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**Precautionary savings behavior during the COVID-19 pandemic: The role of health risk and financial challenges in the United States**

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**Abstract:**

The COVID-19 pandemic created unprecedented economic uncertainty, yet the relationship between health risk perceptions and precautionary household savings behavior remains poorly understood. This study examines how perceived health risks and financial hardship influenced precautionary savings behavior in the United States during the pandemic. Using data from the 2022 U.S. Survey of Consumer Finances (SCF), we applied the Health Belief Model framework to analyze 4,595 households through hierarchical logistic regression, controlling for demographic and economic factors. Financial hardship (OR = 1.45,  $p < .05$ ) and government assistance (OR = 1.41,  $p < .001$ ) significantly predicted precautionary savings behavior, while a direct COVID-19 diagnosis did not. Notably, Black households were 65.6% more likely to save for precautionary reasons than White households. In conclusion, economic vulnerability was a more potent driver of precautionary saving than direct health risk perception. The findings provide a framework for designing culturally responsive policies and financial products to strengthen household resilience.

**Keywords:**

financial resilience, Health Belief Model, precautionary savings, behavioral economics, COVID-19 financial behavior, government stimulus, racial wealth gap

**1. Introduction**

The COVID-19 pandemic exposed critical linkages between health shocks and financial decision-making in the United States, where readily available, free primary healthcare is not universally accessible and treatment expenses are considerable. While macroeconomic impacts were widely studied, less attention has been paid to how individual perceptions of health risks—

such as fear of infection or financial strain from medical costs—shaped microeconomic behaviors like precautionary savings. This gap is pivotal: understanding the relationship between health beliefs and financial actions can inform policies and business strategies to enhance resilience during crisis (Hausmann & Schetter, 2022; Pangallo et al., 2024; Roy et al., 2021).

Traditionally, economic models often treat health shocks as exogenous to financial decisions (Carroll, 1997). Yet behavioral evidence shows that perceptions of risk drive action (Liu & Menegatti, 2019; Warmath et al., 2022; French & Vigne, 2019). For instance, households receiving negative health news rapidly increase emergency savings while cutting long-term investments (Smith et al., 2001). The pandemic amplified this dynamic, creating simultaneous health and economic uncertainties that uniquely tested household preparedness (Bayer et al., 2023). With inflation, job instability, and medical costs rising, families faced stark trade-offs between consumption and precautionary saving—a behavior poorly captured by classical models. Similar patterns likely apply in other countries with comparable healthcare systems where health and financial vulnerabilities intersect.

This study adapts the Health Belief Model (HBM)—a framework from health psychology—to explain financial preparedness within the U.S. context. The HBM posits that behavior is driven by perceived susceptibility, severity, and “cues to action” (Rosenstock, 1974). We argue that precautionary savings during COVID-19 functioned as a financial analog to health prevention: households saved to mitigate perceived economic vulnerabilities, much as patients adhere to treatments to avoid illness. Prior research supports this lens; for example, perceived financial vulnerability predicts emergency savings (O'Neill et al., 2022), and pandemic-related health anxiety correlated with conservative financial behaviors (Warmath et al., 2022).

Using data from the 2022 U.S. Survey of Consumer Finances (SCF), we examine:

1. How perceived severity of COVID-19 (financial hardship) influenced savings.
2. Whether government assistance (a “cue to action”) increased precautionary savings.
3. How these patterns varied by race/ethnicity, reflecting historical disparities in risk exposure.

Our findings aim to guide financial institutions, policymakers, and businesses in designing interventions that address both health and economic vulnerabilities—a need highlighted by the

pandemic's lasting effects in healthcare systems characterized by high treatment costs and variable access.

## 1. Literature Review

Precautionary savings—defined as additional wealth accumulated to buffer against future uncertainties—has been extensively studied within economic literature (Carroll, 1997; Leland, 1968). While income uncertainty has traditionally been the primary focus, recent literature has expanded to consider health uncertainty as a distinct driver of precautionary behavior. Palumbo (1999) developed a life-cycle model incorporating uncertain health expenses, finding that precautionary motives against health costs lead to systematically higher savings rates throughout the life cycle. This theoretical prediction has been empirically validated by De Nardi et al. (2010), who demonstrated that uncertain medical expenses account for a substantial portion of savings among elderly Americans, particularly at higher income levels. Households rapidly adjust financial strategies after negative health diagnoses (Smith et al., 2001), with perceived severity of health conditions predicting larger shifts toward safer assets than objective medical indicators (Bogan & Fertig, 2022).

The COVID-19 pandemic created a unique natural experiment to examine precautionary savings under both income and health uncertainty. Studies found that savings rates surged during lockdowns beyond what income loss alone could explain (Coibion et al., 2020), with health concerns (e.g., fear of infection) independently predicting conservative financial behaviors. Similarly, Bayer et al. (2023) found that German households increased their desired savings rate by approximately 2.4 percentage points during the pandemic, with the effect strongest among those expressing health concerns. These findings suggest that perceived health risks—not just objective economic conditions—motivate precautionary saving.

Behavioral economists have increasingly recognized how health risk perceptions uniquely shape financial decisions. Building on prospect theory (Kahneman & Tversky, 1979), research reveals that people often weigh health risks differently than other financial risks when making economic choices. Picone et al. (2004) found that individuals with higher subjective probabilities of illness were significantly more likely to purchase health insurance and accumulate precautionary savings, even controlling for objective health status. This suggests perception, rather than reality alone, drives financial protection behaviors. Smith et al. (2001) demonstrated that new health information prompts immediate financial reallocation, with

households receiving negative health news increasing emergency savings while reducing long-term investments. This behavioral pattern was particularly pronounced among households with limited insurance coverage.

The application of the Health Belief Model (HBM) to financial decisions represents a promising interdisciplinary approach. Originally developed to explain health prevention behaviors, the HBM suggests that actions are motivated by perceived susceptibility, perceived severity, perceived benefits, perceived barriers, and cues to action (Janz & Becker, 1984; Rosenstock, 1974). O'Neill et al. (2022) recently adapted this framework to financial behaviors, demonstrating that perceived financial vulnerability (analogous to susceptibility) and potential severity of financial consequences significantly predicted engagement in protective financial actions such as emergency savings accumulation. During the COVID-19 pandemic, Cerami et al. (2020) found that perceived health vulnerability strongly influenced financial decisions, with individuals reporting greater COVID-19 concerns showing more conservative financial behaviors, including increased liquid savings and reduced discretionary spending. This relationship persisted after controlling for actual infection rates, suggesting the primacy of perception over objective risk in driving financial behavior.

Experiencing financial hardship has been shown to influence subsequent financial behavior through multiple psychological mechanisms, including increased risk awareness, financial trauma, and learned adaptive responses. While traditional economic theory might predict that financial constraints reduce saving capacity, behavioral evidence suggests more complex relationships. Empirical research by Skoufias (2003) on Mexican households facing economic shocks found that experience with financial hardship led to persistent changes in financial strategies, including increased precautionary savings during subsequent periods of stability. Similarly, Lusardi (1998) demonstrated that previous unemployment episodes significantly predicted higher savings rates even years after employment stabilized, suggesting long-lasting behavioral impacts of hardship experiences. More recent work by Asebedo and Wilmarth (2017) found that financial hardship experiences create psychological “scars” that manifest as more conservative financial behaviors—particularly increased emergency savings—even after controlling for current financial capabilities. During COVID-19 specifically, O'Connor et al. (2022) found that households experiencing pandemic-related financial hardship subsequently increased their savings rates when financial conditions stabilized, particularly if they attributed their hardship to insufficient preparation rather than external factors.

