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Financial Literacy, Health Insurance, and Health-Related Financial Behaviors

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Financial Literacy, Health Insurance, and Health-Related Financial Behaviors

Abstract

Research on financial literacy seeks to determine whether costly financial mistakes can be avoided. Decisions all consumers face are whether to purchase health insurance, purchase prescriptions, pursue recommended medical testing, and seek medical help for related problems by comparing perceived costs and benefits. Using data from the National Financial Capability Study, this paper provides evidence that financial literacy is a significant determinant in health insurance demand that also reduces the probability of less desirable health-related financial behaviors.

Keywords

financial literacy, health insurance, health behavior

Cover Page Footnote

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Introduction

As of November 2022, the Bureau of Labor Statistics (BLS) reports that health insurance expenditures make up a non-negligible 0.804% of the entire representative consumption basket used to construct the BLS consumer price index for urban residents (CPI-U). In comparison, the typical consumer spends less on daycare, less on airline tickets, less on vehicle repair, and less on all meat products in a year. Health insurance expenditure in the CPI-U is only related to premiums and does not include medical commodities, medications, copays, or any out-of-pocket medical costs. Health insurance costs make up about a sixth of medical services not related to hospital use, vision, or dental services.[1] Prescription drugs make up another 1.044% of the entire consumer basket with physician services not at hospitals being another 1.900%. Furthermore, the price of health insurance and health-related expenses have been increasing relative to other items in the CPI-U. The decision to purchase health insurance as well as other health-related financial decisions affects every consumer, and mistakes may be costly due to the sizable portion of these expenses in the typical household budget.

Furthermore, the Affordable Care Act (ACA) of 2010 spurred much economic research related to the costs and benefits associated with the health insurance mandate aspect of the bill. Akosa et al. (2013) and Cawley et al. (2015) both focus specifically on the health insurance mandate and the targeting of the ACA for improving health insurance demand across population subgroups.[2] Programs such as Medicaid and Medicare, where eligibility is based on income and age, generate differences in the demand for health insurance based on demographics and socioeconomic status. The ACA expanded both Medicaid and Medicare. Medicaid expansions allowed states to expand benefits, and Medicare limited out-of-pocket expenditures via Part D coverage.[3]

Researchers concerned with *financial literacy* seek to examine whether financial knowledge can help individuals avoid costly financial mistakes that lead to undesirable pecuniary or non-pecuniary outcomes. Lusardi and Mitchell (2023) discuss the value of studying financial literacy, and there is a new *Journal of Economic Literature (JEL)* code designated for this purpose (G53). Financial products have become more complex over time. Lusardi and Mitchell (2011) demonstrate that alternative financing options through auto title loans, tax refund loans, and payday lenders have increased credit availability that have large

[1]Based on author's calculations using the Bureau of Labor Statistics 2022 CPI-U.

[2]See French et al. (2016) for a review of the provisions and literature related to the ACA.

[3]See Schwartz et al. (2013) for more detail on the alterations to Medicaid and Medicare from the ACA.

consequences in terms of higher annual percentage rates (APR). Similarly, Poterba et al. (2008) show that the structure of retirement planning has shifted from pensions with a financial intermediary to defined contribution plans and 401(k) policies that place more responsibility on individuals to plan and forecast for their retirement. Financial decisions are becoming increasingly more complex, and the burden is shifting to individuals to make more complicated financial decisions. Mistakes in financial decisions from a lack of financial literacy can lead to individuals outliving their retirement savings, being financially paralyzed from compounding loan interest, or losing their homes from miscalculating mortgage costs.

While the costs of low financial literacy can be high, the costs of being uninsured can also be harmful. Currie and Madrian (1999) and Gruber and Madrian (2002) review the literature on labor market outcomes and show that health insurance can have a large impact on wages, earnings, labor supply, hours, occupational choice, job mobility, turnover, retirement, and the structure of employment. Ahuja and Jutting (2004) assert that health insurance can provide a way for poor households to avoid falling into a poverty trap. Robust insurance markets may be an indicator for economic growth, as seen in Hussels et al. (2005). Insurance considerations are crucial at the micro and macro level, and health-related financial decisions affect most households. If financial literacy aids in avoiding costly financial mistakes and health-related financial decisions are expensive, there may be a link between financial literacy and health-related financial decisions.

Financial literacy may affect insurance demand and health-related financial decisions through multiple channels. The application process for insurance can be difficult and time-consuming. There may be reason to believe that financial literacy eases the strain of applying for insurance, makes the insurance application process more likely to be successful, or eases administrative navigation of health-related financial decisions. More conceptually, financially literate individuals may better recognize the value of health insurance as a way to mitigate risk which would also increase insurance demand. Financial literacy may contribute to understanding the value of health insurance or understanding health insurance institutions, which would result in higher demand for health insurance and fewer health-related financial mistakes.

Literature

This paper blends two literatures. The first literature is on financial literacy which relates the ability of individuals to make financial decisions that lead to real financial

consequences in a climate of increasing complexity surrounding financial decisions. A review of topics in financial literacy can be found in Lusardi and Mitchell (2014), which covers short-term borrowing, retirement, savings, credit, mortgages, student loans, and annuities, among other topics. Other main research questions related to financial literacy seek to identify similarities or patterns that are correlated with sub-optimal financial behavior or undesirable financial outcomes.

Canonical models in financial decision-making include rational agents who aim to optimize consumption decisions over time to smooth utility. One of the main assumptions in these models is that individuals are indeed rational maximizers that are capable of complex optimization given changing macroeconomic factors and financial constraints. In practice, individuals have a proclivity to make mistakes that cause sub-optimal outcomes. These shortcomings have been shown to lead to optimization mistakes in day to day financial skills (Hilgert et al. 2003), investment decisions in the stock market (Van Rooij et al. 2011), retirement planning (Lusardi and Mitchell 2007), mortgage interest (Moore 2003), mortgage refinancing (Campbell 2006), unsecured loan interest (Stando and Zinman 2009), and identifying transaction fees (Lusardi and Tufano 2015). Taken together, financial mistakes can be costly over a lifetime. The volume of mistakes, types of mistakes, and time horizon impacted by mistakes can dramatically reduce wealth accumulation and consumption over the life cycle.

Financial literacy varies across population subgroups and demographics. Financial literacy has been shown to be hump-shaped during the life cycle of individuals, suggesting that the young and old are more likely to be financially illiterate, as found in Lusardi et al. (2017) and Agarwal et al. (2009). Those with more financial literacy are typically more educated, male, and non-minorities (Lusardi and Mitchell 2008). Additionally, Allgood and Walstad (2013) show that those who misperceive their own financial literacy are likely to make financial mistakes regardless of whether the misperception is an overestimate or underestimate.

The second literature strand addressed in this paper is insurance demand. The concept of risk aversion and its relation to insurance[4] goes back to seminal works by Pratt (1964) and Arrow (1971) with extensive theoretical and empirical contemporaries. Cutler and Zeckhauser (2000) review the empirical literature on adverse selection and report a general consensus about the positive correlation between risk behavior and insurance coverage. Models of insurance demand typically focus on readily observed demographic characteristics or indicators of socioeconomic status. These models usually fail to take human capital in the form

[4]The concepts of moral hazard and adverse selection are formalized by Arrow (1963) and Rothschild and Stiglitz (1976), respectively.

of financial literacy into account when individuals make the decision whether to purchase health insurance. Broadly, insurance is purchased by consumers as a way to reduce economic hardship from out-of-pocket expenses in the case of an adverse event, effectively smoothing income and consumption over time. If financial literacy is a way to reduce costly financial mistakes, financial literacy is expected to have a positive impact on health insurance demand.[5]

Perhaps the most similar paper to this work is Allgood and Walstad (2016) which provides empirical evidence that perceptions about financial literacy affect various financial behaviors including increasing the probability of purchasing health insurance between 1.23% and 3.86%, depending on the level of misperception. This paper deviates in the measure of financial literacy and the use of more recent data.

