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The early impacts of the coronavirus pandemic on Americans' economic security

1. Introduction

In early March 2020, the World Health Organization declared the COVID-19 outbreak a pandemic. In addition to the serious public health risk, the pandemic has had enormous effects on the U.S. economy due to governmental mandates temporarily closing businesses and schools, and individuals remaining home due to fears of infection (Goolsbee and Syverson, 2021). Weekly unemployment claims skyrocketed to 3.3 million in the third week of March 2020, more than four times the previous weekly record, then doubled to 6.6 million the next week (Department of Labor, 2020).

Marco Angrisani
University of Southern California, Center for Economic and Social Research

Jeremy Burke
University of Southern California, Center for Economic and Social Research

Arie Kapteyn
University of Southern California, Center for Economic and Social Research

There are reasons to be concerned that the first wave of the pandemic may have had serious negative repercussions on many Americans' financial stability, especially in light of recent empirical evidence documenting households' limited ability to weather unexpected financial shocks. The Federal Reserve Board's 2018 Survey of Household Economics and Decisionmaking found that 39% of households were unable to cover a $400 unexpected expense with cash or a cash equivalent. Limited household savings coupled with the large, negative shock to employment, as well as reduced time available for labor due to increased childcare demands (Zamarro and Prados, 2020), may have placed considerable strain on many households' financial situations. In addition, the serious public health risk, uncertainty about the duration of the pandemic, and its possibility for recurrence in the future may have caused difficulties in planning and budgeting.

In response to concerns about the pandemic's possible adverse impacts on households' financial stability, policymakers passed legislation providing many individuals with Economic Impact Payments (the first round of which was distributed starting in April and May 2020) and expanded and increased unemployment benefits. This policy response may have meaningfully blunted some of the negative effects of the pandemic on American's economic security—recent research suggests that the policies may have been effective in offsetting reductions in income and spending (Cox et al., 2020; Han, Meyer, and Sullivan, 2020).

In this paper, we use longitudinal survey data from a nationally representative internet panel, the Understanding America Study, to examine the early impacts of the pandemic, and policy responses, on Americans' financial stability, financial well-being, and financial behavior. Our primary analysis sample consists of three annual surveys fielded in May 2018, 2019, and 2020, spanning the onset of the COVID-19 pandemic. Our data measure respondents' financial situations in detail, including information on employment, income, spending, saving, debt accumulation, subjective financial well-being, financial fragility, retirement savings, and financial stress. We couple this with additional surveys eliciting subjective retirement preparation and Social Security retirement benefits claiming intentions, before and during the pandemic.

We find that rather than experiencing large declines, Americans' financial stability *improved*, on average, early after the onset of the pandemic. In particular, we observe increases both in subjective measures, like financial satisfaction, and more objective measures, like financial fragility and savings behavior and balances. Moreover, individuals who were more economically vulnerable in the pre-pandemic period—those with lower incomes and financial literacy and those struggling with debt burdens or having difficulty making ends meet—experienced more substantial improvements in their financial situation during the pandemic than their better-off counterparts. We find evidence that much of the improvement, both overall and differential, was driven by the stimulus, which was more impactful for those who were more economically vulnerable. Rather than simply help prevent widening inequality in financial stability, the governmental policy response may have helped close the gap, at least early in the life of the pandemic. While we find that Americans' current financial situation improved during the pandemic, we observe little difference in retirement savings behavior or security, suggesting these early effects may not translate into improved retirement outcomes in the future.

The remainder of the paper proceeds as follows. Section 2 briefly describes the data used for this study and presents summary statistics. Section 3 presents year-over-year changes in descriptive statistics, our empirical approach, main results, and analyses of heterogeneity. Section 4 concludes.

