

Essays in Household Finance: The Role of Non-Traditional Approaches to Building
Financial Capability

By

Madelaine L'ESPERANCE

*A dissertation submitted in partial fulfillment of
the requirements for the degree of*

Doctor of Philosophy

Human Ecology: Consumer Behavior and Family Economics

at the

University of Wisconsin-Madison

2019

Date of final oral examination: June 3, 2019

The dissertation is approved by the following members of the Final Oral Committee:

J. Michael Collins, Associate Professor, Department of Consumer Science

Clifford Robb, Associate Professor, Department of Consumer Science

Lydia Ashton, Assistant Professor, Department of Consumer Science

Rourke O'Brien, Assistant Professor, LaFollette School of Public Affairs

Justin Sydnor, Associate Professor, Department of Risk and Insurance

Abstract

Many US adults have difficulty managing their financial lives. Financial capability, the knowledge, skills, and access to resources to handle finances effectively, is essential to promoting financial well-being. However, the pathways to improve financial capability remain unclear. Traditional approaches, including financial education, counseling and coaching as well as safety net programs and safe, affordable financial services, are well explored by researchers. However, there are also non-traditional channels which have received less attention.

In this dissertation, these approaches are examined, specifically learning by doing, learning from others, and behavioral interventions. First, the influence of repeated experiences in the financial market on financial capability is explored. Using a panel of US couples, the study reveals that relative income is a key determinant of financial responsibility in couples, and partners who defer responsibility are less likely to know their credit score. The second essay examines the effect of youth employment, an experience that may build financial capability, on financial well-being in young adulthood using several approaches to deal with selection into youth employment. Working in high school may provide youth with an opportunity to learn how to effectively manage their finances through experiences and information sharing. The analysis reveals that those who work as youth are not more financial capable in young adulthood than their counterparts who were not employed. Finally, the third essay investigates the role of reminders for encouraging consumers to attend to information about their finances. This study uses a field experiment to test whether reminding credit union members that they have access to a free credit monitoring service motivates them to check their credit score and report. Despite the promise of this low-cost approach to improving accuracy of beliefs about creditworthiness, those who receive the message are no more likely to check their credit than a control group who receives no message. Overall, these essays contribute new evidence on the potential role of non-traditional pathways to financial capability that inform the design of programs and financial services that aim to better inform consumers and improve financial well-being. A roadmap for future research is offered.

Acknowledgements

My professors and mentors, family, and friends supported me tremendously over the last five years. I thank each of the members of my dissertation committee who provided invaluable advice, criticism, and encouragement: Clifford Robb, Lydia Ashton, Rourke O'Brien, and Justin Sydnor. I especially thank my dissertation chair and advisor, J. Michael Collins, who tirelessly guided me from the very beginning. He is an impressive scholar, teacher, and mentor that I am grateful to have as a role model and source of sound advice.

I thank the participants of the Consumer Science Graduate Workshop, Institute for Research on Poverty Graduate Research Fellows Seminar, and Center for Financial Security Household Finance Seminar who contributed comments on this work at various stages. I am indebted to my fellow School of Human Ecology Dissertation Accountability Group members, Emily Parrott, Alisa Pykett, and Amy Taub, for motivating me while writing this dissertation.

Personally, I am thankful to my family for lifting me up throughout this journey, especially Alexis L'Esperance. Many friends and colleagues offered inspiration and generous feedback along the way; a special thanks to Hugh Roland, Molly Clark-Barol, and Pauline Day.

Contents

Abstract	i
Acknowledgements	ii
1 Introduction	1
1.1 What is financial capability?	1
1.2 Why does financial capability matter?	2
1.3 How is financial capability built?	3
1.4 How effective are non-traditional financial capability approaches?	4
2 Does Responsibility for Financial Tasks Influence Credit Knowledge and Behavior?: Evidence from a Panel of US Couples	6
2.1 Introduction	6
2.2 Data, Measures, and Methods	10
2.2.1 Data	10
2.2.2 Measures	11
2.2.3 Methods	14
2.3 Results	16
2.3.1 Predictors of Responsibility for Financial Tasks	16
2.3.2 Accounting for Fixed Individual-Level Heterogeneity	18
2.3.3 Does the Division of Responsibility Influence Credit Knowledge and Behavior?	19
2.3.4 Robustness Checks	20
2.4 Limitations	21
2.5 Conclusion	22
2.6 Tables and Figures	25
3 Youth Employment and Financial Well-being: Does Work in High School Build Financial Capability?	36
3.1 Introduction	36
3.2 Literature Review	38
3.3 Empirical Strategy	42

3.3.1	Ordinary Least Squares Regression (Conditional Independence) . . .	43
3.3.2	Instrumental Variables Approach	44
	The Instrument	44
	Estimation	46
3.3.3	Sibling Fixed-Effects	47
3.4	Data	48
3.4.1	Youth Employment	49
3.4.2	Measuring Financial Well-Being	50
3.4.3	Covariates	52
3.5	Results	52
3.5.1	Effects of Youth Employment on Financial Outcomes	53
3.5.2	Effect of Youth Employment on Subjective Financial Well-being	55
3.5.3	Sibling Fixed Effects Estimates	57
3.5.4	Effects of Summer Youth Employment	58
3.6	Conclusion	60
3.7	Tables and Figures	63
4	What Motivates Consumers to Check Their Credit?: Evidence from a Field Experiment	79
4.1	Introduction	79
4.2	Experimental Design	82
4.2.1	The Credit Monitoring Service	82
4.2.2	Sample Population and Random Assignment	83
4.2.3	Experimental Treatments	84
	Simple Reminder Condition	84
	Positive Motivation I Condition (Social Information Messaging + “High” Credit Score)	85
	Positive Motivation II Condition (Social Information Messaging + “Low” Credit Score)	85
	Negative Motivation Condition	85
4.2.4	Data and Summary Statistics	86
	Administrative Data	86
	Main Outcomes of Interest	87
4.2.5	Estimation	87
4.3	Results	88
4.3.1	Intent-to-Treat Effects on Attention to Information about Creditworthiness	88
	Heterogeneous Effects	89
4.3.2	Treatment-on-the-Treated Effects on Attention to Information about Creditworthiness	90

4.4	Limitations	91
4.5	Conclusion	91
4.6	Tables and Figures	94
5	Conclusion	100
A	Appendix	103
A.1	Chapter 2	103
A.1.1	Survey of Consumer Payment Choice (SCPC) Items	103
A.2	Chapter 4	105
A.2.1	Email Message Example	105
	Bibliography	106

List of Figures

2.1	Probability responsible for paying bills before and after income rank change	27
2.2	Probability responsible for saving and investing before and after income rank change	28
2.3	Probability responsible for paying bills before and after initial income rank change (Two or more changes)	29
2.4	Probability responsible for saving and investing before and after initial income rank change (Two or more changes)	30
4.1	Timeline of Events	94
4.2	Experimental Design	94
A.1	Email Message: Simple Reminder Condition	105

List of Tables

1.1	Traditional and Non-Traditional Approaches to Building Financial Capability	4
2.1	Descriptive Statistics for Full Sample in First Period	25
2.2	Summary Statistics by Change in Income Rank in First Period, 2009	26
2.3	Pooled OLS Estimates of Predictors of Responsibility for Financial Tasks	31
2.4	Fixed Effects Estimates of Responsibility for Financial Tasks	32
2.5	Estimates of Responsibility and Relative Income on Financial Outcomes	33
2.6	Estimates of Responsibility and Relative Income on Financial Outcomes Controlling for Baseline Financial Literacy	34
2.7	Robustness Check: Fixed Effects Estimates of Relative Income on Responsibility for Financial Tasks by Sample Restriction	35
3.1	Means and Standard Deviations of Youth Employment, Instrument, and Outcome Variables	63
3.2	First-Stage Estimate of Unemployment Rate on Youth Employment During the School Year	64
3.3	OLS and 2SLS Estimates of Effect of Youth Employment	65
3.4	OLS and 2SLS Estimates of Effect of Youth Employment	66
3.5	OLS and 2SLS Estimates of Effect of Youth Employment	67
3.6	OLS and 2SLS Estimates of Effect of Youth Employment	68
3.7	Sibling Fixed Effects Estimates of Teen Employment on Financial Outcomes	69
3.8	Sibling Fixed Effects Estimates of Teen Employment on Financial Outcomes	70
3.9	Sibling Fixed Effects Estimates of Teen Employment on Financial Outcomes	71
3.10	Sibling Fixed Effects Estimates of Teen Employment on Financial Outcomes	72
3.11	First-Stage Estimate of Unemployment Rate on Youth Employment During the Summer	73
3.12	Means for Survey Sample, Estimation Sample, and Sibling Sample	74
3.13	OLS and 2SLS Estimates of Effect of Summer Youth Employment	75
3.14	OLS and 2SLS Estimates of Effect of Summer Youth Employment	76
3.15	Instrumental Variables Probit Estimates for Binary Financial Outcomes	77
3.16	Four Elements of Financial Well-Being and Study Measures	78
4.1	Balance Test and Treatment Cell Size	95

4.2	Non-Compliance: Balance Test	96
4.3	Dependent Variables Frequency and Test of Independence	97
4.4	Heterogenous Effects of Email Message	98
4.5	First Stage Estimates of Email Message Opened	99
4.6	2SLS Estimates of Opening Email Message on Attention to Information about Creditworthiness	99

Dedicated to my grandmother

1 Introduction

Many Americans experience low financial well-being. About forty percent of those surveyed by the Federal Reserve Bank were not able to cover a \$400 expense and one-in-ten do not earn enough to pay monthly bills (Board of Governors of the Federal Reserve System, 2019). Stress related to financial status is widespread (American Psychological Association, 2015). Recognizing these trends, researchers and policymakers have focused on better understanding the state of financial well-being in order to build policy and programs that improve the financial lives of families and individuals. Many point to financial capability as a key pathway to increasing financial well-being. Financial capability is the capacity, based on knowledge, skills, and access, to manage financial resources effectively (House, 2012). If financial well-being is a policy goal, then it is important to investigate the role of financial capability.

1.1 What is financial capability?

In the past, researchers focused on financial literacy: the ability to process economic information and make informed financial decisions. They were primarily interested in individuals' knowledge and skills related to finances. This work revealed that many consumers have low financial literacy as measured by the inability to correctly answer a three-question quiz on economic concepts, including compound interest, inflation, and

diversification (Lusardi and Mitchell, 2011). However, the underlying phenomenon is more complex than a simple financial literacy quiz can measure. The measure does not reflect the complexity of the financial markets nor the shift in risk from institutions to individuals. Recently, researchers have changed course toward an examination of how people employ knowledge to make choices rather than studying knowledge in isolation. Financial capability reflects that movement by measuring knowledge and skills as well as access to resources required for effective money management. Along with measuring financial literacy, financial capability incorporates one's financial inclusion, including access to a bank account and access to resources from institutions and social networks, like social safety net programs.

1.2 Why does financial capability matter?

Financial capability has important connections to financial well-being. Recent work in household finance reveals the effects of financial capability, knowledge, skills, and access to resources, on a wide range of financial outcomes. A large literature finds that financial knowledge and skills improve financial outcomes, including wealth accumulation (Lusardi and Mitchell, 2014) while a lack of financial knowledge and skills limits participation in the stock market and homeownership (Calcagno and Monticone, 2015; Gathergood and Weber, 2017). A less developed line of inquiry finds connections to financial inclusion, another element of financial capability. Banked households accumulate assets, have better access to debt, and have a lower probability of facing financial strain (Celerier and Matray, *Forthcoming*). Individuals from financially underdeveloped areas enter consumer credit markets later, have lower credit scores, and have more delinquent accounts

(Brown, Cookson, and Heimer, 2019). Also, access to resources from social safety net programs are central to financial well-being. These programs provide benefits that protect workers from foreclosure, bankruptcy, eviction, and mortgage default (Deshpande, Gross, and Su, 2019; Hsu, Matsa, and Melzer, 2018; Gallagher, Gopalan, and Grinstein-Weiss, 2019). The effects of financial capability may extend beyond the individual. Less sophisticated consumers often subsidize those who are sophisticated by paying more for services (Gabaix and Laibson, 2006; Armstrong and Vickers, 2012), which may lower welfare (Heidhues and Kőszegi, 2017). Recent work finds that differences in financial knowledge contribute to wealth inequality (Lusardi, Michaud, and Mitchell, 2017a).

1.3 How is financial capability built?

Financial capability develops through many different channels summarized in Table 1.1. Traditional approaches include those that improve knowledge and skills, like financial education, financial coaching, and financial counseling, as well as those that improve access to resources, like social safety net programs and safe, affordable financial services. Despite the promise of educating consumers to improve financial decision-making, these programs have limited effectiveness in increasing financial knowledge, especially when rigorously evaluated (Collins and O'Rourke, 2010; Mandell and Klein, 2009; Kaiser and Menkhoff, 2017; Miller et al., 2014; Fernandes, Lynch Jr, and Netemeyer, 2014). Non-traditional approaches reflect that financial capability is developed through indirect channels, like social connections, and addressing cognitive biases. Individuals may learn by doing in financial markets. They may also learn from others gaining knowledge and skills from observing the behavior of family members, peers, and partners (Jorgensen

and Savla, 2010; Van Campenhout, 2015). Nudges are behavioral interventions that recognize the role of cognitive biases, like limited attention and present bias (Willis, 2008; Willis, 2011). Social networks allow for access to resources, like informal transfers and informal channels, to borrow and save outside of financial institutions.

	Traditional approaches	Non-traditional approaches
Knowledge and skills	Financial education Financial coaching Financial counseling	Learning by doing Learning from others Nudges
Access to resources	Safety net programs Safe, affordable services	Informal transfers Informal channels to borrow, save

TABLE 1.1: Traditional and Non-Traditional Approaches to Building Financial Capability

1.4 How effective are non-traditional financial capability approaches?

Based on a critical read of this literature, three essays are presented that contribute evidence on the role of non-traditional approaches in building financial capability. The dissertation integrates theory and empirical evidence from economics, sociology, and behavioral science, uses unique survey and administrative data sources, and employs quasi-experimental and experimental approaches to estimate causal effects. Chapter 2 is a descriptive study that considers the role of learning by doing and learning from others in couples. Specifically, couples are followed over time using panel data from the Survey of Consumer Payment Choice to examine how couples decide who will act as the key

financial decision-maker for the household, and how this division of responsibility influences one's credit record knowledge and management. The study suggests that couples rely in part on relative income when choosing the decision maker. Partners who defer responsibility are less likely to know their credit, but are no worse at debt management. Chapter 3 describes and attempts to identify the effect of youth employment on the development of financial capability in young adulthood. Youth employment is an experience early in the life cycle which through many mechanisms, including earning an income for the first time, interacting with peers, and learning on-the-job skills applicable to financial choices, youth may develop financial capability that persists into young adulthood. The findings reveal that working in high school has limited effects on financial capability later in life. Chapter 4 uses a field experiment to examine the role of nudges for financial capability, particularly knowledge of one's credit record. This study reveals that receiving a message is not effective at encouraging consumers to check their credit. However, those consumers who view the message are more likely to check their credit. Together these studies largely find small and statistically insignificant effects of non-traditional approaches to building financial capability. Chapter 5 orients these essays in the existing literature and offers avenues for future work. The essays discussed in this dissertation largely corroborate past studies that investigate the effectiveness of learning through experience, social learning, and reminders in household finance.

2 Does Responsibility for Financial Tasks Influence Credit Knowledge and Behavior?: Evidence from a Panel of US Couples

2.1 Introduction

Although household debt has declined since its height in 2009, many Americans are struggling to manage credit. Delinquency rates have risen in recent years, especially for credit cards and auto loans, and 32% of Americans have debt in collections (Journal, 2017; Institute, 2018). Managing household finances requires substantial effort and expertise. Consumers must align day-to-day consumption and saving decisions with preparation for unexpected shocks and progress towards long-term financial goals. Deciding who will make these financial choices for the household is critical to financial well-being. However, relatively little is known about how couples divide responsibility for financial tasks and how this choice influences economic outcomes.

Past studies have shown that despite the intention to divide responsibility for finances equally, couples tend to select one partner to take responsibility for financial tasks (Bernasek and Bajtelsmit, 2002; Fonseca et al., 2012; Burgoyne et al., 2007; Pahl, 1995). Financial tasks, like other housework, offer the opportunity for couples to specialize to improve efficiency (Becker, 1985). Specialization results in a division of housework where couples rely on one partner to take actions that are in the best interest of the household. However, financial accounts are held both jointly and individually, which can make household-level optimization difficult. For example, the household financial manager may not have accurate information about their partner's account balances and terms. Also, the partner who does not specialize in financial decision-making may fail to attend to information about finances and accumulate financial knowledge exacerbating the complexity of joint financial decision-making. The division of responsibility for financial tasks could lead to substantial differences in the financial knowledge and behavior between partners, as well as difficulty achieving household financial well-being.

Many empirical studies have revealed that couples rely on factors unrelated to financial knowledge when they decide who will manage financial tasks. Relative income largely drives differences in who executes financial decisions on behalf of the household. Bernasek and Bajtelsmit (2002) revealed that women's involvement in savings and investment decisions is positively related to their contribution to the total household income. Hitzenko (2016) presented evidence that the higher earner is more likely to take on greater responsibility for financial decisions, regardless of gender. Carman and Hung

(2017) found that the husband or primary earner (if not the husband) tends to manage retirement assets, and that relative income influences the distribution of retirement contributions between partner retirement saving account. Retirement planning based on individuals' accounts rather than the household portfolio may lead to suboptimal retirement saving decisions. Relative income plays a central role in the division of responsibility for finances, as well as financial outcomes, like wealth accumulation.

Most couples do not initially select the decision-maker based on financial expertise. Instead, they use other factors to choose who will manage finances. Over time, the selected decision-maker develops financial expertise. This division may in part explain the well-documented gender gap in financial literacy, particularly the widening of the gap over time (Lusardi and Mitchell, 2008; Lusardi, Mitchell, and Curto, 2009; Fonseca et al., 2012). As the financial manager in the couple attends to financial information and builds experience in the financial market, a significant gap in financial knowledge develops. Recent experimental work has shown that when the responsibility for financial choices is initially given to a partner, they do not exhibit greater expertise. Instead, the expertise develops over time (Ward, Lynch, and Lee, 2018). The deferring partner does not have the same incentives to learn about finances.

However, a recent study revealed that when the deferring partner anticipates the financial manager's death in older age, they accumulate the information needed to make financial choices and largely close the gender gap in financial literacy (Hsu, 2016). Descriptive evidence from a cross-section of US couples showed that when those who rely on another partner to manage finances must make an independent financial decision, they are not equipped with requisite knowledge, nor able to search effectively to overcome the knowledge deficit (Ward, Lynch, and Lee, 2018). These findings point to the importance

of incentives for building financial literacy, as well as the need to have the time or ability to anticipate that the knowledge will be needed in the future.

Another related line of literature reveals that many are not well-informed about their creditworthiness, which can lead to suboptimal outcomes in credit markets. Levinger, Benton, and Meier (2011) showed that low-to-middle income consumers tend to underestimate or completely lack information about their creditworthiness. They also found that those who had less financial experience were more likely to inaccurately estimate their credit rating. This inaccuracy of credit information is associated with greater perceived barriers to credit. Other studies also found evidence that consumers inaccurately assess their creditworthiness (Courchane, Gailey, and Zorn, 2008; Perry, 2008). Self-assessment of financial standing is revealed as an important component of financial literacy. Together these studies have shown that despite access to a free credit report each year, consumers often do not have accurate information about their credit that could lead to costly borrowing decisions. Unlike prior work, this study will explore the role of responsibility for financial tasks on credit knowledge and behavior.

Overall, this literature suggests two questions to address in this study: (1) to what extent does relative income influence division of responsibility for financial tasks after accounting for fixed individual characteristics? and (2) are credit rating awareness and credit card outcomes influenced by relative responsibility? This study aims to generate new evidence based on a longitudinal dataset of relatively affluent married and cohabiting couples followed from 2009 to 2014.

This study makes several contributions. First, we use a unique dataset from the Federal Reserve of Boston that follows a panel of US adults that includes information about

household financial tasks and economic outcomes. Second, unlike prior studies, we control for time-invariant individual-level heterogeneity using a fixed-effects approach exploiting the longitudinal data to estimate the influence of relative income on division of responsibility for finances. Third, we examine the role of responsibility for building financial capability, particularly acquisition of information about creditworthiness and credit card borrowing behavior. Finally, we control for measured financial literacy of the deferring partner among a subsample to isolate the role of financial responsibility.

2.2 Data, Measures, and Methods

2.2.1 Data

This study uses data from the 2009-2014 Survey of Consumer Payment Choice to analyze how married and cohabiting couples decide who will be responsible for household finances. The Federal Reserve Bank of Boston has conducted the SCPC each year since 2008 to measure American consumer use of financial products and services. SCPC is a longitudinal consumer panel conducted online as part of the RAND American Life Panel (ALP). ALP is a nationally representative, probability-based panel whose participants are regularly interviewed online. Respondents without access to an internet-connected computer are provided with one to participate in the study. The SCPC is matched to the ALP's MyHousehold Questionnaire (MHQ) in the most recent quarter of the MHQ's collection each year; the MHQ includes demographic information about the respondent and their household.

The data are ideal for this study because they include measures of relative income as well as relative responsibility for two types of household financial tasks (see Appendix [A](#)

for survey questions).¹ They also include information on credit knowledge and behavior. ALP offers a supplement with questions to measure financial literacy.

In this study, we focus on the 2009 to 2014 survey years². The sample is restricted to household heads in male-female couples who are married or cohabiting and participated in at least two of the six survey years. The estimation sample includes 1297 unique individuals. Table 2.1 details the summary statistics in 2009, the baseline survey year. Over half of the sample are responsible for paying monthly bills or managing savings, investments, and borrowing in their household. A third of the sample report household income greater than \$100,000. Only 13% of households have partners that earn equal income. More than two-thirds are educated beyond a high school diploma, employed, and white. Most know their credit score and estimate a FICO score above 700 points. About half of the sample do not carry a balance on any of their credit cards. About 40% of the sample experience a change in income rank over the study period. More than two-thirds of these households experience only one change in rank. Table 2.2 shows that those who change income rank tend to have low income and low education level.

2.2.2 Measures

In this study we explore two sets of dependent variables. First, we study the influence of relative income on relative responsibility for finances. The dependent variable for

¹Unlike other studies that include each partner's income allowing computation of continuous relative income, the data for this study only include a categorical ranking of the respondent's income relative to the income of others in the household. Past studies demonstrate crossing the 0.50 relative income share threshold as meaningful for division of household responsibility, so we do not anticipate issues with interpreting results using a categorical versus continuous measure of relative income. However, we are not able to control for each partner's income, which may bias our results.

