The Impact of the COVID-19 Income Shock on Debt Management: A Mediation Analysis

Congrong Ouyang,[1] Thomas Crandall,[2] and Swarn Chatterjee[3]

Abstract

This study uses the 2021 wave of the FINRA National Financial Capability Study dataset to examine the association between large and unexpected income drops experienced by individuals during the COVID-19 pandemic and an individual's use of stimulus checks to settle debt obligations. This study also examines the mediating role of individuals' perceived lack of financial control in the association between the large drop in income and the use of stimulus checks for debt payments. The results reveal that over one-third of households allocated their stimulus checks towards debt payments. Notably, individuals experiencing a large and unexpected drop in income had 5.5% higher odds of using pandemic stimulus checks for debt management. Moreover, this relationship was significantly mediated by an individual's perceived lack of financial control. The findings from this study shed light on the complex associations between experiencing an unexpected and large income reduction, perception of financial control, and debt management decisions of individuals. The significant role of perceived financial control in describing individuals' debt management decisions found in this study suggests that perceived control is not just a reflection of a household's financial situation but also a determinant of their financial decision-making in times of crisis. Furthermore, the results underscore the critical role of stimulus checks and other financial assistance in mitigating the economic impacts of the pandemic on American households. Findings from this study contribute to a deeper understanding of financial decision-making processes during periods of economic uncertainty and offer implications for future economic policies and financial literacy programs.

Recommended Citation

Ouyang, C., Crandall, T., & Chatterjee, S. (2025). The impact of the COVID-19 income shock on debt management: A mediation analysis. *Financial Services Review, 33*(1), 1-27.

Introduction

The worldwide outbreak of COVID-19 infections in early 2020 led to an acute economic crisis (Borio, 2020). Notably, about 22 million workers filed for unemployment in the United States. during the four weeks from March 2020 to April 2020 (Armantier et al., 2021). Over 27% of U.S. households reported experiencing financial

[1] Corresponding author (congrong@ksu.edu). Kansas State University, Manhattan, KS, USA
[2] Kansas State University, Manhattan, KS, USA
[3] University of Georgia, Athens, GA, USA

hardship, and over 30% missed debt payments (Liu et al., 2021). The U.S. government responded to the economic crisis by introducing the 2020 Coronavirus Aid, Relief, and Economic Security Act (CARES Act, 2020), signed into law on March 27th, 2020, which provided a stimulus check of up to $1,200 per adult and $500 per child for most Americans in the United States earning less than $99,000 (or $198,000 for joint tax filers) (treasury.gov). By March 2021, following two additional rounds of stimulus, pandemic-related disbursements to American households tallied $803 billion (Pandemic Oversight, 2022).

Consumer debt obligations of Americans had been steadily rising long before the COVID-19 pandemic (Berger & Houle, 2019; Fan & Chatterjee, 2017; Ouyang & Hanna, 2022). The total consumer debt in the United States increased from below $10 trillion in 2005 to more than $16 trillion mid-way through 2022, $11.6 trillion of which was outstanding mortgage debt (Federal Reserve Bank of New York, 2022). Past literature has shown varied results for the consequences of debt on people's well-being and decision-making (Amromin & Smith, 2003; Argento et al., 2015; Butrica et al., 2010; Tharayil & Walstad, 2022); however, differences in debt payment classifications, the specific consumer debt variables analyzed, and the various research model structures employed in these previous studies , have likely influenced these results. In these studies, financial shocks, such as unexpected and significant income drops or sudden surges in expenses, have been associated with individuals' debt management decisions. These differences in results and hints of association with decisions around debt service found in the extant literature underscore the need for new and continued research in this area.

With debt loads higher than ever, consumers were particularly susceptible to the economic instability brought forward by the COVID-19 pandemic. Income shocks can directly result in debt management challenges and adversely affect the psychological well-being of households (Netemeyer et al., 2018; Shevlin et al., 2020). Over the long term, studies have found that experiencing debt hardships (i.e., delinquency on debt payments and credit constraints) can increase mortality risk and affect the psychological well-being of both older women and men (Marshall & Tucker-Seeley, 2018; Tucker-Seeley et al., 2009). This effect may be magnified for pre-retiree adults (ages 50-65), given their low financial capability and inadequate retirement savings (Gillers et al., 2018; Lusardi & de Bassa Scheresberg, 2016). The experience of personal financial hardship resulting from the inability to meet financial obligations, such as paying bills or servicing debts, has consistently been associated with adverse effects on households' physical and psychological well-being (Drentea & Lavrakas, 2000; Sweet, 2021). Moreover, the inability to meet debt obligations has been associated with helplessness or a perception of loss of control over one's financial situation when confronted with the impossibility of fulfilling financial obligations during times of financial hardship (Lea et al., 1995). However, other studies have shown that when individuals experience uncertainty regarding their financial situation, they are driven to make decisions aimed at gaining clarity and regaining a perception of control over their finances (Whitson & Galinsky, 2008).

Due to differences in household financial resources, individuals may have distinct approaches to utilizing stimulus checks, including smoothing out their consumption patterns and managing debt obligations, especially when encountering unexpected economic shocks. Consequently, people who experienced financial challenges during the COVID-19 pandemic may have been inclined to utilize their available financial resources, including stimulus checks, to pay outstanding debt obligations. This urgency to pay off one's debt obligations arises from the potentially severe consequences of the inability to meet such obligations, which may be salient in peoples' minds. Additionally, settling a portion of their debt obligations can contribute to regaining a perception of control over their financial situation.

There is currently very little information available in the extant literature on the behavioral aspects of peoples' financial decision-making during the COVID-19 pandemic (Xu & Yao, 2022; Yue et al., 2020). Our study fills this important gap in the literature by examining the

association between financial hardship and the perception of being controlled by one's financial situation when managing debt payments amid the pandemic. Furthermore, our study provides insight into the impact of stimulus payments in mitigating the debt management challenges experienced by households.

Literature Review

Influence of Perception of Control on Financial Behavior and Debt Repayment

Prior research has generally converged on the consideration that individuals who perceive themselves to be in control over their life situations exhibit positive financial behaviors toward savings and budgeting (Cobb-Clark et al., 2016; Perry & Morris, 2005), debt management (Caputo, 2012), investing (Salamanca et al., 2020), and retirement planning (Foltice & Ilcin, 2019). Conversely, individuals who feel a lack of control over their financial situation are likely to make cognitive errors in their financial decisions that may further exacerbate their financial situations (Lindgren, 1980). A Norwegian study on immigrants found that experiencing adverse economic situations and experiencing a perceived lack of control over their life situations were associated with adverse psychological outcomes (Dalgard et al., 2006). Additionally, Zhang (1989) found that people with fewer financial resources were more likely to develop a plan for using their available financial resources. Another study found that the debt burden of college students was associated with a student's perception of lack of financial control (Dryden et al., 2023). Similarly, Goel and Rastogi (2023) found that individuals who exhibited an external locus of control, or perceived that they did not have control over their life situations, were associated with lower creditworthiness. Similarly, Kamleithner et al. (2013) found that over-indebtedness was associated with greater financial stress, adverse money management behaviors, and a lower perceived control over one's financial situation.

Debt Management Decisions During Income Shocks

Income shocks pose significant challenges to households, often forcing them to reassess and modify how they manage financial obligations (Colarieti et al., 2024). While income volatility in the U.S. has generally trended down in the United States since the late 1990s, it remains that volatility is negatively associated with income stability, except for those at the top of the income distribution curve (Guvenen et al., 2022). Additionally, despite the overall trend lower, the United States has faced three communal economic shocks in the last twenty-five years: the 'Dot.Com' bust (2000-2002), the Global Financial Crisis (2007-2009), and the COVID-19 Pandemic (2020-2021). Income shocks lead to increased income volatility, particularly during recessionary environments (Guvenen et al., 2022; Peetz & Robson, 2021). Broad societal trends, including the emergence of the gig economy, a population that faces higher undesired income volatility and little safety net (Peetz & Robson, 2021), may serve to exaggerate these trends in the future.

Households respond to income shocks in various ways. Some households may respond by increasing their usage of debt facilities or drawing from savings, including those savings earmarked for retirement, to supplant at least a portion of the income that was lost (Colarieti et al., 2024; Ghilarducci et al., 2019). Some households are more likely to use available resources, such as stimulus checks, to manage debt when they feel a loss of control over their financial situation (Coibion et al., 2020). Others may change spending habits to control the cost side of the ledger (Colarieti et al., 2024), with more stringent cost controls put in place by those with higher debt levels (Baker, 2015). While Colarieti et al. (2024) ascribe behavioral components to this cohort, Baker(2017) research on the 2013 United States Federal Government shutdown suggests that a household's decision to reduce spending may simply be a function of their access to debt facilities. (Colarieti et al., 2024; Kamakura & Du, 2012). Financial literacy may be a mitigating factor in how or whether one uses debt during times of financial uncertainty (Lusardi & Mitchell, 2013).The diversity in responses to financial shocks underscores the importance of tailored financial education and interventions that enhance financial resilience. By understanding the nuanced behaviors that characterize different demographic groups under

financial stress, policymakers and financial advisors can better support households in strengthening their financial positions against future economic uncertainties.