This paper contributes to the literature through the estimation of the empirical relationship between health insurance, health-related financial behaviors, and financial literacy. The main questions of interest are whether financial literacy has an impact on the decision to purchase health insurance and whether financial literacy has an impact on health service avoidance due to cost. One aspect that neither literature strand has addressed is the direct relationship between health-related financial behaviors and financial literacy. Health insurance and health behaviors are financial decisions that can have a significant impact on individuals, and financial literacy is demonstrated to be a contributing factor to the decision to purchase health insurance and seek treatment for medical concerns.

Data

Data for the empirical work come from the National Financial Capability Study (NFCS)[6] conducted by ARC Research and financed by the Financial Industry Regulatory Authority (FINRA) Investor Education Foundation since 2009. The NFCS is a nationally representative online survey of individuals that takes place every three years and includes almost 150 questions. Around 500 individual respondents are surveyed in each state including the District of Columbia for national representation. Specifically, the 2018 wave of the NFCS has 27,091 observations from all fifty-one regions. Quotas for demographic subpopulations on age, gender, ethnicity, education level, and income are based on the American Community Survey portion of the Census and allow for survey weighting.

Survey questions in the NFCS are grouped by topic where the topics include

[5]While a literature on insurance supply and equilibrium exists, supply factors are not observed in the data in this paper. For that reason, the empirical strategy focuses on individual health insurance demand.

[6]The waves of the NFCS at the Financial Industry Regularoty Authority (2018) can be accessed at https://www.usfinancialcapability.org/downloads.php.

extensive demographic information, financial attitudes and behaviors, banking, retirement accounts, government benefits, home and mortgages, credit cards, other debt, insurance, self-assessments, and financial literacy. State is the smallest geographic regional identifier. Descriptive statistics for the 2018 wave of the NFCS are in Table 1. Panel A shows the main controls of interest and the financial literacy mean scores. Panel B shows the outcome variables.

Table 1
Summary Statistics — NFCS 2018 Wave

	Mean	St.Dev.	Min	Max
Panel A				
Big Five	2.77	1.44	0	5
Household Income	4.57	2.09	1	8
Male	0.44	0.50	0	1
White	0.71	0.46	0	1
Marital Status	1.76	1.03	1	5
Employment Status	1.51	0.99	0	3
Age Group	3.24	1.43	1	6
Education	4.46	1.71	1	7
Has Financial Dependents	0.65	0.48	0	1
Number of Financial Dependents	0.83	1.13	0	4
Spouse/Partner Employment Status	0.96	1.04	0	3
Has Second Job	0.32	0.47	0	1
Financial Education Offered	0.62	0.87	0	2
Financial Education Required	0.20	0.40	0	1
Panel B				
Health Insurance	0.89	0.32	0	1
Has Medical Debt	0.27	0.45	0	1
NOT Filled Rx	0.20	0.40	0	1
SKIPPED Recommendation	0.24	0.42	0	1
NOT Go To Doctor	0.26	0.44	0	1
Observations	16,190			

The NFCS has several features that help answer the proposed research question. Each three-year wave introduces new, more relevant questions to financial consumers as well as updating some existing questions. Waves of the NFCS can be treated as repeated cross-sections for questions that have been unaltered between waves. The closed-ended nature of the responses allows for easy comparisons and aggregations between respondents, across waves, and more questions in the survey while keeping the time investment low for respondents.

An essential section in the NFCS for answering the proposed research question is the Big Five[7] financial literacy questions which are a common metric used to standardize the quantification of financial literacy.[8] These questions cover

[7]See Hastings et al. (2013) for a full explanation of the Big Five.

[8]The questionnaires are available on the FINRA Foundation website, and the Big 5 are questions M6, M7, M8, M9, and M10 on pages 31, 32, and 33 in the 2018 wave. Visit https://www.finrafoundation.org/sites/finrafoundation/files/NFCS-2018-State-by-State-Qre.pdf to view the full questionnaire from 2018.

five components of financial decision-making to assess basic understanding of interest accrual on savings, bond prices, inflation, portfolio diversification, and the interest costs of borrowing money. The first three topics are given as multiple choice questions, and the latter two are true/false questions. In each question, respondents can answer "Don't know" or "Prefer not to say," and these are treated as incorrect answers so each respondent either does or does not answer correctly. The sum of correct answers to these five questions gives a financial literacy score between 0 and 5.[9] If financial literacy is predictive of health insurance demand and health behaviors, coefficients will be positive for the probability of the respondent having health insurance and negative for the probability of carrying medical debt or avoiding medical services due to the cost.

The average financial literacy score in the 2018 NFCS wave is 2.77, which shows that the average survey respondent answered more questions in the Big Five correctly than incorrectly. The average respondent has income between $35,000 and $75,000 and is between 35 and 44 years old. The sample is more female than male, mostly Caucasian, and has at least some college credits with no degree, on average. Most of the sample have at least one financial dependent. At 89%, a large majority of respondents indicate having health insurance. The other health-related financial outcomes listed in Panel B have more variation than health insurance, but each represents about a quarter of respondents.

Summary statistics for the 2015 wave of the NFCS are in Table 2. The average financial literacy score in the 2015 NFCS wave is 2.90 which is slightly larger than the 2018 wave. The average respondent in the 2015 NFCS wave is similar by age, education, race, and sex to the 2018 NFCS wave. The health-related financial outcomes have slightly smaller magnitudes in Panel B of Table 2 than Panel B of Table 1.

The empirical analysis restricts the sample of respondents to those who did not select "Don't know" or "Prefer not to say" as responses to the outcome variables and covariates. The financial literacy score measure treats "Don't know" or "Prefer not to say" as incorrect responses. Further, the sample is restricted to respondents in non-retired households. These limitations give results that have a clearer interpretation and attribute to different sample sizes across outcomes.

To estimate financial literacy's impact on the decision to purchase health insurance, the NFCS includes information on whether individuals have health insurance, financial literacy, and demographic characteristics allowing for empirical investigation. The NFCS is limited in answering the research question because the section on health insurance was newly added in the 2015 wave, the

[9]Reviews and discussions on the measurement of financial literacy can be found in Lusardi and Mitchell (2014) and Hastings et al. (2013).

health section has only one question on health insurance on the extensive margin, and the question does not allow for a distinction between different types of health insurance such as Medicaid, Medicare, or private insurance. Given the cross-sectional nature of the NFCS, the 2015 wave is used to provide a more complete picture of financial literacy and health insurance demand by using a different sample of individuals and the same survey questions. Descriptive statistics for this wave are in Table 2. Taken together, the NFCS data source will provide a starting point to further investigate the relationship between financial literacy, health insurance, and potentially health-related outcomes.

Table 2
Summary Statistics — NFCS 2015 Wave

	Mean	St.Dev.	Min	Max
Panel A				
Big Five	2.90	1.44	0	5
Household Income	4.46	2.07	1	8
Male	0.44	0.50	0	1
White	0.70	0.46	0	1
Marital Status	1.73	1.02	1	5
Employment Status	1.46	1.03	0	3
Age Group	3.21	1.43	1	6
Education	4.57	1.68	1	7
Has Financial Dependents	0.63	0.48	0	1
Number of Financial Dependents	0.82	1.11	0	4
Spouse/Partner Employment Status	0.97	1.05	0	3
Panel B				
Health Insurance	0.88	0.32	0	1
Has Medical Debt	0.23	0.42	0	1
NOT filled Rx	0.17	0.37	0	1
SKIPPED recommendation	0.20	0.40	0	1
NOT go to doctor	0.23	0.42	0	1
Observations	20,503			

Empirical Model

To investigate the relationship between financial literacy and health behaviors, financial literacy is the main explanatory variable in an ordered probit regression or linear probability model.[10]

$$Y_i = \gamma FinanicalLiteracy_i + X'\beta + \varepsilon_i \tag{1}$$

The main coefficient γ is of interest for this paper in estimating the effects of financial literacy on health-related financial outcomes. The vector of controls X contains income bins, age group, educational attainment, whether the respondent

[10]The model is a specific application of the theoretical estimation equation shown in Equation (7) in the appendix for Insurance Demand Theory.

has children, the number of financial dependents, an indicator for male, an indicator for Caucasian, marital status, employment status, spouse/partner's employment status, whether the respondent has multiple jobs, and indicators for state effects.[11] The estimated coefficients are interpreted as probabilities.