²We omit the first year of survey collection where the sample is half the size of later years. In 2009, the study includes the full panel of households that are followed in subsequent survey years. (Foster et al., 2010)

the analysis is self-reported responsibility for two household financial tasks: (1) paying bills and (2) managing savings, investments, and borrowing. Indicator variables are constructed equal to 1 if the individual reported “Most” or “All or almost all” to the question. “In your household, how much responsibility do you have for paying monthly bills (rent or mortgage, utilities, cell phone, etc.)?” and “In your household, how much responsibility do you have for making decisions about savings and investments (whether to save, how much to save, where to invest, how much to borrow)?”, 0 otherwise.³

When we move to examining credit knowledge and behavior, we use awareness of credit score, self-assessed credit score, and whether one repays credit card balance(s) in full each month as dependent variables. In the study, we construct a measure that indicates whether or not one answers “Do not know” to “Please estimate your most recent credit rating, as measured by a FICO score?”. Knowing one’s credit rating is an important diagnostic piece of information when participating in credit markets that impacts loan approval and borrowing terms. We also construct a measure that indicates whether one estimates their credit rating to be 700 points or above, a cutoff often recognized as signifying prime credit score⁴. Those who respond “700-749”, “750-800”, or “Above 800” to “Please estimate your most recent credit rating, as measured by a FICO score?” are coded as 1, 0 otherwise. Finally, we construct a dummy variable that indicates whether one never carries a balance on their credit card(s). Respondents who answer “No” to “During the past 12 months, did you carry an unpaid balance on any credit card from one month to the next (that is, you did not pay the balance in full at the monthly due date)?” are coded

³Hitczenko (2016) found that couples tend to provide consistent responses to questions about contribution to household financial activities using a sample of households where both partners were surveyed in the 2012 SCPC.

⁴The Consumer Protection Bureau defines the cutoff for prime risk profile as credit scores ranging from 660-719.

as 1, 0 otherwise. The measure tells us whether the respondent uses their credit card to transact only rather than to borrow. Paying off a credit card in full each month positively impacts one's credit rating and the borrower avoids incurring high interest costs on their credit card balance.

The key independent variables for the study are relative income and relative responsibility for finances. Relative income is a self report to the question "What does your own personal income rank within your household?". We construct an indicator for highest income rank that equals one if the individual reports "Highest in my household", 0 otherwise. We construct an indicator that equals one if the individual reports "None or almost none", 0 otherwise, to "In your household, how much responsibility do you have for these tasks?" for each task.

We control for individual and household characteristics that may influence the relationship of interest. The control variables include equal income rank, gender, family income, education level, employment status, age, and household size. We construct a dummy to indicate whether one earns the same income level as one's partner based on whether they answer "About equal to the highest (roughly the same as another household member)" to "What does your own personal income rank within your household?". Family income is collected based on the past 12 months of total combined income of all family members. The responses are split into three categories, and we construct dummy variables that indicate whether family income is \$0-\$59,000, \$60,000-\$99,999, or \$100,000 or more. Income is measured in US dollars. Education level is also categorized and dummy variables constructed to indicate whether education level attained is high school degree or less, some college, college degree, or graduate or professional degree. Employment status is measured by an indicator variable equal to 1 if the individual reports "Working

Now” to “What is your current employment situation?”, 0 otherwise. Race/ethnicity is measured by the self-report to “Do you consider yourself primarily white or Caucasian, Black or African American, American Indian, or Asian?” Indicator variables are constructed for each race/ethnicity category. Age is measured in years. Household size is the count of total household members reported by the respondent to “Now we would like to know about other members of your household, if there are any. How many other people live with you?” We also include interactions of the control variables with the female dummy to allow the influence of these factors to vary by gender based on prior evidence (Bertrand, Kamenica, and Pan, 2015).

2.2.3 Methods

In this study, we employ a fixed-effects approach exploiting the panel nature of the data to estimate the influence of individual and household characteristics on responsibility for household financial tasks. The equation below serves as the baseline econometric specification to estimate the association between changes in relative income and financial outcomes relative to time-invariant factors, including ability. The specification includes household-level controls, including family income and household size, and a vector of individual-level characteristics for the primary household respondent, including employment status, education level, and an indicator for respondents 55 years and older. Estimates are computed using a linear probability model with individual fixed effects, year indicators, and Huber-White robust standard errors ⁵. The econometric specification is:

⁵The results are consistent using a fixed-effects logistic regression. The linear probability model (LPM) is employed in this study to improve interpretability since we include a set of gender interactions. LPM is also preferred because estimates are moderately sized probabilities.

$$Y_{it} = \beta_1 \text{Earns More}_{it} + \beta_2 \mathbf{X}_{it} + \beta_3 \text{Female}_i * \mathbf{X}_{it} + c_i + \epsilon_{it}$$

Y_{it} is a dichotomous variable that equals one if the respondent assumes all or most responsibility for financial management tasks in the household: responsibility for paying bills and responsibility for managing savings and investments. β_1 captures the influence of Earns More_{it} , earning more income than one's partner, a measure of bargaining power, on responsibility for financial management. β_2 captures the influence of \mathbf{X}_{it} , a vector of time-varying covariates. In this vector, we include an indicator for whether one earns equal income to their partner to interpret the estimates on β_1 as the influence of earning more relative to earning less than one's partner. c_i is an individual fixed effect that captures the influence of time-invariant individual characteristics. ϵ_{it} is an error term that is clustered by individual and year.

Next, we examine how the division of responsibility for financial tasks influences credit knowledge and behavior. We estimate the following equation:

$$Y_i = \beta_1 \text{Never Responsible}_i + \beta_2 \mathbf{X}_i + \beta_3 \text{Female}_i * \mathbf{X}_i + \epsilon_i$$

Y_i is a set of three dependent variables that measure whether or not the individual knows their credit rating, whether or not their estimated credit rating is above 700 points, and whether or not they carry a balance on their credit card(s). $\text{Never Responsible}_i$ is an indicator variable that equals 1 if the individual is not responsible for paying bills nor

managing savings and investments in all periods they are observed over the study period, 2009-2014. \mathbf{X}_i is a vector of individual and household-level characteristics. $\text{Female}_i * \mathbf{X}_i$ represents a set of interactions of gender with individual and household-level characteristics.

2.3 Results

In this section, we detail the results from the estimation of the econometric specifications detailed above. First, we present the results from the analysis using the pooled cross-section over the entire study period without accounting for the panel structure. Next, we discuss the results for the analysis that includes individual-level fixed effects in the model to control for observed and unobserved time-invariant characteristics that may influence responsibility for financial tasks. Finally, we examine how deferring responsibility for financial tasks influences credit knowledge and outcomes.

2.3.1 Predictors of Responsibility for Financial Tasks

Figures 2.1 and 2.2 are event studies of predicted probability of responsibility for paying bills and managing saving and investing, respectively. These figures illustrate that those who experience a change in income rank experience a change in financial responsibility. Those who have higher income rank have higher predicted responsibility while those who experience an income rank drop are less likely to be the decision-maker. Changes in responsibility resulting from a change in income rank persist years after. Figures 2.3 and 2.4 show event studies only for those who experience more than one income rank change. These figures show a similar pattern following the initial change in income rank

to that of couples who only experience one change in income rank. However, changes in responsibility are less pronounced for later changes in income rank. These estimates are based on a small subset of the sample who change rank more than once.

In Table 2.3, we present the results for the pooled cross-section. Column 1 and 2 show the estimates for the model that excludes control variables and interactions with gender. Those who earn more than their partner are 9.9 percentage points more likely to be responsible for paying monthly bills and 33 percentage points more likely to be responsible for managing savings and investments. In columns 3 and 4, individual- and household-level controls are included in the regression equation. Those who earn more are significantly more likely to be responsible for both financial tasks, even after controlling for a rich set of demographic characteristics and differential influence of these controls by gender. The magnitude of the coefficient on $Earns\ More_{it}$ is almost 40% larger than the estimate in Column 1. Women who earn more than their partner are more likely to pay monthly bills than their male counterparts. This suggests that women with higher relative income may compensate their partner for violating the male-breadwinner gender norm by taking more responsibility for this task (Bertrand, Kamenica, and Pan, 2015). Partners with higher levels of education up to a four-year college degree are significantly more likely to oversee monthly bill pay. When we consider the influence of relative income on responsibility for saving and investing, the coefficient on top income rank is 4% smaller than the estimate from the baseline specification. Equal earning partners are also more likely to manage this financial task although the magnitude is smaller. Education, age, and income also significantly influence responsibility for managing saving and investing. Those who have some college education or a college degree are significantly more likely to manage this task. However, there is no additional influence of education on financial

responsibility for those with a professional or graduate degree. Older adults, those over 55 years old, are less likely to handle this task perhaps due to cognitive decline (Hsu and Willis, 2013). The above estimates do not account for the panel nature of the data. The fixed-effects approach nets out factors that do not change over time, exploiting the observation of individuals over time.

2.3.2 Accounting for Fixed Individual-Level Heterogeneity

In Table 2.4, we focus on relative income exploiting changes in income rank over time. We account for time-invariant characteristics that are observed and unobserved at the individual-level using the fixed effects approach. This approach uses those households who experience a change in income rank to identify the influence of relative income on responsibility for financial tasks. Table 2.2 reveals that these results represent the association for those households who have lower income and lower education relative to the pooled OLS results. The fixed effects approach estimates represent the change in responsibility for finances that are associated with changes in income rank. We find that the influence of income rank remains positive and statistically significant. In Column 1, the estimate on $Earns More_{it}$ is 43% smaller than the specification in Table 2.3 column 3. The magnitude of the estimate decreases even more dramatically when we turn to the influence on responsibility for saving and investing in Column 2. The higher earner is only 9.7 percentage points more likely to be responsible for this task compared to 31.6 percentage points in the specification that excludes time-invariant observed and unobserved factors. In this study, the individual fixed effects approach allows us to control for individual-level heterogeneity. However, changes in income rank over time are not random, and the identifying sample disproportionately represents groups who are more likely to change

income rank. The difference between the estimates from the pooled OLS and fixed effects approaches suggests that the influence of relative income on financial responsibility is small once time-invariant observable and unobservable characteristics are accounted for.

2.3.3 Does the Division of Responsibility Influence Credit Knowledge and Behavior?

Does it matter who takes responsibility for these tasks in terms of household financial well-being? Economic theory suggests that the partner who makes the financial decisions will act altruistically, executing decisions that are in the best interest of the household (Becker and Becker, 2009). Thus, it should not matter who makes these decisions. However, the division of responsibility for finances may influence the accumulation of knowledge required to make financial decisions. In this study, we examine the credit knowledge and behavior of those who defer responsibility for financial decisions to their partner in an attempt to measure the role of responsibility in explaining past findings that consumers poorly assess their credit rating and credit constraints. Table 2.5 Panel A reveals that those who are never responsible for managing savings and investment decisions for their household are significantly less likely to know their credit rating relative to those who engage with saving and investing choices. However, there is no significant association with estimated credit rating or probability of not carrying a credit card balance, measures of creditworthiness and responsible debt management. In Panel B we find that there is no significant relationship between deferring responsibility for paying monthly bills and credit knowledge or behavior.

Overall, these results reveal that responsibility for financial tasks is significantly, positively associated with earning more than one's partner, particularly for management of

savings and investments. Responsibility influences credit knowledge, the partner who avoids responsibility is less likely to know their credit score. We find that one mechanism underlying past empirical findings that many consumers are not able to accurately assess their credit rating may be driven in part by the division of responsibility for financial decision-making.

2.3.4 Robustness Checks

We perform two robustness checks to address potential omitted variable bias in each part of our analysis. We verify the importance of controlling for time-invariant unobserved factors using individual-level fixed effects by comparing results from a pooled ordinary least squares (OLS) regression in the previous section. If there are omitted confounders, the estimates from the pooled OLS regression will be biased.

We address concerns about omitted variable bias in the fixed-effects approach by estimating the model with several sample restrictions to test the robustness of the results to alternative comparison groups. To combat omitted variable bias, we run the regression changing the comparison group by omitting those who are disabled, have children, age 65 years or older, and unemployed. This approach is motivated by the possibility that changes in relative income resulting from health, parenthood, retirement, and unemployment could undermine the empirical strategy leading to biased estimates. Table 2.7 details the results from this analysis. We find that the estimates of the influence of relative income on responsibility for finances are largely not sensitive to sample restrictions. However, it is important to note that when we exclude individuals who have children, the influence of earning more than one's partner on responsibility for paying bills is statistically insignificant.

For a subset of the sample, we observe scores on a three-question financial literacy quiz modeled after the assessment proposed by Lusardi and Mitchell (2008) completed as part of a supplemental survey of the RAND ALP fielded in 2009 (details on the three questions are included in the Appendix). This information allows us to control for measured financial literacy at baseline when estimating the influence of deferred responsibility for financial tasks on credit knowledge and behavior detailed in Table 2.6. We find that main results are robust to the inclusion of this potential confounding factor. The influence of deferring responsibility for managing savings and investments increases in magnitude and remains statistically significant at the 5% level when we control for baseline measured financial literacy. However, measured financial literacy alone does not influence whether or not one knows their credit score, suggesting that a lack of financial knowledge does not drive this result. Measured financial literacy significantly influences estimating a credit rating above 700 points and using a credit card only to transact only.

2.4 Limitations

The evidence presented in this study has several limitations. First, the study relies on a sample of married and cohabiting couples who are older and more affluent than the population. Given the lack of representativeness, the findings should not be generalized to the population of male-female married and cohabiting couples in the United States. Second, although the sample used for this study includes both married and cohabiting couples, we are not able to differentiate between these two relationship types to analyze how the division of responsibility for financial decisions differs by type. Recent research

that explores financial decision making of cohabiting couples reveals that their behavior is distinct from married couples (Addo, 2014). Third, the survey collects responses from one primary respondent for each household which does not allow for comparison of responses between partners.⁶ Fourth, neither the income level nor income share for each partner is collected. Without this information, we are unable to control for the extent to which a partner earns more than the other. Finally, the fixed effects approach relies on a non-random sample of individuals who switch income rank over the study period for identification. Selection into the identifying sample places greater weight on those who participate in more survey waves as they are mechanically more likely to experience a switch. Respondents with lower socioeconomic status measured by income and education are also more likely to experience a change in income rank limiting the generalizability of these findings.

2.5 Conclusion

In this study, we make two contributions bridging together past empirical work on the importance of the division of household financial responsibility for financial capability and economic outcomes.

First, we show that relative income is a positive and significant predictor of household financial management responsibility whether considering bill payments or saving and investment choices. These findings suggest that bargaining power, as measured by relative income, influences the choice of which partner is the financial decision-maker, corroborating past evidence using a unique panel dataset. These results hold even after

⁶A subset of the sample includes responses from both partners. However, the subsample is not analyzed due to small sample size and selection into the survey for the secondary respondent.

accounting for a rich set of demographic characteristics and fixed individual-level heterogeneity. The estimates from the fixed-effects approach are much smaller than those from the pooled OLS approach.

Second, we offer evidence that the division of responsibility for managing saving and investment decisions negatively influences the ability to estimate credit rating for partners who defer this responsibility— a previously unexplored mechanism. Together, the estimates from this analysis suggest an economically small, statistically significant negative influence of foregoing financial experiences by choosing a single decision-maker for the household.

The findings from this study reveal several avenues for future research. We are able to demonstrate that financial responsibility influences knowledge related to borrowing decisions, however, the relationship with decision-making quality remains unclear. Future work should explore this relationship in a sample that is more representative of the population of interest. Finally, this research highlights the importance of exploring joint financial decision-making processes and identifying sources of data that support these analyses.

This study informs policies and programs that aim to build financial capability and improve household financial well-being. Policymakers and practitioners should recognize that couples often rely on a single decision-maker for joint financial choices based on relative contributions to family income. The division of responsibility for financial tasks may leave the partner who defers responsibility uninformed about their own financial standing. Interventions should address the gap in financial knowledge, including experiences in the financial market and self-assessment of financial standing, that results from

specialization in financial decision-making. The deferring partner may be financially vulnerable, especially in the event of divorce, cognitive decline, or widowhood. Attempts to motivate consumers to check their free credit report may target those who are not the main household financial decision-maker who appear to systematically lack this information.

2.6 Tables and Figures

	Mean/Prop.	Standard Deviation
Responsible for bills	0.577	0.494
Responsible for save/invest	0.448	0.497
Female	0.535	0.499
Income rank changes	0.384	0.487
Earns More	0.450	0.498
Equal Earnings	0.133	0.339
Earns Less	0.330	0.471
Family Income		
\$0-59K	0.386	0.487
\$60-99K	0.322	0.468
\$100K+	0.291	0.455
Education		
<i>HS Grad or Less</i>	0.172	0.377
<i>Some College</i>	0.346	0.476
<i>College Degree</i>	0.271	0.445
<i>Graduate/Prof. Degree</i>	0.210	0.408
Employed	0.720	0.449
White	0.875	0.331
Age	48.873	14.168
Household size	2.055	1.114
Financial Literacy Quiz (3pt)	2.565	0.680
Know credit score	0.823	0.382
Credit score 700+	0.719	0.450
No credit card balance	0.483	0.500
Observations	1297	

TABLE 2.1: Descriptive Statistics for Full Sample in First Period

Data are from the 2009 Survey of Consumer Payment Choice. The table shows summary statistics for each household in the first period of the study, 2009.

	No Change in Relative Income	Change in Relative Income
Responsible for bills	0.593	0.585
Responsible for save/invest	0.438	0.416
Female	0.552	0.508
Earns More	0.433	0.481
Equal Earnings	0.113	0.206
Earns Less	0.373	0.255
Family Income		
\$0-59K	0.340	0.430
\$60-99K	0.320	0.317
\$100K+	0.339	0.253
Education		
<i>HS Grad or Less</i>	0.155	0.195
<i>Some College</i>	0.339	0.359
<i>College Degree</i>	0.284	0.251
<i>Graduate/Prof. Degree</i>	0.222	0.195
Employed	0.658	0.663
White	0.884	0.863
Age	50.855	50.707
Household Size	2.053	2.000
Financial Literacy Quiz (3pt)	2.582	2.539
Know Credit Score	0.790	0.754
No Overdraft Fees	0.746	0.701
Credit Score 700+	0.723	0.687
No Credit Card Balance	0.472	0.449
Observations	799	498

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

TABLE 2.2: Summary Statistics by Change in Income Rank in First Period, 2009

Data are from the 2009 to 2014 Survey of Consumer Payment Choice (SCPC). The table shows summary statistics for each household in the first period of the study, 2009. Responsible for X are binary variables that indicate whether or not the respondent assumes all or most of the responsibility for the corresponding task. Source: Survey of Consumer Payment Choice (SCPC).

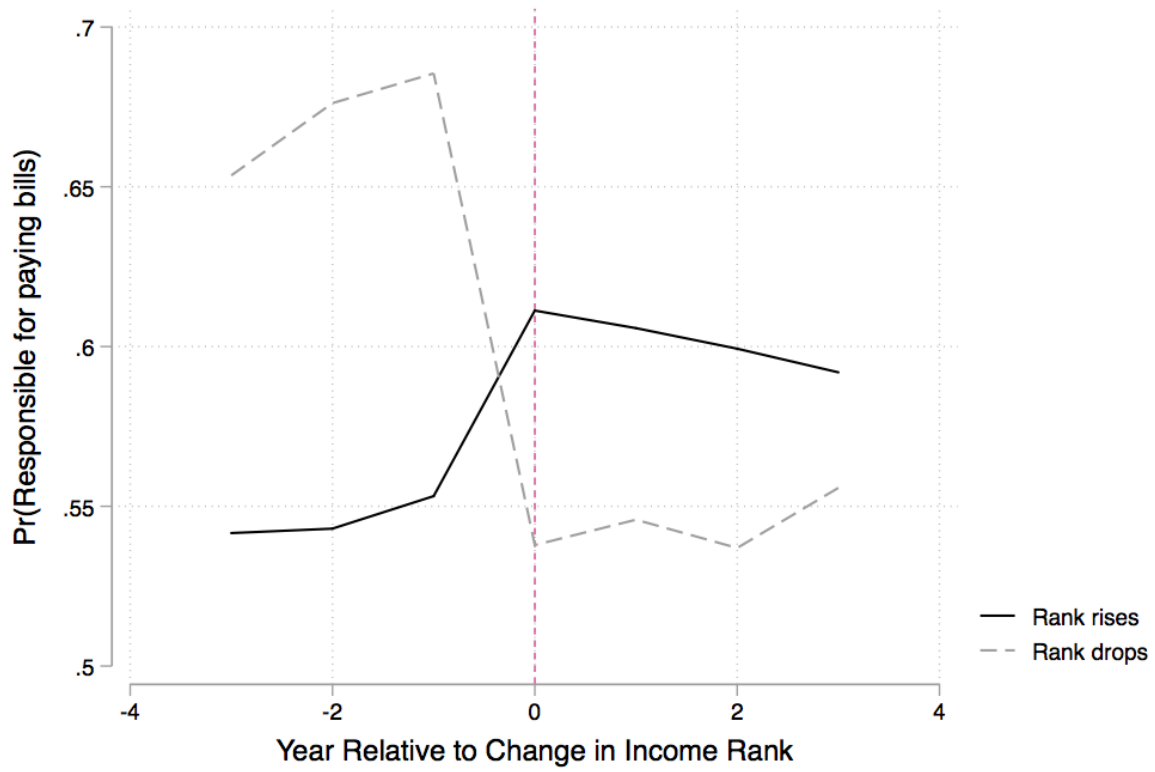


FIGURE 2.1: Probability responsible for paying bills before and after income rank change

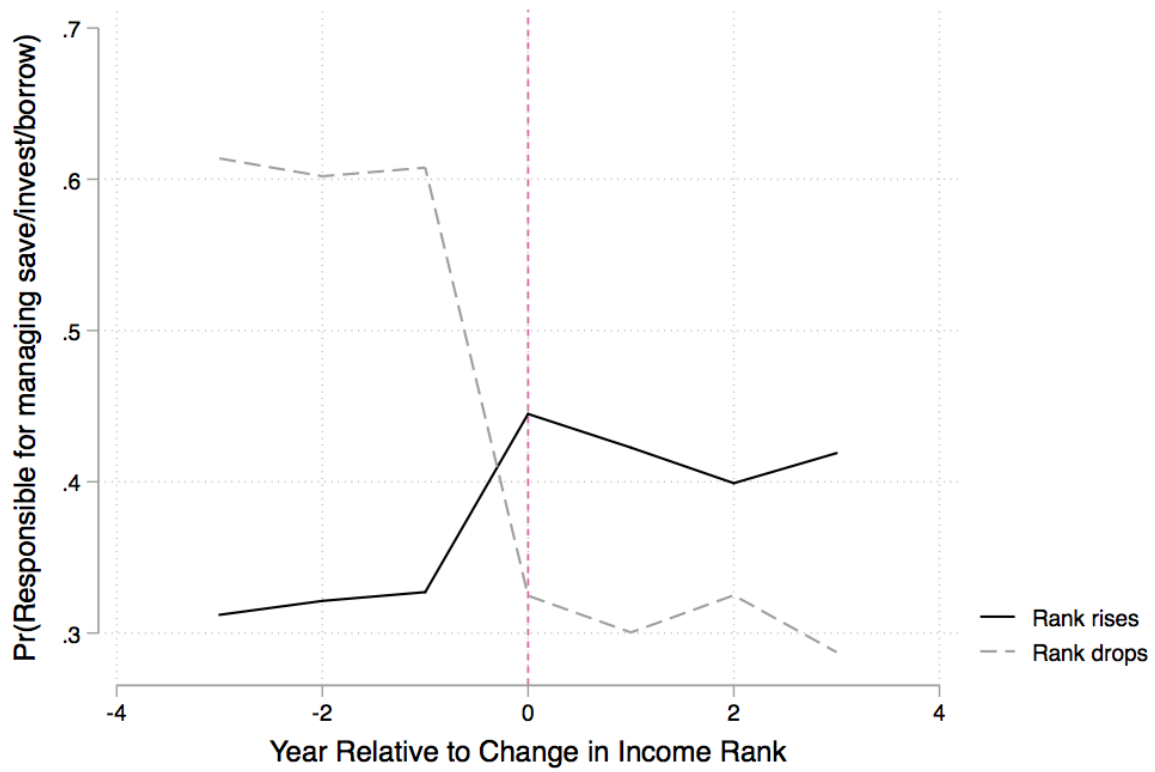


FIGURE 2.2: Probability responsible for saving and investing before and after income rank change