Households Debt During COVID-19 Pandemic

Consumer over-indebtedness has been a long-standing issue in the U.S., and debt has now "become a persistent feature of household balance sheets at every stage of life" (Lusardi & Tufano, 2015, p. 360). The issue grew during the COVID-19 pandemic when households faced severe and unexpected negative shocks to household income and expenses. Over-indebtedness is a vital social issue that can result in extreme financial difficulties for the household, including bankruptcy, foreclosure, being denied credit, and future employment (Bricker & Thompson, 2016).

When economic conditions deteriorate, like they did during the Great Recession (the period 2007 – 2009), decreased employment opportunities and incomes can strain family finances and lead to a rise in missed debt payments and defaults (Ouyang & Hanna, 2022). However, researchers found that delinquency rates fell during the COVID-19 pandemic despite a historic rise in unemployment (Dettling & Lambie-Hanson, 2021). Pandemic-related stimulus checks received from the federal government in 2021 may have provided cushions that households used to make debt payments.

Stimulus Use

Economic Impact Payments (EIP) were provided during the COVID-19 pandemic to assist U.S. households with their financial needs and stimulate the economy (Garrison et al., 2022). According to the Household Pulse Survey in June 2020, most households that received or expected to receive a stimulus payment planned to use the payment for expenses, while less than a quarter of households planned to use stimulus checks to pay down debt (Garner et al., 2020). The Federal Reserve Bank of New York reported that about 34.5% of households used their first round of EIP stimulus payments on debt payments, 37.4% of households used their second round of stimulus payments on debt payments, and 33.7% of households used their third round of stimulus payments on debt payments (Armantier et al., 2022). Further, Armantier et al. reported that households with lower than college degrees, from lower income thresholds, and that had negative shocks on income and/or employment during the pandemic, utilized stimulus checks for debt payments (2020). Among pre-retirees (ages 50 to 65), more than 45% of households reported using stimulus checks to pay down debt (Liu et al., 2021).

Economic stimulus payments had been used before and were not new to consumers. In 2008, U.S. households received over $120 billion from the Economic Stimulus Act of 2008 for financial assistance and to help with recovery from the Great Recession (Amadeo, 2020; Parker et al., 2013). Based on research results, 48% of consumers used these stimulus payments for debt payments, 32% allocated it toward saving, and less than 20% spent the funds (Shapiro & Slemrod, 2009). Homeowners spent more of their stimulus payments than did renters, especially on debt payments. (Parker et al., 2013). Broda and Parker (2008) discovered that although a substantial majority of households used the 2008 stimulus payments for debt repayment or savings, households with lower income were nearly twice as inclined to expend the extra funds.

The Consumer Financial Protection Bureau reported an eight percentage-point decline between June 2019 and June 2020 in the proportion of people indicating a high perceived lack of financial control (Fulford et al., 2021). The first of the Economic Impact Payments was signed into law and disbursed during this window, though the authors stop short from claiming the drop is related to the stimulus. However, (Kleimeier et al., 2023) claim that only economically weak households perceived a gain in control over their finances as a result of receiving government stimulus checks during COVID-19.

While the literature has shown the significant usage of stimulus checks to make debt payments, limited studies have analyzed the impact of households' perceived lack of control of their finances on their financial decision-making or the effect of government-supplied stimulus payments

on an individual's perception of control. Moreover, the findings from previous literature underscore the need for more nuanced empirical models that account for variability in income and the psychological dimensions of financial decision-making, especially during periods of economic uncertainty.

Theory and Conceptual Model

Extended Life Cycle Savings Theory

The original life cycle model (Modigliani & Brumberg, 1954), which assumed certainty about future income, has evolved into the extended life cycle model to incorporate the realistic element of income uncertainty (Shefrin & Thaler, 1988). This model suggests that unpredictability in future income patterns significantly influences household savings and net worth accumulation (Yuh & Hanna, 2010). The extended life cycle certainty equivalence model, which further extends the life cycle hypothesis, posits that individuals who face greater income uncertainty should ideally save more and borrow less. Empirical evidence supports this theory. Browning and Lusardi (1996) found a correlation between transitory income uncertainty and increased savings from current income, leading to reduced borrowing.

Our study extends these findings to the context of the COVID-19 pandemic, a period marked by heightened income uncertainty. The pandemic's impact on employment status and income stability underscores the relevance of these theories in contemporary economic scenarios, especially for individuals who experience more variable income patterns. According to Browning and Lusardi (1996), such individuals should ideally borrow less than their more stable counterparts, reflecting the need for precautionary savings. However, the normative Life Cycle Saving (LCS) model, which assumes that individuals are well-informed and fully rational (Browning & Crossley, 2001; Modigliani & Brumberg, 1954), may not fully account for the bounded rationality of real-world scenarios. Ibrahim and Alqaydi (2013) argued that individuals face challenges due to the complexities associated with financial decision-making, limited financial capability, and constraints in time and resources. This perspective is crucial in understanding peoples' responses to income shocks, as we expected to observe in our study.

Additionally, a perception of losing control over one's financial situation could arise in cases where an individual's available financial resources were insufficient to offset the financial shock and uncertainty endured during the COVID-19 pandemic (Lea et al., 1995). Past research has shown that feeling a sense of control over one's circumstances reduces stress and increases resilience during periods of uncertainty (Bordia et al., 2004; Glass et al., 1973; Polizzi et al., 2020). When people perceive a loss of control over their situation, the resulting stress can motivate them to make decisions aimed at altering their current circumstances to gain a greater perception of control over their situation (Brehm, 1966; Whitson & Galinksy, 2008).

During pandemic, when economic uncertainty is high and income is potentially reduced, many households received stimulus checks as a form of government support (CARES Act, 2020). According to life cycle savings theory, these households are likely to use these funds to pay down debt on maintaining balanced consumption over their lifetime (Modigliani & Brumberg, 1954; Yuh & Hanna, 2010). By reducing debt, households decrease their future interest obligations and potential financial distress from perceived financial control, which could disrupt their consumption smoothing (Netemeyer et al., 2018). Essentially, paying off debt during a downturn allows households to adjust their financial strategies to ensure more stable consumption in the future, minimizing the impact of current income shocks (Lea et al., 1995).

Furthermore, life cycle savings theory suggests that by reducing liabilities, households are effectively increasing their net savings, which aligns with the theory's principle of preparing for later stages of life when income will decrease due to retirement (Modigliani & Brumberg, 1954; Yuh & Hanna, 2010). In the context of a pandemic, this behavior reflects a precautionary saving motive, where households prioritize financial stability and resilience in anticipation of prolonged economic uncertainty or additional negative income shocks (Lusardi, 1998; Deaton

2005). Thus, the use of stimulus checks to pay off debt during a pandemic can be seen as a strategic alignment with the life cycle savings theory, aiming to secure financial stability and smooth consumption over the uncertain period ahead (Deaton, 2005).

Many individuals experienced income uncertainty and financial hardship during the COVID-19 pandemic (Bierman et al., 2021; Kim et al., 2019; Yue et al., 2020), and it is probable these individuals were inclined to tap into their financial resources, including stimulus checks, to settle their debt-related obligations. This decision to pay one's debt is motivated by a desire to reduce financial uncertainty and to regain a greater perception of control over one's financial situation (Baum et al., 1986; Lea et al., 1995; Whitson & Galinsky, 2008). Hence, as shown in figure 1, we also expect that a perception of lack of control would mediate the association between experiencing financial hardship and the use of stimulus checks to pay off debt. Our study contributes to understanding how perceived financial control and negative income shocks during the COVID-19 pandemic influenced household debt management decisions.