2. Data and sample characteristics

We draw our data from the Understanding America Study (UAS) panel. The UAS is a nationally representative, probability-based internet panel that longitudinally tracks a U.S. representative sample of over 9,000 adults. Panel members are recruited exclusively through Address Based Sampling and receive a tablet and broadband access (and related training) if they do not have internet access. This mitigates selection problems facing convenience panels, where respondents are recruited from existing internet users. The UAS contains a very large set of background characteristics for all panel members, including demographic (e.g., age, gender, race, education), financial (e.g., income, financial literacy), health (e.g., self-assessed health), personality traits (the big five) and cognition measures (e.g., number series, propositional analogies, picture vocabulary).

Since 2018, more than 4,000 panel members have completed annual surveys tracking their financial lives in detail as part of the U.S. Financial Health Pulse

project.[1] The third wave was fielded in late April/early May 2020, after the onset of the COVID-19 pandemic. These longitudinal data contain repeated measures of subjective financial well-being (particularly financial satisfaction) and numerous indicators of economic security and financial distress. These include, but are not limited to, employment and income shocks, spending and saving behavior, debt accumulation and levels, financial fragility (e.g., inability to cover a $400 emergency expense with a cash equivalent; months of expenditure covered by savings), retirement saving behaviors, and financial stress. We restrict our analysis sample to individuals who completed all three waves of the surveys, though results are qualitatively unchanged when including all survey responses.

We augment this series of three annual surveys with additional modules fielded in the UAS that measure respondents' knowledge about Social Security programs and benefits. As a part of these surveys, individuals are asked to self-assess how financially well prepared they are for retirement on a four-point scale. Those who have not yet claimed their Social Security retirement benefits report the age at which they intend to claim. Three waves of these surveys have been fielded – one in 2015/2016, one in 2017/2018, and one at the beginning in April 2020 that remains open until August 2021.

Table 1 presents sample summary statistics in 2018, the first wave of surveys in our primary analysis sample. Over 3,700 respondents completed all three waves of the survey. Average age in the sample is 51 years, 57 percent of the sample identifies as female, and 86 percent of respondents are White. A little less than a quarter of the sample has a high school education or less; approximately 40 percent has completed some college or received an associate degree, with the remainder completing a bachelor's degree or more. There is considerable variation in household income, with approximately a quarter of the sample in each income bracket: below $30,000, between $30,000 and $60,000, between $60,000 and $100,000, and $100,000 or more per year. Approximately 62 percent of our respondents indicated that they were working at the time of the survey, and 15 percent claimed to be in "fair" or "poor" health.

3. Results

a. Year-over-year descriptive statistics

Table 2 presents levels of some key variables of interest in each year of our data. Relative to prior years, there is a notable increase in financial satisfaction (measured on a five-point scale from "Not at all satisfied" to "Extremely satisfied") in 2020, after the onset of the COVID-19 pandemic. In particular, relative to 2019, financial satisfaction increased by 0.1 points in 2020. We observe a similar, relatively large reduction in financial stress over time. Between consecutive years, the fraction of respondents indicating that they are experiencing either a "moderate" or "high" amount of stress due to their financial situation drops by four percentage points, from 42 percent in 2018 to 34 percent in 2020. Financial fragility—an inability to cover an unexpected $400 expense with cash or a cash-equivalent—remains relatively constant over time, dropping slightly to 40 percent of the sample in 2020 from 42 percent in 2019. We also observe an increase in savings activity. The fraction of respondents who indicate that they are currently saving increased seven percentage points between 2019 and 2020, from 74 percent to 81 percent. The observed boost in saving is driven primarily by activity in liquid accounts (checking or savings accounts, cash, other non-retirement account saving or investing), with 79 percent of respondents indicating that they were saving in liquid accounts in 2020 relative to 71 percent in 2019. On the other hand, we see little difference in saving activity in retirement accounts (employer-sponsored retirement accounts or IRAs) across our study years.

The improvement in financial situation is especially notable considering the substantial decrease in labor force participation amongst our sample. Mirroring the national experience, there was a substantial drop of approximately 6 percentage points (10 percent) in the fraction of our respondents who were working in 2020 relative to 2019.

