20} The rotation method for comparison and usage in future multivariate analysis will be varimax orthogonal, following the example of Atkinson et al., 2006.
12 months, did your household receive any of the following types of income: other federal or state benefits, like unemployment, disability, SSI, TANF?” became an element in computing the Positive Financing factor with a factor loading of 0.2738. One of the other spea components, which asked whether the household received money from a family member not in the household, already loaded onto this factor. Though these had relatively negligible factor loadings, these were kept in the model for determination of the significance of the speas in financial wealth building behaviors to be assessed in the remaining empirical chapters of this dissertation. The other component (v72, which read, “Over the past 12 months, did your household receive any of the following types of income: social security retirement benefits?” loaded onto the making ends meet factor, with a loading of 0.3083. The remaining elements comprising the index score for making ends meet are shown in Table 2.5.
Table 2.10: Number of Social and Program Income Sources & Index Scores

<table>
<thead>
<tr>
<th>Income Level</th>
<th>#SPEA Income Sources</th>
<th>Observations n=12,999</th>
<th>Mean</th>
<th>Std. Dev.</th>
<th>Min</th>
<th>Max</th>
</tr>
</thead>
<tbody>
<tr>
<td>Less than $15K</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0</td>
<td>1,355</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>1,575</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>403</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>50</td>
<td>0.748</td>
<td>0.718</td>
<td></td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>SAFSI Score</td>
<td>3,383</td>
<td>-2.219</td>
<td>1.959</td>
<td></td>
<td>-5.478</td>
<td>13.505</td>
</tr>
<tr>
<td>FSI Score</td>
<td>3,383</td>
<td>-2.235</td>
<td>1.931</td>
<td></td>
<td>-5.366</td>
<td>13.228</td>
</tr>
<tr>
<td>$15K to $25K</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0</td>
<td>1,137</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>1,362</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>433</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>50</td>
<td>0.797</td>
<td>0.743</td>
<td></td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>SAFSI Score</td>
<td>2,982</td>
<td>-1.314</td>
<td>2.054</td>
<td></td>
<td>-5.454</td>
<td>13.467</td>
</tr>
<tr>
<td>FSI Score</td>
<td>2,982</td>
<td>-1.354</td>
<td>2.037</td>
<td></td>
<td>-5.346</td>
<td>13.211</td>
</tr>
<tr>
<td>$25K to $35K</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0</td>
<td>1,276</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>1,219</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>352</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>38</td>
<td>0.706</td>
<td>0.729</td>
<td></td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>SAFSI Score</td>
<td>2,885</td>
<td>-0.577</td>
<td>2.035</td>
<td></td>
<td>-5.410</td>
<td>13.467</td>
</tr>
<tr>
<td>FSI Score</td>
<td>2,885</td>
<td>-0.601</td>
<td>2.059</td>
<td></td>
<td>-5.306</td>
<td>13.211</td>
</tr>
<tr>
<td>$35K to $45K</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0</td>
<td>1,823</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>1,551</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>333</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>42</td>
<td>0.625</td>
<td>0.692</td>
<td></td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>SAFSI Score</td>
<td>3,749</td>
<td>-0.038</td>
<td>1.992</td>
<td></td>
<td>-5.371</td>
<td>13.610</td>
</tr>
<tr>
<td>FSI Score</td>
<td>3,749</td>
<td>-0.051</td>
<td>1.987</td>
<td></td>
<td>-5.254</td>
<td>13.331</td>
</tr>
</tbody>
</table>

21 All reported information was calculated for the entire data set (n = 25,509), but my study is only interested in low- and moderate-income households, so only those with income levels <= $45,000 are reported.
V. Discussion