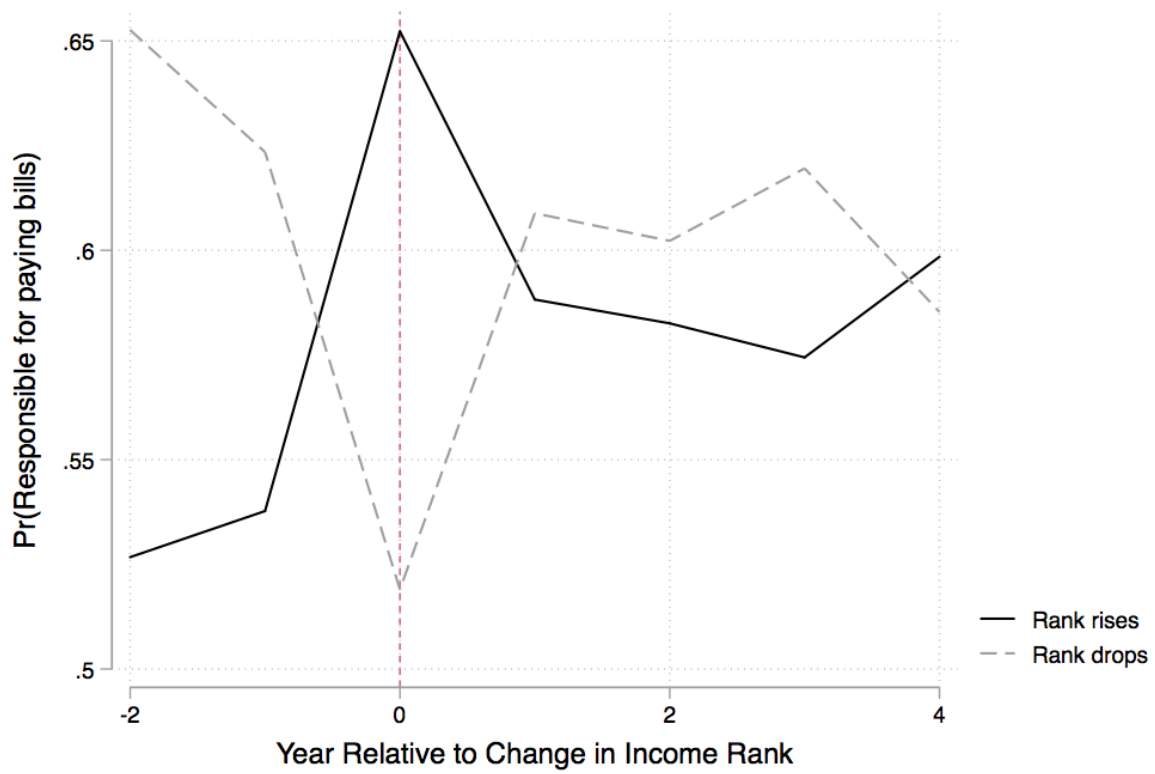


FIGURE 2.3: Probability responsible for paying bills before and after initial income rank change (Two or more changes)

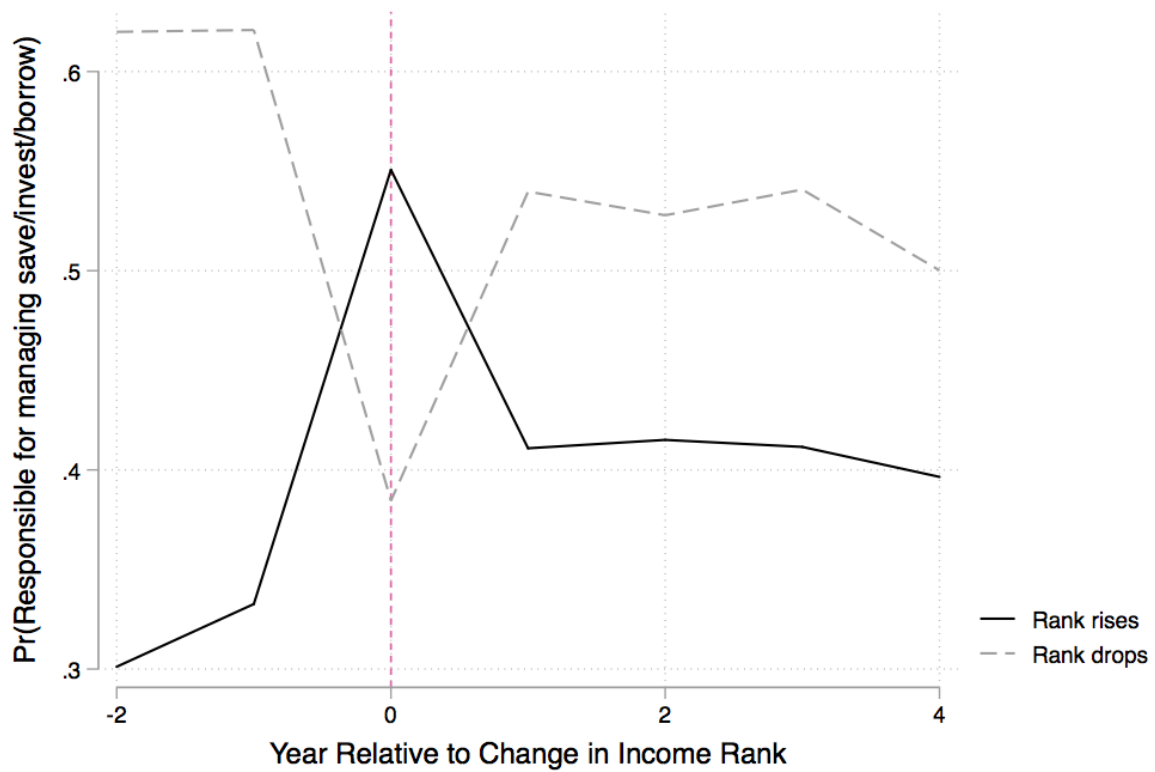


FIGURE 2.4: Probability responsible for saving and investing before and after initial income rank change (Two or more changes)

	(1)	(2)	(3)	(4)
	Pay Bills	Save/Invest	Pay Bills	Save/Invest
Earns More	0.099 *** (0.000)	0.330 *** (0.000)	0.138 ** (0.002)	0.316 *** (0.000)
Equal Earner			0.039 (0.452)	0.129 ** (0.005)
Female × Earns More			0.100 † (0.082)	0.023 (0.660)
Female			0.112 (0.198)	-0.027 (0.712)
Some College			0.093 † (0.097)	0.114 * (0.014)
College Degree			0.111 † (0.066)	0.154 ** (0.003)
Graduate/Prof. Degree			0.044 (0.505)	0.072 (0.203)
Age 55+			-0.053 (0.223)	-0.075 * (0.043)
60K-99K			0.011 (0.819)	0.019 (0.630)
100K+			0.045 (0.378)	0.136 ** (0.002)
Have children			0.019 (0.626)	-0.001 (0.974)
Constant	0.520 *** (0.000)	0.306 *** (0.000)	0.349 *** (0.000)	0.271 *** (0.000)
<i>Female * X_{it}</i>	No	No	Yes	Yes
Survey Year Dummies	Yes	Yes	Yes	Yes
Controls	No	No	Yes	Yes
Mean	0.588	0.438	0.588	0.438
Standard Deviation	0.492	0.496	0.492	0.496
Observations	5146	5142	5146	5142
R ²	0.011	0.110	0.043	0.147

† $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

TABLE 2.3: Pooled OLS Estimates of Predictors of Responsibility for Financial Tasks

Data are from the 2009-2014 Survey of Consumer Payment Choice. Standard errors clustered at the individual-level. See Measures section for variable details.

	(1)	(2)
	Pay Bills	Save/Invest
Earns More	0.078 ** (0.004)	0.097 ** (0.001)
Individual Fixed Effects	Yes	Yes
Survey Year Dummies	Yes	Yes
Controls	Yes	Yes
Mean	0.588	0.438
Standard Deviation	0.492	0.496
Observations	5146	5142
R^2	0.016	0.012
Number of Individuals	1295	1295

† $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

TABLE 2.4: Fixed Effects Estimates of Responsibility for Financial Tasks

Data are from the 2009-2014 Survey of Consumer Payment Choice. Standard errors clustered at the individual-level. See Measures section for variable details.

Panel A: Responsible for Managing Savings/Investments			
	(1)	(2)	(3)
	Know Credit Score	Credit Score 700+	No Credit Card Balance
Never Responsible for Save/Invest/Borrow	-0.088* (0.017)	-0.057 (0.188)	-0.026 (0.559)
Survey Year Dummies	Yes	Yes	Yes
<i>Female</i> * X_{it}	Yes	Yes	Yes
Controls	Yes	Yes	Yes
Observations	1228	984	1068
R^2	0.068	0.179	0.114

Panel B: Responsible for Paying Bills			
	(1)	(2)	(3)
	Know Credit Score	Credit Score 700+	No Credit Card Balance
Never Responsible for Bills	-0.045 (0.133)	0.037 (0.264)	-0.001 (0.986)
Survey Year Dummies	Yes	Yes	Yes
<i>Female</i> * X_{it}	Yes	Yes	Yes
Controls	Yes	Yes	Yes
Observations	1230	985	1070
R^2	0.062	0.177	0.113

+ $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

TABLE 2.5: Estimates of Responsibility and Relative Income on Financial Outcomes

Standard errors clustered at the individual-level. Means and standard deviations for the dependent variable are provided in each column. Data are from the 2009 to 2014 Survey of Consumer Payment Choice. The unit of observation is an individual (the partner that responds to the survey). The sample is restricted to partners in male-female couples who are married or cohabiting and who participated in at least two survey years. The dependent variables column-by-column are (1) *Know Credit Score*, (2) *Credit Score 700+*, and (3) *No Credit Card Balance*. See Measures section for variable details.

Panel A: Responsible for Saving and Investing			
	(1)	(2)	(3)
	Know Credit Score	Credit Score 700+	No Credit Card Balance
Never Responsible for Save/Invest/Borrow	-0.097* (0.040)	-0.080 (0.123)	-0.019 (0.730)
High Measured Financial Literacy	0.039 (0.251)	0.103** (0.009)	0.162*** (0.000)
Survey Year Dummies	Yes	Yes	Yes
<i>Female</i> * X_{it}	Yes	Yes	Yes
Controls	Yes	Yes	Yes
Observations	728	586	666
R^2	0.062	0.150	0.155
Panel B: Responsible for Paying Bills			
	(1)	(2)	(3)
	Know Credit Score	Credit Score 700+	No Credit Card Balance
Never Responsible for Bills	-0.050 (0.174)	0.020 (0.583)	0.012 (0.781)
High Measured Financial Literacy	0.039 (0.256)	0.100* (0.010)	0.159*** (0.000)
Survey Year Dummies	Yes	Yes	Yes
<i>Female</i> * X_{it}	Yes	Yes	Yes
Controls	Yes	Yes	Yes
Observations	731	588	669
R^2	0.056	0.142	0.155

† $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

TABLE 2.6: Estimates of Responsibility and Relative Income on Financial Outcomes Controlling for Baseline Financial Literacy

Standard errors clustered at the individual-level. Means and standard deviations for the dependent variable are provided in each column. Data are from the 2009 to 2014 Survey of Consumer Payment Choice. The unit of observation is an individual (the partner that responds to the survey). The sample is restricted to partners in male-female couples who are married or cohabiting and who participated in at least two survey years. The dependent variables column-by-column are (1) *Know Credit Score*, (2) *Credit Score 700+*, and (3) *No Credit Card Balance*. See Measures section for variable details.

Panel A: Responsible for Saving and Investing				
	(1)	(2)	(3)	(4)
	No Disabled	No Children	No Age 65+	No Unemployed
Earns More	0.090 ** (0.007)	0.119 * (0.013)	0.074 † (0.088)	0.072 * (0.048)
Constant	0.679 *** (0.000)	0.368 *** (0.000)	0.640 *** (0.000)	0.699 *** (0.000)
Individual Fixed Effects	Yes	Yes	Yes	Yes
Survey Year Dummies	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes
Mean	0.448	0.423	0.453	0.458
Standard Deviation	0.497	0.494	0.498	0.498
Observations	4081	1889	2452	3292
R^2	0.014	0.014	0.022	0.015
Number of Individuals	917	425	544	725
Panel B: Responsible for Paying Bills				
	(1)	(2)	(3)	(4)
	No Disabled	No Children	No Age 65+	No Unemployed
Earns More	0.073 * (0.016)	0.055 (0.137)	0.071 † (0.067)	0.059 † (0.078)
Constant	0.604 *** (0.000)	0.311 *** (0.001)	0.513 *** (0.000)	0.630 *** (0.000)
Individual Fixed Effects	Yes	Yes	Yes	Yes
Survey Year Dummies	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes
Mean	0.593	0.557	0.600	0.596
Standard Deviation	0.491	0.497	0.490	0.491
Observations	4086	1891	2458	3297
R^2	0.017	0.029	0.025	0.017
Number of Individuals	917	425	544	725

† $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

TABLE 2.7: Robustness Check: Fixed Effects Estimates of Relative Income on Responsibility for Financial Tasks by Sample Restriction

Data are from the 2009-2014 Survey of Consumer Payment Choice. Standard errors clustered at the individual-level. See Measures section for variable details. Sample restrictions are based on reports from the 2009 SCPC.

3 Youth Employment and Financial Well-being: Does Work in High School Build Financial Capability?

3.1 Introduction

Some young people have difficulty effectively managing their finances (Lusardi, Mitchell, and Curto, 2010). About forty percent of those surveyed by the Federal Reserve Bank were not able to cover a \$400 expense and one-in-ten do not earn enough to pay monthly bills (Board of Governors of the Federal Reserve System, 2019). This is reflected in widespread sentiments of financial insecurity, particularly for young adults (American Psychological Association, 2015).

Young adulthood is an important period where individuals transition to independence. Young adults begin to make financial decisions, like investing in higher education, borrowing, and saving, that have long-lasting impacts on financial stability in later years. Younger Americans are more likely to be credit invisible or have unscored records (10.2307/26328254; Research, 2015). Today's young adults have high levels of student

loan debt relative to past generations. Credit constraints resulting from poor credit history may even contribute to the rising number of young adults who co-reside with their parents to smooth consumption (Dettling and Hsu, 2018). Young adults who live independently have higher rates of homeownership, greater stock market participation, and a lower rate of high debt payments (Dettling, Hsu, et al., 2014). The potential mechanisms underlying how some young people develop financial capability are important to understand. The financial choices of young adults could extend to parents and the broader economy.

After reviewing key prior studies on the development of financial capability, including the role of learning by doing and its connection to financial well-being, this paper explores one potential mechanism that builds financial capability—youth employment. This study offers an empirical approach to estimate the effect of youth employment addressing bias stemming from selection into employment. Using data from a panel of young adults at age 24-25 in the US, an instrumental variable approach exploits exogenous variation in the unemployment rate within states over time to isolate the effect of youth employment during the school year on objective and subjective markers of financial well-being. Using the unique survey sampling frame which includes siblings, this study also estimates a sibling fixed-effects model to account for household factors that may influence the relationship between youth employment and economic outcomes in young adulthood.

This study provides evidence to answer two questions: (1) Does building financial capability through high school employment affect financial well-being in young adulthood? and (2) Are these young adults building a financial buffer with savings and credit?. The next sections describe the relevant literature, data, measures, and sample characteristics, as well as the main estimates, including those that address omitted variable bias from

fixed household-level heterogeneity. Overall, the results suggest working in high school does not have a lasting negative financial impact on young people, and may even have a positive effect.

3.2 Literature Review

Financial literacy is particularly low among the young. Lusardi, Mitchell, and Curto (2010) show that only a third of young adults are able to correctly answer three basic financial literacy questions on diversification, inflation, and compound interest. Higher levels of measured financial knowledge are associated with better financial behaviors and economic outcomes (for a review see Lusardi and Mitchell, 2014). Lack of financial sophistication can be costly for consumers. Less sophisticated consumers subsidize others by paying more for financial services than the well-informed (Gabaix and Laibson, 2006; Armstrong and Vickers, 2012). Lusardi and Tufano (2009) found that those who lack financial literacy related to debt pay a disproportionate share of credit card charges and fees. A lack of knowledge can even limit participation in certain markets altogether (Van Rooij, Lusardi, and Alessie, 2011; Calcagno and Monticone, 2015). Gathergood and Weber (2017) found that young adults in the United Kingdom view financial literacy as a precursor to home ownership, and borrowers are more likely to take on more risky mortgages when they lack financial expertise. Recent evidence shows that financial knowledge also contributes to wealth inequality (Lusardi, Michaud, and Mitchell, 2017b).

One way that consumers gain financial knowledge is through formal financial education. Despite the promise of educating consumers to improve financial decision-making, these programs have limited effectiveness in increasing financial knowledge, especially

when rigorously evaluated (Collins and O'Rourke, 2010; Mandell and Klein, 2009; Kaiser and Menkhoff, 2017; Miller et al., 2014). The impact of financial education also tends to fade over time (Fernandes, Lynch Jr, and Netemeyer, 2014). Some have cast doubt on financial education as the tool to address limited financial knowledge and improve household financial welfare by offering alternative approaches that recognize the role of cognitive biases (Willis, 2008; Willis, 2011), including consumer protection and financial product innovation.

However, recent rigorous evaluations of financial education provide promising findings on the role of financial education and offer recommendations for optimal intervention design. Exposure to state-level high school financial education mandates that aim to increase financial knowledge decreased the number of defaults and increased credit scores in young adulthood (Urban et al., 2018). Experiential learning provides an opportunity to apply knowledge and simulate real-world decisions (Dewey, 2007). Studies using administrative data reveal that learning through experience making financial decisions may impact future behavior through exposure to negative feedback. Those who pay costly fees on their credit card and bank accounts are less likely to miss payments or overdraw in the future (Gathergood et al., 2017; Stango and Zinman, 2014). However, learning by doing in the financial market is inefficient and may have downstream negative effects on financial security. Recent empirical work revealed that integrating experiential learning into classroom financial education through simulated decision-making is a promising pathway for accumulation of financial expertise (Batty et al., 2017).

Lusardi and Mitchell (2011) found that the employed have higher financial literacy than the unemployed. This difference may operate through several mechanisms: employers offer financial education programs, workers learn from one another, and employees

gain skills related to financial decision-making on the job.

Bernheim and Garrett (2003) demonstrated that households who report availability of employer-based financial education have higher savings rates and levels. Preceding work explored this question at the employer-level, and the studies found that those who were exposed to employer-based financial education were more likely to participate and contribute at higher rates to savings (Bernheim et al., 1998). Participation rates and contributions to voluntary savings plans are significantly higher for those employees who are exposed to financial education at work, specifically when information is delivered through retirement seminars rather than written materials (Bayer, Bernheim, and Scholz, 2009).

Others explore the role of workplace peers in financial decision-making. Hong, Kubik, and Stein (2004) found that those who have peers who participate in the stock market are more likely to also participate, particularly in areas where stock market participation rates are high. Duflo and Saez (2002) found that participation in and choice of mutual fund vendor is impacted by the choice of peers. Duflo and Saez (2003) showed evidence that encouraging employees to attend retirement seminars increased participation rates in these plans for those who attended as well as those in departments where colleagues were treated. Sorensen (2006) found that social learning plays a role in health plan choice among employees. Bursztyn et al. (2014) distinguished peer effects as stemming from social learning and social utility channels, and they presented evidence that both channels operate when investors select assets.

Cognitive and non-cognitive skills may be acquired on the job, including financial literacy, numeracy, self-efficacy, and optimism. These skills are associated with better financial outcomes. Although there is little work that explores how these skills develop

through employment, there are studies that demonstrate the importance of these skills for financial well-being. Many studies have shown that financial literacy is associated with better economic outcomes, including stock market participation, precautionary savings accumulation, and credit card repayment (Van Rooij, Lusardi, and Alessie, 2011; Bassa Scheresberg, 2013; Mottola, 2013). Gerardi, Goette, and Meier (2013) found that borrowers with higher numerical ability are less likely to default on their subprime mortgages. Non-cognitive abilities like self-efficacy and optimism also have important relationships with financial behavior. Those with high self-efficacy are less likely to default on debt and bill payments, particularly when they experience income or health shocks (Kuhnen and Melzer, 2018). Another study finds that those who are more optimistic about macroeconomic conditions are more likely to invest, particularly those who also have high socioeconomic status (Das, Kuhnen, and Nagel, 2017).

Employment is one experience where teenagers can gain financial expertise and improve financial well-being. For many teenagers, a first job marks an important milestone. Employment provides an opportunity for youth to earn income for the first-time. It requires them to make new financial choices, like selecting a bank account, budgeting, and filing taxes. They also interact with colleagues who may share information about financial decisions. Finally, teens may acquire skills on the job that are relevant to financial decision-making.

Youth employment could impact financial well-being in young adulthood in several ways. First, there is some empirical evidence that youth employment improves financial well-being in adulthood. Adolescent employment is associated with greater wealth accumulation in young adulthood, including higher rates of home and stock ownership (Painter II, 2010). Second, there is evidence that youth employment is associated with

higher earnings in adulthood (for a review see Ruhm (1997)). However, when selection into youth employment is addressed, others find that working while in school does not have a significant impact on wages (Hotz et al., 2002; Häkkinen, 2006). Second, teens may also learn from their peers. They may learn from peers' choices, and they may directly gain utility from engaging in behavior in line with their peer group (Bursztyn et al., 2014). Third, they develop skills on the job, such as self-control and time management. Fourth, teens must make financial decisions required for employment, like filing taxes, that incentivize them to build financial knowledge and skills. There are incentives for teens to build financial capability because it now has value for decision-making. Finally, teens who are more motivated or have higher ability may choose to work. They may also be more affluent and have better financial health through parents passing down information relevant for financial decision-making.