Table 3 describes the distribution of savings and debt balances across years. The bottom end of the liquid account balance distribution saw increases in 2020 relative to prior years. In particular, balances at the 25th percentile nearly doubled in 2020, to a little less than $1,000, relative to prior years. Balances at the upper end of the distribution fell somewhat instead, decreasing approximately 15 percent between 2019 and 2020. Removing other savings and investing and

1 https://finhealthnetwork.org/programs-and-events/financial-health-pulse/

focusing strictly on checking and savings balances, we see similar patterns. The 25th percentile of checking and savings balances increased nearly 70 percent between 2019 and 2020; the median was also notably higher in 2020 relative to 2019 by about $750 (25 percent), while the 75th percentile exhibited little or no change. The comparison of liquid account and checking/savings balances suggests that the decrease in liquid account balances in the top end of the distribution is driven by a decrease in the value of non-retirement investment accounts. This may be partly due to reductions in the stock market, which had not yet fully recovered from a precipitous decline in March 2020 at the time our respondents completed their surveys.[2] In line with this argument, retirement account balances also dropped substantially (at the median and above) between 2019 and 2020, a phenomenon attributable to falling stocks' values and, to a lesser extent, respondents drawing down their retirement wealth in the early months of the pandemic.[3] Table 3 also explores debt levels across our window of observation. Relative to 2019, both total debt and non-mortgage debt increased by around 20 percent at the median in 2020. Credit card borrowing is less pervasive in our sample (median level of credit card debt is zero in all years), though it remained relatively constant at the 75th percentile between 2019 and 2020.

b. Empirical approach and regression results

We exploit the longitudinal nature of our data to estimate individual fixed effects regressions of the following form:

$$(1)\quad Y_{it} = \alpha + \beta X_{it} + \phi_i + \gamma_t + \varepsilon_{it}$$

where Y_{it} captures an outcome of interest for individual i in year t, X_{it} is a vector of (time-varying) financial and demographic characteristics and behaviors, and ϕ_i and γ_t capture individual and year fixed effects, respectively. We cluster standard errors at the individual level. Our primary coefficient of interest is the 2020 indicator, capturing how financial situation and behavior differs after the onset of the pandemic relative to prior years.

Table 4 examines effects on subjective outcome measures and financial fragility. On average, financial situations improved during the pandemic. In 2020, financial satisfaction was 0.09 points higher (p-value < 0.001), a 3 percent increase, relative to the omitted year (2018), and by 0.11 points higher (p-value < 0.001), a 4 percent increase, relative to 2019. Relatedly, respondents were 7.5 percentage points (p-value < 0.001) and 3.6 percentage points (p-value < 0.001) less likely to report that their financial situation was causing them a moderate or high amount of stress in 2020 than in 2018 and 2019, respectively. Financial fragility was also lower in 2020—by approximately 3 percentage points—than in either 2018 (p-value = 0.001) or 2019 (p-value = 0.001).

Along with a general improvement in financial situations, we also see increased savings activity. Table 5 shows that respondents were 5.4 percentage points more likely (p-value < 0.001) to be currently saving in 2020 relative to 2018, and a 6.1 percentage point more likely (p-value < 0.001) relative to 2019. The increase in savings activity appears concentrated mostly in liquid accounts rather than in retirement accounts. Participants were 6.6 percentage points (p-value < 0.001) and 7.8 percentage points (p-value < 0.001) more likely to be currently saving in checking or savings accounts, cash, or other non-retirement saving or investment accounts in 2020 relative to 2018 and 2019, respectively. We see no meaningful difference in retirement saving activity between 2020 and 2018, though relative to 2019 respondents were 2.1 percentage points more likely (p-value = 0.01) to be currently saving in IRAs or employer-sponsored retirement accounts in 2020.