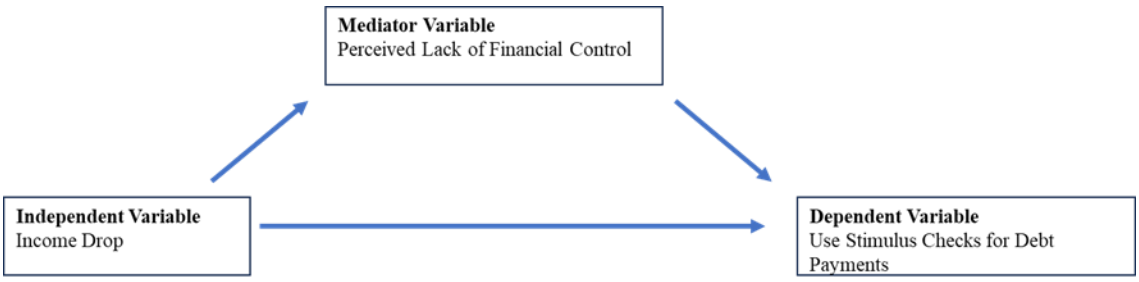

Figure 1. **Conceptual Framework of this Study**

Methods

Dataset and Analytical Sample

This study used the 2021 National Financial Capability Study (NFCS) State-by-State dataset collected and published by the Financial Industry Regulatory Authority (FINRA) Foundation. The NFCS survey has been administered every three years since its first collection in 2009 (finrafoundation.org). Information on the diverse characteristics of respondents, including their financial knowledge, behaviors, and attitudes, is collected. The 2021 NFCS was collected between June and October 2021. The focal variables asked about events during the COVID-19 pandemic. A total of 20,218 respondents were included in the original sample, which was reduced to 18,790 respondents who received pandemic-related stimulus payments. Respondents who did not receive the stimulus check were removed from the study. National sampling weights available in the 2021 NFCS datasets were used. The sample weights used were representative of the respondents' age, gender, ethnicity, education, and Census Division based on the American Community Survey (Lin et al., 2022).

Endogenous (Dependent) Variables

The major dependent variable, "Use stimulus checks for debt payments," was defined based on two questions from the NFCS survey (Table 1). The first question was whether one received stimulus checks from the federal government. Respondents were asked, "Did you receive a pandemic-related stimulus payment from the federal government in 2021?" The possible responses to this question were (1) Yes, (2) No, (98) Don't know, and (99) Prefer not to say. The variable was coded as 1 if yes and as 0 if otherwise. Only respondents who reported "Yesto receiving stimulus checks, were captured in this study.

A follow-up question was presented to respondents who answered (1) Yes to the question of "Did you receive a pandemic-related stimulus payment from the federal government in 2021?" These respondents were subsequently asked, "What did you use the money for?" The variable was coded as 1 if "Paid down debt" was

selected as one of their uses of stimulus checks; the variable was coded as 0 if this was not the case. Observations with 'Don't know' and 'Prefer not to say' responses were dropped from analyses.

Exogenous (Independent) Variables

Periods of income shock have been associated with increased savings in past literature (Abdelrahman & Oliveira, 2023; Cox et al., 2020; Immordino et al., 2022). Hence, income shock was included as a control variable for the empirical analyses of this study. Negative income shock, or income drop during COVID-19, was assessed based on the question (Table 1), "In the past 12 months [have you / has your household] experienced a large drop in income which you did not expect?" Possible options were (1) Yes, (2) No/Not applicable, (98) Don't know and (99) Prefer not to say. A binary indicator was created and 'Don't know' and 'Prefer not to say' responses were dropped from the analyses.

Mediator

Previous studies have found that a household's money attitude, encompassing aspects such as money anxiety and money confidence, mediates their financial behaviors (Forbes & Kara, 2010; Gasiorowska, 2014; Heo et al., 2016; Hayes, 2013; Tang, et al., 2005). Respondents' attitudes toward their household finances were measured based on a survey question about self-assessed financial control which reads, "My finances control my life," with answers ranging from 1 to 5. A higher score indicates a respondent perceived a greater lack of control over their finances (see Table 1).

Control Variables

Sociodemographic variables including age, gender, race/ethnicity, number of financial dependents, education, employment status, marital status of the respondent, homeownership, and household income were controlled because of their association with financial decision making in past literature (Grable et al., 2009; Grable et al., 2023; Ouyang & Hanna, 2022). Other household factors related to the presence of an emergency fund, financial strains, objective and subjective financial knowledge [4], and subjective credit record because of their expected association with financial behaviors and outcomes (Fan & Chatterjee, 2017; Grable & Palmer, 2022; Lee et al., 2023; Liu et al., 2021).

[4] Subjective financial knowledge responses ranged from 1-7: "On a scale from 1 to 7, where 1 means very low and 7 means very high, how would you assess your overall financial knowledge?" (NFCS, 2021). Objective financial knowledge was computed based on respondents' correct answers to seven financial knowledge related questions. The scores ranged from 0 (incorrect answers to all seven questions) to 7 (correct answers to all seven financial knowledge questions) (NFCS, 2021). The Financial knowledge questions are described in Appendix A).

Table 1. Overview and Descriptions of Key Variables Used in the Empirical Analysis

Variables	Description
Exogenous (independent) Variables	
Income Drop	Answers based on question: "In the past 12 months, [have you / has your household] experienced a large drop in income which you did not expect?" Yes was coded as 1, otherwise 0.
Mediator Variable	
Perceived Lack of Financial Control	Self-reported scale from 1 –5 based on the statement: "My finances control my life" was recorded and normalized. Where "1" means to as "Never", "2" means "Rarely", "3" means "Sometimes", "4" means "Often", "5" means "Always".
Endogenous (Dependent) Variables	
Use Stimulus Checks for Debt Payments	"What did you use the money for?" Households chose "2. Paid down debt" were recorded as 1, otherwise 0.

Methodology

A weighted logistic regression, as shown in equation (1), is employed to examine the sociodemographic and financial characteristics correlated with using stimulus checks for debt payments.

$$P(Y) = \frac{e^{\alpha+\beta.X_i}}{1+e^{\alpha+\beta.X_i}} \qquad (1)$$

Where *Y* takes the value 1 if a respondent selected yes to having utilized stimulus checks to make debt payments, *Y* takes the value 0 otherwise. X_i denotes the sociodemographic and financial characteristics (seen in Table 3) controlled for in the study.

To further analyze households' utilization of stimulus checks, we conducted a mediation analysis to investigate whether an individual's perceived lack of financial control mediated the association between income shock during COVID-19 and the utilization of stimulus checks for debt repayment. For this purpose, we employed a Potential Outcomes Framework (POF), a fundamental tool in causal inference, which facilitates the estimation of causal effects by considering both observed and unobserved potential outcomes. This framework allows for the systematic examination of the values of outcomes that would prevail under varying conditions, such as the presence or absence of a treatment (Rubin, 2005; Imai et al., 2011).

The POF allows the study to estimate what would happen to the debt management behavior of individuals under different scenarios: receiving a stimulus check versus not receiving one, and experiencing an income shock versus not experiencing one. This framework helps in drawing causal inferences about the effect of these variables on debt management decisions. By employing a mediation analysis within the POF, the study quantifies how much of the effect of the income shock on debt management is direct and how much is mediated through changes in perceived financial control. This is crucial for understanding not just the direct impact of economic shocks but also the psychological pathways through which these shocks influence financial behaviors (Imai et al., 2011). The framework allows for the decomposition of the total effect of the income shock on the use of stimulus checks for debt payments into direct effects (impact of income shock directly on the outcome) and indirect effects (impact mediated through changes in perceived financial control).

Our analysis integrates causal mediation models to evaluate the impact of an intervention on specific outcomes, acknowledging that this impact may be direct or indirect through an intermediary variable identified as a mediator. The potential outcomes framework provides the flexibility needed for the analysis, allowing us to account for potential interactions between the mediator and the treatment. Consequently, we did

not presuppose a uniform effect of the mediator on the outcome across treated and untreated groups.

We utilized the mediate package in Stata (version 18) for the mediation analyses, applying it to both the full analytical sample and conceptual model groups. This involved the decomposition of the total effect of the treatment on the outcome into direct and indirect effects in two distinct ways, aligning with our research question. We defined these effects in a model-free manner, enabling the selection of an estimation method best suited to our data. Notably, classical approaches and causal mediation analyses via the potential-outcomes framework converge to similar results when conducting linear regressions for endogenous variables and the mediators (Pattanayak, et al., 2011; Stata, 2023).

Results

Descriptive Results

In Table 2, we present the descriptive statistics of the variables used in the study. Among the respondents who received stimulus checks during the COVID-19 pandemic, 33.54% reported using these funds for debt payments. The average score for households' perceived lack of financial control was 2.96, within a range of 1 to 5. The responses varied, with 'sometimes' being the most common (30.25%), followed by 'rarely' (22.85%), 'often' (17.22%), 'always' (15.14%), and 'never' (14.54%). Additionally, about 25.76% of the respondents reported a substantial income drop during the pandemic.

Regarding control variables, the demographic composition of the sample included about 54% females and 74% non-Hispanic Whites. Living arrangements and employment status were also notable, with 58% living with a partner and approximately 39% employed full-time. Financial security was a key concern, as almost 56% of respondents had emergency funds, and 20.5% experienced layoffs during the pandemic. Homeownership and credit quality were also reported, with nearly 60% being homeowners and about 45% having a 'very good' credit record. Finally, the average objective financial knowledge score of the sample was 3.52 (on a scale of 1 to 7), whereas the average subjective financial knowledge was 5.12 (on a scale of 1 to 7), indicating varied levels of financial literacy among the respondents. Weak correlation was observed between objective and subjective financial knowledge (0.24) justifying controlling for both objective and subjective financial knowledge in our empirical analyses. This is reported in Appendix B.