This study explores whether youth employment builds financial capability and improves economic outcomes in young adulthood. The empirical strategy employed in this paper addresses selection into youth employment and focuses on new outcomes, the ability to absorb financial shocks and manage finances day-to-day, that are important to consider when designing policy that influences the decision to work in high school.

3.3 Empirical Strategy

This study examines the relationship between youth unemployment and financial well-being in young adulthood. The effect may operate through two channels. Youth employment may improve financial well-being in young adulthood through the information channel – those who work as teens gain financial capability on the job that improves their

financial health later in life. Youth employment may also improve financial well-being later in life through higher earnings. This study examines the first channel. Earnings are controlled for to isolate this channel from improved financial well-being stemming from higher earnings in adulthood. Bayer, Bernheim, and Scholz (2009) suggest that education may confer skills that are of importance to the employer but they may also confer decision making skills. In a similar fashion, employees learn skills that are relevant to their work, but employment also confers skills relevant to financial decision-making.

Youth employment may have positive or negative effects on financial well-being in young adulthood. Youth who work while in school may gain information on the job by learning by doing or learning from others, increasing their financial capability and subsequently their financial well-being. However, the learning that occurs on the job may crowd out learning that the youth would receive in school or at home that builds financial capability. If the information channels at home or in-school are better equipped to improve financial capability, then working while in school may have negative effect on financial well-being relative to those who do not work while in school.

3.3.1 Ordinary Least Squares Regression (Conditional Independence)

First, an ordinary least squares (OLS) approach is employed to understand the relationship between work in high school and financial capability. The financial capability of those young adults who worked as youth are compared to those who did not work as youth conditional on covariates. The data include a rich set of demographic characteristics observed over time for both the young adult and their parent. This approach relies on observation of characteristics that capture selection into youth employment rather than using an exogenous source of variation for identification of its effects. Results from the

conditional independence approach provide an informative baseline that is used to understand the nature of selection. These results are compared to two other identification strategies that leverage exogenous variation in employment conditions over time within state as well as a sampling frame that includes siblings.

3.3.2 Instrumental Variables Approach

Selection into youth employment should be accounted for to isolate the impact of working in high school on financial well-being. The most affluent teens tend to work while in school. Geography also impacts whether or not teens work while in school. There is evidence that minority teens are less likely to work while in school. Finally, those who are most motivated may also be those who choose to work while in school. These studies suggest that there is positive selection into employment. Those who are likely to be better off in terms of financial well-being later in life are also more likely to work while they are in high school. If selection is not addressed, the simple comparison of those who work while in school to those who do not will overstate the effect of youth employment on financial well-being. To address this bias, an instrumental variables approach is employed which uses within-state variation in unemployment rate over time to estimate a local average treatment effect (LATE) of working while in school. The results reflect the impact of youth employment on financial well-being in young adulthood for those who were induced to work by the state unemployment rate.

The Instrument

When the unemployment rate increases, family income may decrease. It is also more difficult for a teen to find employment as the low-skill/low-wage jobs that they would

seek are filled by other workers. Poor labor market conditions may influence the decision to work through an “added-worker effect”. A teen decides to work when their parent is unemployed to supplement lower family income. Since teens are usually secondary workers in their families, they are influenced to work by the employment and earnings of their parents. The “discouraged worker effect” may also operate—teens face higher opportunity cost of work when there are fewer jobs and lower wages available. Evidence suggests that teens are less likely to work because of the latter effect (Arkes, 2010; Gustman and Steinmeier, 1981).¹

Teens are unlikely to move to a state because of employment conditions, and the state unemployment rate faced at age 15 is not influenced by the teen. The exogeneity of state unemployment rate allows for preferences for financial well-being to be separated from youth employment status. While teens who live in states with a high unemployment rate may differ from those in low unemployment states, using fixed-effects at the state-level can help control for state trends.

It is unlikely that youth would relocate to states where the unemployment rate is below average—the choice to move would be driven by parent or guardian rather than the teen. The first stage estimate reported in Table 3.2 shows a significant negative relationship between the unemployment rate experienced at age 15 and youth employment. Youth employment is measured using an indicator variable that equals 1 if the youth is employed, 0 otherwise, and a continuous variable of the number of hours worked weekly.

¹In a supplementary analysis (available on request from author), estimates from a model that includes an indicator for parental unemployment show that youth employment is negatively related to parental unemployment. If the added worker effect operates, we would expect that those children with an unemployed parent would be more likely to work while in high school. I find that having an unemployed parent has a significant negative effect on the likelihood of working while in school. Youth are 4.6 percentage points less likely to work if their parent is not employed. Parent unemployment has a negative, but statistically insignificant effect on hours worked. Overall, these findings support the explanation that youth employment is motivated by the discouraged worker effect rather than the added worker effect.

Column 1 reveals that a one percent increase in the state unemployment rate in a given year is related to a 12.5 percentage point decrease in the probability that the individual is employed as a teenager. Column 2 shows that a one percent increase in the unemployment rate is related to 0.60 fewer hours worked. The F-statistics are far above the threshold of 10, and the coefficient on unemployment rate differs from zero.

The instrumental variables approach uses the variation in youth employment induced by within-state change in unemployment rate from 1999-2006 to estimate the effect of youth employment on financial well-being. The local average treatment effect is among compliers who are impacted by state unemployment rate to work. This study compares those who are predicted to work as a teen by unemployment rate to those who are predicted not to work by high unemployment rate. Many use unemployment rate at the state or local level as an instrumental variable to estimate the effect of employment (Arkes, 2010; Häkkinen, 2006; Light, 2001).

Table 3.1 includes means for the full sample and by youth employment status and unemployment rate (higher than state average over period) to illustrate the selection into youth employment in this sample. Table 3.12 compares the full survey sample to the sample used for estimation.

Estimation

To estimate the effect of youth employment, this study uses the following first stage and second stage equations:

$$\text{Employed as Youth}_{i,t-1} = \pi \text{Unemployment Rate}_{s,t-1} + \delta_s + \delta_t + V_i' \rho + W_{s,t-1}' \kappa + \mu_{it} \quad (3.1)$$

$$\text{Financial Well-Being}_{it} = \beta \text{Employed as Youth}_{i,t-1} + \gamma_s + V_i' \theta + W_{s,t-1}' \lambda + \epsilon_{it} \quad (3.2)$$

In Equation 3.2, Financial Well-Being_{it} represents the measures of objective and subjective financial well-being at age 24-25. In both equations, Employed as Youth_{i,t-1} is an indicator that equals 1 if the young adult worked at any point between the ages 15-17. In 3.1, the instrumental variable, Unemployment Rate_{s,t-1}, is the unemployment rate in state *s* in year *t-1*, the year that the individual was 15 years old. γ_s and δ_s are state fixed effects. V_i' represents a vector of individual characteristics, including earnings, marital status, mother's educational attainment, age, high school graduation status, employment status, whether have children, measured at age 24-25. Finally, $W_{s,t-1}'$ is an indicator that equals 1 if the state changed their minimum wage in the year that the young adult was age 15. Recent work shows that higher minimum wage decreases teen employment while in school (Neumark and Shupe, 2018). The effect of youth employment is also estimated using a control function approach, the instrumental variables probit two-step approach. This approach deals with potential misspecification issues that may arise when using a linear specification with binary outcome variables. Table 3.15 presents the estimates from this analysis.

3.3.3 Sibling Fixed-Effects

Next, a fixed effects approach that exploits differences in youth employment within families is employed to control for time-invariant household heterogeneity. The PSID TA Supplement follows all children of the original PSID sample, so the sample includes siblings.

In the sample, there are 675 families with 235 that include siblings (96 differ in employment status between siblings within a family). The following regression specification is estimated:

$$\text{Financial Well-Being}_{it} = \beta \text{Employed as Youth}_{i,t-1} + V_i' \theta + c_i \delta + \gamma_s + W_{s,t-1}' \lambda + \epsilon_{it} \quad (3.3)$$

The sibling fixed effects approach assumes that there is a fixed family effect, c_i , and the disturbance $\epsilon_{it} = c_i + \nu_{it}$. Estimation with fixed effects will capture the component of the error term that leads to biased estimates of the effect of youth employment, if the dependence of youth employment status and ϵ_{it} operates through c_i .

3.4 Data

The biannual Panel Study of Income Dynamics (PSID) Transition Into Adulthood Supplement (TA) from 2005-2015 and Childhood Development Supplement (CDS) was collected every five years from 1997-2007². The CDS and TA follows children of the original, nationally-representative PSID sample of adults. The TA survey follows young adults from 18-28 years old whose parent or guardian participated in the CDS. The CDS follows children from when they enter the study in 1997 at age 0-12 years until they are 18 years old. At 18, the children join the TA Supplement where they answer questions about young adulthood until age 28 years. From the six TA waves from 2005-2015, I construct

²Panel Study of Income Dynamics (www.psidonline.org). Produced and distributed by the Survey Research Center, Institute for Social Research, University of Michigan, Ann Arbor, MI.

a cross-section of 24-25 year olds born between 1984-1991. The CDS provides information about youth employment status and childhood household environment, including mother's educational attainment. The TA survey includes information about banking status, bank account balance, credit card use, and credit card balance in young adulthood, as well as demographic information including educational attainment, marital status, number of children, earnings, and gender from age 18-28.

Table 3.1 shows for the full sample in Column 1, by youth employment status in Columns 2 and 4, and by exposure to a state unemployment rate at age 15 above the state average in Columns 3 and 5.³

3.4.1 Youth Employment

Youth employment is measured using self-reported employment status at age 15-17 years. In the CDS, respondents are asked: "Do you have a regularly paying job at the present time?". I observe employment status at two points in adolescence, and I construct an indicator based on the earliest observation that equals 1 if the respondent answers "Yes", 0 otherwise. Selecting the earliest observation limits the possibility that employment status reflects movement of respondent to better labor market conditions, like lower unemployment rate, which is central to the identification strategy used in this study. The CDS is collected from October to May, so the employment measure will reflect employment during the school year. I exclude summer employment as this differs in two ways: (1) youth face less time constraints when they are out of school; and (2) summer employment is

³Seasonally-adjusted annual state unemployment rate of the civilian non-institutional population from 1999-2006 retrieved from the Bureau of Labor Statistics (BLS). The average unemployment rate for this sample is 5.10 percent with a standard deviation of 1.12 percent points. This study uses the state unemployment rate for all adults rather than youth unemployment rate because this rate reflects unemployment among youth and their parents/guardian.

episodic presenting less of an opportunity for students to develop financial capability related to employment. Self-reported employment status provides information about formal and informal employment, including babysitting for a neighbor, mowing lawns, and shoveling snow, that are particularly prevalent for teens. Formal employment includes cashiers, waitstaff, retail salesperson, and food preparation worker. Youth employment in this study should be conceived as informal or formal work that is done on a regular basis for pay during the school year.

3.4.2 Measuring Financial Well-Being

In 2017, the Consumer Financial Protection Bureau introduced a four element scale of financial well-being, including “Control over your day-to-day, month-to-month finances”, “Capacity to absorb a financial shock”, “Financial freedom to make choices to enjoy life”, and “On track to meet your financial goals”. This study includes outcomes that reflect the availability of a financial buffer to absorb volatility and ability to effectively manage finances. Table 3.16 maps the outcomes used in this study to these two elements.

The objective outcomes are self-reported banking status, bank account balance, credit card ownership, use of credit card to borrow, and credit card carry over balance. These outcomes are selected because they illustrate the liquidity available to young adults through personal savings and credit markets. Having a bank account reflects that the young adult has a safe place to store their money and use complementary services provided by banks, like check cashing. The accumulation of personal savings, a form of self-insurance, that a young adult can tap into in case of an unexpected expense, drop in income, or job loss. Credit access allows the young adult to smooth consumption by borrowing. They are

asked: "Do you use credit cards or store cards that are in your name? We are only interested in cards where your name is on the account.". Access to credit also reflects that the young adult is trusted enough by creditors that they are willing to accept their credit card application, another sign of financial wellness. The last two outcomes reflect credit card debt management. The first reflects whether the young adult uses a credit card to transact only, a step toward building a positive credit history. Respondents are asked: "Do you currently have any carryover balances on any credit cards or store cards?". The second reflects whether they are carrying balances on their credit card which are accompanied by costly interest and fees. They are asked: "If you added up all of these debts, about how much would they amount to right now?". In some cases, use of credit cards to borrow rather than as transaction accounts will make sense as a means to smooth consumption.

In addition to objective measures that reflect the available financial buffer and effective management of debt, this study explores the impact of working in-school on subjective measures of financial well-being. These measures include how much one worries about money, one's perceived ability to manage money, and responsibility for paying bills. Respondents answer: "(On a scale of 1 to 7, where 1 means "Never" and 7 means "Daily",) how often do you worry that you may not have enough money to pay for things?". They also answer: "(On a scale of 1 to 7, where 1 means "Not At All Well" and 7 means "Extremely Well",) how good are you at managing money?". Finally, they report: "How much responsibility do you currently take for managing your money? (Would you say: somebody else does this for me all of the time, somebody else does this for me most of the time, I do this half of the time, I do this most of the time, or I am completely responsible for this all of the time?)". All scales are standardized with mean zero, standard deviation of 1.

3.4.3 Covariates

Mother's educational attainment, gender, age, marital status, high school graduation status, employment status, whether or not have children, and earnings are included as covariates. Educational attainment beyond high school is only observed for some respondents. Therefore, mother's education serves as a proxy for children's educational attainment. Children and parent educational attainment are highly positively correlated evidenced by many empirical studies (for a review see (Haveman and Wolfe, 1995)). Gender, age, marital status, high school graduation status, whether or not have children, and earnings are included as covariates because they are likely correlated with preferences for financial well-being. Conditioning on these covariates strengthens the identification strategy because these variables are likely related to financial well-being. They further separate the effect of youth employment from preferences. For example, if those who experience poor labor market conditions in high school adopt more conservative financial behavior, this approach will control for many of the variables that may correlate with this behavior.

3.5 Results

This section presents estimates of the effect of youth employment on financial well-being in young adulthood. First, the estimates of the effect of youth employment on objective and subjective financial well-being outcomes are discussed. These measures include banking status, bank balance, credit card use, credit card borrowing, credit card carry over balance, worry about money, ability to manage money, and responsibility for paying bills. The odd columns present results from the OLS regression while the even columns

include estimates from 2SLS regression. These estimates reflect the effect of youth employment on financial well-being for the full sample and a group within that sample who are induced to work in high school by their state's unemployment rate. The OLS estimates reflect the mean difference in financial outcomes for those who work as a teen relative to those who do not. The 2SLS estimates are the effect of youth employment for those who are induced to work by the difference in state unemployment rate at age 15 from the average over 1999-2006 within that state. Both the OLS and 2SLS specifications include demographic controls.

3.5.1 Effects of Youth Employment on Financial Outcomes

Table 3.3 shows estimates of the effect of youth employment on objective financial outcomes. The results from the ordinary least squares regression are presented in odd columns. Column 1 shows that those who work as youth are 0.1 percentage points more likely to be banked, though, the estimate is statistically insignificant. In Column 3, the estimate reveals that there is a positive association between youth employment and bank balance. Those who work as youth have bank balances as young adults that are 22.5 percent higher than those who do not work at age 15-17. The estimate in Column 5 reveals that those who work at age 15 are 7.7 percentage points more likely to have a credit card in young adulthood. Column 7 shows that those who work in high school are 2.8 percentage points more likely to use their credit card to borrow— they carry over balances on their credit cards from month-to-month accruing interest. Finally, the estimate in column 9 shows that those employed as teens have 19.5 percent higher credit card balances at age 24-25 than those who do not work in high school.

The even columns in Table 3.3 include the estimates of the effect of youth employment on financial outcomes from the two-stage least squares instrumental variables approach. In Column 2, the estimate shows that those who are predicted to work by state unemployment rate at age 15 are 15.8 percentage points less likely to have a bank account in young adulthood. Column 4 shows that those who are predicted to work as youth have 47.8 percent smaller bank balances. Column 6 reveals that young adults are 16.3 percentage points more likely to have a credit card by age 24-25. Column 8 shows that those who are employed in high school are 12.8 percentage points less likely to carry a balance on their credit card. Column 10 reveals that those who are predicted to work in high school have credit card balances that are 46.2 percent smaller than those who are not predicted to work. Overall, these results reveal that youth employment may be beneficial in terms of building a financial buffer through access to credit, as well as effectively managing credit card debt. However, the estimates are imprecise.

While the OLS estimates attempt to isolate the relationship between youth employment and later life financial capability by conditioning on observed variables, the IV estimates attempt to deal with selection into employment by choosing an instrumental variable that induces youth to work to isolate the effect of working. The IV estimates are larger than the OLS estimates. Further analysis of the nature of selection into youth employment reveals that the effect of youth employment represents the effect for a small group who have more highly educated mothers, a proxy measure for socioeconomic status. When interpreting results, it is important to recognize that the IV strategy estimates the effect of youth employment for those who are pushed into employment by better labor market conditions, a lower unemployment rate.

Since the number of hours worked may be a better measure of exposure to employment, Table 3.4 includes estimates of the relationship between weekly hours worked as a youth and objective financial well-being. Columns 1 and 2 reveal that working more hours does not increase the probability that a young adult is banked, regardless of the approach used to account for selection. Column 3 reveals that an additional hour of work as a youth increase bank balances modestly by 3.9 percent. However, the estimate from the 2SLS approach in column 4 shows that an hour of work reduces bank balance by 8.5 percent. Column 5 and 6 show a consistent relationship between hours worked and credit card adoption. An additional hour of work is associated with 1.2 to 4.4 percentage point high probability of having a credit card. Column 7 shows that those who have credit cards are 1.4 percentage points more likely to use their credit card to borrow than young adults who do not work as youth. The 2SLS estimate in Column 8 reveals that one more hour of work per week as a youth reduces the likelihood that one will borrow on their credit card as a young adult by 2.5 percentage points. Finally, columns 9 and 10 show the relationship between hours worked and the amount young adults borrow on their credit cards. The OLS estimate shows that credit card balances are 11.8 percent higher with each additional hour worked while the 2SLS estimate shows that balances are 7.2 percent smaller. Overall, the estimates from both approaches suggest that working more hours as a youth has small and largely statistically insignificant effects on financial well-being in young adulthood.

3.5.2 Effect of Youth Employment on Subjective Financial Well-being

Table 3.5 presents estimates of the effect of youth employment on subjective financial well-being. Once again, the odd columns present results from the OLS regression while

the even columns include estimates from 2SLS regression. The three subjective financial well-being outcomes explored are scales that measure the extent one worries about money, ability to manage money, and responsibility for paying bills. The three scales are standardized, and the estimates presented in Table 3.5 are interpreted in terms of standard deviation differences. Column 1 reveals that those who were employed as youth are 0.069 of a standard deviation less worried about money in young adulthood. Column 3 shows that young adults who worked as teens report ability to manage their money 0.12 of a standard deviation lower than those who did not work. Column 5 reveals that those who were employed in high school are 0.84 of a standard deviation more responsible for paying their monthly bills. The 2SLS and OLS estimates differ in direction for all subjective financial well-being measures. Column 2 shows that those who are induced to work by state unemployment conditions as a teen report being 0.015 standard deviations more worried about money. In Column 4, those who are predicted to work in high school are 0.106 of a standard deviation more able to manage their money as a young adult. Finally, column 6 shows that young adults predicted to work at age 15-17 are 0.035 of a standard deviation less responsible for paying their monthly bills. Next, the relationship between the exposure to work and financial well-being is estimated using the OLS and IV 2SLS approaches. Table 3.6 details the estimates. Columns 1 and 2 reveal that an additional hour of work has effectively no impact on stress related to money. Column 3 shows that there is no difference between those who work as youth and those who do not in terms of ability to manage money. The 2SLS estimate in Column 4 corroborates the finding from OLS. Finally, Columns 5 and 6 reveal that regardless of the approach used to account for selection into youth employment, there is no effect of hours worked on responsibility for paying bills.

3.5.3 Sibling Fixed Effects Estimates

Table 3.7 and 3.9 present results for the fixed effects model for objective and subjective financial well-being outcomes, respectively. In Table 3.7 column 1, the estimate from the sibling fixed effects regression reveals that those who are employed during high school are 1.9 percentage points more likely to be banked in young adulthood than their sibling who is not employed as a teen. The estimate is economically small and statistically insignificant. These young adults have bank balances 22.3 percent higher than those who do not work, though, the estimate is statistically insignificant. In terms of credit card access and repayment, Column 3 shows these young adults are 19.2 percentage points more likely to have a credit card and Column 4 shows that those who have credit cards are 19.2 percentage points more likely to carry balance on their credit cards from month-to-month. Column 5 reveals that the carry over balances at age 24-25 for those who worked as teens are about 160 percent higher than their sibling who did not work at age 15-17. These estimates are statistically significant at the 1% level. Demographic controls included in the specification reveal that siblings who graduated from high school are more likely to be banked than their sibling who did not graduate. Women are more likely to be banked, have higher bank balances, and more likely to access credit than their brothers. Those who have children at age 24-25 are less likely to be banked, have lower bank balances, and less likely to have a credit card than their sibling who does not have children. Finally, higher earning siblings are more likely to have a credit card in young adulthood. Table 3.9 displays the estimates from the sibling fixed effects regression on subjective financial well-being outcomes. Column 1 shows that siblings who work during high school are 0.202 of a standard deviation more worried about money. Column 2 reveals that siblings who were employed as teens feel they are slightly less able to manage money than those

who do not work. Column 3 shows that those who are employed as youth report slightly less responsibility for bills. The estimate is close to zero. The estimates of the influence of youth employment on subjective financial well-being are statistically insignificant.

The results in Table 3.8 and 3.10 detail estimates that take into account the amount of time spent working each week in high school. The estimates from this approach echo the findings from the analysis that uses a youth employment indicator. However, Table 3.10 shows that siblings who work an additional hour are 0.051 of a standard deviation more worried about money in young adulthood.

Overall, the sibling fixed effects approach supports the finding that those who are employed as youth do not exhibit higher financial well-being in young adulthood relative to those who do not work. It is important to note that fixed effects estimates reflect the local average treatment effect for those who switch youth unemployment within families. Two issues arise with fixed effects estimation: (1) a small number of families who have siblings that differ in youth employment contribute to the identification of the treatment effect, and (2) the characteristics of the sample used for identification may differ from the population of interest, specifically larger families are more likely to appear in the identifying sample (Miller, Shenhav, and Grosz, 2018).