Table 6 examines effects on savings balances. Given the highly skewed nature of the data with many zeros, we transform balance variables using the inverse hyperbolic sine function and calculate elasticities following Bellemare and Wichman (2020). We find that liquid account balances increased, on average, by about 32 percent in 2020 relative to 2018 and 2019 (p-values < 0.001). This finding is predominately driven by activity in short-term savings: balances in checking and savings accounts increased approximately 45 percent relative to 2018 and 36 percent relative to 2019 (p-values < 0.001). In contrast, we see no statistical differences, on average, in retirement savings account balances across study years.

Table 7 explores effects on debt loads. Total debt—comprised of mortgage debt, auto debt, student loans, business loans, medical debt, credit card balances,

2 The vast majority of our respondents (94%) answered the third wave of the Financial Health Pulse survey between April 20 and April 30, 2020. The Dow Jones Industrial Average closed at 23,723 on May 1, 2020 up from the trough of 19,173 on March 20, 2020. For context, the same index was at 26,430 on May 1, 2019, and 24,099 on May 1, 2018.

3 From a different UAS survey, we observe that about 5% of our respondents withdrew money from retirement accounts in the early months of the pandemic.

and other debt—was about 23 percent lower (p-value = 0.02) in 2020 than in 2018, though it did not change significantly between 2019 and 2020. Analogous patterns are obtained after removing mortgage debt (Column 2). Results are also similar when focusing specifically on credit card debt levels. Credit card debt was considerably lower in 2020 than in 2018, by around 50 percent (p-value < 0.001), though it does not exhibit significant changes between 2019 and 2020. We do, however, observe differences on a subjective measure —whether debt burdens feel unmanageable—in the early months of the pandemic. Respondents were approximately 4 percentage points less likely to report that they have more debt than is manageable in 2020 than in 2018 or 2019 (p-values < 0.001).

c. The effects of stimulus payments

Despite the stark interruption to economic activity and tumult in the labor market, the previous section suggests that, on average, household financial situation improved following the onset of the pandemic. A natural possible contributing factor to this pattern of results is the policy response, particularly stimulus payments. In April 2020, the IRS began distributing checks of up to $1,200 to most U.S. adults (subject to earnings limits). Though the timing of stimulus receipt is not random (and depended in part on tax filing status and ability to receive direct deposit), there is considerable variation in whether our participants had received their stimulus payment by the time they responded to our 2020 survey wave, with 53 percent indicating that they had already received their payment. We exploit this variation to examine how much of the improvement in financial situation and behavior can be attributed to stimulus receipt.

Table 8 replicates Table 4, exploring effects on subjective measures of financial stability and financial fragility, accounting for stimulus receipt. Unsurprisingly, receiving a stimulus payment is positively associated with improved financial situation. Individuals who had received their stimulus check prior to responding to our survey reported levels of financial satisfaction 0.07 points higher than individuals who had not (p-value = 0.01), and were six percentage points (p-value = 0.001) and four percentage points (p-value = 0.01) less likely to be experiencing high financial stress and report financially fragility, respectively. Stimulus receipt also accounts for nearly all of the reduction in financial stress and fragility observed at the time the pandemic had hit. Specifically, after accounting for stimulus receipt, we see no statistical differences in perceived financial stress and financial fragility between 2019 and 2020. However, after controlling for whether a respondent had received their stimulus payment, 2020 is still associated with 0.71 point increase in financial satisfaction (p-value = 0.001) relative to 2019. This compares to a 1.07 difference in Table 4.

Table 9 examines savings behavior after accounting for stimulus receipt. In short, we see little evidence of a relationship between whether a respondent is saving and having received their stimulus payment. Point estimates on the indicators for currently saving, currently saving in liquid accounts, and currently saving in retirement accounts are all small and not statistically significant. Notably, after accounting for stimulus receipt, we still observe a similarly sized and positive association between 2020 and saving activity, particularly in liquid accounts.