The outcome variable Y_i is a binary indicator for having health insurance, whether the respondent has outstanding medical debt, whether the respondent did not fill a prescription because of the cost, whether the respondent skipped a recommended medical test or procedure because of the cost, or whether the respondent did not seek help for a medical problem because of the cost.[12] Financial literacy is expected to have a positive impact on the probability of having health insurance, a negative impact on whether a consumer has outstanding medical debt, and negative impacts on not filling prescriptions, skipping a recommended treatment, or not going to see a health care provider due to the cost.

To investigate the intensive and extensive margins of financial literacy on health behaviors, two indices are constructed using the outcomes that do not include the decision to purchase health insurance. The intensive margin health behavior index is the sum of outcome indicators that an individual experiences not including the decision to purchase health insurance which takes values from 0 to 4. The construction of the intensive health behavior index by summing binary outcomes follows the construction of the financial literacy measure which sums correct answers to five financial questions. This index gives a more complete picture of financial literacy and health behaviors than any of the individual behaviors estimated alone because the outcomes themselves may give mixed results because of their specificity. Condensing the outcomes into an intensive margin health behavior index better measures the overall impact of financial literacy on health behaviors at the loss of some specificity. By defining an index for health behavior, the relationship between financial literacy and health behaviors becomes clearer because researchers need not focus on specific outcomes. Further, the intensive margin index offers a measure of correlation between different

[11] Self-assessed financial risk tolerance is assessed in the NFCS, but that may not correspond to tolerance for risk factors that affect one's health. In an unreported exercise, including financial risk tolerance as a control did not change signs or significance for the estimates of financial literacy, and all the estimates of financial literacy were made slightly larger in absolute value. While a measure of health risk tolerance/exposure would be a useful inclusion if available, willingness to take on financial risk does not seem to be an important factor in this application. It may be the case that demographic characteristics are highly correlated with financial risk tolerance.

[12] Since the responses "Don't know" and "Prefer not to say" are possible responses to these outcome variables, the analysis assumes missing completely at random whereby the respondents who selected "Don't know" or "Prefer not to say" are dropped from the analysis. If respondents who chose these answers are not substantively different from the respondents that selected quantifiable options, there is no bias from dropping responses with these specific answers from the analysis.

outcomes. If the coefficient on the intensive margin index is larger in magnitude, the outcomes that comprise the measure are more correlated with each other.

The extensive margin index is a binary indicator for whether an individual experiences *any* of the outcomes that are not the decision to purchase health insurance. Financial literacy is expected to have a negative impact on the intensive and extensive health behavior indices because the effect of financial literacy is expected to have negative impacts on each component of the indices. If the extensive and intensive indices are similar in magnitude, there is evidence to suggest that the outcomes that make up the indices are not correlated.

Results

All results in this section are survey weighted. Table 3 shows main results of the empirical estimation of Equation (1) using the 2018 wave of the NFCS. Each outcome corresponds to a column, and financial literacy is measured using the Big Five financial literacy questions. The estimation methods along the rows are a linear probability model (LPM) and ordered probit (OP). For the ordered probit estimations, the reported coefficients are the average marginal effects. The omitted group in each regression is non-working married women with income less than $15,000, age less than 25, who did not complete high school, with no financial dependents, and whose spouse/partner also does not work.

The first column of Table 3 shows the effect of the financial literacy score on health insurance. The linear probability model and ordered probit estimations show that financial literacy increases the probability of having health insurance by 1.21% and 1.31%, respectively, compared to the excluded group. In each estimation method, financial literacy has a significant, positive effect on the probability of having health insurance which suggests financial literacy is an essential component in the demand for health insurance. Put differently, individuals with more financial literacy are more likely to demand health insurance. The second column shows the effect of the financial literacy score on whether individuals have outstanding medical debt. The coefficients are all negative and range from -1.81% to -2.14%. There is evidence to suggest that financial literacy consistently reduces the probability of having outstanding medical debt.

The middle three columns of Table 3 are health behaviors that were avoided because of the cost. The third column relates to whether an individual skipped filling a prescription. The LPM and OP methods generate negative coefficients of -1.05% and -1.07%, respectively. In this column, all the coefficients are strongly statistically significant. The fourth column is skipping recommended medical

Table 3
Financial Literacy on Health Behaviors — 2018 NFCS

2018 NFCS			Skipped Due to Cost				
Estimation	Health Insurance	Medical Debt	Prescription	Medical Procedure/Test	Clinic Visit	Intensive Index	Extensive Index
LPM	0.0121***	-0.0181***	-0.0105***	-0.0044*	-0.0000	-0.0358***	-0.0011
	(0.0023)	(0.0027)	(0.0025)	(0.0026)	(0.0027)	(0.0082)	(0.0030)
LPM R-squared	0.108	0.128	0.073	0.071	0.084	0.138	0.121
OP	0.0131***	-0.0187***	-0.0107***	-0.0043	-0.0004	-0.0091**	-0.0012
	(0.0022)	(0.0028)	(0.0025)	(0.0026)	(0.0028)	(0.0032)	(0.0030)
Observations	20,236	20,051	20,066	20,040	20,030	19,213	20,762

Standard errors in parentheses, $*p < 0.10$, $**p < 0.05$, $***p < 0.01$

procedures or testing. For this outcome, the LPM and OP generate negative coefficients of -0.44% and -0.43%, respectively. The fifth column is skipping a visit to a doctor or medical clinic when the respondent had a medical problem. Each estimation method produces negative, statistically insignificant coefficients around 0.00%.

The final two columns of Table 3 are the two indices defined in the Empirical Model section related to the intensive and extensive margins of health behaviors. The sixth column shows the effects of financial literacy on the intensive margin index. By construction, the intensive margin index is the sum of outcomes in columns two through five. The coefficients in this column are larger, on average, than any other outcome. The LPM and OP methods produce statistically significant, negative coefficients of -3.58% and -0.91%, respectively. The final column is the extensive margin of whether an individual experiences *any* health behavior of columns two through five. The LPM and OP methods produce statistically insignificant, negative coefficients of -0.22% and -0.12%, respectively. Full results from the 2018 NFCS wave are in Table B1 for the LPM and Table B2 for the OP in Appendix B.

The 2015 wave of the NFCS provides a robustness check to test the sensitivity of the impacts across samples. Results from this wave are survey weighted for this wave. There are 27,564 observations. Table 4 shows the main results of the same estimation strategies used to generate Table 3. The only difference is that the 2015 wave does not contain information on multiple jobs for the respondent, so that control is not included. The coefficients on the financial literacy score in Table 4 are overall similar in magnitude and sign as in Table 3. The only coefficients with different signs are statistically insignificantly positive coefficients in the LPM and OP approaches in the fifth column. The effects of financial literacy on having outstanding medical debt and skipping a recommended medical procedure or test due to the cost are now all strongly statistically significant, and the coefficients on having outstanding medical debt have increased in negative magnitude. The coefficients on the intensive and extensive indices are larger in negative magnitude

Table 4
Financial Literacy on Health Behaviors — 2015 NFCS

2015 NFCS			Skipped Due to Cost				
Estimation	Health Insurance	Medical Debt	Prescription	Medical Procedure/Test	Clinic Visit	Intensive Index	Extensive Index
LPM	0.0100***	-0.0225***	-0.0076**	-0.0047*	0.0009	-0.0334***	-0.0054*
	(0.0022)	(0.0026)	(0.0024)	(0.0025)	0.0026	(0.0079)	(0.0029)
LPM R-squared	0.102	0.094	0.046	0.048	0.061	0.095	0.087
OP	0.0114***	-0.0230***	-0.0082***	-0.0051**	0.0001	-0.0099**	-0.0056*
	(0.0020)	(0.0025)	(0.0023)	(0.0025)	(0.0025)	(0.0030)	(0.0029)
Observations	21,401	21,191	21,362	21,311	21,306	20,680	21,769

Standard errors in parentheses, $*p < 0.10$, $**p < 0.05$, $***p < 0.01$

relative to Table 3. The results from the 2015 wave generally reinforce the findings from the 2018 wave.