3.5.4 Effects of Summer Youth Employment

Many youth work during the summer months. In this sample, a third more youth work in the summer than during the school year, and they work more hours on average. Youth face do not face the same tradeoffs in terms of time in the summer– they have more time free to work. To understand the effect of summer employment for youth on financial capability, the same analysis is conducted to explore whether work during the school

year has different effects from that during the school year. Table 3.13 and 3.14 present the estimates from the analysis of summer youth employment. In Table 3.13, the OLS estimates, detailed in the odd columns, reveal that those who work in the summer as youth are 1.7 percentage points less likely to be banked, have 11.2 percent lower bank balances, and are 2.7 percentage points more likely to have a credit card. However, these estimates are not statistically significant. Columns 7 and 9 reveal that those who work as youth in the summer are 7 percentage points more likely to borrow on their credit cards, and they carry over credit card balances that are 52.1 percent higher than those who do not work during the summer. When selection into summer employment is accounted for using an instrumental variables approach, the relationship between work in the summer and financial well-being differs. The estimates are larger across all outcomes, but they are not statistically significant. Table 3.14 detail the results for the analysis of subjective financial well-being. Column 1 reveals that those who work in the summer are 0.15 of a standard deviation more worried about money than those who do not work. Column 3 show that summer employment does not influence ability to manage money. However, young adults who worked as youth in the summer are 0.095 of a standard deviation more responsible for bills. The 2SLS estimates presented in the even columns suggest that there is no statistically significant effect of summer employment on subjective financial well-being after accounting for selection into work using the unemployment rate as an instrument.

3.6 Conclusion

This study offers causal evidence that working as a teenager increases the likelihood of having a credit card using two approaches that address selection into youth employment. The two approaches identify the estimated influence of youth employment when (1) comparing those who are predicted to work by the plausibly exogenous change in state unemployment rate at age 15 from the average rate over the period, 1999-2006; and (2) comparing financial well-being outcomes in young adulthood for siblings who differ in employment status during high school. The second approach corroborates findings from the instrumental variables approach by exploiting the survey sampling frame which includes siblings. Young adults are more likely to use credit cards by age 25 even after controlling for household-level heterogeneity.

These findings have implications for financial education policy as well as practical implications for parents with teenage children. The Workforce Innovation and Opportunity Act (WIOA) 2014 introduced financial literacy as a new youth program element requiring employers to integrate financial literacy education in the workplace for teen workers. If youth employment programs are being designed by policymakers to include financial education, it is important to understand how youth employment on its own impacts financial well-being. Along with contributing evidence to this end, this study also informs the focus of future educational efforts pointing to credit card debt management as an important topic.

Future research should explore the complementary relationship between financial education and experiential learning. This work may explore the returns to WIOA's introduction of financial literacy education for worker financial capability and well-being. Another promising project would analyze whether state-mandated high school personal financial education course requirements have heterogeneous effects for those who work while in school. Finally, the role of the workplace, more generally, as a setting for the development of financial capability merits renewed research interest.

Little research provides evidence on the effect of youth employment on financial independence from parents. This study shows that there are positive effects of youth employment on access to credit to smooth consumption in young adulthood. There are also positive, but statistically insignificant, effects of youth employment on subjective well-being, including greater responsibility for paying bills. The findings from this study support parents encouraging their child to work while in high school. Future work should explore the effect of youth employment on financial independence in young adulthood, especially parental co-residence.

This study's design has several important limitations. First, youth employment is not randomly assigned. Isolating the effect of youth employment with state unemployment conditions does not perfectly replicate random assignment. Second, the sample is relatively small which leads to imprecise estimates. Also, sibling fixed effects approach relies on a limited, non-random sample of sibling pairs for identification. Finally, the financial outcomes are self-reported. Future work should employ larger datasets and administrative information to estimate the effect of youth employment on financial well-being.

Overall, this study finds that working in high school does not appear to have any negative effects on financial capability or well-being. In fact, working in high school

has positive effects on credit card adoption in young adulthood. The evidence suggests that young adults who worked during high school build a financial buffer by taking up credit cards, and that they are not more burdened by credit card debt. These findings are consistent with policies and programs that support youth who engage in work early in life.

3.7 Tables and Figures

	Full Sample	Employed as Youth?		Unemployment rate above state average?	
		Yes	No	Yes	No
Employed as Youth	0.20 (0.40)			0.12 (0.32)	0.30 (0.46)
Instrument					
Unemployment Rate Above State Average	0.54 (0.50)	0.31 (0.46)	0.60 (0.49)		
Objective Financial Well-Being Outcomes					
Banked	0.79 (0.41)	0.82 (0.39)	0.79 (0.41)	0.79 (0.41)	0.80 (0.40)
Transaction Accounts Balance	3,468 (9,425)	4,534 (12,407)	3,199 (8,496)	3,781 (9,928)	3,105 (8,801)
Have Credit Card(s)	0.45 (0.50)	0.52 (0.50)	0.44 (0.50)	0.43 (0.50)	0.48 (0.50)
Borrow on Credit Card	0.28 (0.45)	0.33 (0.47)	0.26 (0.44)	0.27 (0.45)	0.28 (0.45)
Loans Balance	671 (1,994)	750 (1,949)	650 (2,005)	554 (1,635)	806 (2,337)
Subjective Financial Well-Being Outcomes					
Worry about money (7 pt)	3.69 (1.87)	3.55 (1.95)	3.72 (1.85)	3.66 (1.85)	3.72 (1.91)
Ability to Manage Money (7pt)	5.46 (1.25)	5.36 (1.27)	5.49 (1.24)	5.46 (1.24)	5.46 (1.25)
Responsible for Bills (5pt)	4.48 (0.99)	4.66 (0.78)	4.43 (1.03)	4.47 (0.99)	4.49 (0.99)
Covariates					
Mother High School Graduate	0.26 (0.44)	0.32 (0.47)	0.25 (0.43)	0.18 (0.39)	0.35 (0.48)
Mother Education > HS	0.44 (0.50)	0.52 (0.50)	0.42 (0.49)	0.37 (0.48)	0.53 (0.50)
Female	0.51 (0.50)	0.48 (0.50)	0.52 (0.50)	0.51 (0.50)	0.51 (0.50)
Age	24.47 (0.50)	24.51 (0.50)	24.46 (0.50)	24.43 (0.50)	24.52 (0.50)
Married	0.15 (0.35)	0.19 (0.39)	0.13 (0.34)	0.16 (0.37)	0.13 (0.34)
Graduated High School or GED	0.73 (0.45)	0.83 (0.38)	0.70 (0.46)	0.71 (0.46)	0.76 (0.43)
Working Now	0.78 (0.42)	0.82 (0.39)	0.76 (0.42)	0.79 (0.41)	0.76 (0.43)
Have Children	0.35 (0.48)	0.39 (0.49)	0.33 (0.47)	0.35 (0.48)	0.34 (0.47)
Earnings (\$)	17,386 (17,114)	19,926 (16,531)	16,744 (17,208)	17,037 (17,121)	17,792 (17,114)
State Min. Wage Change	0.12 (0.32)	0.14 (0.34)	0.11 (0.31)	0.08 (0.28)	0.15 (0.36)
Observations	1016	205	811	546	470

TABLE 3.1: Means and Standard Deviations of Youth Employment, Instrument, and Outcome Variables

	Employed as Youth	Weekly Hours Worked as Youth
Unemployment Rate	-0.125 *** (0.016)	-0.604 *** (0.088)
State FE	Yes	Yes
Controls	Yes	Yes
Mean	0.201	0.809
Observations	1009	988
R^2	0.186	0.186
F-Stat	59.83	46.91

TABLE 3.2: First-Stage Estimate of Unemployment Rate on Youth Employment During the School Year

+ $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$. Standard errors clustered at family-level. State fixed effects. Covariates include mother's educational attainment, gender, age, marital status, high school graduation status, employment status, whether or not have children, earnings.

	Banked		Bank Balance (IHS)		Have Credit Card		Borrow on Credit Card		Credit Card Balance (IHS)	
	OLS	2SLS	OLS	2SLS	OLS	2SLS	OLS	2SLS	OLS	2SLS
Employed as Youth	0.001 (0.026)	-0.158 (0.114)	0.225 (0.247)	-0.478 (1.019)	0.077* (0.036)	0.163 (0.146)	0.028 (0.037)	-0.128 (0.146)	0.195 (0.298)	-0.462 (1.168)
Mother HS Graduate	0.034 (0.029)	0.054+ (0.031)	0.012 (0.243)	0.104 (0.260)	0.012 (0.036)	0.000 (0.039)	0.032 (0.035)	0.052 (0.038)	0.331 (0.271)	0.417 (0.298)
Parent Income (IHS)	0.035* (0.014)	0.034** (0.013)	0.348** (0.110)	0.344*** (0.104)	0.014 (0.009)	0.015+ (0.009)	0.007 (0.006)	0.006 (0.006)	0.050 (0.045)	0.046 (0.044)
Parent Wealth (IHS)	0.004+ (0.002)	0.004+ (0.002)	0.061** (0.020)	0.061** (0.019)	0.005* (0.002)	0.005* (0.002)	0.002 (0.002)	0.002 (0.002)	0.013 (0.017)	0.013 (0.017)
Parent Unemployed	-0.075** (0.029)	-0.082** (0.028)	-0.562* (0.240)	-0.593* (0.237)	-0.061+ (0.033)	-0.057+ (0.032)	0.008 (0.032)	0.001 (0.032)	0.073 (0.252)	0.044 (0.256)
Female	0.094*** (0.022)	0.087*** (0.022)	0.562** (0.199)	0.533** (0.201)	0.065* (0.030)	0.068* (0.030)	0.073** (0.028)	0.067* (0.029)	0.678** (0.223)	0.651** (0.227)
Age=25	0.019 (0.023)	0.026 (0.023)	0.343+ (0.200)	0.373+ (0.196)	0.039 (0.030)	0.036 (0.030)	0.002 (0.029)	0.009 (0.029)	-0.010 (0.228)	0.019 (0.228)
Married	0.097** (0.030)	0.100*** (0.030)	1.188*** (0.264)	1.202*** (0.257)	0.125** (0.041)	0.123** (0.040)	0.051 (0.045)	0.054 (0.044)	0.618+ (0.371)	0.631+ (0.363)
Graduated high school	0.102*** (0.027)	0.119*** (0.029)	0.622* (0.242)	0.699** (0.260)	-0.019 (0.032)	-0.028 (0.034)	0.085** (0.030)	0.102** (0.034)	0.631** (0.236)	0.703** (0.264)
Employed	0.204*** (0.037)	0.210*** (0.036)	1.822*** (0.316)	1.849*** (0.305)	0.132*** (0.038)	0.129*** (0.037)	0.132*** (0.033)	0.138*** (0.032)	1.056*** (0.256)	1.081*** (0.250)
Have Children	-0.173*** (0.028)	-0.162*** (0.028)	-2.041*** (0.244)	-1.996*** (0.246)	-0.230*** (0.034)	-0.235*** (0.034)	-0.030 (0.031)	-0.020 (0.031)	-0.246 (0.244)	-0.204 (0.249)
Earnings Last Year (IHS)	0.009* (0.004)	0.010** (0.004)	0.124*** (0.029)	0.127*** (0.029)	0.011** (0.004)	0.010** (0.004)	0.006+ (0.004)	0.007* (0.004)	0.050+ (0.028)	0.053+ (0.028)
State Min. Wage Change	0.030 (0.040)	0.037 (0.040)	-0.438 (0.366)	-0.404 (0.359)	-0.004 (0.060)	-0.008 (0.059)	0.007 (0.059)	0.014 (0.059)	-0.028 (0.460)	0.004 (0.454)
State FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Mean	0.795	0.795	5.993	5.993	0.454	0.454	0.276	0.276	2.150	2.150
Observations	1009	1009	1009	1009	1009	1009	1009	1009	1009	1009
R ²	0.298		0.373		0.232		0.132		0.134	

TABLE 3.3: OLS and 2SLS Estimates of Effect of Youth Employment

+ $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$. Standard errors clustered at family-level. State fixed effects. Covariates include mother's educational attainment, family wealth as youth, family income as youth, parental employment status as youth, gender, age, marital status, high school graduation status, employment status, whether or not have children, earnings. Account balances are inverse hyperbolic sine transformed to allow for zero and negative values.

	Banked		Bank Balance (IHS)		Have Credit Card		Borrow on Credit Card		Credit Card Balance (IHS)	
	OLS	2SLS	OLS	2SLS	OLS	2SLS	OLS	2SLS	OLS	2SLS
Weekly Hours										
Worked as Youth	-0.000 (0.005)	-0.034 (0.024)	0.039 (0.048)	-0.085 (0.213)	0.012 (0.008)	0.044 (0.031)	0.014 + (0.008)	-0.025 (0.031)	0.118 + (0.063)	-0.072 (0.247)
Mother HS Graduate	0.034 (0.029)	0.054 + (0.031)	0.012 (0.244)	0.085 (0.258)	0.013 (0.036)	-0.006 (0.040)	0.034 (0.035)	0.056 (0.038)	0.356 (0.272)	0.467 (0.296)
Parent Income (IHS)	0.031 * (0.013)	0.032 ** (0.012)	0.317 ** (0.101)	0.319 *** (0.097)	0.010 (0.009)	0.010 (0.008)	0.006 (0.006)	0.006 (0.006)	0.039 (0.047)	0.042 (0.046)
Parent Wealth (IHS)	0.003 (0.002)	0.004 + (0.002)	0.060 ** (0.020)	0.061 ** (0.019)	0.005 * (0.002)	0.005 * (0.002)	0.002 (0.002)	0.002 (0.002)	0.013 (0.017)	0.014 (0.017)
Parent Unemployed	-0.081 ** (0.029)	-0.087 ** (0.029)	-0.582 * (0.243)	-0.604 * (0.239)	-0.056 + (0.033)	-0.051 (0.032)	0.006 (0.032)	-0.001 (0.033)	0.067 (0.256)	0.033 (0.259)
Female	0.091 *** (0.023)	0.087 *** (0.023)	0.540 ** (0.202)	0.527 ** (0.200)	0.063 * (0.030)	0.066 * (0.030)	0.072 * (0.028)	0.068 * (0.029)	0.675 ** (0.225)	0.655 ** (0.224)
Age=25	0.022 (0.023)	0.039 (0.025)	0.337 + (0.204)	0.397 + (0.216)	0.037 (0.031)	0.022 (0.033)	-0.005 (0.029)	0.014 (0.033)	-0.070 (0.232)	0.021 (0.257)
Married	0.101 ** (0.030)	0.101 *** (0.030)	1.242 *** (0.265)	1.243 *** (0.258)	0.129 ** (0.042)	0.129 ** (0.041)	0.047 (0.045)	0.047 (0.045)	0.604 (0.377)	0.605 + (0.367)
Graduated high school	0.099 *** (0.028)	0.120 *** (0.030)	0.611 * (0.248)	0.685 * (0.270)	-0.013 (0.032)	-0.032 (0.036)	0.082 ** (0.031)	0.105 ** (0.036)	0.604 * (0.240)	0.718 ** (0.278)
Employed	0.195 *** (0.037)	0.201 *** (0.037)	1.725 *** (0.319)	1.747 *** (0.309)	0.136 *** (0.038)	0.130 *** (0.038)	0.130 *** (0.033)	0.137 *** (0.033)	1.045 *** (0.260)	1.079 *** (0.253)
Have Children	-0.181 *** (0.029)	-0.176 *** (0.029)	-2.108 *** (0.248)	-2.087 *** (0.244)	-0.224 *** (0.035)	-0.229 *** (0.034)	-0.032 (0.032)	-0.026 (0.031)	-0.258 (0.250)	-0.227 (0.247)
Earnings Last Year (IHS)	0.009 * (0.004)	0.010 ** (0.004)	0.127 *** (0.029)	0.130 *** (0.029)	0.011 ** (0.004)	0.010 ** (0.004)	0.006 + (0.004)	0.007 * (0.004)	0.048 + (0.028)	0.053 + (0.028)
State Min. Wage Change	0.029 (0.040)	0.029 (0.039)	-0.420 (0.369)	-0.418 (0.357)	0.006 (0.061)	0.006 (0.059)	0.005 (0.059)	0.005 (0.059)	-0.059 (0.461)	-0.056 (0.457)
State FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Mean	0.797	0.797	6.016	6.016	0.459	0.459	0.277	0.277	2.165	2.165
Observations	988	988	988	988	988	988	988	988	988	988
R ²	0.292		0.372		0.229		0.134		0.137	

TABLE 3.4: OLS and 2SLS Estimates of Effect of Youth Employment

+ $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$. Standard errors clustered at family-level. State fixed effects. Covariates include mother's educational attainment, family wealth as youth, family income as youth, parental employment status as youth, gender, age, marital status, high school graduation status, employment status, whether or not have children, earnings. Account balances are inverse hyperbolic sine transformed to allow for zero and negative values.

	Worry about Money		Ability to Manage Money		Responsibility for Bills	
	OLS	2SLS	OLS	2SLS	OLS	2SLS
Employed as Youth	-0.069 (0.088)	0.015 (0.336)	-0.116 (0.082)	0.106 (0.325)	0.084 + (0.048)	-0.035 (0.212)
Mother HS Graduate	0.021 (0.077)	0.010 (0.085)	-0.159 * (0.078)	-0.188 * (0.086)	0.028 (0.051)	0.043 (0.057)
Parent Income (IHS)	-0.015 (0.020)	-0.015 (0.019)	-0.019 (0.017)	-0.018 (0.016)	-0.018 (0.014)	-0.019 (0.013)
Parent Wealth (IHS)	-0.004 (0.005)	-0.004 (0.005)	-0.004 (0.005)	-0.004 (0.005)	0.002 (0.003)	0.002 (0.003)
Parent Unemployed	0.116 + (0.069)	0.119 + (0.068)	-0.127 + (0.066)	-0.117 + (0.066)	-0.028 (0.047)	-0.033 (0.047)
Female	0.097 (0.066)	0.101 (0.065)	0.104 (0.063)	0.113 + (0.062)	-0.010 (0.042)	-0.015 (0.042)
Age=25	-0.014 (0.065)	-0.017 (0.065)	0.107 + (0.062)	0.097 (0.061)	0.082 + (0.042)	0.087 * (0.042)
Married	0.029 (0.090)	0.027 (0.088)	0.090 (0.085)	0.085 (0.084)	-0.124 * (0.061)	-0.122 * (0.059)
Graduated high school	-0.038 (0.075)	-0.047 (0.080)	0.007 (0.072)	-0.018 (0.078)	0.143 ** (0.051)	0.156 ** (0.054)
Employed	-0.174 * (0.088)	-0.177 * (0.085)	-0.074 (0.085)	-0.083 (0.083)	0.347 *** (0.074)	0.351 *** (0.072)
Have Children	0.150 * (0.074)	0.144 + (0.074)	0.036 (0.071)	0.021 (0.073)	0.071 (0.048)	0.079 (0.049)
Earnings Last Year (IHS)	-0.021 * (0.009)	-0.021 * (0.009)	0.008 (0.008)	0.007 (0.008)	0.019 ** (0.006)	0.020 ** (0.006)
State Min. Wage Change	0.135 (0.127)	0.130 (0.124)	0.089 (0.129)	0.078 (0.130)	-0.079 (0.082)	-0.074 (0.080)
State FE	Yes	Yes	Yes	Yes	Yes	Yes
Mean	-0.044	-0.044	0.006	0.006	0.435	0.435
Observations	1009	1009	1009	1009	1004	1004
R ²	0.091		0.073		0.142	

TABLE 3.5: OLS and 2SLS Estimates of Effect of Youth Employment

+ $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$. Standard errors clustered at family-level. State fixed effects. Covariates include mother's educational attainment, family wealth as youth, family income as youth, parental employment status as youth, gender, age, marital status, high school graduation status, employment status, whether or not have children, earnings. Account balances are inverse hyperbolic sine transformed to allow for zero and negative values.

	Worry about Money		Ability to Manage Money		Responsibility for Bills	
	OLS	2SLS	OLS	2SLS	OLS	2SLS
Weekly Hours						
Worked as Youth	0.002 (0.019)	-0.017 (0.070)	-0.006 (0.014)	0.035 (0.066)	0.011 (0.009)	-0.016 (0.045)
Mother HS Graduate	0.026 (0.077)	0.037 (0.084)	-0.188 * (0.078)	-0.212 * (0.083)	0.040 (0.052)	0.056 (0.057)
Parent Income (IHS)	-0.004 (0.018)	-0.003 (0.017)	-0.025 (0.018)	-0.026 (0.017)	-0.025 * (0.012)	-0.024 * (0.012)
Parent Wealth (IHS)	-0.005 (0.005)	-0.005 (0.005)	-0.003 (0.006)	-0.003 (0.005)	0.001 (0.003)	0.002 (0.003)
Parent Unemployed	0.124 + (0.070)	0.121 + (0.068)	-0.128 + (0.067)	-0.120 + (0.067)	-0.035 (0.048)	-0.040 (0.047)
Female	0.119 + (0.067)	0.117 + (0.065)	0.090 (0.063)	0.094 (0.062)	-0.017 (0.043)	-0.019 (0.042)
Age=25	-0.008 (0.067)	0.001 (0.073)	0.097 (0.062)	0.078 (0.067)	0.073 + (0.043)	0.086 + (0.047)
Married	0.050 (0.091)	0.050 (0.089)	0.066 (0.087)	0.066 (0.087)	-0.124 * (0.062)	-0.124 * (0.061)
Graduated high school	-0.032 (0.074)	-0.021 (0.081)	-0.002 (0.071)	-0.027 (0.077)	0.142 ** (0.051)	0.158 ** (0.056)
Employed	-0.178 * (0.090)	-0.175 * (0.087)	-0.065 (0.086)	-0.072 (0.083)	0.339 *** (0.075)	0.344 *** (0.073)
Have Children	0.147 + (0.076)	0.150 * (0.074)	0.038 (0.072)	0.031 (0.072)	0.079 (0.049)	0.084 + (0.049)
Earnings Last Year (IHS)	-0.020 * (0.009)	-0.020 * (0.009)	0.007 (0.008)	0.006 (0.008)	0.021 ** (0.006)	0.022 *** (0.007)
State Min. Wage Change	0.141 (0.127)	0.141 (0.124)	0.079 (0.130)	0.078 (0.126)	-0.071 (0.082)	-0.071 (0.080)
State FE	Yes	Yes	Yes	Yes	Yes	Yes
Mean	-0.050	-0.050	0.010	0.010	0.434	0.434
Observations	988	988	988	988	983	983
R ²	0.092		0.073		0.138	

TABLE 3.6: OLS and 2SLS Estimates of Effect of Youth Employment

+ $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$. Standard errors clustered at family-level. State fixed effects. Covariates include mother's educational attainment, family wealth as youth, family income as youth, parental employment status as youth, gender, age, marital status, high school graduation status, employment status, whether or not have children, earnings. Account balances are inverse hyperbolic sine transformed to allow for zero and negative values.