Table 10 explores the relationship between savings balances and receipt of one's stimulus payment. As expected given the short temporal distance between when the first checks were distributed and the timing of our survey, stimulus receipt is associated with large increases (approximately 50%) in liquid account balances (both overall and specifically in checking and savings accounts) and appears to be an important driver of the observed rise in savings in the early months of the pandemic. In fact, after accounting for stimulus receipt, we see no statistical differences in either liquid account balances or checking and savings balances between 2019 and 2020. We also find little evidence that receiving one's stimulus payment is associated with retirement savings balances. While after accounting for stimulus receipt we do see a reduction in retirement balances in 2020 relative to 2018 for those who had not received their stimulus, the difference between 2019 and 2020 is not statistically significant at conventional levels (p-value > 0.05).

In contrast to the large impact on savings balances, there is no apparent relationship between stimulus receipt and debt levels—perhaps due to the time between receipt of the check and survey completion being too short to start paying down debt. Table 11 documents a lack of significant correlations between stimulus receipt and total debt, non-mortgage debt, or credit card debt. Relatedly, none of the differences in these objective outcomes between 2019 and 2020 are significant after controlling for whether one has received their stimulus. We find some suggestive evidence that stimulus receipt is associated with a 2.6 percentage point reduction

in the likelihood that respondents feel that their debt is unmanageable, though this effect is only marginally significant (p-value = 0.07). After controlling for stimulus receipt, we still see that individuals were less likely to perceive that their debt was unmanageable in 2020 relative to 2019 (p-value = 0.05).

Overall, we find that much of the improvement in financial situation that we document between 2019 and 2020 can be attributed to receipt of the stimulus payments. In particular, stimulus receipt accounts for nearly all the observed reductions in financial stress and financial fragility as well as the observed increases in liquid account balances. However, stimulus receipt does not tell the whole story. In fact, after controlling for receipt of a stimulus check, we still find that respondents were approximately six percentage points more likely to be currently saving. This increase in savings activity may be due in part to precautionary motives as a result of increased uncertainty, or due to reduced ability to spend with closed businesses and travel restrictions. Also, the stimulus does not explain all of the increase in overall financial satisfaction—even after controlling for stimulus receipt, financial satisfaction increased by 0.07 points on the five-point scale in 2020 relative to 2019. It is possible that the increase in financial satisfaction is in part driven by more active saving and less spending.

While we find average improvements in financial situation and financial behavior in the population, individual experiences are not homogeneous and there may exist important dimensions of heterogeneity of the pandemic's effects across households. The next section explores differences in effects across several demographic and financial characteristics.

d. Heterogeneity

i. Age

We first examine whether older adults were differentially impacted by the pandemic on our main outcome variables of interest. For this purpose, we create an indicator variable for whether an individual is 60 years old or above in our first survey in 2018, and interact it with the 2020 time dummy. Table 12 shows little evidence of differential impacts for older adults along financial fragility and subjective measures of financial well-being. We observe no significant difference along impacts to one's ability to cover a $400 shock with cash or a cash equivalent, or in overall financial satisfaction. There exists a marginally significant difference along financial stress – individuals age 60 or older were 3.3 percentage points more likely to report that their financial situation was causing them moderate or high stress in 2020 relative to 2018 than their younger counterparts (p-value = 0.07).

We also find little evidence of heterogeneity in savings responses by age. Interestingly, Table 13 shows that there were similar increases in short-term saving activity among older and younger respondents. Both groups were approximately 5 percentage points more likely to say that they are currently saving in 2020 than in 2019 or 2018. Older adults are directionally less likely to say they are currently saving in liquid accounts relative to 2018 than younger adults, by about 2.5 percentage points, though this difference is not statistically significant (p-value = 0.11). Neither older nor younger adults experience changes in the likelihood of saving in retirement accounts after the onset of the pandemic.

ii. Race

Table 14 examines heterogeneous effects by race. Given that the clear majority of our sample identifies as White, we create a binary indicator splitting the sample into White or non-White.[4] We find little evidence of racial heterogeneity in effects on subjective measures and financial fragility. In particular, there are no statistically significant differences along any of the three outcome variables contained in Table 14, though we find directional evidence that minorities may have experienced a larger reduction in financial fragility than similarly situated Whites (point estimate = 2.7 percentage points, p-value = 0.27).