Table 2. Summary Statistics

Key Variables	%
Stimulus checks for debt payments	33.54
Perceived Lack of Financial Control	
1 - Never	14.54
2 - Rarely	22.85
3 – Sometimes	30.25
4 – Often	17.22
5 - Always	15.14
Income Drop	
Yes	25.76
No	74.33
Control Variables	
Age	
18-24	11.10
25-34	17.32
35-44	16.83
45-54	17.03
55-64	17.45
65+	20.29
Gender	
Male	45.97
Female	54.03
Ethnicity	
Non-Hispanic White	73.98
Non-White	26.02
Marital Status	
Non-partner	41.99
Partner	58.01
Employment	
Employed	38.55
Part-time	8.70
Self-employed	7.90
Homemaker	6.71
Full-time Student	2.80
Unemployed	8.10
Disabled	5.65
Retired	21.59
Emergency funds	55.89
Laid off during Pandemic	20.54
Have Money Left	
Never	11.25
Rarely	18.00
Sometimes	25.93

Often	19.42
Always	25.40
Homeownership	59.88
Financial Strain	31.94
Subjective credit record	
Very bad	4.15
Bad	12.34
Average	17.98
Good	20.55
Very good	44.97

Note. N=18,790; Mean of objective financial knowledge = 3.52, subjective financial knowledge =5.12.

Multivariate Results

Table 3 presents the outcomes from the logistic regression analysis, which focused on discerning significant patterns among households utilizing stimulus checks for debt repayments. The analysis revealed that with all other variables controlled, households that reported an income drop during the pandemic had about 1.12 times the odds of using received stimulus checks for debt payments compared to households that reported no income drop. Furthermore, the degree of perceived lack of financial control emerged as a robust predictor in this context. Relative to households reporting no perceived lack of financial control, those categorizing their lack of financial control as 'rarely' demonstrated 34% higher odds of using stimulus checks for debt repayments. The odds escalated progressively with higher levels of perceived lack of control: households reporting 'sometimes' showed 60.3% higher odds, 'often' corresponded to 75% higher odds, and those indicating 'always' exhibited 91.2% higher odds of using their stimulus checks for debt payments. These findings underscore the influential role of perceived lack of financial control in the decision-making processes regarding the use of stimulus funds for debt management.

Controlling for other variables, middle-aged households demonstrated a greater propensity for using stimulus proceeds for debt service than their younger counterparts. Specifically, households aged between 25 and 34 were found to have 42% higher odds of using their stimulus checks for debt payments than those under 24 years of age. This trend continued with older age groups: households aged 35 to 44 had 29.30% increased odds, and those aged 45 to 54 showed 17.30% higher odds compared to the under-24 cohort.

Gender differences were also notable. Women had 8.30% higher odds of utilizing their stimulus checks for debt payments compared to men. Ethnicity further influenced this pattern, with non-white households having 15.40% higher odds of using these funds for debt payments than white households.

Employment status and income levels also played a role. Compared to employed households, households comprised of self-employed individuals, part-time workers, homemakers, and full-time students were less likely to allocate stimulus checks towards debt repayments. Additionally, households with an income level above $15,000, particularly those in the middle to upper-middle-class bracket, exhibited higher odds of using their stimulus checks for this purpose compared to households with an income level of less than $15,000.

After controlling all other factors, the presence of emergency funds significantly influenced the use of stimulus checks for debt repayments. Households with such funds exhibited 1.55 times the odds of using their stimulus checks for debt payments compared to those without emergency funds. Additionally, homeownership was a notable predictor; homeowners had 1.67 times the odds of using stimulus checks for debt payments than renters.

We also found a positive association between households' financial knowledge, both subjective and objective, and the use of stimulus checks for debt payments. Households experiencing financial strains were 1.27 times the odds of using these checks for debt payments than those without such strains. Credit history emerged as another influential factor. Households with a better credit record, compared to those with a very poor credit record, showed a positive association with the use of received stimulus checks for debt payments, with odds ranging from 1.27 times to 2.40 times.

Furthermore, the extent of remaining funds after essential expenses also affected this usage. Households reporting 'rarely' having money left exhibited 16.00% higher odds of using their stimulus checks for debt payments than those with no money left. Interestingly, households that 'often' or 'sometimes' had funds remaining were less likely to use their stimulus checks for debt payments, with 18.00% and 37.00% lower odds, respectively.

Table 3. Logistic Regression of Whether Households Used Stimulus Checks for Debt Payments

Use Stimulus checks for Debt Payments		**Odds Ratio**	**S.E.**
Exogenous (Independent) Variables			
Income Drop	Yes	1.12**	.05
Lack of Perceived Fin Control	Rarely	1.34***	.08
	Sometimes	1.60***	.10
	Often	1.75***	.12
	Always	1.91***	.14
Control Variables			
Age Group	25-34	1.42***	.10
	35-44	1.29**	.10
	45-54	1.17*	.09
	55-64	1.10	.09
	65+	1.05	.09
Gender	Female	1.08*	.04
Ethnicity	Non-White	1.15***	.05
Family status	Live with partner/spouse	1.13**	.04
Employment	Self-employed	.73***	.05
	Work Part-time	.84**	.05
	Homemaker	.76***	.05
	Full-time student	.76*	.10
	Permanently sick	.96	.08
	Unemployed	.72***	.05
	Retired	.77***	.05
Education	Some college	1.10*	.05

	Associate's degree	1.15*	.07
	Bachelor's degree	1.09	.05
	Post graduate degree	.96	.06
Income Levels	$15,000 to $25,000	1.25**	.09
	$25,000 to $35,000	1.40***	.10
	$35,000 to $50,000	1.34***	.09
	$50,000 to $75,000	1.45***	.11
	$75,000 to $100,000	1.42***	.12
	$100,000 to $150,000	1.35**	.12
	$150,000 to $200,000	1.24	.15
	$200,000 to $300,000	1.11	.22
	$300,000 or more	1.24	.32
Laid off during pandemic	Yes	1.09	0.05
Emergency fund	Yes	1.55***	.07
Homeownership	Yes	1.67***	.04
Objective Financial Knowledge		1.02*	.01
Subjective Financial Knowledge		1.03*	.01
Financial Strain	Yes	1.27***	.05
Subjective Credit Record	Bad	1.30***	.12
	Average	1.94***	.17
	Good	2.40***	.22
	Very good	1.79***	.17
Have money left	Rarely	1.16*	.07
	Sometimes	1.08	.07
	Often	.82**	.06
	Always	.63***	.05
	N	18,790	

Note. Standard errors in parentheses, * p<.05 ** p<.01 *** p<.001; Financial strain includes unpaid medical bills, late payments on student loans, late on mortgage payments, and being late on credit card payments; Never Perceived Lack of Financial Control, employed, high school, age group of younger than 25 years, annual income less than $150K, no subjective/objective financial knowledge, very bad credit record, no money left are the omitted categories.

Mediation Results for the Full Sample

Table 4 presents the mediation results for the full sample. The total effect indicates that for households who received stimulus checks, the probability of using the stimulus checks for debt payments increased by 0.05 points on the probability scale compared to households that did not report an income drop.

The indirect effect indicates the indirect association between households' income drop

and utilization of stimulus checks to pay down debt when mediated by lack of financial control. The direct effect captures the direct association between households' income drop and the likelihood of using stimulus checks to pay down debt when controlling for other factors. The results from the full mediation model, as shown in Table 4, indicate that income drop had a total (coef = 0.05***; odds = 1.24), direct (coef = 0.04***; odds = 1.18), and indirect association (coef = 0.01***; odds = 1.06) through lack of financial control, on the utilization of stimulus checks for paying down debt.

Table 4. Full Mediation Model Results

Mediator: Perceived Lack of Financial Control			
Treatment	TE	DE	IE
Income Drop	0.05*** Odds = 1.24	0.04*** Odds = 1.18	0.01** Odds = 1.06

Note: Outcome equation includes treatment and mediator interaction. Coefficients in parentheses, * p<.05 ** p<.01 *** p<.001; N = 18,790.

Table 5 presents the mediation results for the partial model, where we focused on the mediation effects among respondents' reported income drop—perceived lack of financial control—utilized stimulus checks for debt payments (Figure 1). The results indicate that income drop had a total (coef = 0.11***; odds = 1.59), direct (coef = 0.08***; odds = 1.41), and indirect association (coef = 0.03***; odds = 1.13) through lack of financial control, on the utilization of stimulus checks for paying down debt. Therefore, based on the partial model, the probability of using the stimulus checks for debt payments increased by 10% on the probability scale compared to households that did not report an income drop.