A growing body of research reveals significant racial and ethnic differences in how families approach saving and respond to financial risks (Clark et al., 2019). These variations likely reflect differential historical experiences with economic institutions, intergenerational wealth transfers, discriminatory policies, and persistent wealth gaps that shape risk perception and financial strategies. Gittleman and Wolff (2004) documented that Black households maintain higher saving rates than White households at comparable income levels, despite significantly lower absolute wealth levels. This pattern has been attributed to greater perceived economic vulnerability and reduced access to wealth-building mechanisms beyond personal savings. Francis and Weller (2021) demonstrated that Black and Hispanic households maintain higher liquid-to-illiquid asset ratios than White households with similar financial resources, suggesting stronger precautionary motives.

These differential saving patterns appear to be influenced by varying experiences with financial institutions. Blanchflower et al. (2003) documented persistent disparities in credit access across racial groups, with Black and Hispanic loan applicants experiencing higher rejection rates even after controlling for creditworthiness measures. Charron-Chénier and Seamster (2018) found that restricted access to financial products leads to compensatory financial strategies, including greater cash holdings and emergency savings among minority households. The COVID-19 pandemic intensified these patterns. Weller and Roberts (2021) documented greater increases in precautionary savings among Black and Hispanic households during the pandemic, despite these groups experiencing more severe economic impacts. Similarly, Chen et al. (2022) found that racial minorities reported greater financial anxiety during COVID-19 and subsequently engaged in more protective financial behaviors compared to White respondents with similar financial circumstances.

The relationship between government assistance and financial behavior represents another important dimension of household financial decision-making. Theoretical predictions about this relationship are ambiguous—government support could either crowd out private precautionary savings (by reducing perceived need) or complement such savings (by providing financial stability that enables saving). Hubbard et al. (1995) demonstrated that means-tested government programs can discourage asset accumulation among low-income households due to asset limits for program eligibility. However, more recent work by Halpern-Meekin et al. (2015) found that temporary government assistance through tax refunds often serves as a catalyst for precautionary savings among low-income families, creating “financial breathing room” that

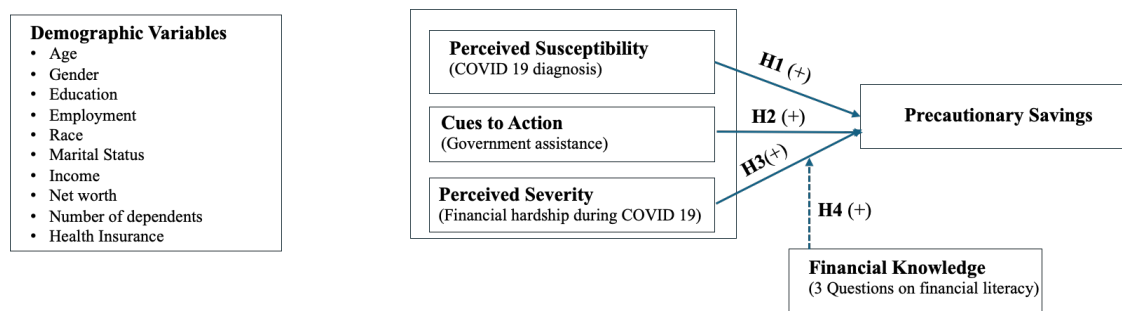
enables forward-looking financial behaviors. During COVID-19 specifically, Baker et al. (2020) analyzed banking data to track spending and saving behaviors following government stimulus payments, finding that liquidity-constrained households primarily used funds for immediate consumption while households with greater financial stability significantly increased savings rates. Supporting this interpretation, Chetty et al. (2022) found that enhanced unemployment benefits during the pandemic led to increased savings among recipients, particularly among households that had experienced previous episodes of financial hardship.

Beyond race and ethnicity, numerous demographic characteristics have been empirically linked to precautionary financial behaviors. Age demonstrates a non-linear relationship with precautionary motives—Kennickell and Lusardi (2005) found that precautionary savings peak during middle age, declining somewhat in later years as retirement savings motives become dominant. However, De Nardi et al. (2016) demonstrated that health-related precautionary motives specifically increase with age, particularly past age 70 when medical expense uncertainty grows. Education consistently predicts greater precautionary savings, even controlling for income and wealth. Lusardi (1998) found that college-educated households maintain larger precautionary buffers relative to income than less-educated households. Clark et al. (2019) demonstrated that this education effect operates partly through financial literacy, with higher education predicting greater understanding of financial risks and appropriate precautionary measures.

Employment stability, marital status, and household composition also shape precautionary motives. Benito (2006) documented substantially higher precautionary savings among the self-employed and those with variable income compared to those with stable employment. Fisher and Montalto (2010) found that single-parent households maintain higher precautionary savings relative to income than married households with children, despite having lower absolute resources, suggesting that the absence of a potential second earner increases perceived financial vulnerability. West and Mottola (2016) demonstrated that single women exhibit particularly strong precautionary motives, maintaining liquid assets approximately 9% higher than comparable single men. Household income and net worth demonstrate complex relationships with precautionary behaviors—while higher-income households maintain larger absolute precautionary reserves, Carroll et al. (2003) found that precautionary motives as a percentage of total savings actually decline with wealth, suggesting diminishing marginal utility of precautionary balances.

Based on the empirical literature reviewed above, we propose a conceptual framework that adapts the Health Belief Model to financial behavior during the COVID-19 pandemic (see Figure 1).

**Figure 1. Conceptual Model**



Source: Conceptual model modified from Health Belief Model, Rosenstock (1966)

Informed by the Health Belief Model and prior research, we hypothesize that:

**H1:** Perceived susceptibility—measured by having received a COVID-19 diagnosis—is positively associated with the likelihood of engaging in precautionary savings.

**H2:** Cues to action—operationalized as receiving government assistance during the COVID-19 pandemic—are positively associated with precautionary savings.

**H3:** Perceived severity—measured by the experience of financial hardship during COVID-19—is positively associated with precautionary savings.

**H4:** Financial knowledge moderates the relationship between perceived severity and precautionary savings, such that the positive association is stronger for individuals with higher financial knowledge.

The findings aim to contribute to understanding household financial resilience during crises and offer insights for financial professionals, policymakers, and business strategists

## 2. Methodology

### Data

We analyzed data from the 2022 U.S. Survey of Consumer Finances (SCF), a comprehensive national survey conducted every three years that captures detailed information about how American families manage their finances, along with their demographic characteristics and economic attitudes. The 2022 SCF was particularly valuable for this research due to its inclusion of COVID-19-specific questions addressing health impacts, financial hardships, and

government assistance received during the pandemic. The SCF employs multiple imputation techniques to handle missing data, generating five complete datasets (implicates) for each respondent. Our analytical sample consisted of 4,595 households, resulting in 22,975 observations across the five implicates. All analyses incorporated population weights to ensure national representativeness, with the weighted sample representing approximately 131 million U.S. households.