Heterogeneity across Financial Literacy Scores

Instead of treating financial literacy as a continuous measure, Tables 5 and 6 report the coefficients from every level of financial literacy on each outcome. This exercise shows heterogeneity among those who scored differently on the Big Five. The most striking pattern is that, on the whole, signs change around the average financial literacy score, which rounds to 3. In these tables, each coefficient is interpreted relative to the same omitted group as before with the added condition that they are relative to respondents who answered every question in the Big Five either incorrectly, did not know, or preferred not to say. Answering either four or five questions correctly significantly raises a respondent's probability of purchasing health insurance between 3.68% for the LMP where FL = 4 in Table 6 and 5.92% where FL = 5 for the OP in Table 5. This is paired by high financial literacy scores or four or five significantly lowering the probability of carrying medical debt. Interestingly, those who answered between one and three correctly were more likely to not fill a prescription, skip a medical procedure, or skip a clinic visit due to the cost than those who did not answer any of the questions correctly. As a result, those who answered one to three questions correct have a higher probability of any or all of the potentially costly outcomes.

Discussion

Using multiple survey waves and a common measure of financial literacy, the impact of financial literacy on the probability of having health insurance ranges from 1.00% to 1.31% for the linear probability model and ordered probit estimation methods from Tables 3 and 4. Overall, these magnitudes are not dissimilar from Allgood and Walstad (2016) who measured financial literacy perceptions and found results between 1.23% and 3.86%, although a different

Table 5
Levels of Financial Literacy on Health Behaviors – 2018 NFCS

2018 NFCS			Skipped Due to Cost				
Levels of FL	Health Insurance	Medical Debt	Prescription	Medical Procedure/Test	Clinic Visit	Intensive Index	Extensive Index
LPM: FL = 1	0.0108	0.0207	0.0559***	0.0608***	0.0453**	0.171***	0.0853***
	(0.0143)	(0.0157)	(0.0139)	(0.0144)	(0.0148)	(0.0464)	(0.0161)
LPM: FL = 2	0.0304*	0.0625***	0.0911***	0.0991***	0.0852***	0.337***	0.133***
	(0.0132)	(0.0149)	(0.0132)	(0.0137)	(0.0141)	(0.0442)	(0.0151)
LPM: FL = 3	0.0457***	-0.0038	0.0104	0.0484***	0.0518***	0.0951*	0.0851***
	(0.0130)	(0.0149)	(0.0126)	(0.0135)	(0.0140)	(0.0431)	(0.0152)
LPM: FL = 4	0.0542***	-0.0502***	-0.0041	0.0261	0.0266	-0.0096	0.0433**
	(0.0132)	(0.0149)	(0.0129)	(0.0138)	(0.0143)	(0.0436)	(0.0156)
LPM: FL = 5	0.0528***	-0.0542***	0.0060	0.0184	0.0318*	0.0035	0.0378*
	(0.0137)	(0.0162)	(0.0143)	(0.0150)	(0.0159)	(0.0477)	(0.0177)
LPM R-squared	0.108	0.132	0.080	0.076	0.087	0.146	0.127
OP: FL = 1	0.0087	0.0193	0.0506***	0.0586***	0.0434**	0.0520**	0.0823***
	(0.0117)	(0.0147)	(0.0129)	(0.0136)	(0.0137)	(0.0174)	(0.0154)
OP: FL = 2	0.0272*	0.0578***	0.0843***	0.0942***	0.0800***	0.0927***	0.129***
	(0.0109)	(0.0140)	(0.0123)	(0.0130)	(0.0131)	(0.0162)	(0.0145)
OP: FL = 3	0.0391***	-0.0007	0.0098	0.0485***	0.0507***	0.0435**	0.0837***
	(0.0110)	(0.0141)	(0.0119)	(0.0129)	(0.0132)	(0.0163)	(0.0147)
OP: FL = 4	0.0537***	-0.0498***	-0.0073	0.0253	0.0235	0.0023	0.0417**
	(0.0117)	(0.0145)	(0.0124)	(0.0134)	(0.0137)	(0.0168)	(0.0153)
OP: FL = 5	0.0592***	-0.0717***	-0.0020	0.0111	0.0231	-0.0030	0.0309
	(0.0139)	(0.0172)	(0.0150)	(0.0156)	(0.0167)	(0.0196)	(0.0182)
Observations	20,236	20,051	20,066	20,040	20,030	19,213	20,762

Standard errors in parentheses, $*p < 0.10$, $**p < 0.05$, $***p < 0.01$

measure of financial literacy is used in this paper. Nearly all the coefficients on financial literacy are strongly statistically significant and not economically small. There is strong evidence supporting that financial literacy is an essential aspect of health insurance demand that is robust to different samples and estimation methods. Financial literacy is not the largest component of health insurance demand, but the evidence suggests that it is a non-negligible aspect as predicted by the theoretical model.

The coefficient on financial literacy score using the Big Five in the regression on whether the respondent did not seek help for a medical problem is mostly insignificant in both survey waves of the NFCS across estimation methods. However, primary care providers may act like gatekeepers to other medical services. Consumers may be required to get a referral to see a specialist, get medical testing, or receive a prescription. It may be the case that consumers see the initial healthcare provider then make the decision whether to comply with the provider's recommendations. The consumer compares the value of the recommendation with the cost and chooses whether to spend more on further medical services. Consumers may desire peace of mind with a medical diagnosis then choose whether to comply.

Respondents in the 65+ age group are eligible for Medicare and are much more likely to have health insurance compared to the less than 25 age group.

Table 6
Levels of Financial Literacy on Health Behaviors – 2015 NFCS

2015 NFCS			Skipped Due to Cost				
Levels of FL	Health Insurance	Medical Debt	Prescription	Medical Procedure/Test	Clinic Visit	Intensive Index	Extensive Index
LPM: FL = 1	-0.0057	0.0625***	0.0424**	0.0649***	0.0568***	0.229***	0.105***
	(0.0146)	(0.0162)	(0.0144)	(0.0149)	(0.0152)	(0.0486)	(0.0172)
LPM: FL = 2	0.0164	0.0564***	0.0403**	0.0579***	0.0757***	0.226***	0.116***
	(0.0133)	(0.0151)	(0.0133)	(0.0138)	(0.0142)	(0.0449)	(0.0160)
LPM: FL = 3	0.0162	0.0095	0.0126	0.0399**	0.0641***	0.0130**	0.0999***
	(0.0131)	(0.0148)	(0.0130)	(0.0136)	(0.0140)	(0.0446)	(0.0158)
LPM: FL = 4	0.0386***	-0.0438**	-0.0007	0.0271*	0.0493***	0.0383	0.0491**
	(0.0130)	(0.0148)	(0.0132)	(0.0138)	(0.0143)	(0.0443)	(0.0162)
LPM: FL = 5	0.0400**	-0.0541***	-0.0046	0.0119	0.0278	-0.0133	0.0226
	(0.0135)	(0.0157)	(0.0142)	(0.0149)	(0.0153)	(0.0476)	(0.0176)
LPM R-squared	0.108	0.132	0.080	0.076	0.087	0.146	0.127
OP: FL = 1	-0.0076	0.0596***	0.0401***	0.0608***	0.0521***	0.0785***	0.0100***
	(0.0119)	(0.0152)	(0.0133)	(0.0139)	(0.0138)	(0.0177)	(0.0163)
OP: FL = 2	0.0117	0.0521***	0.0361**	0.0534***	0.0685***	0.0817***	0.112***
	(0.0110)	(0.0142)	(0.0124)	(0.0128)	(0.0130)	(0.0165)	(0.0152)
OP: FL = 3	0.0131	0.0094	0.0108	0.0372**	0.0583***	0.0699***	0.0964***
	(0.0109)	(0.0139)	(0.0121)	(0.0127)	(0.0129)	(0.0164)	(0.0150)
OP: FL = 4	0.0397***	-0.0461**	-0.0042	0.0240	0.0438**	0.0022	0.0456**
	(0.0111)	(0.0141)	(0.0125)	(0.0130)	(0.0133)	(0.0168)	(0.0155)
OP: FL = 5	0.0517***	-0.0654***	-0.0114	0.0037	0.0140	-0.0113	0.0136
	(0.0124)	(0.0155)	(0.0140)	(0.0146)	(0.0149)	(0.0186)	(0.0174)
Observations	21,401	21,191	21,362	21,311	21,306	20,680	21,769

Standard errors in parentheses, $*p < 0.10$, $**p < 0.05$, $***p < 0.01$

Income becoming statistically significant at a certain level is not surprising. It may be the case that health insurance is too expensive for households below the $50,000–$75,000 threshold. Marital status, age group, employment status, and spouse/partner employment status are likely to all be correlated with income. Interestingly, the indicator for having multiple jobs has negative estimated coefficients with respect to health insurance. Working more than one job is correlated with income, but it may also be an indicator for part-time work in multiple places, financial distress that made more jobs necessary, or several part-time jobs that do not offer benefits.