Table 5. Partial Mediation Model Results

Mediator: Perceived Lack of Financial Control			
Treatment	TE	DE	IE
Income Drop	0.11*** Odds = 1.59	0.08*** Odds = 1.41	0.03** Odds = 1.13

Note: Outcome equation includes treatment mediator interaction; Coefficients in parentheses, * p<.05 ** p<.01 *** p<.001; N = 18,790; Multicollinearity analysis was also done for the study. The Variable Inflation Factors (VIF) for the variables are reported in Appendix C. No multi-collinearity was found in the analyses of this study.

Discussion

This study examined how a perceived lack of financial control influences the relationship between unexpected negative income shocks and the use of stimulus checks for debt payments during the COVID-19 pandemic. The findings revealed a significant association between reported income drop and the use of stimulus checks for debt payments, supporting the study's proposed mediation model. Regardless of other factors, a household's perceived lack of financial control was a strong predictor of using stimulus checks for debt payments. The greater the perceived lack of control, the more likely households were to allocate stimulus checks towards debts. This suggests that policy measures aimed at increasing financial stability should not only provide temporary financial assistance but also support efforts to enhance financial literacy and management skills among the population.

This research validates earlier findings that a lack of financial control mediates individuals'

willingness to alleviate their financial situation and improve their financial wellness by settling their debt obligations when faced with sudden income shock or economic uncertainty (Gasiorowska, 2014; Tang et al., 2005). We found that households experiencing an income drop were 1.055 times more likely to use stimulus checks for debt payments than those without such income shocks, especially when influenced by perceived financial insecurity. Further, with other factors controlled, households that experienced an income drop exhibited 13.10% higher odds of using stimulus checks for debt payments, mediated by their perceived lack of financial control. However, it should be noted that income drop was a self-reported measure, reflecting the presence of an income shock during the pandemic but not the specific magnitude. The decision to use stimulus checks for debt payments represented a direct financial response to the pandemic. The perceived lack of financial control was gauged through self-assessment rather than their actual financial management abilities.

This study suggests that perceived financial control—or the lack thereof—plays a mediating role between negative income shocks and the decision to pay off debt using financial resources, including using COVID-19 stimulus checks. It has been suggested by others that the decision to pay one's debt is motivated by a desire to reduce financial uncertainty and to regain a greater perception of control over their financial situation (e.g., Baum et al., 1986; Lea et al., 1995; Whitson & Galinsky, 2008). Furthermore, the findings from this study underscore the importance of considering psychological factors, such as individuals' perceptions of control and helplessness, when examining their debt management behaviors. The findings from this study also underscore the usefulness of considering self-assessment of individuals' ability to be in control of their finances when examining the financial behavior of individuals who experience income shock or economic uncertainty.

Moreover, while the findings from this study indicate that providing households with stimulus checks during the COVID-19 pandemic was a timely intervention that helped some people reduce their debt obligations, findings also underscore the importance of educating people to build sufficient emergency savings to sustain a household through periods of economic uncertainty. Emergency savings may play a protective role as a financial resource during periods of income uncertainty, in addition to being an important factor in the psychological well-being of people. This is because people can use emergency savings to meet their financial obligations, and the decision to reduce their debt obligations may provide them with a sense of control over their financial situation during periods of economic uncertainty.

Based on the findings from this study, outstanding debt was likely a salient factor for individuals who faced income uncertainty and were unable to meet their financial debt obligations. Interestingly, the results from this study indicate that traditionally financially underserved socio-demographic groups such as women and non-white households were more likely to use stimulus checks to reduce their outstanding debt obligations. Additionally, the results from this study suggest that people with higher levels of financial resources may be able to cope better during periods of income uncertainty than people without adequate emergency funds. And as a corollary, it should be noted that carrying a lower debt burden can protect people from experiencing adverse outcomes when experiencing financial hardship; and having adequate emergency savings, while being able to maintain lower financial debt burdens, may ultimately help households stay out of poverty during periods of income uncertainty.

Individuals' debt burdens can have deleterious consequences on their well-being, and more broadly, the consequences of carrying debt obligations may have a cascading negative effect in the community during periods of economic uncertainty. The significance of financial knowledge variables also underscores the need for developing greater financial capability within the population as previous studies have indicated that financial capability can play an important role and contribute to the overall financial resiliency of the population (Klapper & Lusardi, 2020; Lusardi & Mitchell, 2013).

Policy implications from this study are significant. First, it suggests that economic policies, such as the provision of stimulus checks, play a critical role in supporting households during downturns by providing them with the necessary liquidity to manage debts. However, the effectiveness of such measures could be enhanced by simultaneous initiatives aimed at improving financial literacy and control. Programs designed to increase financial awareness and planning capabilities could help individuals make more informed decisions about how to use such financial aids effectively.

Additionally, our findings suggest a need for policies that are tailored to the psychological impacts of financial stress. Since perceived lack of financial control is a significant stressor that influences financial behavior, interventions that address both the financial and psychological needs of individuals during crises are crucial. This might include counseling services or workshops on financial management during the rollout of stimulus measures.

In conclusion, while stimulus payments serve as essential tools for immediate economic relief, their long-term efficacy could be significantly enhanced by policies that also address financial education, financial advice and psychological resilience. This multidimensional approach could form a cornerstone of future economic crisis interventions, ensuring that households are not only financially supported but also empowered to manage their financial health proactively during and after economic shocks.

Limitations

While providing valuable insights, this study has some limitations. Primarily, its cross-sectional design restricts its ability to capture the dynamic nature of financial attitudes and behaviors over time. Given the ever-evolving economic environment, understanding how an income drop and the perceived lack of financial control evolve and interact over time is crucial. Future research could employ longitudinal datasets to delve deeper into these dynamics, potentially uncovering causal relationships and offering a more nuanced understanding of how these factors influence households' financial decisions as economic conditions fluctuate.

Moreover, the study's focus could be broadened in subsequent research to encompass a more diverse range of factors that contribute to financial well-being. Investigating various dimensions of money attitudes beyond the scope of perceived financial control (or lack thereof), would enrich the field’s understanding of the mechanisms at play in the relationship between changes in household wealth and overall financial health. Additionally, incorporating variables such as personality traits, community backgrounds, and other financial benchmarks could offer a more holistic view of the factors that shape households' financial decision-making processes.

Furthermore, the study suggests potential linkages between perceived lack of financial control, negative income shocks, and debt management. However, there are additional relationships that warrant exploration in future studies. Aspects such as financial literacy, credit management skills, and the role of financial education (Lusardi & Mitchell, 2013; Xiao et al., 2022), could provide further insights. Understanding these connections could be instrumental in developing more effective strategies for improving financial well-being and resilience among households.

In conclusion, while this study contributes significantly to our understanding of financial behavior during economic downturns, it also opens avenues for more comprehensive future research. Such research could ultimately aid in the development of targeted policies and interventions to enhance financial stability and preparedness among households facing economic uncertainties.

Conclusion

The labor market disruptions caused by the COVID-19 pandemic led to rapid and significant increases in the unemployment rate, mirroring other historical labor market shocks like the Great Recession. However, our study extends beyond merely recognizing these economic upheavals. It delves into the complex relationship between negative income shocks, perceived lack of financial control, and the subsequent use of stimulus checks for debt payments. Our findings indicate a notable positive correlation between a decrease in income and stronger perceived lack of

financial control, which in turn correlates with a higher likelihood of using stimulus checks to manage debt obligations.

This study highlights a critical aspect of financial behavior during times of economic distress. When households allocate a substantial portion of their resources to financial commitments, their capacity to handle unforeseen economic shocks diminishes significantly. This situation was evident during the COVID-19 pandemic, where many Americans found themselves unprepared for such abrupt and severe financial challenges. Our results suggest the necessity for improved financial resilience among the population. By fostering greater financial capability and promoting strategies for financial management, households can be better equipped to handle future economic uncertainties and shocks.

Furthermore, these findings have broader implications for policymaking. They underscore the importance of measures aimed at enhancing financial capability and providing tools for effective financial planning. Such initiatives could play a pivotal role in mitigating the adverse effects of future labor market shocks. In conclusion, this study not only sheds light on the behavioral responses to the recent pandemic but also offers valuable insights for preparing more resilient financial strategies to withstand future economic challenges.

References

Abdelrahman, H., & Oliveira, L. E. (2023). The Rise and Fall of Pandemic Excess Savings. *FRBSF Economic Letter*, *11*.

Amadeo, K. (2021, October 24). Stimulus checks: 2020 compared to 2009 and 2008. The Balance. https://www.thebalance.com/stimulus-checks-3305750.