### *Measures*

The dependent variable, precautionary savings, was operationalized as a binary measure following established methodologies (Fisher & Anong, 2012; Fisher, 2010). Households were coded as “1” if they reported saving for unemployment, illness, medical expenses, emergencies, or liquidity needs, and “0” otherwise. This approach captures intentional precautionary saving motives distinct from other savings goals.

We constructed three key measures based on the Health Belief Model framework. To capture perceived susceptibility, we identified households where either the respondent or their spouse/partner had received a COVID-19 diagnosis. Perceived severity was operationalized as financial hardship related to medical expenses during the pandemic, with respondents coded as “1” if they reported delayed or unpaid medical bills. Cues to action were measured through receipt of government assistance, including stimulus payments, unemployment benefits, or PPP loans. Financial knowledge, the moderator variable, was constructed as a score (0–3) based on responses to three validated financial literacy questions assessing understanding of interest, inflation, and risk diversification (Angrisani et al., 2020).

Control variables included race/ethnicity (Non-Hispanic White as reference, plus Non-Hispanic Black, Hispanic, and Other Non-Hispanic categories), gender/marital status (married/partnered, single female, single male), age (continuous), education level, employment status, presence of children under 18, and health insurance coverage. Economic factors were addressed through log-transformed income and inverse hyperbolic sine-transformed net worth to accommodate skewed distributions and negative values.

### *Analytical Approach*

We employed hierarchical logistic regression analysis to examine factors associated with precautionary saving behavior. Model 1 established baseline relationships using only sociodemographic and economic control variables. Model 2 added the three HBM components (perceived susceptibility, perceived severity, and cues to action) while maintaining demographic controls. Model 3 extended this framework by incorporating financial knowledge and its interaction with perceived severity to test for moderation effects as hypothesized in H4.

All analyses were conducted using Stata software, with the multiple imputation structure of the SCF addressed through Rubin's rules for combining results across imputates. Model comparisons were performed using Wald tests for nested models to assess the significance of added variables. Diagnostic tests, including examination of variance inflation factors (VIF), confirmed the absence of problematic multicollinearity (all VIF < 5). The use of population weights throughout the analysis ensured that results remained representative of U.S. households.

Model 1:

$$\ln(P(Y=1)/P(Y=0)) = \beta_0 + \beta_1(\text{Race}) + \beta_2(\text{Age}) + \beta_3(\text{Gender/Marital\_Status}) + \beta_4(\text{Dependents}) + \beta_5(\text{Employment}) + \beta_6(\text{Education}) + \beta_7(\ln\_Income) + \beta_8(\text{ih\_NetWorth}) + \beta_9(\text{Has\_Insurance}) + \varepsilon$$

Model 2:

$$\ln(P(Y=1)/P(Y=0)) = \beta_0 + \beta_1(\text{COVID}) + \beta_2(\text{Financial\_Hardship}) + \beta_3(\text{Govt\_Assistance}) + \beta_4(\text{Race}) + \beta_5(\text{Age}) + \beta_6(\text{Gender/Marital\_Status}) + \beta_7(\text{Dependents}) + \beta_8(\text{Employment}) + \beta_9(\text{Education}) + \beta_{10}(\ln\_Income) + \beta_{11}(\text{ih\_NetWorth}) + \beta_{12}(\text{Has\_Insurance}) + \varepsilon$$

Model 3:

$$\ln(P(Y=1)/P(Y=0)) = \beta_0 + \beta_1(\text{COVID\_Diagnosed}) + \beta_2(\text{Financial\_Hardship}) + \beta_3(\text{Govt\_Assistance}) + \beta_4(\text{Race}) + \beta_5(\text{Age}) + \beta_6(\text{Gender\_Marital\_Status}) + \beta_7(\text{Children}) + \beta_8(\text{Employment\_Status}) + \beta_9(\text{Education}) + \beta_{10}(\ln\_Income) + \beta_{11}(\text{ih\_NetWorth}) + \beta_{12}(\text{Has\_Insurance}) + \beta_{13}(\text{Financial\_Knowledge}) + \beta_{14}(\text{Financial\_Hardship} \times \text{Financial\_Knowledge}) + \varepsilon$$

### 3. Results

#### *Descriptive Statistics*

The sample comprised 4,595 households from the 2022 SCF, with a mean age of 54.47 years ( $SD = 16.19$ ). Socioeconomic characteristics revealed a predominantly White (62.05%), married (63.22%), and educated sample (49.48% held at least a bachelor’s degree). Notably, 29.10% reported a COVID-19 diagnosis, 6.90% experienced pandemic-related medical financial hardship, and 12.14% received government assistance. Financial knowledge scores averaged 1.89 ( $SD = 0.92$ ) on a 0–3 scale. See Table 1 below for the descriptive statistics for the study sample.

**Table 1:** Descriptive Statistics of Study Sample (N = 4,595)

#### **Panel A: Continuous Variables**

| <b>Variable</b> | <b>Mean</b> | <b>SD</b> | <b>Min</b> | <b>Max</b> |
|-----------------|-------------|-----------|------------|------------|
| Age (years)     | 54.47       | 16.19     | 18.00      | 95.00      |
| Log Income      | 11.77       | 1.70      | 6.07       | 19.93      |
| Net Worth (IHS) | 12.02       | 6.81      | -13.92     | 22.19      |

#### **Panel B: Categorical Variables**

| <b>Variable</b>               | <b>Frequency</b> | <b>Per cent</b> |
|-------------------------------|------------------|-----------------|
| <b>Race/Ethnicity</b>         |                  |                 |
| White                         | 2,851            | 62.05           |
| Black/African American        | 718              | 15.63           |
| Hispanic/Latino               | 624              | 13.58           |
| Asian/Others                  | 402              | 8.75            |
| <b>Marital Status</b>         |                  |                 |
| Married/Partnered             | 2,905            | 63.22           |
| Single Female                 | 1,049            | 22.83           |
| Single Male                   | 641              | 13.95           |
| <b>Educational Attainment</b> |                  |                 |

|  |       |       |
|--|-------|-------|
| High School or Less                    | 1,335 | 29.05 |
| Some College/Associate                 | 986   | 21.46 |
| Bachelor's Degree                      | 1,182 | 25.72 |
| Graduate Degree                        | 1,092 | 23.76 |
| <b>Employment Status</b>               |       |       |
| Working                                | 2,973 | 68.81 |
| Unemployed/Laid-off                    | 189   | 4.11  |
| Retired                                | 1,059 | 23.05 |
| Disabled                               | 304   | 6.62  |
| Not in Labor Force                     | 70    | 1.52  |
| <b>Have dependents/children &lt;18</b> |       |       |
| Yes                                    | 1,382 | 30.0  |
| No                                     | 3,213 | 70.0  |
| <b>Have health insurance</b>           |       |       |
| Yes                                    | 4,305 | 93.7  |
| No                                     | 290   | 6.3   |
| <b>Health Belief Model Variables</b>   |       |       |
| Diagnosed with COVID-19                | 736   | 29.10 |
| Financial Hardship                     | 317   | 6.90  |
| Received Government Assistance         | 558   | 12.14 |

Source: U.S. Survey of Consumer Finance (SCF) 2022

Pearson correlations (see Table 2) showed no coefficients exceeding 0.50, and variance inflation factors (VIFs) were all below 5 (mean VIF = 2.16), indicating no multicollinearity concerns. Expected patterns emerged, such as positive correlations between income, net worth, and education (all  $p < .05$ ).