We find considerably more evidence of heterogeneity in terms of saving behaviors. Minorities experienced larger increases in their likelihood of saving during the pandemic than Whites. Table 15 shows that the proportion of minorities who responded that they were currently saving in 2020 rose by 6.7 percentage points (p-value < 0.01) more than that for Whites (which also rose relative to 2018 and 2019 levels). Much of the racial heterogeneity is driven by differential increases in short-term savings activity—non-White respondents experienced a 7.2 percentage point (p-value < 0.01) larger increase in the likelihood of saving in 2020 relative to 2018 than Whites. We also see suggestive evidence that minorities may have also experienced differential

4 Non-white is of course heterogeneous, and experiences may differ across different racial groups. This is an important area for additional research.

increases in their likelihood of saving in retirement accounts, though our estimate is only marginally significant (p-value = 0.09).

Digging deeper, minority savings rates in 2020 were particularly sensitive to receipt of the stimulus. As shown in Table 16, we see essentially no difference in savings rates in 2020 relative to pre-pandemic periods for White individuals based on whether or not they had received their stimulus check. On the other hand, among non-Whites who had received their stimulus at the time of our 2020 survey the likelihoods of saving in general and saving in liquid accounts increased by 6.5 (p-value < 0.01) and 8.7 percentage points (p-value < 0.01) more than among non-Whites who had not received the stimulus, respectively. Interestingly, we also observe that stimulus receipt is associated with increased likelihood of saving for retirement among non-Whites (point estimate = 7.1 percentage points, p-value = 0.03).

iii. Gender

Recent evidence has indicated that increased childcare responsibilities arising after the onset of the pandemic due to closures of schools and daycares fell disproportionately on women (Zamarro and Prados, 2020). It is possible that the pandemic may have also led to disparate impacts on women's financial stability. Table 17 documents heterogeneity in the pandemic's effects by gender, though women's financial well-being disproportionately *improved*. During the pandemic, women experienced a 0.08 point larger increase in financial satisfaction than men (p-value < 0.01) and a larger decrease in financial stress, which dropped by 4.5 percentage points more (p-value = 0.01) than men's. Women have directionally larger reductions in financial fragility, though differences are not statistically significant.

Additionally, women exhibit larger, positive changes in savings behavior. The likelihood of currently saving in 2020 rose by 2.5 percentage points more for women than men (p-value = 0.06) relative to pre-pandemic levels, driven by heterogeneity in saving in liquid accounts —where women experienced a 3.3 percentage point larger increase than men (Table 18). At the same time, the likelihood of saving for retirement increased by 2.9 percentage points (p-value = 0.05) more among women than men during the pandemic.

We find suggestive evidence that the gendered effects are in part driven by heterogeneous effects from receiving the stimulus. Table 19 shows that women experienced a marginally significant 0.07 point larger increase (p-value = 0.08) in financial satisfaction in 2020 from receiving the stimulus than did men (we estimate no statistically significant effect of the stimulus on financial satisfaction for men). Women also experienced directionally larger reductions in financial fragility and financial stress from receiving the stimulus than men, though differences are not statistically significant. Table 20 shows little evidence of differential savings responses to the stimulus based on gender. None of the gendered interactions for overall savings, liquid savings, or retirement savings are significant, though all are directionally consistent with women being more likely to save following the receipt of the stimulus.

iv. Income

Table 21 explores whether the pandemic had heterogeneous effects by level of income, where we split the sample into above and below median household income in 2018, corresponding to $60,000 per annum. In short, financial situation disproportionately improved for individuals with below median incomes. Relative to their higher income counterparts, financial satisfaction rose by 0.08 points more (p-value < 0.01) in 2020 compared to pre-pandemic levels for individuals living in households earning less than $60K a year. Individuals with below median household income also experienced larger reductions in financial stress, by 5.8 percentage points (p-value = 0.001), and had directionally larger (by about a factor of 2) reductions in financial fragility, though differences are not statistically significant.