The intensive margin index in part measures the correlation between health-related financial decisions estimated in this paper. From its construction as the sum of outcomes, larger coefficients on the intensive margin index indicate that outcomes are increasingly correlated with each other. The intensive margin index estimates are consistently larger in magnitude than the extensive margin index so there is evidence that the health-related financial outcomes are correlated with each other.

Since the decision to purchase health insurance and health insurance options are conditional on age, employment status, or income, the demand for health insurance may be less of a choice than this work has assumed thus far. The existence of Medicare and Medicaid as well as the health insurance marketplace

are all features that impact the health insurance choices consumers face. For example, only those who meet age qualifications can be covered under Medicare. Given the assumptions in this paper, consumers value all health insurance options available given their characteristics and weigh all options. It is possible that financial literacy has differential impacts on the demand for health insurance given the menu of coverage options available to individuals with different characteristics. For instance, perhaps financial literacy has different impacts for a consumer whose employer does not offer health insurance as a benefit than a consumer whose employer does offer health insurance, assuming that the full premium falls on the consumer in either case because the choice set is different. Using other health-related financial decisions somewhat circumvents these realities in demonstrating the impact of financial literacy on more flexible choices that are somewhat robust to consumer characteristics.

Some of these market forces may be driving the counter-intuitive results below the average financial literacy score in the Heterogeneity across Financial Literacy Scores section where each number of correct responses is measured individually. Perhaps those with low financial literacy scores are also those who qualify for Medicare or Medicaid on demographic or income characteristics. The correlation between income and financial literacy may be behind the counter-intuitive results because those respondents who answer only a few of the Big Three correct may make just enough income to disqualify for Medicaid, which can dramatically increase the utilization of health care services.

Endogeneity concerns arise when estimating the effects of financial literacy on any financially-related outcome. Consider the following reverse causality question: Does financial literacy lead to behavior or does behavior induce the accumulation of financial literacy? Using financial literacy as a regressor may be problematic if people can strategically improve their financial literacy. In this framework, any potential instrumental variable (IV) would need to be correlated with financial literacy and not be a determinant of health insurance demand or health-related financial behaviors. Numeracy, the ability to perform simply calculations and math skills, is necessary to compare costs and benefits of all potential outcomes in any financial decision. Financial literacy and numeracy are shown to be correlated in Christelis et al. (2010), Lusardi (2012), and Cole et al. (2016). In the NFCS, self-reported math skills measured in a Likert scale are available, but self-assessments may not correspond to actual financial literacy, as in Allgood and Walstad (2016), so an instrumental variable approach may not be appropriate given the available instruments.[13]

[13]In an unreported exercise, numeracy is shown to be a statistically exogenous instrument based on a Sargan test for financial literacy. In both instrumental linear probability models and instrumental

Financial literacy is not the largest determinant of health insurance demand nor a deterrent for skipping medical behaviors due to the cost. However, financial literacy is shown to be an essential component in health insurance demand and health-related financial decisions.

Conclusion

This paper presents a model of insurance demand that explicitly includes financial literacy as an essential component in health insurance demand. In this model, consumers compare the perceived costs and benefits of any financial decision to determine which action to pursue from the menu of options. The application of this paper is binary outcomes of whether to purchase health insurance and other related health behaviors.

The evidence supports financial literacy reducing the probability that an individual will have outstanding medical debt, not fill prescriptions, or not pursue recommended procedures or tests due to the respective costs. Not seeking medical help due to the cost makes economic sense if primary care providers in clinical settings act as gatekeepers to other medical services or prescriptions which are not sensitive to sample choice. Taken together, the empirical results are indicative that financial literacy has an economically significant effect on health-related financial behaviors overall.

Extensions of this work ought to investigate other health behaviors than the ones presented in this paper to provide a more comprehensive impact of financial literacy on health. Future work in this area should also link financial literacy with other types of insurance. Zietz (2003) reviews the literature on the demand for life insurance which has been removed from the NFCS in more recent waves. Allgood and Walstad (2016) use the 2009 wave of the NFCS and estimate the effect of financial literacy perceptions on the probability of purchasing life insurance and auto insurance and find positive effects with their measure of financial literacy. The evidence provided in this paper suggests that financial literacy contributes to the demand for health insurance and may be a positive component in the demand for other types of insurance.

Other future work should attempt to link financial behaviors instead of financial literacy measures with the probability of purchasing health insurance and health-related outcomes. In this way, health outcomes are related to behavioral patterns rather than a measurement of financial knowledge. There is also little descriptive work on how the relationship between financial literacy and health

probit models, the IV estimates generally reinforce the main estimates presented with absolute values mostly between two and five times larger with similar signs.

insurance varies across population subgroups, which should be explored. Extensions may attempt to link financial literacy with measurable health status rather than health behaviors. Health and financial knowledge may have a more robust relationship if financial literacy is related to health behaviors which lead to health status outcomes.

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Appendix A: Insurance Demand Theory

The theoretical model in this paper is an application of the canonical model of expected utility theory. The model was proposed by Tversky and Kahneman (1992) in prospect theory as an application of the expected utility variant found in Von Neumann and Morgenstern (1953). The canonical models do not include financial literacy as a component of insurance demand, and this paper explicitly defines financial literacy as an essential aspect of consumer choice related to insurance decisions that can be empirically tested.

First, define γ as a vector of characteristics for each consumer with constant absolute risk aversion (CARA). The elements of γ are financial literacy, demographic information, risk characteristics, preferences, and income. This paper deviates from the standard expected utility model for insurance demand in the explicit inclusion of financial literacy in the vector of consumer characteristics.[14]

Next, let health insurance contracts be described by a vector of two parameters, ϕ and p, representing the coverage characteristics and the premium, respectively. For now, assume there is only one available health insurance contract. Consumers choose their behavioral patterns $b \in B$ over the coverage period with state space S. In general, the probability $\pi(s|b,\gamma)$ of any $s \in S$ is dependent on the behaviors, b, and the risk characteristics in the vector, γ. The consumer's utility during the coverage period depends on their health insurance choice and is denoted by $u(s,b,\gamma,\phi,p)$, which satisfies the axioms of a Von Neumann–Morgenstern (VNM) utility function. The consumer's valuation of a contract with parameters (ϕ,p) is denoted by $v(\phi,p,\gamma)$ and is an analogue[15] for expected utility. The standard value function is increasing in plan characteristics, ϕ, and decreasing in plan premium, p. Note that financial literacy impacts consumer valuation of insurance contracts because of the dependence of the value function on consumer characteristics, γ. The consumer then chooses their behavioral patterns[16] in the coverage period to solve the following expected utility problem given the probabilities of occurrences in S[17]:

$$v(\phi,p,\gamma) = \max_{b\in B} \sum_{s\in S} \pi(s|b,\gamma)\, u(s,b,\gamma,\phi,p) \tag{2}$$

[14]For an explanation of how the model for insurance demand in this paper interacts with the supply of insurance in an equilibrium framework, see Einav et al. (2010).