**Table 2.** Pearson Correlation Matrix of Study Variables

| Variable         | 1    | 2    | 3    | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 |
|------------------|------|------|------|---|---|---|---|---|---|----|----|----|----|----|----|
| 1. Log Income    | —    |      |      |   |   |   |   |   |   |    |    |    |    |    |    |
| 2. IHS Net Worth | .41* | —    |      |   |   |   |   |   |   |    |    |    |    |    |    |
| 3. Age           | .17* | .35* | —    |   |   |   |   |   |   |    |    |    |    |    |    |
| 4. Black         | .22* | .28* | .10* | — |   |   |   |   |   |    |    |    |    |    |    |

|                               |      |      |      |      |      |      |      |      |       |      |       |      |       |      |   |  |  |  |  |  |
|-------------------------------|------|------|------|------|------|------|------|------|-------|------|-------|------|-------|------|---|--|--|--|--|--|
| 5. Hispanic                   | .15* | .13* | .18* | .19* | —    |      |      |      |       |      |       |      |       |      |   |  |  |  |  |  |
| 6. Asian/Others               | .04* | .05* | .07* | .13* | .13* | —    |      |      |       |      |       |      |       |      |   |  |  |  |  |  |
| 7. Gender/Marital Status      | .38* | .37* | .09* | .27* | .05* | .08* | —    |      |       |      |       |      |       |      |   |  |  |  |  |  |
| 8. Education Category         | .38* | .25* | .05* | .18* | .31* | .14* | .22* | —    |       |      |       |      |       |      |   |  |  |  |  |  |
| 9. Employment Category        | .11* | 0    | .37* | 0    | .07* | .05* | .11* | .11* | —     |      |       |      |       |      |   |  |  |  |  |  |
| 10. Children in Household     | 0    | .09* | .42* | .02* | .14* | .07* | .12* | .05* | .21*  | —    |       |      |       |      |   |  |  |  |  |  |
| 11. COVID-19 Diagnosed        | .15* | .05* | .16* | .10* | .06* | .01* | .16* | .08* | .15*  | .15* | —     |      |       |      |   |  |  |  |  |  |
| 12. Financial Hardship        | .32* | .37* | .25* | .26* | .18* | .04* | .24* | .30* | -0.01 | .12* | -0.01 | —    |       |      |   |  |  |  |  |  |
| 13. Government Assistance     | .34* | .24* | .17* | .12* | .07* | .04* | .14* | .20* | -0.01 | .07* | .03*  | .19* | —     |      |   |  |  |  |  |  |
| 14. Has Insurance             | .17* | .15* | .19* | .07* | .17* | .04* | .09* | .21* | .09*  | .02* | .02*  | .19* | -0.01 | —    |   |  |  |  |  |  |
| 15. Financial Knowledge Score | .28* | .28* | .09* | .20* | .15* | .07* | .27* | .35* | .04*  | .04* | .08*  | .25* | .13*  | .13* | — |  |  |  |  |  |

Note. Coefficients are Pearson correlation coefficients. \*  $p < .05$ .

Source: U.S. Survey of Consumer Finance (SCF) 2022

### Hierarchical Analysis

The results of the hierarchical logistic regression analysis examining factors associated with precautionary saving behavior show three sequential models, with each model building upon the previous one to examine the effects of demographic factors, Health Belief Model variables, and financial knowledge as a potential moderator (See Table 3).

Our initial analysis of demographic factors alone revealed several important patterns in precautionary saving behavior. Age was negatively associated with precautionary saving ( $\beta = -0.015$ ,  $**p < .001$ ), indicating that for each additional year of age, the odds of engaging in precautionary saving decreased slightly (OR = 0.985). Race/ethnicity was a significant predictor. Compared to White households, Black households were significantly more likely to report precautionary saving motives ( $\beta = 0.505$ ,  $**p < .001$ ), corresponding to 65.6% higher odds (OR = 1.656). Higher educational attainment was also positively associated with precautionary saving. Compared to those with less than a high school education, households where the respondent had completed some college ( $\beta = 0.371$ ,  $*p < .01$ ; OR = 1.449) or held a college degree or higher ( $\beta = 0.431$ ,  $**p < .001$ ; OR = 1.539) showed significantly greater odds of precautionary saving behavior. Among employment categories, compared to those who were unemployed or laid off, retired individuals ( $\beta = 0.668$ ,  $*p < .01$ ; OR = 1.951) and disabled individuals ( $\beta = 0.564$ ,  $*p < .01$ ; OR = 1.757) were significantly more likely to report precautionary saving.

Model 2 incorporated Health Belief Model factors while controlling for demographic characteristics (Table 2). The significant relationships observed in Model 1 for age, Non-Hispanic Black race, education level, and retired/disabled status remained significant predictors after adding the HBM variables. Among the Health Belief Model factors added in Model 2, facing financial hardship ( $\beta = 0.047$ ,  $*p < .01$ ; OR = 1.048) and receiving government assistance (such as unemployment insurance, stimulus payments, or PPP loans) during the pandemic ( $\beta = 0.347$ ,  $**p < .001$ ) were significant positive predictors of precautionary saving behavior. Households that received government assistance had 41.4% higher odds of engaging in precautionary saving compared to those who did not receive such assistance. Being diagnosed with COVID-19 (representing perceived susceptibility in this model) did not show a significant direct relationship ( $p > .05$ ) with precautionary saving behavior in this step of the analysis.

Model 3 examined whether financial knowledge moderated the relationship between financial hardship and precautionary saving. When including the financial knowledge score and its interaction with financial hardship, the previously established relationships remained consistent. Age, Non-Hispanic Black race, education level, retired/disabled status, financial hardship and government assistance maintained their significant associations with precautionary saving. However, financial knowledge was not significant as a main effect ( $\beta = -0.014$ ,  $p = .838$ ) but the interaction between financial hardship and financial knowledge ( $\beta = 0.103$ ,  $p = .055$ ) was marginally significant. This suggests that while financial knowledge itself does not directly predict precautionary saving behavior in this sample, it marginally moderated the relationship between financial hardship and precautionary saving. It is noteworthy that the coefficient for financial hardship changed from a small positive value ( $\beta = 0.047$ ) in Model 2 to a larger negative value ( $\beta = -0.170$ ) in Model 3 when the interaction term was added.

Overall, these findings highlight the importance of demographic factors—particularly age, race, education, and retirement status—as well as government assistance in predicting precautionary saving behavior. The Health Belief Model provides support through the significance of perceived severity (financial hardship), cues to action (government assistance), and the moderation effect by financial knowledge.