	Banked	Bank Bal- ance (IHS)	Have CC	Borrow CC	Credit Card Balance (IHS)
Employed as Youth	0.019 (0.044)	0.223 (0.403)	0.192 ** (0.061)	0.192 ** (0.068)	1.588 ** (0.523)
Mother HS Graduate	-0.011 (0.051)	-0.379 (0.459)	-0.022 (0.069)	-0.002 (0.064)	0.158 (0.477)
Parent Income (IHS)	0.021 (0.018)	0.247 * (0.107)	-0.017 (0.011)	0.005 (0.012)	0.029 (0.084)
Parent Wealth (IHS)	0.010 + (0.006)	0.085 + (0.050)	0.007 (0.005)	0.004 (0.004)	0.021 (0.034)
Parent Unemployed	-0.010 (0.070)	-0.187 (0.551)	-0.047 (0.064)	0.046 (0.068)	0.267 (0.529)
Female	0.048 (0.040)	0.022 (0.332)	0.118 * (0.053)	0.114 * (0.045)	1.068 ** (0.348)
Age=25	-0.007 (0.038)	0.096 (0.336)	-0.021 (0.050)	-0.017 (0.050)	-0.170 (0.385)
Married	0.080 (0.066)	0.909 (0.581)	0.052 (0.078)	0.023 (0.084)	0.500 (0.660)
Graduated high school	0.103 * (0.046)	0.496 (0.389)	-0.038 (0.054)	0.013 (0.055)	0.165 (0.417)
Employed	0.095 + (0.055)	1.407 ** (0.532)	0.155 * (0.067)	0.063 (0.063)	0.479 (0.492)
Have Children	-0.081 (0.053)	-0.982 * (0.491)	-0.195 ** (0.063)	-0.021 (0.058)	-0.320 (0.441)
Earnings Last Year (IHS)	-0.001 (0.006)	0.069 (0.044)	0.014 * (0.007)	-0.005 (0.006)	-0.048 (0.046)
State Min. Wage Change	0.037 (0.072)	0.202 (0.641)	-0.120 (0.095)	-0.119 (0.096)	-0.800 (0.762)
Household FE	Yes	Yes	Yes	Yes	Yes
State FE	Yes	Yes	Yes	Yes	Yes
Mean	0.795	5.993	0.454	0.276	2.150
Observations	1009	1009	1009	1009	1009
R ²	0.193	0.225	0.232	0.185	0.197
Number of Households	671	671	671	671	671

TABLE 3.7: Sibling Fixed Effects Estimates of Teen Employment on Financial Outcomes

+ $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$. Standard errors clustered at family-level. State fixed effects. Covariates include mother's educational attainment, family wealth as youth, family income as youth, parental employment status as youth, gender, age, marital status, high school graduation status, employment status, whether or not have children, earnings. Account balances are inverse hyperbolic sine transformed to allow for zero and negative values.

	Banked	Bank Bal- ance (IHS)	Have CC	Borrow CC	Credit Card Balance (IHS)
Weekly Hours					
Worked as Youth	0.014 (0.009)	0.109 (0.084)	0.029 * (0.013)	0.043 ** (0.014)	0.338 ** (0.106)
Mother HS Graduate	-0.003 (0.052)	-0.248 (0.458)	-0.012 (0.071)	0.016 (0.067)	0.309 (0.490)
Parent Income (IHS)	0.012 (0.013)	0.167 * (0.067)	-0.026 + (0.014)	-0.006 (0.008)	-0.042 (0.059)
Parent Wealth (IHS)	0.010 + (0.006)	0.076 (0.052)	0.009 + (0.005)	0.005 (0.004)	0.019 (0.033)
Parent Unemployed	-0.020 (0.074)	-0.399 (0.556)	-0.048 (0.069)	-0.003 (0.067)	-0.143 (0.528)
Female	0.041 (0.041)	0.022 (0.341)	0.099 + (0.054)	0.099 * (0.045)	0.952 ** (0.351)
Age=25	-0.020 (0.040)	0.004 (0.345)	-0.031 (0.052)	-0.031 (0.052)	-0.279 (0.396)
Married	0.084 (0.065)	0.944 (0.576)	0.031 (0.081)	-0.000 (0.083)	0.292 (0.653)
Graduated high school	0.094 * (0.047)	0.419 (0.390)	-0.035 (0.055)	0.011 (0.058)	0.157 (0.438)
Employed	0.055 (0.056)	1.053 + (0.536)	0.167 * (0.070)	0.064 (0.066)	0.512 (0.522)
Have Children	-0.094 + (0.053)	-1.133 * (0.489)	-0.173 * (0.068)	-0.012 (0.058)	-0.205 (0.437)
Earnings Last Year (IHS)	0.002 (0.006)	0.089 * (0.045)	0.015 * (0.007)	-0.006 (0.006)	-0.059 (0.049)
State Min. Wage Change	0.033 (0.073)	0.154 (0.635)	-0.099 (0.095)	-0.110 (0.098)	-0.717 (0.780)
Household FE	Yes	Yes	Yes	Yes	Yes
State FE	Yes	Yes	Yes	Yes	Yes
Mean	0.797	6.016	0.459	0.277	2.165
Observations	988	988	988	988	988
R ²	0.168	0.231	0.226	0.183	0.193
Number of Households	661	661	661	661	661

TABLE 3.8: Sibling Fixed Effects Estimates of Teen Employment on Financial Outcomes

+ $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$. Standard errors clustered at family-level. State fixed effects. Covariates include mother's educational attainment, family wealth as youth, family income as youth, parental employment status as youth, gender, age, marital status, high school graduation status, employment status, whether or not have children, earnings. Account balances are inverse hyperbolic sine transformed to allow for zero and negative values.

	Worry about Money	Ability to Manage Money	Responsible for Paying Bills
Employed as Youth	0.202 (0.159)	-0.066 (0.168)	-0.017 (0.098)
Mother HS Graduate	0.047 (0.136)	-0.038 (0.145)	0.009 (0.079)
Parent Income (IHS)	-0.025 (0.029)	-0.001 (0.020)	-0.045 * (0.020)
Parent Wealth (IHS)	-0.003 (0.011)	-0.000 (0.011)	0.006 (0.007)
Parent Unemployed	0.065 (0.163)	0.107 (0.142)	0.138 (0.085)
Female	0.105 (0.105)	-0.052 (0.119)	-0.062 (0.079)
Age=25	-0.073 (0.114)	0.177 + (0.107)	-0.014 (0.072)
Married	0.049 (0.176)	0.072 (0.177)	-0.071 (0.117)
Graduated high school	-0.062 (0.128)	0.079 (0.124)	-0.003 (0.081)
Employed	-0.244 + (0.141)	-0.162 (0.142)	0.430 *** (0.129)
Have Children	0.039 (0.138)	-0.017 (0.158)	0.064 (0.087)
Earnings Last Year (IHS)	-0.022 (0.017)	0.019 (0.016)	0.022 * (0.011)
State Min. Wage Change	0.066 (0.222)	0.195 (0.216)	0.139 (0.110)
Household FE	Yes	Yes	Yes
State FE	Yes	Yes	Yes
Mean	-0.044	0.006	0.435
Observations	1009	1009	1004
R ²	0.115	0.171	0.230
Number of Households	671	671	669

TABLE 3.9: Sibling Fixed Effects Estimates of Teen Employment on Financial Outcomes

+ $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$. Standard errors clustered at family-level. State fixed effects. Covariates include mother's educational attainment, family wealth as youth, family income as youth, parental employment status as youth, gender, age, marital status, high school graduation status, employment status, whether or not have children, earnings.

	Worry about Money	Ability to Manage Money	Responsible for Paying Bills
Weekly Hours			
Worked as Youth	0.051 + (0.030)	0.015 (0.033)	0.008 (0.019)
Mother HS Graduate	0.052 (0.140)	-0.078 (0.143)	0.015 (0.081)
Parent Income (IHS)	-0.012 (0.027)	0.003 (0.020)	-0.061 * (0.027)
Parent Wealth (IHS)	-0.009 (0.011)	-0.003 (0.012)	0.008 (0.007)
Parent Unemployed	0.104 (0.172)	0.037 (0.153)	0.105 (0.091)
Female	0.101 (0.110)	-0.046 (0.121)	-0.082 (0.080)
Age=25	-0.101 (0.116)	0.175 (0.109)	-0.014 (0.074)
Married	0.086 (0.178)	0.058 (0.187)	-0.029 (0.115)
Graduated high school	-0.066 (0.127)	0.056 (0.126)	-0.007 (0.083)
Employed	-0.258 + (0.152)	-0.179 (0.154)	0.402 ** (0.134)
Have Children	0.026 (0.144)	-0.007 (0.166)	0.066 (0.090)
Earnings Last Year (IHS)	-0.021 (0.017)	0.016 (0.016)	0.023 * (0.011)
State Min. Wage Change	0.091 (0.224)	0.181 (0.216)	0.138 (0.111)
Household FE	Yes	Yes	Yes
State FE	Yes	Yes	Yes
Mean	-0.050	0.010	0.434
Observations	988	988	983
R ²	0.125	0.169	0.224
Number of Households	661	661	659

TABLE 3.10: Sibling Fixed Effects Estimates of Teen Employment on Financial Outcomes

+ $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$. Standard errors clustered at family-level. State fixed effects. Covariates include mother's educational attainment, family wealth as youth, family income as youth, parental employment status as youth, gender, age, marital status, high school graduation status, employment status, whether or not have children, earnings.

	Employed as Youth	Weekly Hours Worked as Youth
Unemployment Rate	-0.088 *** (0.019)	-0.677 *** (0.100)
State FE	Yes	Yes
Controls	Yes	Yes
Mean	0.260	1.018
Observations	1009	1007
R^2	0.118	0.160
F-Stat	21.90	45.44

TABLE 3.11: First-Stage Estimate of Unemployment Rate on Youth Employment During the Summer

+ $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$. Standard errors clustered at family-level. State fixed effects. Covariates include mother's educational attainment, gender, age, marital status, high school graduation status, employment status, whether or not have children, earnings.

	Survey Sample	Estimation Sample	Sibling Sample
	Mean	Mean	Mean
Employed as Youth	0.19	0.20	0.20
Weekly Hours Worked in School Year	0.75	0.81	0.86
Employed in Summer as Youth	0.25	0.26	0.23
Weekly Hours Worked in Summer	0.95	1.02	0.94
Unemployment Rate Above State Average	0.54	0.54	0.56
Banked	0.77	0.79	0.80
Transaction Accounts Balance (\$)	3547.91	3463.94	3135.60
Have Credit Card(s)	0.42	0.45	0.44
Borrow on Credit Card	0.25	0.28	0.25
Loans Balance	598.09	663.01	555.45
Worry about money (5pt)	3.72	3.68	3.72
Ability to manage money (7pt)	5.47	5.46	5.45
Responsible for Bills (5pt)	4.43	4.48	4.52
Mother HS Graduate	0.26	0.26	0.26
Mother Education > HS	0.45	0.44	0.46
Female	0.51	0.51	0.51
Age	24.48	24.47	24.50
Married	0.15	0.15	0.14
Graduated High School or GED	0.73	0.73	0.72
Working Now	0.75	0.78	0.78
Have Children	0.37	0.34	0.35
Earnings (\$)	17627.27	17441.78	17327.99
State Min. Wage Change	0.11	0.12	0.11
Parent Income	58573.97	61088.70	58995.28
Parent Wealth	98331.92	114026.07	103884.77
Parent Unemployed	0.28	0.28	0.27
Observations	1503	1009	571

TABLE 3.12: Means for Survey Sample, Estimation Sample, and Sibling Sample

	Banked		Bank Balance (IHS)		Have Credit Card		Borrow on Credit Card		Credit Card Balance (IHS)	
	OLS	2SLS	OLS	2SLS	OLS	2SLS	OLS	2SLS	OLS	2SLS
Employed in Summer as Youth	-0.017 (0.026)	-0.225 (0.163)	-0.112 (0.222)	-0.681 (1.455)	0.027 (0.034)	0.232 (0.212)	0.070* (0.033)	-0.183 (0.207)	0.521* (0.258)	-0.658 (1.659)
Mother HS Graduate	0.037 (0.029)	0.070+ (0.038)	0.059 (0.244)	0.150 (0.319)	0.017 (0.037)	-0.016 (0.048)	0.024 (0.035)	0.065 (0.047)	0.273 (0.270)	0.462 (0.369)
Parent Income (IHS)	0.035* (0.014)	0.036** (0.012)	0.347** (0.109)	0.349*** (0.104)	0.014 (0.009)	0.013 (0.009)	0.007 (0.006)	0.008 (0.006)	0.047 (0.045)	0.051 (0.043)
Parent Wealth (IHS)	0.004+ (0.002)	0.004+ (0.002)	0.061** (0.019)	0.061** (0.019)	0.005+ (0.002)	0.005* (0.002)	0.002 (0.002)	0.002 (0.002)	0.013 (0.017)	0.013 (0.017)
Parent Unemployed	-0.075** (0.029)	-0.078** (0.028)	-0.573* (0.239)	-0.579* (0.232)	-0.064+ (0.033)	-0.062+ (0.033)	0.007 (0.032)	0.005 (0.031)	0.069 (0.252)	0.058 (0.247)
Female	0.093*** (0.022)	0.084*** (0.023)	0.548** (0.199)	0.525* (0.208)	0.063* (0.030)	0.071* (0.031)	0.075** (0.028)	0.065* (0.030)	0.691** (0.223)	0.643** (0.236)
Age=25	0.020 (0.023)	0.022 (0.023)	0.354+ (0.199)	0.360+ (0.194)	0.042 (0.030)	0.040 (0.030)	0.003 (0.029)	0.006 (0.029)	-0.007 (0.227)	0.006 (0.224)
Married	0.096** (0.030)	0.094** (0.031)	1.191*** (0.264)	1.186*** (0.258)	0.127** (0.041)	0.128** (0.040)	0.052 (0.044)	0.050 (0.045)	0.627+ (0.370)	0.616+ (0.363)
Graduated high school	0.106*** (0.027)	0.146*** (0.041)	0.669** (0.242)	0.781* (0.373)	-0.016 (0.032)	-0.056 (0.051)	0.074* (0.030)	0.124* (0.053)	0.550* (0.236)	0.782+ (0.409)
Employed	0.203*** (0.037)	0.195*** (0.037)	1.826*** (0.317)	1.804*** (0.320)	0.136*** (0.038)	0.144*** (0.039)	0.136*** (0.033)	0.126*** (0.034)	1.084*** (0.259)	1.037*** (0.267)
Have Children	-0.172*** (0.028)	-0.162*** (0.029)	-2.021*** (0.244)	-1.995*** (0.246)	-0.226*** (0.034)	-0.236*** (0.035)	-0.031 (0.031)	-0.019 (0.032)	-0.258 (0.241)	-0.203 (0.252)
Earnings Last Year (IHS)	0.009* (0.004)	0.011** (0.004)	0.125*** (0.029)	0.129*** (0.030)	0.011** (0.004)	0.010* (0.004)	0.006+ (0.004)	0.007* (0.004)	0.048+ (0.028)	0.054+ (0.029)
State Min. Wage Change	0.030 (0.040)	0.042 (0.041)	-0.421 (0.364)	-0.391 (0.367)	-0.001 (0.060)	-0.012 (0.061)	0.004 (0.059)	0.018 (0.059)	-0.046 (0.461)	0.017 (0.459)
State FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Mean	0.795	0.795	5.993	5.993	0.454	0.454	0.276	0.276	2.150	2.150
Observations	1009	1009	1009	1009	1009	1009	1009	1009	1009	1009
R ²	0.298		0.373		0.230		0.136		0.137	

TABLE 3.13: OLS and 2SLS Estimates of Effect of Summer Youth Employment

+ $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$. Standard errors clustered at family-level. State fixed effects. Covariates include mother's educational attainment, family wealth as youth, family income as youth, parental employment status as youth, gender, age, marital status, high school graduation status, employment status, whether or not have children, earnings. Account balances are inverse hyperbolic sine transformed to allow for zero and negative values.

	Worry about Money		Ability to Manage Money		Responsibility for Bills	
	OLS	2SLS	OLS	2SLS	OLS	2SLS
Employed in Summer as Youth	0.152 * (0.073)	0.021 (0.479)	-0.028 (0.077)	0.152 (0.459)	0.095 * (0.044)	-0.051 (0.308)
Mother HS Graduate	-0.013 (0.077)	0.008 (0.105)	-0.170 * (0.078)	-0.199 + (0.104)	0.024 (0.052)	0.047 (0.070)
Parent Income (IHS)	-0.015 (0.019)	-0.015 (0.019)	-0.018 (0.017)	-0.019 (0.017)	-0.019 (0.014)	-0.018 (0.013)
Parent Wealth (IHS)	-0.004 (0.005)	-0.004 (0.005)	-0.004 (0.005)	-0.004 (0.005)	0.002 (0.003)	0.002 (0.003)
Parent Unemployed	0.120 + (0.069)	0.119 + (0.067)	-0.122 + (0.066)	-0.120 + (0.065)	-0.030 (0.047)	-0.032 (0.046)
Female	0.106 (0.066)	0.101 (0.066)	0.107 + (0.063)	0.115 + (0.063)	-0.009 (0.042)	-0.015 (0.043)
Age=25	-0.018 (0.065)	-0.017 (0.063)	0.102 + (0.061)	0.100 + (0.060)	0.085 * (0.042)	0.086 * (0.041)
Married	0.029 (0.090)	0.028 (0.087)	0.087 (0.086)	0.089 (0.084)	-0.121 * (0.060)	-0.123 * (0.059)
Graduated high school	-0.075 (0.074)	-0.049 (0.117)	-0.001 (0.074)	-0.036 (0.115)	0.134 * (0.052)	0.162 * (0.077)
Employed	-0.171 + (0.088)	-0.176 * (0.088)	-0.080 (0.085)	-0.073 (0.086)	0.353 *** (0.075)	0.348 *** (0.074)
Have Children	0.138 + (0.074)	0.144 + (0.074)	0.029 (0.071)	0.021 (0.074)	0.072 (0.047)	0.079 (0.050)
Earnings Last Year (IHS)	-0.022 * (0.009)	-0.022 * (0.010)	0.008 (0.008)	0.007 (0.009)	0.019 ** (0.006)	0.020 ** (0.007)
State Min. Wage Change	0.123 (0.126)	0.130 (0.125)	0.084 (0.130)	0.075 (0.133)	-0.080 (0.082)	-0.073 (0.081)
State FE	Yes	Yes	Yes	Yes	Yes	Yes
Mean	-0.044	-0.044	0.006	0.006	0.435	0.435
Observations	1009	1009	1009	1009	1004	1004
R ²	0.095		0.071		0.143	

TABLE 3.14: OLS and 2SLS Estimates of Effect of Summer Youth Employment

+ $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$. Standard errors clustered at family-level. State fixed effects. Covariates include mother's educational attainment, family wealth as youth, family income as youth, parental employment status as youth, gender, age, marital status, high school graduation status, employment status, whether or not have children, earnings. Account balances are inverse hyperbolic sine transformed to allow for zero and negative values.

	Banked	Have CC	Borrow CC
Employed as Youth	-0.080 (0.430)	-0.048 (0.366)	-0.304 (0.383)
Earnings Last Year (IHS)	0.069 *** (0.011)	0.063 *** (0.010)	0.042 *** (0.012)
Parent Income (IHS)	0.182 * (0.074)	0.169 * (0.068)	0.127 ** (0.045)
Parent Wealth (IHS)	0.022 ** (0.008)	0.017 * (0.007)	0.003 (0.007)
Observations	1009	1009	1009

TABLE 3.15: Instrumental Variables Probit Estimates for Binary Financial Outcomes

+ $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$. Standard errors clustered at family-level. Earnings included as covariate. All other covariates omitted because they are not continuous variables. Instrumental variables maximum likelihood probit.

	Present	Future
Security	Control over day-to-day, month-to-month finances	Capacity to absorb a financial shock
	<i>Use credit card to borrow, Worry about money, Responsible for paying bills, Ability to manage money</i>	<i>Banked, Bank account balance, Have credit card</i>
Freedom of Choice	Financial freedom to make choices to enjoy life	On track to meet your financial goals

TABLE 3.16: Four Elements of Financial Well-Being and Study Measures

CFPB Financial Well-Being Scale: Scale Development Technical Report (2017). Washington DC: Consumer Financial Protection Bureau.

4 What Motivates Consumers to Check Their Credit?: Evidence from a Field Experiment

4.1 Introduction

Most consumers do not obtain their annual credit report or participate in credit monitoring offered by credit reporting agencies and financial institutions. In 2010, only about 16 million American consumers checked their credit for free through one of the big three credit bureaus (Consumer Financial Protection Bureau, 2011). Many possess inaccurate beliefs about their creditworthiness despite the availability of free credit checks (Levinger, Benton, and Meier, 2011; Perry, 2008; Courchane, Gailey, and Zorn, 2008). Financial decisions made with inaccurate credit information may be costly for consumers, harm their ability to borrow in the future, and, ultimately, diminish financial well-being.

Consumers are faced with different incentives to check their credit and correct inaccurate beliefs about creditworthiness. Failure to check one's credit makes consumers vulnerable to errors and identity theft that may harm their ability to borrow in the future.

Limited attention leads some to not acquire and use information in financial decision-making. Even if consumers are presented with opportunities to learn through experience, they often are unable to overcome update their beliefs (Eil and Rao, 2011). Relying on consumers to inform themselves may not be efficient.

Traditional policy approaches attempt to address consumers' inaccurate assessments of credit by providing information through financial education, free credit reports, and disclosure. However, these interventions are expensive and effectiveness is unclear. Another approach is to use "nudges" that make information salient and remind consumers of important decision-making inputs. This approach may prove fruitful in addressing behavioral biases at lower costs than traditional interventions. Empirical evidence revealed that consumers respond to reminders and advertisements that impart no new information in the credit market (Stango and Zinman, 2014; Brevoort, Grimm, and Kambara, 2016). There are incentives for policymakers as well as financial institutions to find those who need to recalibrate their beliefs about creditworthiness. Consumers armed with inaccurate predictions may over borrow, paying higher than necessary interest rates. They may fail to participate in credit markets altogether.

Excessive borrowing in the United States, including large debt burdens and high interest rates, is an ongoing puzzle for researchers. Behavioral biases, including time-inconsistent preferences, price perceptions that make products look deceptively cheap, optimistic expectations about future parameters, and decision rules that rely on heuristics, contribute to this trend (Zinman, 2015). On the supply side, recent theoretical work revealed that firms lend more than socially optimal in a credit market with present-biased consumers to increase the amount of interest that these consumers pay unexpectedly (Heidhues and Köszegi, 2017). Rather than implementing practices to address biases,

firms profit from behavioral consumers . On the demand side, an empirical study found descriptive evidence that biased self-assessed credit rating explains differences in perceived credit constraints and higher interest rates paid by those who underestimate their credit rating (Levinger, Benton, and Meier, 2011).