[15]See Schoemaker (1982) for a discussion on the technical differences between $u(\cdot)$ and $v(\cdot)$ in the expected utility framework.

[16]In this setup, the consumer chooses optimal behaviors $b^*(\gamma,\phi,p)$ to maximize their value.

[17]More generally, the state space and contract options may have support too large to solve analytically. If the support is sufficiently large, Equation (2) is expressed as: $v(\phi,p,\gamma) = \max_{b\in B} \int_s u(s,b,\gamma,\phi,p)\, dF(s)$

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The value function is the perception of value to the consumer. Utility and value may not map perfectly, so the value function represents the perception of value from the utility function across the state space. However, Schlesinger (2013) demonstrates that the statics of $u(\cdot)$ and $v(\cdot)$ are similar in CARA models.

It is useful to separate the value function for insurance based on premium and characteristics. To do this, assume quasi-linearity of the value function with respect to the premium. The resulting value function more explicitly defines the costs and benefits associated with the decision to purchase insurance:

$$v(\phi, p, \gamma) = \tilde{v}(\phi, \gamma) - p \tag{3}$$

This is a convenient result because it specifies a decision-making rule for consumers who are choosing whether to purchase insurance coverage. If $\tilde{v}(\phi, \gamma) < p$, the net value of health insurance with characteristics ϕ is negative to a consumer with characteristics γ, and the consumer would not purchase health insurance. If $\tilde{v}(\phi, \gamma) \geq p$, the consumer purchases health insurance because they are at least as well off being insured. Put differently, the consumer compares the benefits of being insured given all relevant characteristics to the cost of the premium. The assumption of quasi-linearity implies that consumers value perceived changes in the insurance premium at a constant rate regardless of the characteristics of the plan or their own characteristics. Furthermore, the consumer's value function does not change with respect to changes in the premium. Put differently, the consumer's perceived value of health insurance benefits does not depend on the cost of insurance represented by the premium, but the premium is still a component of the decision-making rule that compares overall costs and benefits.

To include financial literacy as a factor of insurance demand, define γ_{FL} as the financial literacy component of the consumer characteristics vector γ and γ_{-FL} as the remaining elements of γ. Total differentiation of Equation (3) yields:

$$d\tilde{v}(\phi, \gamma_{FL}, \gamma_{-FL}) = \frac{\partial \tilde{v}}{\partial \phi} d\phi + \frac{\partial \tilde{v}}{\partial \gamma_{FL}} d\gamma_{FL} + \frac{\partial \tilde{v}}{\partial \gamma_{-FL}} d\gamma_{-FL} = 0 \tag{4}$$

An algebraic reorganization yields:

$$\frac{\partial \tilde{v}}{\partial \gamma_{FL}} = -\frac{\partial \tilde{v}}{\partial \gamma_{-FL}} \frac{d\gamma_{-FL}}{d\gamma_{FL}} - \frac{\partial \tilde{v}}{\partial \phi} \frac{d\phi}{d\gamma_{FL}} \tag{5}$$

The sign of Equation (5) is ambiguous, so theory does not dictate how financial literacy affects the value function in this context. The effect of financial literacy depends on how financial literacy interacts with other consumer characteristics and

how the consumer values changes in policy coverage. Since consumers derive more value from plans with more desirable characteristics, $\partial\tilde{v}/\partial\phi$ is positive, but no other terms in Equation (5) can be signed. Plan characteristics do not vary with any component of consumer characteristics, so the second term of Equation (5) collapses to 0. The theoretical sign of $\partial v/\partial\gamma_{FL}$ is still ambiguous because it depends on interactions of consumer characteristics, so the impact of financial literacy on health insurance demand is an empirical question.

If the value function is increasing in financial literacy, consumers who are less likely to make financial mistakes are those who find more value in insurance coverage. Insurance is a way to smooth consumption and prevent large, unforeseen pecuniary losses. If financial literacy promotes better financial decisions and consumption smoothing is rational, financial literacy can be expected to be non-negatively related to insurance demand:

$$\frac{\partial\tilde{v}(\phi,\gamma)}{\partial\gamma_{FL}} > 0 \tag{6}$$

Finally, let us define $\Omega(\phi,p)$ as the share of consumers who purchase health insurance with (ϕ,p) characteristics. Using this notation and the decision-making rule under quasi-linear preferences in the premium, we combine definitions:

$$\Omega(\phi,p) = \int \mathbf{1}\{\tilde{v}(\phi,\gamma) \geq p\} dF(\gamma) \tag{7}$$

The sign for the impact of financial literacy on the share of consumers who purchase health insurance follows from Equation (5), and theory gives us an ambiguous result. As before, if those with more financial literacy find health insurance as a rational way to smooth consumption:

$$\frac{\partial\Omega(\phi,p)}{\partial\gamma_{FL}} > 0 \tag{8}$$

The share of consumers who purchase health insurance increases with coverage characteristics ϕ, decreases with the premium p, and increases with financial literacy through γ if the value function is increasing in financial literacy. The empirical focus of this paper is demonstrating that the impact of financial literacy on the share of consumers who purchase health insurance is indeed positive.

This paper further abstracts from the canonical model by analyzing the health insurance decision on the extensive margin. In practice, there are many different health insurance coverage options that can be thought of as intensive margin decisions. The empirical model employs several estimation methods including a

semi-parametric, non-linear probit model similar to the form in Equation (7). This approach estimates changes in the share of consumers who purchase health insurance $\Omega(\phi, p)$ by varying financial literacy. The theoretical model presented can be generalized to many types of financial decision-making where financial literacy is an observable component.

The decision-maker may not be able to observe the costs and benefits directly because of the imperfect mapping of the utility and value functions, so this decision-making rule is based on the perception of value. It is useful to think of this as an implicit cost/benefit analysis whereby the decision-maker uses perceived costs and benefits to make financial decisions.

Appendix B: Full Results

Table B1
Full Results – 2018 NFCS Linear Probability Model (LPM)