**Table 3.** Hierarchical Logistic Regression Analysis for Variables Predicting Precautionary Saving Behavior

| Predictor                                      | Model 1   |          | Model 2   |          | Model 3   |          |
|--|-----------|----------|-----------|----------|-----------|----------|
|  | B         | OR       | B         | OR       | B         | OR       |
| <b>Sociodemographic Factors</b>                |           |          |           |          |           |          |
| Log Income                                     | -0.016    | 0.984    | 0.002     | 1.002    | 0.002     | 1.002    |
| IHS Net Worth                                  | 0.006     | 1.006    | 0.007     | 1.007    | 0.007     | 1.007    |
| Age  | -0.015*** | 0.985*** | -0.014*** | 0.986*** | -0.014*** | 0.986*** |
| Race/Ethnicity (ref: Non-Hispanic White)       |           |          |           |          |           |          |
| Non-Hispanic Black                             | 0.505***  | 1.656*** | 0.521***  | 1.684*** | 0.524***  | 1.688*** |
| Hispanic                                       | 0.162     | 1.176    | 0.168     | 1.183    | 0.171     | 1.186    |
| Other Race                                     | -0.148    | 0.862    | -0.119    | 0.887    | -0.121    | 0.886    |
| Gender/Marital Status (ref: Married/Partnered) |           |          |           |          |           |          |
| Single Male Head                               | -0.141    | 0.869    | -0.116    | 0.890    | -0.119    | 0.887    |
| Single Female Head                             | -0.066    | 0.937    | -0.052    | 0.949    | -0.050    | 0.952    |
| Education (ref: Less than HS)                  |           |          |           |          |           |          |
| HS Graduate                                    | 0.158     | 1.171    | 0.141     | 1.151    | 0.137     | 1.147    |
| Some College                                   | 0.371*    | 1.449*   | 0.372*    | 1.451*   | 0.362*    | 1.437*   |
| College Grad+                                  | 0.431**   | 1.539**  | 0.457**   | 1.579**  | 0.446**   | 1.563**  |
| Employment Status (ref: Unemployed/Laid Off)   |           |          |           |          |           |          |
| Employed/Attached                              | 0.320     | 1.378    | 0.302     | 1.353    | 0.300     | 1.350    |
| Retired  | 0.668**   | 1.951**  | 0.646**   | 1.908**  | 0.647**   | 1.910**  |
| Disabled                                       | 0.564*    | 1.757*   | 0.549*    | 1.731*   | 0.546*    | 1.727*   |
| Other OLF                                      | -0.403    | 0.668    | -0.368    | 0.692    | -0.371    | 0.690    |
| Children in Household                          | -0.156    | 0.855    | -0.168    | 0.845    | -0.168    | 0.846    |
| Has Health Insurance                           | -0.046    | 0.955    | -0.082    | 0.921    | -0.090    | 0.914    |
| <b>Health Belief Model Factors</b>             |           |          |           |          |           |          |
| COVID-19 Diagnosed                             |           |          | 0.066     | 1.069    | 0.064     | 1.066    |
| Financial Hardship                             |           |          | 0.047*    | 1.048*   | -0.170*   | 0.844*   |
| Government Assistance                          |           |          | 0.347***  | 1.414*** | 0.346***  | 1.413*** |
| <b>Moderator</b>                               |           |          |           |          |           |          |
| Financial Knowledge Score                      |           |          |           |          | -0.014    | 0.986    |
| Financial Hardship × Financial Knowledge       |           |          |           |          | 0.103*    | 1.109*   |
| Constant                                       | 0.063     | 1.065    | -0.525    | 0.592    | -0.463    | 0.629    |

Note. N = 4,595. OR = odds ratio. \*p < .05. \*\*p < .01. \*\*\*p < .001.

Source: U.S. Survey of Consumer Finance (SCF) 2022

### *Model fit statistics*

To assess whether the addition of variables in each model significantly improved model fit, Wald tests were conducted to evaluate the joint significance of added variables across successive models. The initial model (Model 1) with sociodemographic factors was statistically significant ( $F(17, \infty) = 3.20, p < .001$ ), indicating that demographic factors collectively helped predict precautionary saving behavior.

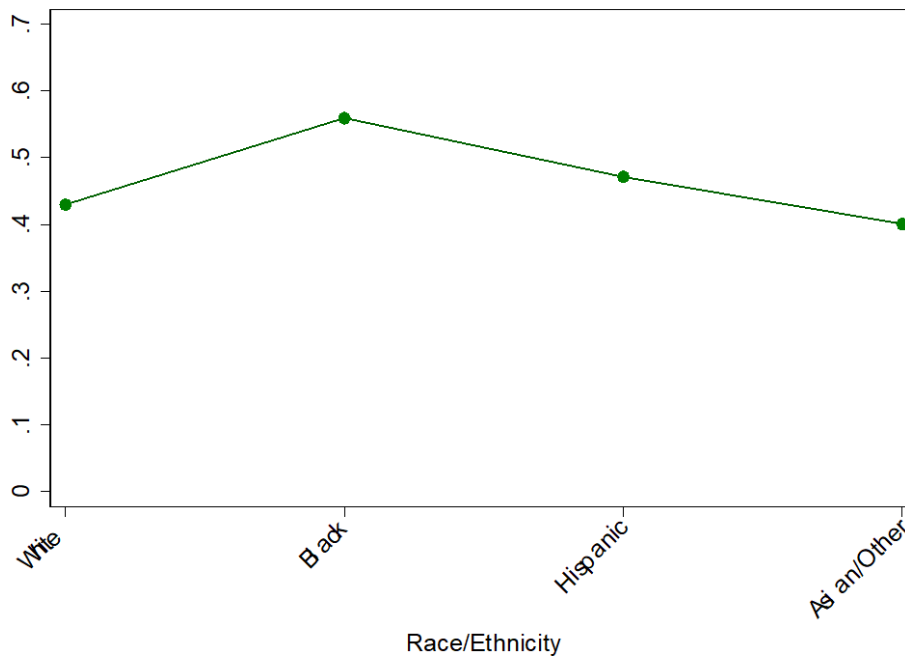
The addition of Health Belief Model factors in Model 2 significantly improved model fit, as indicated by a significant Wald test for the joint effect of COVID-19 diagnosis, financial hardship, and government assistance ( $F(3, \infty) = 4.14, p = .006$ ). This provides evidence that the Health Belief Model factors, when considered together, made a significant contribution to explaining variation in precautionary saving behavior beyond demographic factors alone. The overall model fit for Model 2 was also significant ( $F(20, \infty) = 3.38, p < .001$ ).

In contrast, the addition of financial knowledge as a moderator in Model 3 did not significantly improve model fit. The Wald test for the joint contribution of financial knowledge score and its interaction with financial hardship was marginally significant ( $F(2, \infty) = 0.65, p = .055$ ). This finding indicates that the addition of financial knowledge as a potential moderator did not significantly improve model fit beyond what was already explained by Model 2, suggesting that these variables did not contribute significantly to the prediction of precautionary saving behavior beyond what was already explained by the variables in Model 2. Nevertheless, the overall model remained significant ( $F(22, \infty) = 3.12, p < .001$ ). The Area Under the Curve (AUC = 0.62) for Model 2 also indicated moderate discriminative ability, acceptable for behavioral prediction models in complex social contexts. Based on these model comparison tests and applying the principle of parsimony, Model 2 represents the most efficient model for explaining precautionary saving behavior in this sample. The analysis revealed three key findings in the study. First, perceived susceptibility (operationalized in the model as having a COVID diagnosis), showed no significant influence on precautionary savings. Therefore, H1, was not supported. Second, experiencing perceived severity, measured as households who faced financial hardship, significantly predicted precautionary savings ( $\beta = 0.047, *p < .01$ ), suggesting that economic vulnerability motivates financial preparedness. This finding provides clear support for H2. Third, reflecting cues to action within the Health Belief Model, receiving government assistance (e.g., UI, stimulus, PPP) also showed a statistically significant positive

association with precautionary savings ( $\beta = 0.347$ ,  $**p < .001$ ), corresponding to higher odds of saving among recipients compared to non-recipients.