Part of the improvement in financial situation for individuals with lower incomes may have been driven by differential increases in savings activity. Table 22 shows that the likelihood of currently saving rose by 6 percentage points more (p-value < 0.001) in 2020 than in the pre-pandemic period for individuals with below median household income relative to higher earners. Analogously to the patterns described above, this finding stems from increased saving activity in liquid accounts —where we find a 5.3 percentage point larger (p-value < 0.001) relative increase for individuals in lower income households. In contrast, we observe no differences in likelihood of currently saving for retirement.

Table 23 suggests that the estimated heterogeneous effects by income are in part attributable to differential responses to the stimulus. Individuals from lower income households experienced a 0.07 point larger increase in financial satisfaction following receipt of the stimulus

than did individuals from higher income households, though this difference is not statistically significant (p-value = 0.11). We do find significant differences along financial stress, however. Stimulus receipt is associated with a 6 percentage point larger (p-value = 0.01) reduction in the likelihood of having a moderate or high amount of stress from one's financial situation for lower income individuals. We obtain directionally consistent, though insignificant, results for financial fragility.

Stimulus receipt is associated with increased likelihood of saving among lower income respondents. Table 24 shows that individuals in households with below median incomes experienced a 6.4 percentage larger increase in the likelihood they were saving following stimulus receipt than higher income respondents. Almost all of this heterogeneity in general savings response is concentrated among short-term liquid savings, while no differential responses by income emerge for retirement savings.

v. Financial literacy

In addition to demographic and financial characteristics, the UAS elicits a host of other measures on its participants including financial literacy.[5] Financial literacy in the UAS is measured using 14 questions covering topics from compound interest rate and inflation to risk and return of different assets and house prices, and was elicited prior to 2018. We create a composite score for financial literacy by summing the number of correct answers across these questions. We standardize this index within the sample, and split at the median to create an indicator for "high" financial literacy.

As reported in Table 25, subjective measures of financial stability and financial fragility disproportionately improved in 2020 for individuals with lower financial literacy. Specifically, individuals with below sample median financial literacy experienced, on average, a 0.05 point larger (p-value = 0.10) increase in financial satisfaction between 2018 and 2020 than individuals with higher financial literacy. Similarly, individuals with lower financial literacy had larger reductions in financial stress than individuals with higher financial literacy, by 6.3 percentage points (p-value = 0.001) on average, and larger reductions in financial fragility, by 4.3 percentage points (p-value = 0.01) on average.

Concurrent with improved measures of financial stability, individuals with lower financial literacy were also disproportionately more likely to be currently saving. Table 26 shows that the likelihood of currently saving in 2020 rose by 4.1 percentage points more for individuals with lower financial literacy (p-value < 0.01) than individuals with higher financial literacy, driven by heterogeneity in saving in liquid accounts—where those with lower financial literacy experienced a 4.7 percentage point larger increase than their higher financial literacy counterparts. Similarly to previous sections, we see essentially no evidence of heterogeneity in retirement savings activity.