			Skipped Due to Cost				
LPM	Health Insurance	Medical Debt	Rx	Procedure	Clinic Visit	Index-I	Index-E
Big 5	0.0121***	-0.0181***	-0.0105***	-0.0044*	-0.0000	-0.0358***	-0.0011
	(0.0023)	(0.0027)	(0.0025)	(0.0026)	(0.0027)	(0.0082)	(0.0030)
$15K–$25K	-0.0028	0.0515**	0.0207	0.0317*	0.0544***	0.1569**	0.0577***
	(0.0155)	(0.0169)	(0.0156)	(0.0157)	(0.0164)	(0.0512)	(0.0174)
$25K–$35K	0.0040	0.0169	-0.0018	0.0196	0.0396*	0.0709	0.0315
	(0.0151)	(0.0170)	(0.0154)	(0.0161)	(0.0164)	(0.0507)	(0.0177)
$35K–$50K	0.0431**	-0.0167	-0.0150	0.0214	0.0186	0.0007	0.0026
	(0.0144)	(0.0158)	(0.0149)	(0.0154)	(0.0158)	(0.0485)	(0.0171)
$50K–$75K	0.0714***	-0.0478**	-0.0668***	-0.0176	-0.0233	-0.1597***	-0.0549***
	(0.0138)	(0.0155)	(0.0140)	(0.0148)	(0.0151)	(0.0464)	(0.0167)
$75K–$100K	0.1172***	-0.0301	-0.0305	0.0078	-0.0107	-0.0695	-0.0622***
	(0.0142)	(0.0170)	(0.0158)	(0.0163)	(0.0166)	(0.0525)	(0.0181)
$100K–$150K	0.1095***	-0.1350***	-0.1055***	-0.0857***	-0.0911***	-0.4159***	-0.1947***
	(0.0145)	(0.0168)	(0.0156)	(0.0164)	(0.0168)	(0.0521)	(0.0185)
$150K or more	0.1045***	-0.1792***	-0.1212***	-0.1271***	-0.1421***	-0.5754***	-0.2694***
	(0.0157)	(0.0181)	(0.0171)	(0.0177)	(0.0181)	(0.0564)	(0.0205)
Male	-0.0378***	-0.0290***	-0.0220**	-0.0434***	-0.0460***	-0.1463***	-0.0718***
	(0.0062)	(0.0077)	(0.0070)	(0.0074)	(0.0076)	(0.0229)	(0.0084)
White	0.0059	-0.0139	0.0050	0.0225**	0.0256**	0.0505*	0.0167
	(0.0066)	(0.0083)	(0.0076)	(0.0080)	(0.0082)	(0.0247)	(0.0089)
Single	-0.0353***	-0.0199	-0.0181	-0.0096	-0.0147	-0.0608	-0.0258*
	(0.0091)	(0.0118)	(0.0105)	(0.0112)	(0.0113)	(0.0353)	(0.0123)
Separated	-0.0235	0.1303***	0.0874**	0.0669*	0.0743*	0.3556***	0.1350***
	(0.0254)	(0.0347)	(0.0313)	(0.0332)	(0.0328)	(0.1040)	(0.0327)
Divorced	-0.0277**	0.0122	0.0027	0.0250	0.0124	0.0529	0.0170
	(0.0107)	(0.0145)	(0.0133)	(0.0140)	(0.0139)	(0.0427)	(0.0158)
Widowed	-0.0048	0.0373	0.0306	0.0286	0.0258	0.0969	0.0429
	(0.0168)	(0.0262)	(0.0242)	(0.0234)	(0.0231)	(0.0747)	(0.0274)
Self-Employed	-0.0813***	0.0087	0.0323*	0.0485***	0.0603***	0.1517***	0.0421**
	(0.0131)	(0.0142)	(0.0134)	(0.0141)	(0.0146)	(0.0441)	(0.0158)
Full Time	0.0130	0.0124	0.0099	0.0255*	0.0200*	0.0675*	0.0213
	(0.0086)	(0.0104)	(0.0095)	(0.0100)	(0.0102)	(0.0311)	(0.0111)
Part Time	-0.0248*	-0.0097	-0.0123	0.0147	0.0165	0.0053	0.0131
	(0.0115)	(0.0134)	(0.0121)	(0.0129)	(0.0134)	(0.0402)	(0.0146)
25-34	-0.0133	0.1017***	0.0477***	0.0516***	0.0285*	0.2316***	0.0673***
	(0.0131)	(0.0136)	(0.0132)	(0.0136)	(0.0144)	(0.0430)	(0.0147)
35-44	0.0119	0.0738***	0.0013	-0.0004	-0.0313*	0.0498	0.0119
	(0.0132)	(0.0143)	(0.0135)	(0.0140)	(0.0146)	(0.0442)	(0.0153)
45-54	0.0315*	0.0498***	-0.0141	-0.0141	-0.0617***	-0.0395	-0.0227
	(0.0133)	(0.0144)	(0.0134)	(0.0139)	(0.0146)	(0.0437)	(0.0157)
55-64	0.0656***	0.0082	-0.0493***	-0.0658***	-0.1237***	-0.2291***	-0.0878***
	(0.0134)	(0.0153)	(0.0141)	(0.0147)	(0.0151)	(0.0457)	(0.0169)
65+	0.1252***	-0.0580**	-0.0793***	-0.1367***	-0.2064***	-0.4753***	-0.2016***
	(0.0143)	(0.0189)	(0.0181)	(0.0178)	(0.0182)	(0.0556)	(0.0221)
HS Diploma	0.0558*	-0.0180	-0.0284	0.0048	-0.0284	-0.0664	-0.0028
	(0.0237)	(0.0241)	(0.0221)	(0.0218)	(0.0237)	(0.0765)	(0.0249)
GED	0.0263	-0.0035	-0.0097	-0.0093	-0.0140	-0.0384	0.0366
	(0.0257)	(0.0270)	(0.0243)	(0.0238)	(0.0258)	(0.0826)	(0.0275)
Some College	0.0780***	0.0241	0.0165	0.0314	0.0156	0.0792	0.0543*
	(0.0233)	(0.0237)	(0.0219)	(0.0214)	(0.0234)	(0.0755)	(0.0246)
Associate's	0.0919***	-0.0301	-0.0083	0.0089	-0.0088	-0.0489	0.0304

Continuation of Table B1

			Skipped Due to Cost				
	Health Insurance	Medical Debt	Rx	Procedure	Clinic Visit	Index-I	Index-E
	(0.0242)	(0.0257)	(0.0235)	(0.0233)	(0.0251)	(0.0809)	(0.0266)
Bachelor's	0.1014***	-0.0882***	-0.0333	-0.0174	-0.0427	-0.2001**	-0.0248
	(0.0235)	(0.0243)	(0.0225)	(0.0222)	(0.0241)	(0.0774)	(0.0255)
Graduate Degree	0.1003***	-0.0931***	-0.0373	-0.0151	-0.0352	-0.1984*	-0.0124
	(0.0238)	(0.0250)	(0.0232)	(0.0231)	(0.0251)	(0.0795)	(0.0267)
Dependents=1	0.0130	0.0458***	0.0313**	0.0311*	0.0106	0.1209**	0.0314*
	(0.0091)	(0.0126)	(0.0114)	(0.0121)	(0.0119)	(0.0368)	(0.0136)
Dependents=2	0.0065	0.0455***	0.0084	0.0121	0.0102	0.0694	0.0334*
	(0.0099)	(0.0138)	(0.0121)	(0.0132)	(0.0131)	(0.0401)	(0.0146)
Dependents=3	0.0054	0.0730***	0.0401*	0.0268	0.0290	0.1692**	0.0607**
	(0.0141)	(0.0188)	(0.0172)	(0.0179)	(0.0179)	(0.0565)	(0.0194)
Dependents=4	0.0101	0.0943***	0.0858***	0.0196	0.0516*	0.2376***	0.0839***
	(0.0162)	(0.0238)	(0.0221)	(0.0213)	(0.0225)	(0.0680)	(0.0234)
Self-Employed	-0.0020	0.0196	-0.0064	0.0043	-0.0116	0.0008	0.0190
	(0.0125)	(0.0169)	(0.0151)	(0.0166)	(0.0163)	(0.0495)	(0.0180)
Full Time	-0.0061	0.0358***	-0.0067	0.0123	0.0127	0.0573	0.0209
	(0.0078)	(0.0104)	(0.0093)	(0.0100)	(0.0101)	(0.0308)	(0.0112)
Part Time	-0.0287*	0.0009	0.0107	0.0382*	0.0425*	0.0997	0.0124
	(0.0141)	(0.0176)	(0.0170)	(0.0183)	(0.0187)	(0.0560)	(0.0198)
Two Jobs	-0.0148*	0.1017***	0.0907***	0.1144***	0.1091***	0.4204***	0.1323***
	(0.0069)	(0.0083)	(0.0078)	(0.0082)	(0.0084)	(0.0256)	(0.0089)
Observations	20236	20051	20066	20040	20030	19213	20762

Standard errors in parentheses, * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table B2
Full Results – 2015 NFCS Linear Probability Model (LPM)