Amromin, G., & Smith, P. (2003). What explains early withdrawals from retirement accounts? Evidence from a panel of taxpayers. *National Tax Journal*, *56*(3), 595-612.

Argento, R., Bryant, V. L., & Sabelhaus, J. (2015). Early withdrawals from retirement accounts during the Great Recession. *Contemporary Economic Policy*, *33*(1), 1-16.

Armantier, O., Goldman, L., Koşar, G., Lu, J., Pomerantz, R., & Van der Klaauw, W. (2021). How have households used their stimulus payments and how would they spend the next? Liberty Street Economics. https://libertystreeteconomics.newyorkfed.org/2021/04/an-update-on-how-households-are-using-stimulus-checks/

Baker, S. R. (2015). Debt and the consumption response to household income shocks (Vol. 2541142). SSRN.

Baker, S. R., & Yannelis, C. (2017). Income changes and consumption: Evidence from the 2013 federal government shutdown. *Review of Economic Dynamics*, *23*, 99-124.

Baum, A., Fleming, R., & Reddy, D. M. (1986). Unemployment stress: Loss of control, reactance and learned helplessness. *Social Science & Medicine*, *22*(5), 509-516.

Berger, L. M., & Houle, J. N. (2019). Rising household debt and children's socioemotional well-being trajectories. *Demography*, *56*(4), 1273-1301.

Bierman, A., Upenieks, L., Glavin, P., & Schieman, S. (2021). Accumulation of economic hardship and health during the COVID-19 pandemic: Social causation or selection?. *Social Science & Medicine*, *275*, 113774.

Bordia, P., Hobman, E., Jones, E., Gallois, C., & Callan, V. J. (2004). Uncertainty during organizational change: Types, consequences, and management strategies. *Journal of Business and Psychology*, *18*, 507-532.

Borio, C. (2020). The Covid-19 economic crisis: Dangerously unique. *Business Economics*, *55*(4), 181-190.

Brehm, J. W. (1966). *A Theory of Psychological Reactance*. Academic Press.

Bricker, J., & Thompson, J. (2016). Does education loan debt influence household financial distress? An assessment using the 2007–2009 Survey of Consumer Finances panel. *Contemporary Economic Policy*, *34*(4), 660-677.

Broda, C. & Parker, J. (2008). The impact of the 2008 tax rebates on consumer spending: preliminary evidence. Northwestern University. http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.188.9572&rep=rep1&type=pdf

Browning, M., & Crossley, T. F. (2001). The life-cycle model of consumption and saving. *Journal of Economic Perspectives*, *15*(3), 3-22.

Browning, M., & Lusardi, A. (1996). Household saving: Micro theories and micro facts. *Journal of Economic Literature*, *34*(4), 1797-1855.

Butrica, B. A., Murphy, D. P., & Zedlewski, S. R. (2010). How many struggle to get by in retirement? *The Gerontologist*, *50*(4), 482-494.

Caputo, R. K. (2012). Patterns and predictors of debt: A panel study, 1985-2008. *Journal of Sociology and Social Welfare*, *39*, 7.

Cobb-Clark, D. A., Kassenboehmer, S. C., & Sinning, M. G. (2016). Locus of control and savings. *Journal of Banking & Finance*, *73*, 113-130.

Coibion, O., Gorodnichenko, Y., & Weber, M. (2020). How did U.S. consumers use their stimulus payments? (NBER Working Paper No. 27693). National Bureau of Economic Research. http://www.nber.org/papers/w27693

Colarieti, R., Mei, P., & Stantcheva, S. (2024). *The how and why of household reactions to income shocks* (Working Paper No. w32191). National Bureau of Economic Research. DOI 10.3386/w32191

Cox, N., Ganong, P., Noel, P., Vavra, J., Wong, A., Farrell, D., ... & Deadman, E. (2020). Initial impacts of the pandemic on consumer behavior: Evidence from linked income, spending, and savings data. *Brookings Papers on Economic Activity*, *2020*(2), 35-82.

Dalgard, O. S., Thapa, S. B., Hauff, E., McCubbin, M., & Syed, H. R. (2006). Immigration, lack of control and psychological distress: findings from the Oslo Health Study. *Scandinavian Journal of Psychology*, *47*(6), 551-558.

Deaton, A. (2005). Franco Modigliani and the Life Cycle Theory of Consumption. https://dx.doi.org/10.2139/ssrn.686475

Dettling, L. J. & Lambie-Hanson, L. (2021). Why is the Default Rate So Low? How Economic Conditions and Public Policies Have Shaped Mortgage and Auto Delinquencies During the COVID-19 Pandemic. FEDS Notes No. 2021-03-04-2 https://doi.org/10.17016/2380-7172.2854.

Drentea, P., & Lavrakas, P. J. (2000). Over the limit: the association among health, race and debt. *Social science & medicine*, *50*(4), 517-529.

Dryden, R. P., Campbell, A. V., Perry, R. P., Hamm, J. M., Chipperfield, J. G., Parker, P. C., & Leboe-McGowan, L. (2023). Assisting students in debt to overcome academic setbacks with a cognitive-reframing motivation intervention. *Journal of Educational Psychology*, *115*(1), 55.

Fan, L., & Chatterjee, S. (2017). Borrowing decisions of households: An examination of the information search process. *Journal of Financial Counseling and Planning*, 28(1), 95-106. https://doi.org/10.1891/1052-3073.28.1.95

Federal Reserve Bank of New York. (2022, November). *Quarterly Report on Household Debt and Credit (Q3 2022)*. https://www.newyorkfed.org/medialibrary/interactives/householdcredit/data/pdf/HHDC_2022Q3

Foltice, B., & Ilcin, P. (2019). The influences of locus of control, debt, and framing on retirement contributions. *Journal of Advanced Studies in Finance*, *10*(1), 34-44.

Forbes, J., & Kara, S. M. (2010). Confidence mediates how investment knowledge influences investing self-efficacy. *Journal of Economic Psychology*, *31*(3), 435-443. https://doi.org/10.1016/j.joep.2010.01.012

Fulford, S., Rush, M., & Wilson, E. (2021). Changes in consumer financial status during the early months of the pandemic: Evidence from the second wave of the Making Ends Meet survey. *Consumer Financial Protection Bureau Office of Research Reports Series*, (21-2).

Garner, T. I., Safir, A. & Schild, J. (2020, June). Receipt and use of stimulus payments in the time of the Covid-19 pandemic. *U.S. Bureau of Labor Statistics*. https://www.bls.gov/opub/btn/volume-9/pdf/receipt-and-use-of-stimulus-payments-in-the-time-of-the-covid-19-pandemic.pdf.

Garrison, S.T., Rampold, S.D., Vasquez, K., Gillen, M. & Baker, L.M. (2022). Parents' employment, income, and finances before and during the COVID-19 pandemic. *Journal of Consumer Affairs*. *56*(1), 276-291.

Gasiorowska, A. (2014). The relationship between objective and subjective wealth is moderated by financial control and mediated by money anxiety. *Journal of Economic Psychology*, *43*, 64-74. http://dx.doi.org/10.1016/j.joep.2014.04.007

Ghilarducci, T., Radpour, S., & Webb, A. (2019, Spring). New evidence on the effect of economic shocks on retirement plan withdrawals. *The Journal of Retirement*.

Gillers, H., Tergesen, A., & Scism, L. (2018). A generation of Americans is entering old age the least prepared in decades. *The Wall Street Journal*, *22*.

Glass, D. C., Singer, J. E., Leonard, H. S., Krantz, D., Cohen, S., & Cummings, H. (1973). Perceived control of aversive stimulation and the reduction of stress responses. *Journal of Personality*, *41*(4), 577-595.

Goel, A., & Rastogi, S. (2023). Understanding the impact of borrowers' behavioural and psychological traits on credit default: review and conceptual model. *Review of Behavioral Finance*, *15*(2), 205-223.

Grable, J. E., Park, J. Y., & Joo, S. H. (2009). Explaining financial management behavior for Koreans living in the United States. *Journal of Consumer Affairs*, *43*(1), 80-107.

Grable, J., Kwak, E. J., & Archuleta, K. (2023). Distrust of banks among the unbanked and banked. *International Journal of Bank Marketing*, *41*(6), 1498-1520.

Grable, J. E., & Palmer, L. (2022). *Introduction to personal finance: Beginning your financial journey*. John Wiley & Sons.

Guvenen, F., Pistaferri, L., & Violante, G. L. (2022). Global trends in income inequality and income dynamics: New insights from GRID. *Quantitative Economics*, *13*(4), 1321-1360.

Hayes, A. F. (2013). Introduction to mediation, moderation, and conditional process analysis. A regression-based approach. New York, NY: The Guilford Press.