The social program and experiential ability information, as I defined it in the methodology section, and included into the factor analytic process did not point to new a factor that specifically detailed an internal skill set. The knowledge and abilities associated with gathering income from social programs, friends and family applying for, receiving and maintaining eligibility for social programs was not specifically developed within the NFCS study. To better link social and financial knowledge and savvy, further analysis is needed. However; utilizing the three questionnaire items to indicate a special skill did create some additional variance within the given factors found to represent financial capability. Future research and researchers can determine and further develop how individuals using conventional and non-conventional methods of receiving income use those skills to the best of their situation for financial improvement. This will detail how the spea characteristics and traits influence financial capabilities and general, individual strengths, beyond the influence on just a general measure of financial ability. The SAFSI questionnaire items were shown to change the financial savvy index scores, which shows utility for inclusion in future research studies. Future research comparisons may be made between the influences of the general FSI score and the SAFSI score. How the FSI and SAFSI score influence other financial behaviors will be explored in future analysis in this dissertation. To go beyond this study, however, future factor analytic studies may be conducted as specific questionnaire items can be utilized in new and different survey instruments.
Comparison of Measured Financial Capability Components

Future analysis of this type can use specific social programming questions that gather more specific information about participation, type of service, service duration, number of services, previous social program/service usage, etc. to be added to the FSI scale instrument. By adding this information it will allow refinement of the financial savvy index measure to create a specific construct, with the whole instrument then measuring both financial understanding, skill and savvy and that of social, program and experiential abilities. Analysis of Cronbach’s Alpha values will be necessary to highlight how strong or weak such an instrument will be in measuring its intended values. Additionally, confirmatory factor analysis may be utilized to determine if the constructs outlined actually measure what they are intended to measure. For this study, however, I focused on the structure of an existing study and was able to create a scale and score for both, but further analysis is necessary to determine if either the FSI or SAFSI is influential in wealth behaviors.

This study helped to clearly define a measure of financial capability and savvy that was comprised of six different categories: 1) long-term financial planning, 2) positive financing, 3) making ends meet, 4) credit card debt management, 5) personal daily financial awareness and 6) long-term debts. These six constructs form a strong measure of financial savvy with a high value of scale reliability. The FSI scale consists of 50 items in six categories. The six categories combined questions from different sections of the 2012 National Financial Capability Study State-by-State survey. Unlike
the NFCS, however, my FSI scale focused only on the primary constructs found in the NFCS survey to develop a more specific and concentrated measure of financial savvy and capability. Figure 2.2 below provides a breakdown of financial capability constructs as defined by the FSA by Atkinson et al., 2006, as contextualized to provide a baseline by the designers of the NFCS survey and as extracted by this factor analytic process.

<table>
<thead>
<tr>
<th>FSA Index</th>
<th>NFCS Survey Design</th>
<th>Financial Savvy Index</th>
</tr>
</thead>
<tbody>
<tr>
<td>Managing Money</td>
<td>Making Ends Meet</td>
<td>Long-Term Financial Planning</td>
</tr>
<tr>
<td>Planning Ahead</td>
<td>Planning Ahead</td>
<td>Positive Financing</td>
</tr>
<tr>
<td>Choosing Products</td>
<td>Managing Financial Products</td>
<td>Making Ends Meet</td>
</tr>
<tr>
<td>Staying Informed</td>
<td>Financial Knowledge and Decision Making</td>
<td>Credit Card Debt Management</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Personal Financial Awareness</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Long-Term Debt</td>
</tr>
</tbody>
</table>

The NFCS survey was conceptually designed to comprise the FSA definition of financial capability, and the survey provides a rich source of financial information, detailing financial capability by combining a large set of questions. These questionnaire items highlight a large number of general financial constructs, which ultimately measure overall capability. However, the NFCS survey does not provide an index for what is meant by financial capability. My analysis, resulting in the creation of the FSI and SAFSI, details the primary financial dimensions covered in the NFCS survey across six
domains. These constructs correlate with the measures of financial capability conceptualized and designed by the NFCS and the FSA, but they are not exactly the same. The way in which the NFCS presented its questions through its survey instrument indicated a focus on financial constructs that were different than the definition of financial capability from the literature in that some broad categories of questions became overarching dimensions within the survey, instead of just elements of the four primary financial capability constructs. The NFCS appears to have built its survey on the concepts that comprise the financial savvy index (FSI).