A recent study, closely related to this paper, revealed that messaging encouraged student loan borrowers to check their credit, regardless of message content or frequency of delivery (Homonoff, OBrien, and Sussman, 2019). Other studies found messaging content that highlighted social information, financial consequences, and moral appeals mattered. Ariely, Bracha, and Meier (2009) found that social information matters, especially when it was more visible to others, when making charitable contributions. Overall, these studies highlight that context matters when designing messaging interventions– the messaging must be natural and credible. Fellner, Sausgruber, and Traxler (2013) found that those who evade television fees were more likely to pay fees when they were delivered a threatening letter, but no effect when messaging described the prevalence of fee compliance or offered a moral appeal. Bursztyn et al. (2018) found that moral appeals, without mentioning a threat or negative financial consequences, were effective in encouraging customers to repay their past due debts.

This study builds on a growing literature on reminder effects. Using a field experiment with a credit union in the United States, the effect of email reminders on credit checks is analyzed. Visits to an online dashboard that displays one’s credit score and enrollments in a free credit monitoring service are used to measure attention to information about creditworthiness. Given past work that illustrates the limited impact of reminders on behavior, the reminder is predicted to have modest effects on these outcomes, and

there will be no differences by message type. The reminder effect is explored for several subgroups who are likely to check their credit because they have difficulty managing debt, The subgroups include those who have poorer credit scores, hold no credit card(s), new credit union members, and young adults. Because non-compliance with treatment assignment is expected, an instrumental variables approach will be implemented to estimate the effect of opening the email message on behavior. Those who are assigned and receive treatment are more likely to check their credit.¹

4.2 Experimental Design

4.2.1 The Credit Monitoring Service

In this study, a free credit monitoring service offered by a credit union in the United States is examined. Recently, credit reporting agencies have begun to provide access to credit scores and reports to financial institutions recognizing that consumers benefit from access to their credit report and the low cost to deliver this information.² Financial institutions benefit from sharing this information as an additional benefit to their account holders as well as the ability to market products to consumers. The credit monitoring service explored in this study was first offered to credit union members in 2018. All credit union members are able to view their credit score in their online banking dashboard, even if they have not enrolled in the credit monitoring service. Members may also voluntarily

¹This study was pre-registered on AsPredicted.org: “What Motivates Consumers to Check Credit? April 2019”, (AsPredicted #23386).

²Many credit card companies and banks offer free credit scores and monitoring services to attract and retain customers as well as market credit products. For example, Chase Credit Journey and Capital One CreditWise offer Transunion’s program and US Bank offers FICO Open Access.

enroll and create an account to receive credit monitoring email alerts, including fraudulent activity, access to their credit reports updated monthly, access to a call center to address inaccuracies, educational materials on managing credit, and a credit score simulator. In addition, monthly email delivered on the 14th of each month if no changes to one's credit file over the 30-day period, they also receive an email that notifies them that they have not experienced any changes. If there are changes to one's credit file over the 30-day period, the member receives an email in real-time alerting them to the change that has occurred. Enrolled members also have access to a Credit Call Center when or if consumers notice discrepancies in their credit information. The credit monitoring service provides an online dashboard with a credit score simulator to test financial scenarios, like taking out another loan or cancelling a credit card. Finally, consumer education materials, which focus on how to manage credit and improve one's credit score, are available.

4.2.2 Sample Population and Random Assignment

The population for this experiment includes a random sample of 2,045 credit union members who are not enrolled in the credit monitoring service six months after its introduction between October 2018 and April 2019. Members are eligible for the experiment if they are between 18 and 55 years old, have a credit score and file available, and are not enrolled in the credit monitoring service by April 1, 2019. Figure 4.2 displays a timeline of the experiment, including dates for pre-treatment characteristics measurement, email message delivery, and response measurement. Members who do not have a credit score and credit file available are excluded because they will not receive any information from the credit monitoring service and will not have a score available for view in their dashboard. Enrolled members are also excluded because the interest for this study is what motivates

consumers to take up a freely available credit check. The treatment is assigned at the individual level. From the members selected for the study, 1,636 members were randomly assigned to one of the four email message conditions (409 members per condition) while another group of 409 members were randomly chosen to receive no email message from the credit union. The sample size was determined by a power analysis with the following assumptions: a minimum detectable effect of 0.1, α of 0.05, and power of 0.9.

4.2.3 Experimental Treatments

In this experiment there are five treatment arms: control, simple reminder, positive motivation I, positive motivation II, and negative motivation. Figure 4.2 details the experimental design including the treatment conditions. All email messages include the same subject line, informational video describing the credit monitoring service, additional body text, and a link to the credit monitoring service website on the credit union's website (Appendix A includes an example of the email message treatment). The control group receives no email message.

Simple Reminder Condition

The simple reminder group receives an email message that includes a header that reads, "Track Your Credit", and the following body text, "As a XYZ Credit Union member, you can check your credit score and monitor credit activity in Web Branch anytime for free." The email message also includes an image of the credit monitoring tool on a smartphone with a dashboard homepage for a consumer with a 810 point credit score (henceforth "high" credit score).

Positive Motivation I Condition (Social Information Messaging + “High” Credit Score)

Two email messages are used to test the effectiveness of positive motivation, social information describing the prevalence of participation in the credit monitoring service among fellow credit union members. The first of the two positive motivation groups (Positive Motivation I) receives an email message that includes a call to action “Track & Improve Your Credit” as well as body text that reads “Thousands of XYZ Credit Union members are checking their credit for free. As a XYZ Credit Union member, you can check your credit score and monitor credit activity in Web Branch anytime for free.” The email message also includes an image of the credit monitoring tool on a smartphone with a dashboard homepage with a “high” credit score.

Positive Motivation II Condition (Social Information Messaging + “Low” Credit Score)

The second positive motivation group (Positive Motivation II) receives an email message with the same call to action and body text as Positive Motivation I. The email message displays a lower credit score, 810 point (henceforth “low” credit score), than all other email messages.

Negative Motivation Condition

The negative motivation group receives an email message that includes a call to action, “Track & Protect Your Credit”, as well as body text that reads “Protect against identity theft and errors that may may harm your ability to borrow in the future with free credit check. As a XYZ Credit Union member, you can check your credit score and monitor credit activity in Web Branch anytime for free.” The email message also includes an image of the credit monitoring tool displaying a “high” credit score on a smartphone. The

condition details the negative financial consequences that may result from failing to check one's credit.

4.2.4 Data and Summary Statistics

Administrative Data

The credit union provided administrative data on credit union members selected to participate in the experiment. The administrative data include treatment email assignment, email receipt, and clickthrough to the credit monitoring service website, as well as online banking logins and credit monitoring service enrollment following the intervention. The data also include demographic and account characteristics of members, including member age, deposit account tenure, deposit account balance, credit activity at the financial institution, total fees accrued on all accounts, whether or not the member was delinquent for more than 30-days, and credit score.

Table 4.1 details the summary statistics and balance test for all treatment arms. The characteristics are largely balanced across the treatment conditions, though, there is a statistically significant difference in whether one has a "D" credit rating across the groups at the 10% level. The balance test reveals that randomization was largely successful for assignment to email message conditions.

Table 4.2 includes a balance test for treatment non-compliance. The table details the differences between those who comply with treatment assignment and open the email exposing themselves to the message, versus those who fail to comply and do not open the email. About 30% of those assigned to an email message comply with treatment assignment. Those who do not comply with treatment assignment are less likely to have logged into their online banking dashboard in the three weeks preceding treatment. They

are also less likely to have a credit card and more likely to have a student loan with the credit union compared to those who do comply with treatment assignment.

Main Outcomes of Interest

The main outcome of interest for this study is consumer attention to information about their creditworthiness. Three outcome measures are considered in this study that reflect consumers attending to information about creditworthiness. The main outcomes are: (1) whether or not the consumer clicks a link to view their credit score, (2) whether or not they take up a free credit monitoring service available through their financial institution, and (3) whether they log in to their online banking dashboard where they can view their credit score.

4.2.5 Estimation

In this study the email messages are randomly assigned. The estimation of the effect of the messaging on consumer attention to credit information uses the econometric specification below:

$$Y_i = \alpha + \sum_c \beta_c I_{c,i} + \epsilon_i \quad (4.1)$$

Y_i represents the three outcome measures: online banking logins, credit monitoring service enrollment, and credit monitoring service informational website visits. β_c is the coefficient of interest for this study: the effect of messaging on attention to one's credit. $I_{c,i}$ is an indicator variable that equals one if the member is randomly assigned to treatment, zero if assigned to control. ϵ_i is the error term.

4.3 Results

This section presents the effects of email messaging on attention to information about creditworthiness. First, effects regardless of messaging type are presented for logins to online banking dashboard, enrollment in the credit monitoring service, and visits to the credit monitoring service informational website. These measures reflect engagement with one's credit information through the credit union. All treatment groups are pooled together for comparison with the control group. Next, the effects are estimated by treatment message to determine whether the message content impacts effectiveness. The simple reminder reflects the default communication from the credit union, and this analysis provides a comparison of different messaging to business as usual. Finally, the effects of receiving any message for subgroups who may have different incentives to check their credit and, thus, responses to messaging are presented.

4.3.1 Intent-to-Treat Effects on Attention to Information about Creditworthiness

Table 4.3 shows the frequency that members log in to their account, visit the informational website, and enroll in the credit monitoring service by treatment assignment. The p-value from the chi-squared test of independence is also included. Panel A shows the results for a test of independence of the outcomes by whether one receives any email message. There is no statistically significant difference between those who receive a message and the control across all outcomes measured. Panel B displays the results from a test of independence across each treatment message arm. There is no statistically significant difference in credit monitoring behavior across arms. Overall, this study offers evidence

that a single email message to credit union members does not impact any measure of attention to creditworthiness.

Heterogeneous Effects

Next, the effects of the email messages are evaluated for subgroups. Specifically, heterogeneous effects are estimated for those who have a low credit rating, possess no credit cards, young adults, and new credit union members. These characteristics may lead individuals who would likely benefit from check their credit through the free service to have inaccurate beliefs about their credit. Table 4.4 shows that the email messages do not have heterogeneous effects for the selected subgroups. Columns 1 and 2 detail the differential effects of any email message for those with low credit rating, defined as a rating of either “C” or “D”, on online banking log in. Members with low credit rating who are assigned to an email message are 0.4 percentage points more likely to log in to their online banking where they can view their credit score. These members log in 1.4 fewer times. Finally, members with “low” credit ratings log in to their accounts 4.126 times more than those with high credit ratings. Columns 3 and 4 present the effects of messaging for members who do not have a credit card with the credit union. The messaging effect on logins for this group is zero. These members are 37.3 percentage points less likely to log in to their online banking than those who have a credit card, statistically significant at the 0.1% level. Those assigned to the treatment log in to online banking 0.067 times more than the control group. Members with no credit card log in 5.146 fewer times than those with credit cards through the credit union. Next, columns 5 and 6 include the differential effects of messaging for young adults age 18-35. Young adults assigned to email messaging are 6.2 percentage points more likely to log in to their online dashboard, and they have 1.552

more log ins. Young adults are 7.5 percentage points more likely to log in to online banking and have 0.56 more log ins than older members. Finally, columns 7 and 8 reveal that new members who receive an email message are not more likely to check their online banking. These estimates are statistically insignificant. The emails are not differentially effective in encouraging these selected subgroups to log in to their online dashboard to check their credit.

4.3.2 Treatment-on-the-Treated Effects on Attention to Information about Creditworthiness

Finally, an instrumental variables approach is employed to estimate the effect of opening the email message on checking one's credit, the treatment-on-the-treated effect. The random assignment to an email message is used to instrument for opening the email. Table 4.5 includes the results from the first-stage where email message assignment predicts whether the credit union member opens the email. The estimate is large and statistically significant—those who are assigned to treatment are 27.1 percentage points more likely to open the email. The F-statistic is far above the threshold of 10. Together this indicates that random assignment to email message is a strong instrument for email opening patterns. Since email message assignment is random, this approach allows for estimation of the effect of opening the message on online dashboard logins, visits to the information website, and credit monitoring service enrollments. Table 4.6 details the 2SLS estimates from the IV approach. Those who open the email are 35.9 percentage points more likely to log-in to online banking where their credit score is displayed. They are also 4.2 percentage points more likely to click through in the email to learn more about the credit monitoring service, and 11.4 percentage points more likely to enroll. However, it is important to remember

that these are very low probability outcomes in this study with only 18 visits to the credit monitoring tools website, and 6 enrollments following the intervention.

4.4 Limitations

Although the study uses randomization of treatment in a natural setting to evaluate the effects of messaging on attention to one's credit, there are several limitations that must be addressed. First, the identification strategy requires the assumption that there is no interference between units to be met in order for causal estimates to be credible. Because the messages are transmitted by email, they likely remain private to the individual. Second, noncompliance of the credit union members is an issue for this study. Many members who received the email message may have failed to open the email, thus not receiving the assigned treatment. Table 4.2 compares those who do not open the email are compared to those who comply with treatment assignment and open the email. Although the instrumental variables approach allows for estimation of the treatment on the treated effect, it is important to remember that this represents the local average treatment effect (LATE) for compliers, those who viewed the email message.

4.5 Conclusion

This study uses a field experiment with a financial institution who offers a free credit monitoring service to its members to measure the effectiveness of email messaging "nudges" to check one's credit on attention to information about one's credit record. The evidence presented builds on prior work on the effects of non-monetary incentives on household financial behavior using a sample of credit union members in the United States. Findings

suggest that a single email message is largely not effective at encouraging consumers to check their credit. Email messages, specifically one that emphasizes the indirect financial consequences of failing to attend to credit, have small effects on enrollment in a free credit monitoring service. These messages are not effective at encouraging a higher probability or frequency of logins to online banking to review one's credit score, nor frequency of visits to an informational website about the credit monitoring service. A subgroup analysis reveals that email messaging is not more effective for groups hypothesized to have a higher prevalence of inaccurate credit rating predictions. A single message is not effective at encouraging engagement with one's credit.

These findings have implications for policies that aim to better inform consumers for decision-making in credit markets and improve financial well-being. First, the findings suggest that one-off messaging "nudges" are not very effective in altering consumer propensity to check their credit. Other studies reveal that repeated messages are effective and the importance of the context and content of messaging interventions. Policies that implement similar low-cost behavioral approaches should keep the nuances of messaging in mind. Targeting these interventions to those who are most vulnerable may be a difficult endeavor due to the "pain" that may, in part, prevent consumers from updating beliefs.

Future research should explore the effects of repeated and targeted messaging, as well as expand this research to other financial behaviors and populations. The findings from this study reveal that a single message is largely ineffective, regardless of message content. The literature suggests that there is potential for messaging interventions that make information salient over time and target vulnerable populations. Finally, the present study focuses on effects for members of a local credit union. Therefore, these findings

may not generalize to other populations and require further investigation in diverse contexts.

4.6 Tables and Figures

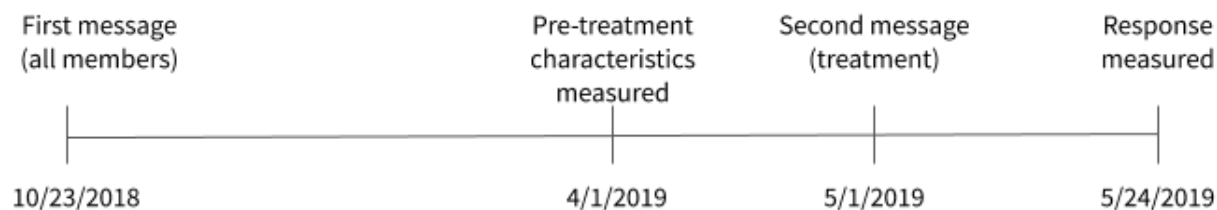


FIGURE 4.1: Timeline of Events

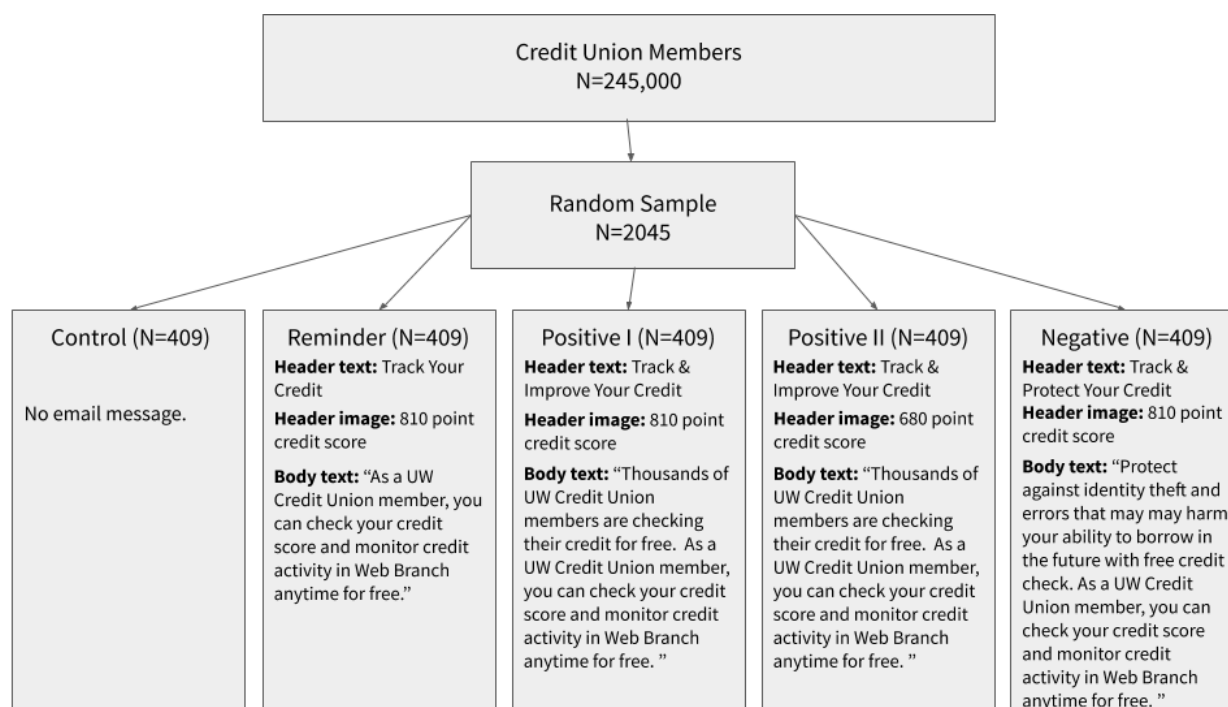


FIGURE 4.2: Experimental Design

	(1) Reminder	(2) Positive - High Score	(3) Positive - Low Score	(4) Negative	(5) Control	(6) p-value
Age (in years)	33.049 (0.466)	34.435 (0.505)	33.545 (0.495)	33.235 (0.502)	34.056 (0.483)	0.240
Deposit Account Balance (in \$)	11,174 (2,510.189)	8,912 (1,339.521)	11,817 (2,063.673)	9,083 (1,222.807)	10,326 (1,650.375)	0.745
Membership Tenure (in years)	8.579 (0.340)	9.017 (0.356)	9.078 (0.369)	8.626 (0.323)	8.665 (0.344)	0.765
Logged In? (Pre)	0.653 (0.024)	0.660 (0.023)	0.633 (0.024)	0.660 (0.023)	0.653 (0.024)	0.928
Login Count (Pre)	11.675 (1.426)	8.286 (0.761)	9.511 (1.001)	11.301 (1.247)	9.878 (0.992)	0.187
Has a Credit Card?	0.369 (0.024)	0.364 (0.024)	0.367 (0.024)	0.372 (0.024)	0.350 (0.024)	0.971
Has an Auto Loan?	0.186 (0.019)	0.225 (0.021)	0.166 (0.018)	0.174 (0.019)	0.203 (0.020)	0.205
Has a Student Loan?	0.100 (0.015)	0.100 (0.015)	0.103 (0.015)	0.081 (0.013)	0.086 (0.014)	0.749
Has a Line of Credit?	0.325 (0.023)	0.320 (0.023)	0.311 (0.023)	0.337 (0.023)	0.337 (0.023)	0.911
Has a Checking Account?	0.763 (0.021)	0.787 (0.020)	0.780 (0.021)	0.782 (0.020)	0.790 (0.020)	0.900
Credit Rating						
A+	0.565 (0.025)	0.562 (0.025)	0.609 (0.024)	0.538 (0.025)	0.557 (0.025)	0.342
A	0.159 (0.018)	0.125 (0.016)	0.132 (0.017)	0.134 (0.017)	0.152 (0.018)	0.596
B	0.108 (0.015)	0.105 (0.015)	0.112 (0.016)	0.110 (0.015)	0.134 (0.017)	0.689
C	0.029 (0.008)	0.059 (0.012)	0.044 (0.010)	0.046 (0.010)	0.027 (0.008)	0.129
D	0.139 (0.017)	0.149 (0.018)	0.103 (0.015)	0.171 (0.019)	0.130 (0.017)	0.068
N	409	409	409	409	409	

TABLE 4.1: Balance Test and Treatment Cell Size

Source: Administrative data April 2019 to May 2019.

	Do Not Open	Open Email	Overall	p-value
Age (in years)	33.570 (0.244)	34.01 (0.497)	33.66 (0.220)	0.415
Deposit Account Tenure (in years)	8.834 (0.173)	8.646 (0.348)	8.793 (0.155)	0.617
Deposit Account Balance (in \$)	9732 (836.283)	12181 (2228.488)	10262 (813.793)	0.215
Logged In? (Pre)	0.633 (0.012)	0.720 (0.021)	0.652 (0.011)	0.001
Login Count (Pre)	10.123 (0.590)	10.156 (0.838)	10.130 (0.496)	0.978
Has a Credit Card?	0.351 (0.012)	0.413 (0.023)	0.364 (0.011)	0.016
Has an Auto Loan?	0.187 (0.010)	0.205 (0.019)	0.191 (0.009)	0.374
Has a Student Loan?	0.105 (0.008)	0.052 (0.011)	0.094 (0.006)	0.001
Has a Line of Credit?	0.325 (0.012)	0.332 (0.022)	0.326 (0.010)	0.774
Has a Checking Account?	0.782 (0.010)	0.774 (0.020)	0.780 (0.009)	0.723
Credit Rating				
A+	0.561 (0.012)	0.585 (0.023)	0.566 (0.011)	0.378
A	0.145 (0.009)	0.124 (0.016)	0.140 (0.008)	0.268
B	0.115 (0.008)	0.111 (0.015)	0.114 (0.007)	0.803
C	0.042 (0.005)	0.038 (0.009)	0.041 (0.004)	0.746
D	0.137 (0.009)	0.142 (0.017)	0.138 (0.008)	0.792
<i>N</i>	1602	443	2045	

TABLE 4.2: Non-Compliance: Balance Test

Source: Administrative data April 2019 to May 2019.