			Skipped Due to Cost				
OP Marginal Effects	Health Insurance	Medical Debt	Rx	Procedure	Clinic Visit	Index-I	Index-E
Big 5	0.0131***	-0.0187***	-0.0107***	-0.0043	-0.0004	-0.0091**	-0.0012
	(0.0022)	(0.0028)	(0.0025)	(0.0026)	(0.0028)	(0.0032)	(0.0030)
$15K–$25K	-0.0088	0.0498**	0.0211	0.0328*	0.0548***	0.0536**	0.0574***
	(0.0128)	(0.0167)	(0.0154)	(0.0157)	(0.0162)	(0.0186)	(0.0173)
$25K–$35K	-0.0091	0.0116	-0.0026	0.0191	0.0388*	0.0211	0.0308
	(0.0130)	(0.0167)	(0.0151)	(0.0158)	(0.0161)	(0.0188)	(0.0177)
$35K–$50K	0.0230	-0.0190	-0.0144	0.0216	0.0196	-0.0128	0.0018
	(0.0125)	(0.0158)	(0.0148)	(0.0153)	(0.0155)	(0.0180)	(0.0170)
$50K–$75K	0.0520***	-0.0482**	-0.0649***	-0.0158	-0.0205	-0.0651***	-0.0546**
	(0.0123)	(0.0157)	(0.0141)	(0.0148)	(0.0150)	(0.0177)	(0.0167)
$75K–$100K	0.1027***	-0.0339*	-0.0335*	0.0064	-0.0113	-0.0778***	-0.0622***
	(0.0124)	(0.0172)	(0.0158)	(0.0164)	(0.0165)	(0.0193)	(0.0183)
$100K–$150K	0.1067***	-0.1414***	-0.1102***	-0.0889***	-0.0935***	-0.2081***	-0.1968***
	(0.0128)	(0.0169)	(0.0154)	(0.0161)	(0.0165)	(0.0196)	(0.0185)
$150K or more	0.1168***	-0.2030***	-0.1335***	-0.1393***	-0.1570***	-0.3008***	-0.2798***
	(0.0145)	(0.0179)	(0.0169)	(0.0170)	(0.0174)	(0.0211)	(0.0201)
Male	-0.0340***	-0.0291***	-0.0235***	-0.0449***	-0.0459***	-0.0701***	-0.0711***
	(0.0060)	(0.0077)	(0.0070)	(0.0074)	(0.0076)	(0.0087)	(0.0084)
White	0.0047	-0.0149	0.0046	0.0221**	0.0243**	0.0196*	0.0167
	(0.0062)	(0.0081)	(0.0074)	(0.0078)	(0.0080)	(0.0092)	(0.0088)
Single	-0.0321***	-0.0244*	-0.0202*	-0.0101	-0.0140	-0.0313*	-0.0255*
	(0.0082)	(0.0111)	(0.0100)	(0.0106)	(0.0108)	(0.0126)	(0.0122)
Separated	-0.0285	0.1126***	0.0766**	0.0673*	0.0758*	0.1181***	0.1329***
	(0.0220)	(0.0324)	(0.0291)	(0.0322)	(0.0325)	(0.0342)	(0.0324)
Divorced	-0.0334**	0.0077	0.0037	0.0276	0.0158	0.0105	0.0177
	(0.0111)	(0.0142)	(0.0134)	(0.0144)	(0.0145)	(0.0162)	(0.0158)
Widowed	-0.0203	0.0444	0.0327	0.0378	0.0366	0.0306	0.0492
	(0.0193)	(0.0267)	(0.0249)	(0.0259)	(0.0258)	(0.0280)	(0.0276)
Self-Employed	-0.0823***	0.0061	0.0274*	0.0442**	0.0570***	0.0421**	0.0406**
	(0.0125)	(0.0139)	(0.0130)	(0.0139)	(0.0145)	(0.0163)	(0.0157)
Full Time	0.0172*	0.0103	0.0057	0.0214*	0.0160	0.0200	0.0195
	(0.0073)	(0.0096)	(0.0088)	(0.0092)	(0.0095)	(0.0111)	(0.0107)
Part Time	-0.0193	-0.0071	-0.0120	0.0133	0.0155	0.0112	0.0139
	(0.0101)	(0.0128)	(0.0113)	(0.0123)	(0.0127)	(0.0147)	(0.0141)
25-34	-0.0184	0.0914***	0.0430***	0.0492***	0.0275	0.0715***	0.0660***
	(0.0109)	(0.0129)	(0.0126)	(0.0133)	(0.0141)	(0.0154)	(0.0145)
35-44	0.0074	0.0674***	-0.0012	-0.0005	-0.0298*	0.0132	0.0113
	(0.0111)	(0.0136)	(0.0129)	(0.0136)	(0.0144)	(0.0160)	(0.0151)
45-54	0.0294*	0.0472***	-0.0153	-0.0137	-0.0607***	-0.0187	-0.0216
	(0.0114)	(0.0140)	(0.0131)	(0.0139)	(0.0146)	(0.0163)	(0.0155)
55-64	0.0649***	0.0028	-0.0532***	-0.0681***	-0.1254***	-0.0910***	-0.0881***
	(0.0115)	(0.0150)	(0.0139)	(0.0145)	(0.0150)	(0.0175)	(0.0168)
65+	0.1326***	-0.0847***	-0.0891***	-0.1448***	-0.2102***	-0.2102***	-0.2094***
	(0.0109)	(0.0189)	(0.0178)	(0.0167)	(0.0169)	(0.0225)	(0.0217)
HS Diploma	0.0369*	-0.0138	-0.0253	0.0041	-0.0274	0.0021	-0.0031
	(0.0180)	(0.0220)	(0.0193)	(0.0205)	(0.0220)	(0.0261)	(0.0237)
GED	0.0112	0.0008	-0.0070	-0.0091	-0.0148	0.0429	0.0356
	(0.0197)	(0.0245)	(0.0213)	(0.0223)	(0.0239)	(0.0288)	(0.0263)
Some College	0.0501**	0.0284	0.0196	0.0302	0.0150	0.0492	0.0532*
	(0.0177)	(0.0217)	(0.0192)	(0.0202)	(0.0217)	(0.0258)	(0.0235)
Associate's	0.0659***	-0.0211	-0.0031	0.0101	-0.0061	0.0258	0.0298
	(0.0189)	(0.0237)	(0.0210)	(0.0221)	(0.0235)	(0.0278)	(0.0255)
Bachelor's	0.0784***	-0.0824***	-0.0276	-0.0155	-0.0401	-0.0299	-0.0248
	(0.0185)	(0.0225)	(0.0201)	(0.0211)	(0.0225)	(0.0268)	(0.0245)

Continuation of Table B2

			Skipped Due to Cost				
	Health Insurance	Medical Debt	Rx	Procedure	Clinic Visit	Index-I	Index-E
Graduate Degree	0.0843***	-0.0938***	-0.0334	-0.0150	-0.0327	-0.0191	-0.0129
	(0.0196)	(0.0237)	(0.0214)	(0.0225)	(0.0242)	(0.0284)	(0.0261)
Dependents=1	0.0111	0.0418***	0.0273*	0.0289*	0.0072	0.0335*	0.0302*
	(0.0099)	(0.0124)	(0.0115)	(0.0124)	(0.0123)	(0.0140)	(0.0137)
Dependents=2	0.0056	0.0421**	0.0069	0.0108	0.0078	0.0295	0.0322*
	(0.0108)	(0.0135)	(0.0120)	(0.0132)	(0.0135)	(0.0151)	(0.0148)
Dependents=3	0.0038	0.0617***	0.0336*	0.0237	0.0227	0.0562**	0.0577**
	(0.0140)	(0.0179)	(0.0162)	(0.0171)	(0.0174)	(0.0202)	(0.0195)
Dependents=4	0.0083	0.0820***	0.0731***	0.0163	0.0442*	0.0781**	0.0818***
	(0.0159)	(0.0222)	(0.0207)	(0.0198)	(0.0215)	(0.0243)	(0.0235)
Self-Employed	-0.0065	0.0144	-0.0097	0.0050	-0.0096	0.0104	0.0199
	(0.0128)	(0.0162)	(0.0143)	(0.0159)	(0.0157)	(0.0186)	(0.0181)
Full Time	-0.0042	0.0335**	-0.0074	0.0123	0.0134	0.0223	0.0219
	(0.0081)	(0.0104)	(0.0092)	(0.0100)	(0.0102)	(0.0117)	(0.0112)
Part Time	-0.0249	-0.0031	0.0105	0.0376*	0.0420*	0.0152	0.0112
	(0.0151)	(0.0173)	(0.0171)	(0.0185)	(0.0190)	(0.0206)	(0.0200)
Two Jobs	-0.0151*	0.1015***	0.0889***	0.1124***	0.1069***	0.1284***	0.1319***
	(0.0064)	(0.0083)	(0.0077)	(0.0082)	(0.0083)	(0.0092)	(0.0089)
Observations	20236	20051	20066	20040	20030	19213	20762

Standard errors in parentheses, * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$