A positive trait of the NFCS survey is that smaller subsets of questionnaire items can be utilized to detail specific aspects of financial capability. This is demonstrated by the large number and type of research studies originated using NFCS data. Another strength of the survey is that the core items of the survey (50 and 52 questions) can be combined to provide an overall measure of financial savvy (FSI) and social, program and experiential ability financial savvy (SAFSI), which is what I accomplished through my exploratory factor analysis. These indices have strong internal reliability and confidently measure the constructs as described. These provide an overall index of financial savvy, providing a score and scoring process that can be useful in detailing the relative financial strengths and weaknesses of those surveyed. Another use of the indices is the possibility of using specific clusters of questions to provide an index score for specific financial capability domains.

Each of the six constructs measured have strong internal scale reliability, although the questionnaire items comprising the Personal Financial Awareness only had an alpha score of 0.68. In the FSI, the first of the constructs – Long-term financial planning – has
the strongest scale reliability score (KMO=0.87) of all those measured in the analysis. Individual scores within individual financial dimensions can be utilized in future research studies to pinpoint relative strengths or weaknesses in particular areas of financial savvy and capability. Within each construct there are questionnaire items that influence the construct positively and/or negatively, based upon the respondent’s answers. However, breaking the FSI (and SAFSI) down into smaller components does not greatly decrease the reliability of the analysis. Part of the reason for this is the large number of questionnaire items that make up most of the financial constructs. The use of this scale within service provision organizations and governmental bodies will highlight the areas in which training or education might be useful to positively influence an individual’s financial savvy.

Limitations

In terms of social, program and experiential ability and financial savvy (the SAFSI), the NFCS survey questionnaire items comprising that knowledge and skill (v72, v73 and v75 from questionnaire item 28 in Table 2.1) did not provide or measure enough of the hypothesized skill and ability of low- and moderate-income individuals to create a separate construct for inclusion in the overall index. Further development is necessary to create an instrument that pinpoints and accurately reflects this skill set. In this analysis, adding the aforementioned variables to the FSI index slightly altered the financial constructs measured by the index to create the SAFSI. However, the reliability measurement of the index went down. The scale reliability coefficient of the SAFSI is KMO=0.8759 in comparison to KMO=0.8761 of the FSI. This means that the SAFSI did
very little in changing the measurement of financial savvy, and what it did, slightly diminished the measurement. This scale reliability measure points to another challenge of this study. In creation of the FSI, the scale reliability score of the survey instrument went down from KMO=0.910 for the overall NFCS survey to KMO=0.876 for the FSI. This fact indicates that to get a fuller picture of financial capability, the whole NFCS survey will provide a slightly clearer picture. Though that is true for the specific concepts that comprise financial capability; it is not true for measuring financial savvy.

This study, though initially attempting to create an index score of financial capability, provides an index score for what I termed financial savvy. This concepts correlates to the financial dimensions that make up financial capability in the literature, but they are not exactly the same. Another item of note is that six financial dimensions, rather than four, were extracted for scoring. This is a strength and a weakness of the study. It is a strength in that it details more specifically the traits and abilities measured by the NFCS survey, but it is a weakness in that only four constructs make up what is known to be financial capability. A part of this weakness though comes from the survey itself. In measuring financial capability, it appears that the NFCS survey included a high number of questions measuring a large number of different financial constructs to combine them to give a measurement of financial capability. One challenge of that approach is that in the development of an index score, the actual financial capability concept is not exactly what is measured. Overall, this study found strong evidence for an underlying structure within the NFCS dataset that focused on a fairly comprehensive measure of financial savvy. However, to construct an index measure for financial
capability, the specific questions utilized in the FSA or a more narrow focus for the most important financial capability elements is necessary.
REFERENCES


Kastrin, A. & Peterlin, B. (2010). *Rasch-Based High-Dimensionality Data Reduction and Class Prediction with Applications to Microarray Gene Expression Data*. Ljubljana, Slovenia: University Medical Centre Ljubljana, Institute of Medical Genetics.


### Appendix 1 – United States Poverty Guidelines

#### 2012 U.S. Poverty Guidelines

2012 Poverty Guidelines for the 48 Contiguous States and the District of Columbia

<table>
<thead>
<tr>
<th>Persons in family/household</th>
<th>Poverty guideline</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>$11,170</td>
</tr>
<tr>
<td>2</td>
<td>15,130</td>
</tr>
<tr>
<td>3</td>
<td>19,090</td>
</tr>
<tr>
<td>4</td>
<td>23,050</td>
</tr>
<tr>
<td>5</td>
<td>27,010</td>
</tr>
<tr>
<td>6</td>
<td>30,970</td>
</tr>
<tr>
<td>7</td>
<td>34,930</td>
</tr>
<tr>
<td>8</td>
<td>38,890</td>
</tr>
</tbody>
</table>

For families/households with more than 8 persons, add $3,960 for each additional person.