	Log In?	Visit Site?	Enroll?	N
Panel A: Any Email Message				
Control	264	2	0	409
Any Message	1057	16	6	1636
p-value	0.982	0.220	0.344	2045
Panel B: By Treatment Message Type				
Control	264	2	0	409
Reminder	269	5	1	409
Positive - High Score	261	6	1	409
Positive - Low Score	259	1	1	409
Negative	268	4	3	409
p-value	0.938	0.404	0.306	2045

TABLE 4.3: Dependent Variables Frequency and Test of Independence

Source: Administrative data April 2019 to May 2019.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Log In?	# of Logins	Log In?	# of Logins	Log In?	# of Logins	Log In?	# of Logins
Low Credit Rating × Any Treatment	0.004 (0.058)	-1.396 (1.644)						
Low Credit Rating	0.026 (0.052)	4.126** (1.397)						
No Credit Card × Any Treatment			-0.000 (0.045)	0.067 (1.436)				
No Credit Card			-0.373*** (0.040)	-5.146*** (1.230)				
Age 18-35 × Any Treatment					0.062 (0.054)	1.552 (1.342)		
Age 18-35					0.075 (0.048)	0.560 (1.155)		
New Member × Any Treatment							0.034 (0.054)	1.205 (1.283)
New Member							-0.122* (0.048)	-2.306* (1.074)
Any Treatment	-0.001 (0.032)	0.940 (0.674)	-0.006 (0.029)	0.405 (1.240)	-0.037 (0.042)	-0.380 (1.052)	-0.011 (0.033)	0.070 (0.913)
Login rate for Control Group Login Count for Control Group	0.645							
N	2045	2045	2045	2045	2045	2045	2045	2045
R ²	0.001	0.011	0.141	0.033	0.017	0.005	0.010	0.003

TABLE 4.4: Heterogenous Effects of Email Message

Source: Administrative data April 2019 to May 2019. Robust standard errors in parentheses. + $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

	(1) Open Email?
Any Message	0.271*** (0.011)
F-Stat	606.91
N	2045
R ²	0.069

TABLE 4.5: First Stage Estimates of Email Message Opened

Source: Administrative data April 2019 to May 2019. Robust standard errors in parentheses. + $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

	(1) Log In?	(2) # of Logins	(3) Visited Site?	(4) Enrolled?
Open Email	0.359 *** (0.098)	4.007 (2.713)	0.042 * (0.020)	0.114 *** (0.033)
Login rate for Control Group	0.645			
Login Count for Control Group		7.318		
View tool rate for Control Group			0.005	
Enrollment rate for Control Group				0.000
N	2045	2045	2045	2045

TABLE 4.6: 2SLS Estimates of Opening Email Message on Attention to Information about Creditworthiness

Source: Administrative data April 2019 to May 2019. Robust standard errors in parentheses. + $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

5 Conclusion

Financial capability is central to financial well-being. Despite evidence that this connection matters, it is not well understood how financial capability is built. Recent work reveals that traditional approaches to developing financial capability have mixed effectiveness. However, non-traditional approaches are largely ignored. These channels reflect that knowledge, skills, and access to resources are affected by social connections, experiences, and behavioral biases. The essays presented set out to contribute evidence on the effectiveness of non-traditional approaches investigating the role of learning by doing, learning from others, and behavioral nudges for financial capability over the life course. These essays provide evidence that improves the understanding of how financial capability is developed, why it varies in the population, and how it contributes to economic inequality.

The first three essays focus on the role of learning by doing, learning from others, and nudges. Chapter 2 explores the influence of dividing responsibility for household financial tasks on credit knowledge and repayment behavior. The study contributes descriptive evidence that partners who defer responsibility fail to acquire knowledge about their creditworthiness. Partners may not learn about their credit record because they lack incentive to get the information from their credit report or other source. They are not using this information for financial decisions nor interacting with institutions who provide this information to consumers. Even though these partners are less knowledgeable about

their credit record, no differences in how debt is managed are found. Deferring responsibility does not influence estimated credit score nor probability of carrying over a credit card balance. The findings suggest that in order to improve studies of household financial behavior, future work should account for the joint decision-making process. Chapter 3 investigates the effect of youth employment on financial well-being in young adulthood. The study reveals that those who work while in high school are more likely to use credit cards as a young adult using several identification strategies. However, there is no evidence that these young adults who are more likely to adopt credit cards by age 25 are having trouble managing repayment. The findings from this study suggest that although youth employment may lead to variation in financial capability later in life, its effect is small. Chapter 4 finds, using a natural field experiment, that reminders are not effective at encouraging consumers to check their credit. The study reveals that receiving a single email reminder, regardless of the message content, is ineffective at encouraging consumers to check their online banking dashboard, learn more about, and take up a free credit monitoring service. Despite the promise of reminders, this low-cost approach to increasing attention to financial information corroborates past findings that they are not effective.

The essays aimed to answer: (1) Is financial capability built through repeated experiences with household financial tasks?, (2) Are these capabilities developed on the job at early ages?, and (3) Are behavioral nudges effective in encouraging consumers to acquire financial information?. Overall, these approaches have small or statistically insignificant effects on financial capability using descriptive and causal methods. These essays should encourage future research to recognize and incorporate a more nuanced understanding of

the channels that build financial capability. Although these channels are not effective independently, they may have important interactions with other interventions contributing to treatment effect heterogeneity. Policymakers who aim to improve financial well-being by building financial capability should recognize these often ignored approaches when they design policies and programs.

A Appendix

A.1 Chapter 2

A.1.1 Survey of Consumer Payment Choice (SCPC) Items

Responsibility for household finances:

- In your household, how much responsibility do you have for paying monthly bills (rent or mortgage, utilities, cell phone, etc.)?
 - None or almost none, Some, Shared equally with other household members, Most, All or almost all

- In your household, how much responsibility do you have for making decisions about saving and investments (whether to save, how much to save, where to invest, how much to borrow)?
 - None or almost none, Some, Shared equally with other household members, Most, All or almost all

Income rank:

- What does your own personal income rank within your household?
 - Highest in my household

- About equal to the highest (roughly the same as another household member)
- Second highest
- Third highest or lower

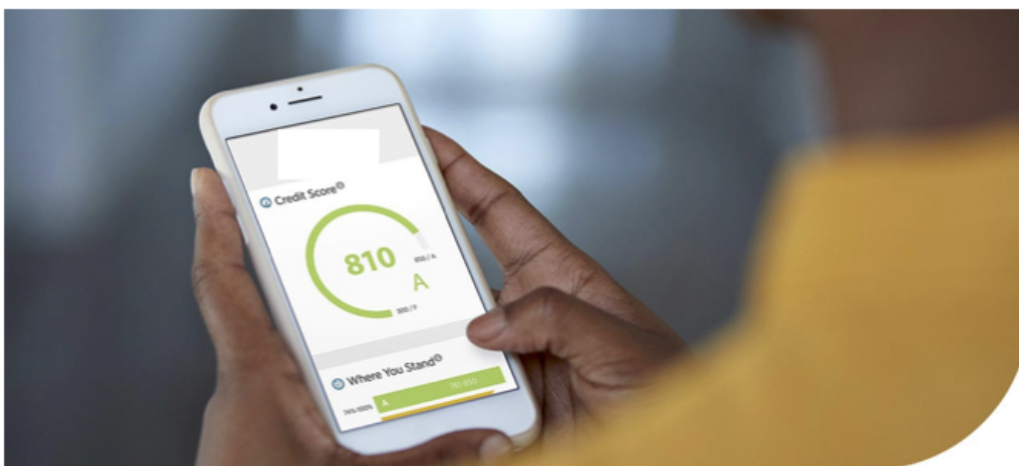
Financial Literacy Quiz:

- Compound interest: "Suppose you had \$100 in a savings account and the interest rate is 20% per year and you never withdraw money or interest payments. After 5 years, how much would you have in this account in total?";
- Inflation: "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?";
- Diversification: "True or False. Buying a single stock [mutual fund] usually provides a safer return than a mutual fund [single stock]."

A.2 Chapter 4

A.2.1 Email Message Example

LOGO



Track Your Credit

[Learn More](#)

As a member, you can check your credit score and monitor credit activity in Web Branch anytime, for free.

You can also test financial choices and see how your score might be impacted if you:

- Eliminate the balance on your credit cards
- Maintain a history of on-time payments
- Take out a loan

FIGURE A.1: Email Message: Simple Reminder Condition

Bibliography

- Addo, Fenaba R (2014). "Debt, cohabitation, and marriage in young adulthood". In: *Demography* 51.5, pp. 1677–1701.
- American Psychological Association (2015). "American Psychological Association survey shows money stress weighing on Americans? health nationwide". In: *American Psychological Association*.
- Ariely, Dan, Anat Bracha, and Stephan Meier (2009). "Doing good or doing well? Image motivation and monetary incentives in behaving prosocially". In: *American Economic Review* 99.1, pp. 544–55.
- Arkes, Jeremy (2010). "Using unemployment rates as instruments to estimate returns to schooling". In: *Southern Economic Journal* 76.3, pp. 711–722.
- Armstrong, Mark and John Vickers (2012). "Consumer protection and contingent charges". In: *Journal of Economic Literature* 50.2, pp. 477–93.
- Bassa Scheresberg, Carlo de (2013). "Financial literacy and financial behavior among young adults: Evidence and implications". In: *Numeracy* 6.2, p. 5.
- Batty, Michael et al. (2017). *Experiential Financial Literacy: A Field Study of My Classroom Economy*. Tech. rep. Working paper.
- Bayer, Patrick J, B Douglas Bernheim, and John Karl Scholz (2009). "The effects of financial education in the workplace: Evidence from a survey of employers". In: *Economic Inquiry* 47.4, pp. 605–624.

-
- Becker, Gary S (1985). "Human capital, effort, and the sexual division of labor". In: *Journal of labor economics* 3.1, Part 2, S33–S58.
- Becker, Gary Stanley and Gary S Becker (2009). *A Treatise on the Family*. Harvard university press.
- Bernasek, Alexandra and Vickie L Bajtelsmit (2002). "Predictors of women's involvement in household financial decision-making". In: *Journal of Financial Counseling and Planning* 13.2, p. 39.
- Bernheim, B Douglas and Daniel M Garrett (2003). "The effects of financial education in the workplace: evidence from a survey of households". In: *Journal of public Economics* 87.7-8, pp. 1487–1519.
- Bernheim, Douglas D et al. (1998). *Financial illiteracy, education, and retirement saving*. Tech. rep. Wharton School Pension Research Council, University of Pennsylvania.
- Bertrand, Marianne, Emir Kamenica, and Jessica Pan (2015). "Gender identity and relative income within households". In: *The Quarterly Journal of Economics* 130.2, pp. 571–614.
- Board of Governors of the Federal Reserve System (2019). *Report on the Economic Well-Being of U.S. Households in 2018*. Tech. rep.
- Brevoort, Kenneth P., Philipp Grimm, and Michelle Kambara (2016). "Credit Invisibles and the Unscored". In: *Cityscape* 18.2, pp. 9–34.
- Brown, James R, J Anthony Cookson, and Rawley Z Heimer (2019). "Growing up without finance". In: *Journal of Financial Economics*.
- Burgoyne, Carole B et al. (2007). "Money management systems in early marriage: Factors influencing change and stability". In: *Journal of Economic Psychology* 28.2, pp. 214–228.

-
- Bursztyn, Leonardo et al. (2014). "Understanding mechanisms underlying peer effects: Evidence from a field experiment on financial decisions". In: *Econometrica* 82.4, pp. 1273–1301.
- Bursztyn, Leonardo et al. (2018). "Moral incentives in credit card debt repayment: Evidence from a field experiment". In:
- Calcagno, Riccardo and Chiara Monticone (2015). "Financial literacy and the demand for financial advice". In: *Journal of Banking & Finance* 50, pp. 363–380.
- Carman, Katherine Grace and Angela Hung (2017). *Household Retirement Savings: The Location of Savings Between Spouses*. Tech. rep. RAND.
- Celerier, Claire and Adrien Matray (Forthcoming). "Bank-branch supply, financial inclusion and wealth accumulation". In: *Review of Financial Studies*.
- Collins, J Michael and Collin M O'Rourke (2010). "Financial education and counseling? Still holding promise". In: *Journal of Consumer Affairs* 44.3, pp. 483–498.
- Courchane, Marsha, Adam Gailey, and Peter Zorn (2008). "Consumer credit literacy: What price perception?" In: *Journal of Economics and Business* 60.1-2, pp. 125–138.
- Das, Sreyoshi, Camelia M Kuhnen, and Stefan Nagel (2017). *Socioeconomic status and macroeconomic expectations*. Tech. rep. National Bureau of Economic Research.
- Deshpande, Manasi, Tal Gross, and Yalun Su (2019). *Disability and Distress: The Effect of Disability Programs on Financial Outcomes*. Tech. rep. National Bureau of Economic Research.
- Dettling, Lisa J and Joanne W Hsu (2018). "Returning to the nest: Debt and parental co-residence among young adults". In: *Labour Economics* 54, pp. 225–236.

-
- Dettling, Lisa J, Joanne W Hsu, et al. (2014). "The state of young adults? balance sheets: Evidence from the survey of consumer finances". In: *Federal Reserve Bank of St. Louis Review* 96.4, pp. 305–330.
- Dewey, John (2007). *Experience and education*. Simon and Schuster.
- Duflo, Esther and Emmanuel Saez (2002). "Participation and investment decisions in a retirement plan: The influence of colleagues? choices". In: *Journal of public Economics* 85.1, pp. 121–148.
- (2003). "The role of information and social interactions in retirement plan decisions: Evidence from a randomized experiment". In: *The Quarterly journal of economics* 118.3, pp. 815–842.
- Eil, David and Justin M Rao (2011). "The good news-bad news effect: asymmetric processing of objective information about yourself". In: *American Economic Journal: Microeconomics* 3.2, pp. 114–38.
- Fellner, Gerlinde, Rupert Sausgruber, and Christian Traxler (2013). "Testing enforcement strategies in the field: Threat, moral appeal and social information". In: *Journal of the European Economic Association* 11.3, pp. 634–660.
- Fernandes, Daniel, John G Lynch Jr, and Richard G Netemeyer (2014). "Financial literacy, financial education, and downstream financial behaviors". In: *Management Science* 60.8, pp. 1861–1883.
- Fonseca, Raquel et al. (2012). "What explains the gender gap in financial literacy? The role of household decision making". In: *Journal of Consumer Affairs* 46.1, pp. 90–106.
- Foster, Kevin et al. (2010). *the 2008 Survey of consumer Payment choice*. Tech. rep. Federal Reserve of Boston.

-
- Gabaix, Xavier and David Laibson (2006). "Shrouded attributes, consumer myopia, and information suppression in competitive markets". In: *The Quarterly Journal of Economics* 121.2, pp. 505–540.
- Gallagher, Emily A, Radhakrishnan Gopalan, and Michal Grinstein-Weiss (2019). "The effect of health insurance on home payment delinquency: Evidence from ACA Marketplace subsidies". In: *Journal of Public Economics* 172, pp. 67–83.
- Gathergood, John and Jörg Weber (2017). "Financial literacy: A barrier to home ownership for the young?" In: *Journal of Urban Economics* 99, pp. 62–78.
- Gathergood, John et al. (2017). "Learning With Your Credit Card: Evidence From Consumer Responses To Penalty Fees". In:
- Gerardi, Kristopher, Lorenz Goette, and Stephan Meier (2013). "Numerical ability predicts mortgage default". In: *Proceedings of the National Academy of Sciences* 110.28, pp. 11267–11271.
- Gustman, Alan L and Thomas L Steinmeier (1981). "The impact of wages and unemployment on youth enrollment and labor supply". In: *The Review of economics and Statistics*, pp. 553–560.
- Häkkinen, Iida (2006). "Working while enrolled in a university: does it pay?" In: *Labour Economics* 13.2, pp. 167–189.
- Haveman, Robert and Barbara Wolfe (1995). "The determinants of children's attainments: A review of methods and findings". In: *Journal of economic literature* 33.4, pp. 1829–1878.
- Heidhues, Paul and Botond Köszegi (2017). "Naivete-based discrimination". In: *The Quarterly Journal of Economics* 132.2, pp. 1019–1054.

-
- Hitczenko, Marcin (2016). *The influence of gender and income on the household division of financial responsibility*. Tech. rep. Federal Reserve of Boston.
- Homonoff, Tatiana, Rourke L O'Brien, and Abigail B Sussman (2019). "Does Knowing Your FICO Score Change Financial Behavior? Evidence from a Field Experiment with Student Loan Borrowers". In: *Evidence from a Field Experiment with Student Loan Borrowers (February 3, 2019)*. NYU Wagner Research Paper.
- Hong, Harrison, Jeffrey D Kubik, and Jeremy C Stein (2004). "Social interaction and stock-market participation". In: *The journal of finance* 59.1, pp. 137–163.
- Hotz, V Joseph et al. (2002). "Are there returns to the wages of young men from working while in school?" In: *Review of Economics and statistics* 84.2, pp. 221–236.
- House, The White (2012). *Every American Financially Empowered: A Guide to Increasing Financial Capability among Students, Workers, and Residents in Communities*. Tech. rep.
- Hsu, Joanne W (2016). "Aging and strategic learning: The impact of spousal incentives on financial literacy". In: *Journal of Human Resources* 51.4, pp. 1036–1067.
- Hsu, Joanne W, David A Matsa, and Brian T Melzer (2018). "Unemployment insurance as a housing market stabilizer". In: *American Economic Review* 108.1, pp. 49–81.
- Hsu, Joanne W and Robert Willis (2013). "Dementia risk and financial decision making by older households: The impact of information". In: *Journal of human capital* 7.4, pp. 340–377.
- Institute, The Aspen (2018). "Consumer Debt: A Primer". In: *The Aspen Institute Expanding Prosperity Impact Collaborative*.
- Jorgensen, Bryce L and Jyoti Savla (2010). "Financial literacy of young adults: The importance of parental socialization". In: *Family relations* 59.4, pp. 465–478.

-
- Journal, Wall Street (2017). "U.S. Household Debt Reaches New Record as Some Delinquency Rates Rise". eng. In: *Dow Jones Institutional News*.
- Kaiser, Tim and Lukas Menkhoff (2017). "Does financial education impact financial literacy and financial behavior, and if so, when?" In: *The World Bank Economic Review* 31.3, pp. 611–630.
- Kuhnen, Camelia M and Brian T Melzer (2018). "Noncognitive Abilities and Financial Delinquency: The Role of Self-Efficacy in Avoiding Financial Distress". In: *The Journal of Finance* 73.6, pp. 2837–2869.
- Levinger, Benjamin, Marques Benton, and Stephan Meier (2011). "The cost of not knowing the score: Self-estimated credit scores and financial outcomes". In: *Journal of Family and Economic Issues* 32.4, pp. 566–585.
- Light, Audrey (2001). "In-school work experience and the returns to schooling". In: *Journal of Labor Economics* 19.1, pp. 65–93.
- Lusardi, Annamaria, Pierre-Carl Michaud, and Olivia S Mitchell (2017a). "Optimal financial knowledge and wealth inequality". In: *Journal of Political Economy* 125.2, pp. 431–477.
- (2017b). "Optimal financial knowledge and wealth inequality". In: *Journal of Political Economy* 125.2, pp. 431–477.
- Lusardi, Annamaria and Olivia S Mitchell (2008). *Planning and financial literacy: How do women fare?* Tech. rep. National Bureau of Economic Research.
- (2011). "Financial literacy around the world: an overview". In: *Journal of pension economics & finance* 10.4, pp. 497–508.
- (2014). "The economic importance of financial literacy: Theory and evidence". In: *Journal of economic literature* 52.1, pp. 5–44.

-
- Lusardi, Annamaria, Olivia S Mitchell, and Vilsa Curto (2009). *Financial literacy and financial sophistication among older Americans*. Tech. rep. National Bureau of Economic Research.
- (2010). “Financial literacy among the young”. In: *Journal of consumer affairs* 44.2, pp. 358–380.
- Lusardi, Annamaria and Peter Tufano (2009). *Debt literacy, financial experiences, and overindebtedness*. Tech. rep. National Bureau of Economic Research.
- Mandell, Lewis and Linda Klein (2009). “The impact of financial literacy education on subsequent financial behavior”. In:
- Miller, Douglas L, Na?ama Shenhav, and Michel Z Grosz (2018). “Selection into Identification in Fixed Effects Models, with Application to Head Start”. In:
- Miller, Margaret et al. (2014). “Can you help someone become financially capable? a meta-analysis of the literature”. In:
- Mottola, Gary R (2013). “In our best interest: Women, financial literacy, and credit card behavior”. In: *Numeracy* 6.2, p. 4.
- Neumark, David and Cortnie Shupe (2018). “Declining Teen Employment: Minimum Wages, Other Explanations, and Implications for Human Capital Investment”. In:
- Pahl, Jan (1995). “His money, her money: Recent research on financial organisation in marriage”. In: *Journal of economic psychology* 16.3, pp. 361–376.
- Painter II, Matthew A (2010). “Get a job and keep it! High school employment and adult wealth accumulation”. In: *Research in Social Stratification and Mobility* 28.2, pp. 233–249.
- Perry, Vanessa Gail (2008). “Is ignorance bliss? Consumer accuracy in judgments about credit ratings”. In: *Journal of Consumer Affairs* 42.2, pp. 189–205.

-
- Research, United States. Consumer Financial Protection Bureau. Office of (2015). *Data point: Credit invisibles*. Consumer Financial Protection Bureau.
- Ruhm, Christopher J (1997). "Is high school employment consumption or investment?" In: *Journal of labor economics* 15.4, pp. 735–776.
- Sorensen, Alan T (2006). "Social learning and health plan choice". In: *The Rand journal of economics* 37.4, pp. 929–945.
- Stango, Victor and Jonathan Zinman (2014). "Limited and varying consumer attention: evidence from shocks to the salience of bank overdraft fees". In: *The Review of Financial Studies* 27.4, pp. 990–1030.
- Urban, Carly et al. (2018). "The effects of high school personal financial education policies on financial behavior". In: *Economics of Education Review*.
- Van Campenhout, Geert (2015). "Revaluing the role of parents as financial socialization agents in youth financial literacy programs". In: *Journal of Consumer Affairs* 49.1, pp. 186–222.
- Van Rooij, Maarten, Annamaria Lusardi, and Rob Alessie (2011). "Financial literacy and stock market participation". In: *Journal of Financial Economics* 101.2, pp. 449–472.
- Ward, Adrian F, John G Lynch, and Leonard Lee (2018). "On a Need-to-Know Basis: How the Distribution of Responsibility between Couples Shapes Financial Literacy and Financial Outcomes". In: *Journal of Consumer Research*.
- Willis, Lauren E (2008). "Against financial-literacy education". In: *Iowa L. Rev.* 94, p. 197.
- (2011). "The financial education fallacy". In: *American Economic Review* 101.3, pp. 429–34.
- Zinman, Jonathan (2015). "Household debt: Facts, puzzles, theories, and policies". In: *economics* 7.1, pp. 251–276.