In addition, predicted probability graphs were created based on the regression model to visualize key relationships and perform robustness check.

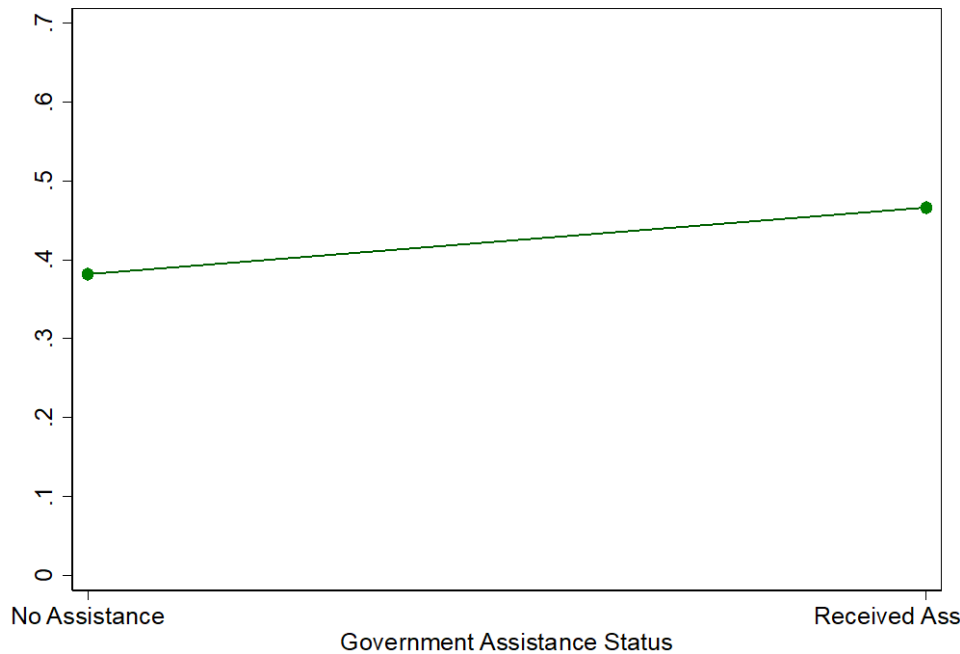
**Figure 2:** Predicted Probability of Precautionary Saving by Race/Ethnicity



Source: U.S. Survey of Consumer Finance (SCF) 2022

Substantial differences emerge in the predicted probability of precautionary saving across racial and ethnic groups, even after accounting for socioeconomic covariates. Black households exhibit a notably higher predicted probability (~56%) relative to White households (~41%), consistent with prior research indicating stronger precautionary saving motives among Black households, and potentially reflecting adaptive strategies to perceived economic vulnerability or long-standing structural barriers to wealth accumulation. Hispanic households display a slightly higher probability (~44%) than White households; however, this difference is not statistically significant. Asian and other racial/ethnic groups show similar probabilities to White households (~39%). These persistent differences, independent of socioeconomic controls, may reflect differential perceptions of financial risk or varied historical experiences with income volatility. The findings underscore the importance of culturally informed financial policies aimed at enhancing economic resilience in diverse communities.

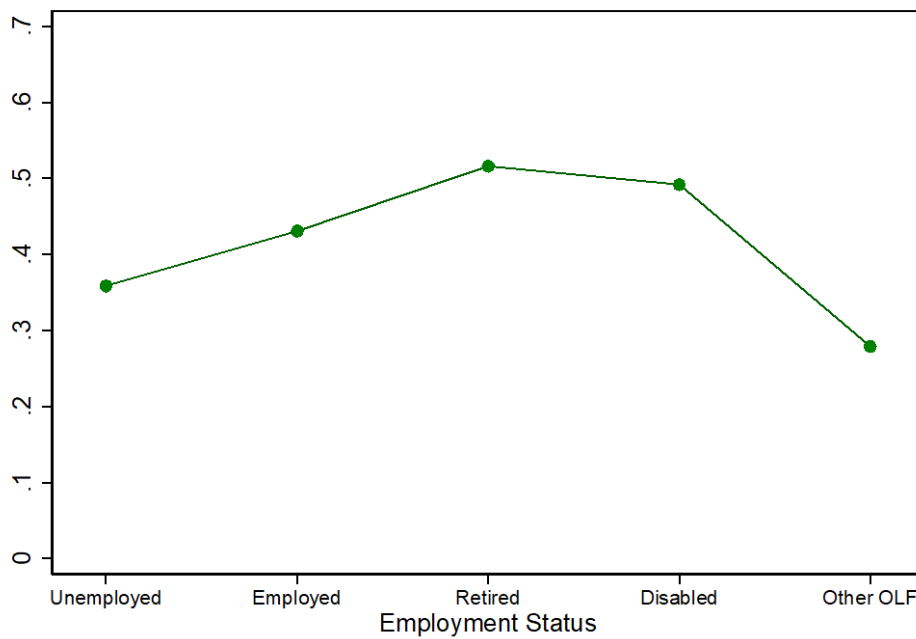
**Figure 3:** Predicted Probability of Precautionary Saving by Government Assistance



Source: U.S. Survey of Consumer Finance (SCF) 2022

Receipt of government assistance during the COVID-19 pandemic—such as unemployment insurance, stimulus checks, or Paycheck Protection Program (PPP) funds—is significantly associated with a higher predicted probability of precautionary saving, net of other factors. Households receiving assistance demonstrated a predicted probability of ~46%, compared to ~37% among non-recipients, representing a statistically significant 9 percentage-point difference ( $\beta = 0.347, p < .001$ ). These findings align with the Health Belief Model’s concept of “cues to action,” suggesting that receipt of financial assistance served as a prompt for savings behavior. This supports existing literature indicating that portions of pandemic-related stimulus payments were saved rather than spent. Potential mechanisms include increased liquidity for financially constrained households, heightened awareness of economic fragility, or differential treatment of lump-sum (“windfall”) income. Contrary to traditional economic models positing that public transfers may crowd out private saving, these results suggest that, under conditions of heightened uncertainty, government aid can complement and even encourage precautionary saving. This underscores the potential for well-designed assistance programs to promote prudent financial behavior during economic crises.