Poverty guidelines are not listed for Alaska and Hawaii, but they are slightly higher than those listed. Poverty guidelines for Alaska and Hawaii for a family of four were $28,820 and $26,510, respectively, for 2012. Limiting my sample to those households with low- to moderate income levels with a $45,000 will capture poor families with as many as nine members in the 48 contiguous states and the District of Columbia, seven members in Alaska, and eight members in Hawaii (U.S. Department of Health and Human Services, Federal Register, 2012). The $45,000 income level marks 195 percent of the federal poverty level for a family of four. Median household income in 2012 was $51,371 (Noss, 2013). Additionally, the $45,000 income level is lower than the median income level in all states except for Alabama, Arkansas, Kentucky, Louisiana, Mississippi, New Mexico, Oklahoma, South Carolina, Tennessee and West Virginia (Noss, 2013). Some social service programs across states provide services or maintain eligibility for households/individuals with as much as 300 percent of the federal poverty level (see note below), as states determine the income levels for eligibility of various social service programs. However, expanding the sample to income levels above $45,000 would open my study to a larger proportion of households that are closer to middle class than near poor, and this research is geared toward the financial capability and behaviors of those with more meager financial means. There were 12,999 households with income levels at or below $45,000 in the 2012 National Financial Capability Study, State-by-State Survey. [Note: The Medicaid program, for instance, gives benefits to individuals/households with a range of income levels; the 300 percent mark denotes eligibility for disabled children and those in home or community based care in South Carolina. As of January 2014, all individuals nationwide in households with income levels at or below 133 percent of the federal poverty level qualified for Medicaid as a result of the Affordable Care Act of 2010.]
## Appendix 2 – NFCS Variable Structure
(Source: FINRA Investor Education Foundation, NFCS)