Heo, W., Nobre, L. H. N., Grable, J. E., & Ruiz-Menjivar, J. (2016). What role does financial risk tolerance play in mediating investing behavior? *Journal of Financial Service Professionals*, *70*(5).

Ibrahim, M. E., & Alqaydi, F. R. (2013). Financial literacy, personal financial attitude, and forms of personal debt among residents of the UAE. *International Journal of Economics and Finance*, *5*(7), 126-138.

Imai, K., Jo, B., & Stuart, E. A. (2011). Commentary: Using potential outcomes to understand causal mediation analysis. *Multivariate Behavioral Research, 46*(5), 842-854. https://doi.org/10.1080/00273171.2011.606743

Immordino, G., Jappelli, T., Oliviero, T., & Zazzaro, A. (2022). Fear of COVID-19 contagion and consumption: Evidence from a survey of Italian households. *Health Economics*, *31*(3), 496-507.

Kamakura, W. A. & Du, R. Y. 2012. How Economic Contractions and Expansions Affect Expenditure Patterns. *Journal of Consumer Research 39*(2), 229-247.

Kim, K. T., Lee, J., & Hanna, S. D. (2019). The effects of financial literacy overconfidence on the mortgage delinquency of U.S. households. *Journal of Consumer Affairs*, *54*(2), 517–540.

Klapper, L., & Lusardi, A. (2020). Financial literacy and financial resilience: Evidence from around the world. *Financial Management*, *49*(3), 589-614.

Klapper, L., Lusardi, A., & Panos, G. A. (2013). Financial literacy and its consequences: Evidence from Russia during the financial crisis. *Journal of Banking & Finance*, *37*(10), 3904-3923.

Kleimeier, S., Hoffmann, A. O., Broihanne, M. H., Plotkina, D., & Göritz, A. S. (2023). Determinants of individuals' objective and subjective financial fragility during the COVID-19 pandemic. *Journal of Banking & Finance*, *153*, 106881.

Lea, S. E., Webley, P., & Walker, C. M. (1995). Psychological factors in consumer debt: Money management, economic socialization, and credit use. *Journal of Economic Psychology*, *16*(4), 681-701.

Lin, J.T., Mottola, G., & Lusardi, A. (July, 2022). Financial Capability in the United States: Highlights from the FINRA Foundation National Financial Capability Study. https://finrafoundation.org/sites/finrafoundation/files/NFCS-Report-Fifth-Edition-July-2022.pdf

Lindgren, H. C. (1980). *Great expectations: The psychology of money*. Los Atos: William Kaufmann Inc.

Liu, Y., Zhang, Y., & Chatterjee, S. (2021): Financial hardship and depression experienced by pre-retirees during the COVID-19 pandemic: The mitigating role of stimulus payments. *Applied Economics Letters*, *30*(3), 391-396 DOI: 10.1080/13504851.2021.1989364

Lusardi, A. (1998). On the Importance of the precautionary saving motive. *The American Economic Review*, *88*(2), 449-453.

Lusardi, A., & de Bassa Scheresberg, C. (2016). Americans' troubling financial capabilities: A profile of pre-retirees. *Public Policy & Aging Report*, *26*(1), 23-29.

Lusardi, A., & Mitchell, O.S. (2013). Debt and debt management among older adults. *Draft Michigan Retirement Research Center*, Ann Arbor, MI.

Lusardi, A., & Tufano, P. (2015). Debt literacy, financial experiences, and overindebtedness. *Journal of Pension Economics and Finance*, *14*(4), 332-368. doi:10.1017/S1474747215000232.

Marshall, G. L., & Tucker-Seeley, R. (2018). The association between hardship and self-rated health: does the choice of indicator matter?. *Annals of Epidemiology*, *28*(7), 462-467.

Modigliani, F., & Brumberg, R. (1954). Utility analysis and the consumption function: An interpretation of cross-section data. *Post-Keynesian Economics*, *1*, 388-436.

Netemeyer, R. G., Warmath, D., Fernandes, D., & Lynch Jr, J. G. (2018). How am I doing? Perceived financial well-being, its potential antecedents, and its relation to overall well-being. *Journal of Consumer Research*, *45*(1), 68-89.

Ouyang, C., & Hanna, S.D. (2022). The effect of racial/ethnic differences on the financial obligations ratio of renters. *Financial Services Review. 30*(2022), 165–177.

Pandemic Oversight https://www.pandemicoversight.gov/data-interactive-tools/data-stories/three-rounds-stimulus-checks-see-how-many-went-out-and-how-much

Parker, J. A., Souleles, N. S., Johnson, D. S., & McClelland, R. (2013). Consumer spending and the economic stimulus payments of 2008. *American Economic Review*, *103*(6), 2530-2553.

Pattanayak, C. W., Rubin, D. B., & Zell, E. R. (2011). Propensity score methods for creating covariate balance in observational studies. *Revista Española de Cardiología* (English Edition), *64*(10), 897-903.

Peetz, J., & Robson, J. (2021). Living gig to gig and paycheque to paycheque: how income volatility affects financial decisions. Centre for Economic Policy Research.

Perry, V. G., & Morris, M. D. (2005). Who is in control? The role of self-perception, knowledge, and income in explaining consumer financial behavior. *Journal of Consumer Affairs*, *39*(2), 299-313.

Polizzi, C., Lynn, S. J., & Perry, A. (2020). Stress and coping in the time of COVID-19: Pathways to resilience and recovery. *Clinical Neuropsychiatry*, *17*(2), 59.

Rubin, D. B. (2005). Causal inference using potential outcomes: Design, modeling, decisions. *Journal of the American Statistical Association*, *100*(469), 322-331. https://doi.org/10.1198/016214504000001880

Salamanca, N., de Grip, A., Fouarge, D., & Montizaan, R. (2020). Locus of control and investment in risky assets. *Journal of Economic Behavior & Organization*, *177*, 548-568.

Shapiro, M.D. & Slemrod, J. (2009) Did the 2008 tax rebates stimulate spending? *American Economic Review*, *99*(2), 374–379. https://doi.org/10.1257/aer.99.2.374

Shefrin, H. M., & Thaler, R. H. (1988). The behavioral life-cycle hypothesis. *Economic Inquiry 26*(4). 609-643. https://doi.org/10.1111/j.1465-7295.1988.tb01520.x

Shevlin, M., McBride, O., Murphy, J., Miller, J. G., Hartman, T. K., Levita, L., ... & Bentall, R. P. (2020). Anxiety, depression, traumatic stress and COVID-19-related anxiety in the UK general population during the COVID-19 pandemic. *BJPsych open*, *6*(6), e125.

Stata. Causal mediation analysis. *In Stata press of Mediate*. Retrieved Dec 10, 2023, from stata.com.

Sweet, E. (2021). Debt-related financial hardship and health. *Health Education & Behavior*, *48*(6), 885-891.

Tang, T. L. P., Luna-Arocas, R., & Sutarso, T. (2005). From income to pay satisfaction: The love of money and pay equity comparison as mediators and culture (the United States and Spain) and gender as moderators. *Management Research: Journal of the Iberoamerican Academy of Management*, *3*(1), 7–26.

Tharayil, A., & Walstad, W. B. (2022). Financial literacy and the early withdrawal of funds from retirement accounts. *Journal of Financial Counseling and Planning*, *33*(1), 44-55.

Tucker-Seeley, R. D., Li, Y., Subramanian, S. V., & Sorensen, G. (2009). Financial hardship and mortality among older adults using the 1996–2004 Health and Retirement Study. *Annals of Epidemiology*, *19*(12), 850-857.

United States Congress. (2020). *Coronavirus Aid, Relief, and Economic Security Act, Pub. L. No. 116-136, 134 Stat. 281*. https://www.congress.gov/bill/116th-congress/house-bill/748/text

Whitson, J. A., & Galinsky, A. D. (2008). Lacking control increases illusory pattern perception. *Science*, *322*(5898), 115-117.

Xia, T., Wang, Z., & Li, K. (2014). Financial literacy overconfidence and stock market participation. *Social Indicators Research*, *119*(3), 1233–1245. https://doi.org/10.1007/s11205-013-0555-9

Xiao, J. J., & Porto, N. (2022). Financial capability and wellbeing of vulnerable consumers. *Journal of Consumer Affairs*, *56*(2), 1004-1018.

Xiao, J.J., Chen, C., Chen, F. (2014). Consumer financial capability and financial satisfaction. *Social Indicators Research, 118*(1), 415–432.

Xu, Y., & Yao, R. (2022). U.S. household financial vulnerability: Prediction analyses in the COVID-19 Pandemic. *Journal of Financial Counseling and Planning*, *33*(2), 228-242.