**Figure 4:** Predicted Probability of Precautionary Saving by Employment Status



Source: U.S. Survey of Consumer Finance (SCF) 2022

Precautionary saving behavior also varies significantly by employment status after adjusting for covariates. Retired individuals (~52%) exhibit the highest predicted probabilities of saving, significantly exceeding those of unemployed or laid-off individuals (~35%). Employed individuals fall in the middle range, while those categorized as “Other/Out of Labor Force” (e.g., students, homemakers) have the lowest predicted probabilities. These results support existing research suggesting that labor market status meaningfully shapes saving motives. The elevated likelihood of saving among retired and disabled individuals may reflect concerns over healthcare costs, fixed income dependency, or broader reassessments of financial security. Conversely, the lower likelihood among individuals outside the labor force may be attributable to limited resources or alternative financial priorities. These findings suggest that financial education and policy interventions should be tailored to employment contexts, particularly to support savings behavior among groups facing heightened economic vulnerability.

#### 4. Discussion and conclusions

Applying the Health Belief Model (HBM), this study explored how pandemic-induced financial hardship and government assistance influenced precautionary savings behavior among U.S. households. Our findings emphasize that economic vulnerability—as captured by financial

hardship—proved a more potent motivator of precautionary savings than direct health risks (COVID-19 diagnosis). This aligns with behavioral theories indicating that tangible economic threats often weigh more heavily in financial decision-making than abstract health risks during crises. The significant role of government assistance as a “cue to action” ( $OR = 1.414, p < .001$ ) further illuminates how policy interventions can catalyze financial resilience by providing liquidity and amplifying risk awareness. These insights challenge conventional assumptions that government aid crowds out private savings, instead highlighting its complementary role during systemic shocks.

Notably, racial disparities in precautionary saving persisted even after controlling for socioeconomic factors. Black households demonstrated 65.6% higher odds of precautionary saving than White households, a pattern reflecting adaptive financial behaviors rooted in historical inequities and heightened perceptions of economic vulnerability. This finding underscores the need for culturally responsive financial services that acknowledge these distinct saving patterns. For instance, product design could be informed by successful international models such as India’s JAM trinity, which combined digital infrastructure with targeted benefits, or Mexico’s BANSEFI program, which paired financial education with government transfers to boost savings. Financial institutions could also integrate resilience screenings into client assessments, identifying opportunities to tailor advice and products to demographic-specific needs.

The study’s null finding for COVID-19 diagnosis (H1) indicates that direct health perceptions may not independently drive financial behavior without accompanying economic consequences. However, the marginally significant moderating role of financial knowledge suggests that literacy programs could potentially amplify the link between hardship and preparedness. This aligns with prior work showing that education enhances risk comprehension and adaptive financial strategies (Lusardi & Mitchell, 2014; Lusardi et al., 2021).

In conclusion, the COVID-19 pandemic clearly revealed the inextricable link between health crises and financial behavior. Our findings highlight that preparedness is not merely a function of wealth but is shaped by lived experiences of hardship, institutional trust, and access to stabilizing resources like government aid. For businesses and policymakers, this suggests a dual mandate: developing products that address demographic-specific vulnerabilities and advocating for policies that mitigate systemic inequities. By integrating financial resilience into crisis

planning, institutions can better serve diverse populations while contributing to broader economic stability—a lesson with enduring relevance for future shocks.

## **5. Limitations and future research**

### **Limitations**

This study has several limitations. First, its reliance on the cross-sectional design of the 2022 SCF prohibits the establishment of causal relationships. While our analysis identifies strong associations between financial hardship, government assistance, and precautionary savings, we cannot definitively conclude that these factors caused the observed saving behavior. Longitudinal data would be necessary to track changes in household savings over time in direct response to specific events. Second, our measures for key HBM constructs are based on survey responses and may be subject to recall bias. For instance, self-reported financial hardship captures a household's subjective experience but may not perfectly align with objective financial metrics. Finally, while the SCF is a high-quality, nationally representative dataset, the findings are specific to the U.S. context and may not be generalizable to countries with different healthcare systems, social safety nets, and cultural norms around saving.

### **Future research**

Several key areas warrant further investigation. First, longitudinal studies could assess the long-term efficacy of integrated health-financial products, particularly their return on investment across diverse demographic segments. Second, research should explore how digital tools (e.g., fintech platforms) might scale financial services during crises, especially in resource-constrained settings where traditional banking infrastructure is limited. Third, future studies should explore additional sociocultural factors that may influence saving behaviors, such as religious affiliation, formative financial experiences during upbringing, and geographic location (e.g., urban versus rural settings), to provide a more nuanced understanding of financial decision-making. Finally, comparative analyses of public-private partnerships could identify best practices for fostering financial resilience, bridging gaps between policy design and market realities. Such work would inform both business strategies and policymaking in an era of compounding health and economic uncertainties.

## References

- Angrisani, M., Burke, J., Lusardi, A., & Mottola, G. (2020). The stability and predictive power of financial literacy: Evidence from longitudinal data. (NBER Working Paper No.w28125). *National Bureau of Economic Research*. <https://www.nber.org/papers/w28125>
- Asebedo, S. D., & Wilmarth, M. J. (2017). Does how we feel about financial strain matter for mental health? *Journal of Financial Therapy*, 8(1), 5. <https://doi.org/10.4148/1944-9771.1130>
- Baker, S. R., Farrokhnia, R. A., Meyer, S., Pagel, M., & Yannelis, C. (2020). Income, liquidity, and the consumption response to the 2020 economic stimulus payments. *National Bureau of Economic Research Working Paper* No. w27097. <https://doi.org/10.3386/w27097>
- Bayer, C., Born, B., Luetticke, R., & Müller, G. J. (2023). The coronavirus stimulus package: How large is the transfer multiplier. *The Economic Journal*, 133(652), 1318-1347.
- Benito, A. (2006). Does job insecurity affect household consumption? *Oxford Economic Papers*, 58(1), 157-181. <https://doi.org/10.1093/oep/gpi041>
- Blanchflower, D. G., Levine, P. B., & Zimmerman, D. J. (2003). Discrimination in the small business credit market. *Review of Economics and Statistics*, 85(4), 930-943. <https://doi.org/10.1162/003465303772815835>
- Bogan, V. L., & Fertig, A. R. (2022). Health shocks and portfolio choices: Evidence from medical expenditures of the elderly. *Journal of Financial Economics*, 144(3), 929-945. <https://doi.org/10.1016/j.jfineco.2022.05.005>
- Carroll, C. D. (1997). Buffer-stock saving and the life cycle/permanent income hypothesis. *Quarterly Journal of Economics*, 112(1), 1-55. <https://doi.org/10.1162/003355397555109>
- Carroll, C. D., Dynan, K. E., & Krane, S. D. (2003). Unemployment risk and precautionary wealth: Evidence from households' balance sheets. *Review of Economics and Statistics*, 85(3), 586-604. <https://doi.org/10.1162/003465303322369740>
- Cerami, C., Santi, G. C., Galandra, C., Dodich, A., Cappa, S. F., Vecchi, T., & Crespi, C. (2020). Covid-19 outbreak in Italy: are we ready for the psychosocial and the economic crisis? Baseline findings from the PsyCovid study. *Frontiers in psychiatry*, 11, 556-605.