<table>
<thead>
<tr>
<th>Variable Name</th>
<th>Variable Label</th>
<th>Measurement</th>
</tr>
</thead>
<tbody>
<tr>
<td>NFCSID</td>
<td>Respondent ID</td>
<td>Nominal</td>
</tr>
<tr>
<td>STATEQ</td>
<td>State</td>
<td>Nominal</td>
</tr>
<tr>
<td>CENSUSDIV</td>
<td>Census Division</td>
<td>Nominal</td>
</tr>
<tr>
<td>CENSUSREG</td>
<td>Census Region</td>
<td>Nominal</td>
</tr>
<tr>
<td>A3</td>
<td>Your gender</td>
<td>Nominal</td>
</tr>
<tr>
<td>A3Ar_w</td>
<td>Age Group</td>
<td>Nominal</td>
</tr>
<tr>
<td>A4A_new_w</td>
<td>Ethnicity</td>
<td>Nominal</td>
</tr>
<tr>
<td>A5_2012</td>
<td>Last Year of Education Completed</td>
<td>Nominal</td>
</tr>
<tr>
<td>A6</td>
<td>Marital Status</td>
<td>Nominal</td>
</tr>
<tr>
<td>A7</td>
<td>Living Arrangements</td>
<td>Nominal</td>
</tr>
<tr>
<td>A11</td>
<td>Number of Financially Dependent Kids</td>
<td>Nominal</td>
</tr>
<tr>
<td>A8</td>
<td>Annual Household Income</td>
<td>Nominal</td>
</tr>
<tr>
<td>A9</td>
<td>Employment Status</td>
<td>Nominal</td>
</tr>
<tr>
<td>A10</td>
<td>Spouse’s Work Status</td>
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</tr>
<tr>
<td>A10A</td>
<td>Retirement Status</td>
<td>Nominal</td>
</tr>
<tr>
<td>A21</td>
<td>Part-time Student Status</td>
<td>Nominal</td>
</tr>
<tr>
<td>A14</td>
<td>Who Has Most Knowledge on Saving, Assets, Debt</td>
<td>Nominal</td>
</tr>
<tr>
<td>J1</td>
<td>Satisfaction with Savings, Assets, Debt</td>
<td>Ordinal</td>
</tr>
<tr>
<td>J2</td>
<td>Willingness for Financial Risk</td>
<td>Ordinal</td>
</tr>
<tr>
<td>J3</td>
<td>Household Spending in the Last Year</td>
<td>Ordinal</td>
</tr>
<tr>
<td>J4</td>
<td>Difficulty Covering Monthly Expenses</td>
<td>Ordinal</td>
</tr>
<tr>
<td>J5</td>
<td>Rainy Day Funds for 3-months of Expenses</td>
<td>Nominal</td>
</tr>
<tr>
<td>J6</td>
<td>Funds for Child’s Education Set Aside</td>
<td>Nominal</td>
</tr>
<tr>
<td>J8</td>
<td>Know How Much is Needed to Retire</td>
<td>Nominal</td>
</tr>
<tr>
<td>J10</td>
<td>Drop in Income Over Last 12 Months</td>
<td>Nominal</td>
</tr>
<tr>
<td>J20</td>
<td>Confidence to Come Up with $2,000</td>
<td>Ordinal</td>
</tr>
<tr>
<td>J11, J12</td>
<td>Checked Credit Report/Score Last 12 Months</td>
<td>Nominal</td>
</tr>
<tr>
<td>K_1, K_2, K_3, K_4 K_5</td>
<td>Sought Money Advice on Debt, Savings, Mortgage, Insurance and Tax Planning</td>
<td>Nominal</td>
</tr>
<tr>
<td>B20_1, B20_2, B20_3, B20_4</td>
<td>Income By Cash, Check, Direct Deposit, or Debit</td>
<td>Nominal</td>
</tr>
<tr>
<td>B11A</td>
<td>Sometimes Use Check Cashing Store</td>
<td>Ordinal</td>
</tr>
<tr>
<td>B21</td>
<td>Receipt of Income in What Form</td>
<td>Nominal</td>
</tr>
<tr>
<td>B22_1, B22_2, B22_3, B22_4, B22_5, B22_6, B22_7</td>
<td>Type of Payment Method: Cash, Check, CC, DC, Pre-Paid DC, Online Direct Payments, Money, Orders, Waving Cell Phone Over Sensor</td>
<td>Ordinal</td>
</tr>
<tr>
<td>B1, B2, B4, B23, B14</td>
<td>Have Checking, Saving/Money Market/CD, Overdrawn Acct, Credit Union, Stocks/Bonds etc.</td>
<td>Nominal</td>
</tr>
<tr>
<td>C1 thru C11</td>
<td>Retirement Acct (Own/Contribute/Withdraw)</td>
<td>Nominal</td>
</tr>
<tr>
<td>D20_1 thru D20_7</td>
<td>Income Sources, including Gov’t Benefit Programs</td>
<td>Nominal</td>
</tr>
<tr>
<td>E(a) thru E20</td>
<td>Home and Mortgage questions</td>
<td>Nominal</td>
</tr>
<tr>
<td>F1 thru F10</td>
<td>Credit Card questions</td>
<td>Ordinal/Nominal</td>
</tr>
<tr>
<td>G1 thru 25_5</td>
<td>Other Debt questions, including Bankruptcy</td>
<td>Nominal/Ordinal</td>
</tr>
<tr>
<td>H1 thru H8</td>
<td>Insurance Policy Ownership questions</td>
<td>Nominal</td>
</tr>
<tr>
<td>M1 thru M11</td>
<td>Self-Assessment &amp; Literacy questions, including the financial capability quiz</td>
<td>Ordinal/Nominal</td>
</tr>
</tbody>
</table>
## Appendix 3 – NFCS Sample Distribution Data Table

<table>
<thead>
<tr>
<th>2012 National Financial Capability Study Data Table (Age, Gender, Ethnicity &amp; Income)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Q#</strong></td>
</tr>
<tr>
<td>-------</td>
</tr>
<tr>
<td>A3</td>
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<tr>
<td>A3a</td>
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