Yue, P., Gizem Korkmaz, A., & Zhou, H. (2020). Household financial decision making amidst the COVID-19 pandemic. *Emerging Markets Finance and Trade*, *56*(10), 2363-2377.

Yuh, Y. & Hanna, S.D. (2010). Which households think they save? *Journal of Consumer Affairs*, *44*, 70–97.

Zhang, K. (1989). *Factors affecting financial resources management behaviors*. The University of Arizona.

Appendix A: Details of independent variables

Details of selected independent variables are presented in this section.

A.1 Age

Age was categorized based on the respondent's response as 25-34, 35-44, 45-54, 55-64, and 65+. The code was based on the following question:
A3a)5 What is your age?

A.2 Gender

Gender was categorized based on the respondent's responses based on the following question:
A50a)4 [BUILDER: PUNCH GENDER FROM Q.A50; IF Q.A50 = 3, RANDOMLY ASSIGN TO MALE
OR FEMALE

Male	1
Female	2

A.3 Ethnicity

Ethnicity was categorized as non-Hispanic White and non-White based on the following question:
A4)7 Which of the following best describes your race or ethnicity?
Select all that apply.
[CODE 99 EXCLUSIVE][BUILDER: NOTE PUNCH 7 IS NOT IN ORDER]
[M]

White or Caucasian	1
Black or African-American	2
Hispanic or Latino/a	3
Asian	4
Native Hawaiian or other Pacific Islander	7
American Indian or Alaska Native	5
Other	6

A.3 Education

I categorize the respondent's highest level of education as less than college, some college, associate degree, bachelor's degree, and post-graduate degree. The code was based on following questions:
A5)12,13 What was the highest level of education that you completed?

Did not complete high school	1
High school graduate – regular high school diploma	2
High school graduate – GED or alternative credential	3
Some college, no degree	4
Associate's degree	5
Bachelor's degree	6
Post graduate degree	7
Prefer not to say	99

A.4 Employment

Employment status of respondents were categorized based on the following question:
A9) Which of the following best describes your current employment or work status?

Self-employed	1
Work full-time for an employer [IF Q.AM21 = 1 INSERT: or the military]	2
Work part-time for an employer [IF Q.AM21 = 1 INSERT: or the military]	3
Homemaker	4

Full-time student	5
Permanently sick, disabled, or unable to work	6
Unemployed or temporarily laid off	7
Retired	8

A.5 Income levels

Respondents' income was categorized based on the following question:

A8)15 What is [IF Q.A7a = 3 INSERT: your approximate annual income/ IF Q.A7a = 1, 2 INSERT: your household's approximate annual income], including wages, tips, investment income, public assistance, income from retirement plans, etc.?

Would you say it is…

Less than $15,000	1
At least $15,000 but less than $25,000	2
At least $25,000 but less than $35,000	3
At least $35,000 but less than $50,000	4
At least $50,000 but less than $75,000	5
At least $75,000 but less than $100,000	6
At least $100,000 but less than $150,000	7
At least $150,000 but less than $200,000	8
At least $200,000 but less than $300,000	9
$300,000 or more	10

A.6 Emergency funds

Whether respondents have emergency fund or not was based on the following question:

J5) Have you set aside emergency or rainy day funds that would cover your expenses for 3 months, in case of sickness, job loss, economic downturn, or other emergencies?

Yes	1
No	2

A.7 Laid off during pandemic

Whether respondents got laid off during pandemic was based on the following question:

J52)27 As a result of the pandemic, were you laid off or furloughed at any time in 2020 or 2021?

Yes	1
No/Not applicable	2

A.8 Subjective financial knowledge score

The subjective financial literacy score is based on the following survey questions:

M4) On a scale from 1 to 7, where 1 means very low and 7 means very high, how would you assess your overall financial knowledge?

A.9 Objective financial knowledge score

The objective financial literacy score is based on the number of correct answers based on a series of financial knowledge questions in the 2021 NFCS.

The survey questions are as follows:

M6) Suppose you had $100 in a savings account and the interest rate was 2% per year. After 5 years, how much do you think you would have in the account if you left the money to grow?

More than $102	1
Exactly $102	2
Less than $102	3

M7) 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?
More than today 1
Exactly the same 2
Less than today 3
M8) If interest rates rise, what will typically happen to bond prices?
They will rise 1
They will fall 2
They will stay the same 3
There is no relationship between bond prices and the interest rate 4
M9) A 15-year mortgage typically requires higher monthly payments than a 30-year mortgage, but the total interest paid over the life of the loan will be less.
True 1
False 2
M10) Buying a single company's stock usually provides a safer return than a stock mutual fund.
True 1
False 2
M31)65 Suppose you owe $1,000 on a loan and the interest rate you are charged is 20% per year compounded annually. If you didn't pay anything off, at this interest rate, how many years would it take for the amount you owe to double?
Less than 2 years 1
At least 2 years but less than 5 years 2
At least 5 years but less than 10 years 3
At least 10 years 4
M50)66 Which of the following indicates the highest probability of getting a particular disease? [RANDOMIZE PUNCHES 1-3]
There is a one-in-twenty chance of getting the disease 1
2% of the population will get the disease 2
25 out of every 1,000 people will get the disease 3

A.10 Money left

Whether respondents have money left was reported based on the following question:
J42_1) I have money left over at the end of the month (1-5).

A.11 Homeownership

Homeownership was recorded based on the following question:
Ea_1)43 Do you [IF Q.A7a = 1 INSERT: or your spouse/ IF Q.A7a = 2 INSERT: or your partner] currently
own your home?
Yes 1
No 2

A.12 Financial Strain

Respondents' financial strain was based on all of their unpaid medical bills, being late on student loan payments (G35), late on mortgage payments (E15), and being late on credit card payments (F2_4):
G35)52 How many times have you been late with a student loan payment in the past 12 months? (If you have more than one student loan, please consider them all.)
Never, payments are not due on my loans at this time 1
Never, I have been repaying on time each month 2
Once 3
More than once 4

E15)47 How many times have you been late with your mortgage payments in the past 12 months? (If you have more than one mortgage on your home(s), please consider them all.)

Never	1
Once	2
More than once	3

F2) In the past 12 months, which of the following describes your experience with credit cards? (Select an answer for each)

F2_4) In some months, I was charged a late fee for late payment

A.13 Subjective credit record

Respondents' self-assessed credit record was coded based on the following question:

J32)28 How would you rate your current credit record?

Very bad	1
Bad	2
About average	3
Good	4
Very good	5

Appendix B: Correlation Table for Objective and Subjective Financial Knowledge

Correlation Table: Objective Financial Knowledge and Subjective Financial Knowledge

Correlation	Obj. Fin Knowledge	Sub. Fin Knowledge
Objective Financial Knowledge	1	
Subj. Financial Knowledge	0.248	1

Appendix C: Variance Inflation Factors

Appendix Table C. Variance Inflation Factor (VIF) for the Independent Variables

Exogenous (Independent) Variables		VIF	1/VIF
Income Drop	Yes	1.46	.685
Perceived Financial Control	Rarely	2.13	.469
	Sometimes	2.64	.379
	Often	2.32	.431
	Always	2.38	.420
Control Variables			
Age Group	25-34	3.08	.325
	35-44	3.22	.311
	45-54	3.37	.297
	55-64	3.68	.272
	65+	5.51	.181
Gender	Female	1.16	.864
Ethnicity	Non-White	1.08	.922
Family status	Live with partner/spouse	1.37	.729
Employment	Self-employed	1.17	.855
	Work Part-time	1.21	.825
	Homemaker	1.24	.809
	Full-time student	1.12	.890
	Permanently sick	1.35	.743
	Unemployed	1.30	.768
	Retired	2.80	.357
Education	Some college	1.58	.634
	Associate's degree	1.37	.732
	Bachelor's degree	1.83	.547
	Post graduate degree	1.54	.648
Income Levels	$15,000 to $25,000	1.98	.505
	$25,000 to $35,000	2.18	.459
	$35,000 to $50,000	2.71	.368
	$50,000 to $75,000	3.47	.288
	$75,000 to $100,000	3.15	.318
	$100,000 to $150,000	3.19	.314
	$150,000 to $200,000	1.75	.572
	$200,000 to $300,000	1.19	.839
	$300,000 or more	1.09	.913
Laid off during pandemic	Yes	1.33	.751
Emergency fund	Yes	1.36	.571
Homeownership	Yes	1.47	.679
Objective Financial Knowledge		1.36	.737
Subjective Financial Knowledge		1.25	.801
Financial Strain	Yes	1.50	.665
Subjective Credit Record	Bad	3.62	.276
	Average	4.57	.219
	Good	5.21	.192
	Very good	8.61	.116
Have money left	Rarely	2.36	.423
	Sometimes	3.22	.310
	Often	3.20	.313
	Always	4.00	.250
Average VIF		2.43	