Charron-Chénier, R., & Seamster, L. (2018). Does debt-free college work? An evaluation of the Kalamazoo Promise on financial aid decisions and degree completion. *Research in Higher Education*, 59(8), 1117-1152. <https://doi.org/10.1007/s11162-018-9501-7>

Chetty, R., Friedman, J. N., Hendren, N., Stepner, M., & The Opportunity Insights Team. (2022). The economic impacts of COVID-19: Evidence from a new public database built using private sector data. *Quarterly Journal of Economics*, 137(2), 1107-1146. <https://doi.org/10.1093/qje/qjac006>

Clark, R., Lusardi, A., & Mitchell, O. S. (2019). Financial fragility during the COVID-19 pandemic. *NBER Working Paper* No. 28207. <https://doi.org/10.3386/w28207>

Coibion, O., Gorodnichenko, Y., & Weber, M. (2020). Labor markets during the COVID-19 crisis: A preliminary view. *NBER Working Paper* No. 27017. <https://doi.org/10.3386/w27017>

De Nardi, M., French, E., & Jones, J. B. (2010). Why do the elderly save? The role of medical expenses. *Journal of Political Economy*, 118(1), 39-75. <https://doi.org/10.1086/651674>

De Nardi, M., French, E., & Jones, J. B. (2016). Savings after retirement: A survey. *Annual Review of Economics*, 8, 177-204. <https://doi.org/10.1146/annurev-economics-080315-015127>

Fisher, P. J. (2010). Income uncertainty and household saving in the United States. *Family and Consumer Sciences Research Journal*, 39(1), 57-74. <https://doi.org/10.1111/j.1552-3934.2010.02045.x>

Fisher, P. J., & Montalto, C. P. (2010). Effect of saving motives and horizon on saving behaviors. *Journal of Economic Psychology*, 31(1), 92-105.

Fisher, P., & Anong, S. (2012). Relationship of saving motives to saving habits. *Journal of Financial Counselling and Planning*, 23(1), 63-79.

French, D., & Vigne, S. (2019). The causes and consequences of household financial strain: A systematic review. *International Review of Financial Analysis*, 62, 150–156. <https://doi.org/10.1016/j.irfa.2018.09.008>

Gittleman, M., & Wolff, E. N. (2004). Racial differences in patterns of wealth accumulation. *Journal of Human Resources*, 39(1), 193-227. <https://doi.org/10.2307/3559010>

- Halpern-Meekin, S., Edin, K., Tach, L., & Sykes, J. (2015). *It's not like I'm poor: How working families make ends meet in a post-welfare world*. University of California Press.
- Hausmann, R., & Schetter, U. (2022). Horrible trade-offs in a pandemic: Poverty, fiscal space, policy, and welfare. *World Development*, 153, 105819.
- Hubbard, R. G., Skinner, J., & Zeldes, S. P. (1995). Precautionary saving and social insurance. *Journal of Political Economy*, 103(2), 360-399. <https://doi.org/10.1086/261987>
- Janz, N. K., & Becker, M. H. (1984). The Health Belief Model: A decade later. *Health Education Quarterly*, 11(1), 1-47. <https://doi.org/10.1177/109019818401100101>
- Kahneman, D., & Tversky, A. (1979). Prospect theory: An analysis of decision under risk. *Econometrica*, 47(2), 263-291. <https://doi.org/10.2307/1914185>
- Kennickell, A., & Lusardi, A. (2005). Disentangling the importance of the precautionary saving motive. *NBER Working Paper No. 10888*. <https://doi.org/10.3386/w10888>
- Leland, H. E. (1968). Saving and uncertainty: The precautionary demand for saving. *Quarterly Journal of Economics*, 82(3), 465-473. <https://doi.org/10.2307/1879518>
- Liu, D., & Menegatti, M. (2019). Optimal saving and health prevention. *Journal of Economics*, 128, 177-191. <https://doi.org/10.1007/s00712-018-00652-6>
- Lusardi, A. (1998). On the importance of the precautionary saving motive. *American Economic Review*, 88(2), 449-453.
- Lusardi, A., & Mitchell, O. S. (2014). The economic importance of financial literacy: Theory and evidence. *Journal of Economic Literature*, 52(1), 5-44.
- Lusardi, A., Hasler, A., & Yakoboski, P. J. (2021). Building financial resilience: Lessons from international experience. *TIAA Institute and the Global Financial Literacy Excellence Center*. <https://doi.org/10.1007/s11299-020-00246-0>
- O'Connor, M., Greenwood, C. J., Letcher, P., Giallo, R., Priest, N., Goldfeld, S., & Olsson, C. A. (2022). Inequalities in the distribution of COVID-19-related financial difficulties for Australian families with young children. *Child: Care, Health and Development*, 48(6), 1040-1051.

O'Neill, B., Sorhaindo, B., Xiao, J. J., & Garman, E. T. (2022). Financially distressed consumers: Their financial practices, financial well-being, and health. *Financial Counseling and Planning*, 16(1), 73-87.

Palumbo, M. G. (1999). Uncertain medical expenses and precautionary saving near the end of the life cycle. *Review of Economic Studies*, 66(2), 395-421. <https://doi.org/10.1111/1467-937X.00092>

Pangallo, M., Aleta, A., del Rio-Chanona, R. M., Pichler, A., Martín-Corral, D., Chinazzi, M., & Farmer, J. D. (2024). The unequal effects of the health–economy trade-off during the COVID-19 pandemic. *Nature Human Behaviour*, 8(2), 264-275.

Picone, G., Uribe, M., & Wilson, R. M. (2004). The effect of uncertainty on the demand for medical care, health capital and wealth. *Journal of Health Economics*, 17(2), 171-185. [https://doi.org/10.1016/s0167-6296\(97\)00028-3](https://doi.org/10.1016/s0167-6296(97)00028-3)

Rosenstock, I. M. (1966). Why people use health services. *The Milbank Memorial Fund Quarterly*, 44(3), 94-127.

Rosenstock, I. M. (1974). Historical origins of the Health Belief Model. *Health Education Monographs*, 2(4), 328-335. <https://doi.org/10.1177/1090198174002004>

Roy, S., Dutta, R., & Ghosh, P. (2021). Towards dynamic lockdown strategies controlling pandemic spread under healthcare resource budget. *Applied Network Science*, 6, 1-15.

Skoufias, E. (2003). Economic crises and natural disasters: Coping strategies and policy implications. *World Development*, 31(7), 1087-1102. [https://doi.org/10.1016/S0305-750X\(03\)00069-X](https://doi.org/10.1016/S0305-750X(03)00069-X)

Smith, V. K., Taylor, D. H., Sloan, F. A., Johnson, F. R., & Desvousges, W. H. (2001). Do smokers respond to health shocks? *Review of Economics and Statistics*, 83(4), 675-687. <https://doi.org/10.1162/003465301753237759>

Warmath, D., O'Connor, G. E., Newmeyer, C., & Wong, N. (2022). Have I saved enough to social distance? The role of household financial preparedness in public health response. *Journal of Consumer Affairs*, 56(1), 319-338. <https://doi.org/10.1111/joca.12410>

Weller, C. E., & Roberts, L. (2021). Eliminating the Black-white wealth gap is a generational challenge. *Center for American Progress*, March 19, 2021.

West, S., & Mottola, G. (2016). A population on the brink: American renters, emergency savings, and financial fragility. *Poverty & Public Policy*, 8(1), 56-71.

<https://doi.org/10.1002/pop4.130>