The observed heterogeneity in improved financial outcomes based on pre-pandemic financial literacy is driven in part by disparate impacts of stimulus receipt. Though we do not find significant differences in financial satisfaction for individuals who received their stimulus based on financial literacy, we do find that stimulus receipt is associated with a 7.6 percentage point larger (p-value < 0.01) reduction in the likelihood of having a moderate or high amount of stress from one's financial situation and an 8.2 percentage point larger (p-value < 0.01) reduction in the likelihood of financial fragility for individuals with below median financial literacy (Table 27). Our regressions also suggest that stimulus receipt is more likely to be associated with savings status for individuals with low financial literacy. As can be seen in Table 28, individuals with low financial literacy who received their stimulus payment experience a 3.1 percentage point larger (p-value = 0.09) and a 4.2 percentage point larger (p-value = 0.02) increase in the likelihood that they are currently saving and currently saving in liquid accounts, respectively, than individuals with higher financial literacy that received the stimulus.

vi. Past financial behavior

It is of interest to examine whether individuals were differentially affected by the pandemic based on their pre-pandemic financial behavior. That is, were our respondents more or less affected by the pandemic based on whether they spent less than income or maintained manageable debt loads pre-pandemic?

Table 29 explores whether individuals who reported spending less than their income in 2019 differentially improved their financial situation in 2020 relative to those who spent equal to or more than their income. In particular, we interact our 2020 indicator with a binary variable capturing whether total spending was more than

5 We find qualitatively similar results examining heterogeneity by cognitive ability.

or equal to total income in 2019. Similar to the evidence above, we find that individuals who were struggling pre-pandemic with their spending relative to their income in 2019 saw larger gains in financial satisfaction, and larger reductions in financial stress and financial fragility. For example, respondents who indicated they spent equal to or more than their income in 2019 experienced increases in financial satisfaction of approximately 0.14 points more (p-value < 0.001) than their counterparts who spent less relative to their pre-pandemic levels. Similarly, the higher spenders saw a 6 percentage point larger reduction (p-value = 0.001) in financial stress, and a 4.7 percentage point larger reduction (p-value < 0.01) in financial fragility post-pandemic.

Table 30 demonstrates that higher spenders also differentially improved the likelihood that they were saving in 2020. The likelihood of being a saver in 2020 rose by 4.4 percentage points more for individuals who spent more than or equal to their income in 2019 (p-value < 0.01) than for individuals who spent less, due to differential increases in the likelihood of saving in liquid accounts (point estimate = 5.4 percentage points, p-value < 0.001). We do not observe any heterogeneity in retirement savings behavior based on 2019 spending.

These findings appear to be driven by differential impacts of the stimulus—the stimulus has been more of a lifeline for individuals who were struggling with their spending pre-pandemic. Table 31 shows that individuals who were spending equal to or more than their income in 2019 experienced 0.16 point larger (p-value < 0.001) increases in financial satisfaction, 5.4 percentage point larger (p-value = 0.03) reductions in financial stress, and 7 percentage point larger (p-value < 0.01) reductions in financial fragility from stimulus receipt than individuals who were spending less. Similarly, Table 32 reports that the stimulus had larger effects on the likelihood of being a saver in 2020 for respondents who indicated they were spending more than or equal to their total income in 2019. The likelihood of saving over all, and saving specifically in liquid accounts, rose 5.6 percentage points (p-value < 0.01) and 7 percentage points (p-value < 0.001) more, respectively, for individuals who were spending more than or equal to their income in 2019 than lower spenders.

We find similar patterns of heterogeneity based on difficulty managing debt pre-pandemic. Table 33 shows that respondents who subjectively assessed that they had more debt than they could manage in 2019 experienced significantly larger improvements in financial situation in 2020 relative to pre-pandemic than those who had manageable debt or no debt. In particular, financial satisfaction increased by 0.17 points, financial stress decreased by 10 percentage points, and financial fragility decreased by 9.2 percentage points more for those who were struggling with their debt burdens in 2019 (p-value < 0.001 for all estimates).

We also find similar heterogeneity with respect to savings activity. Individuals who had unmanageable debt in 2019 saw larger increases in the likelihood they were saving in 2020 by 3.6 percentage points (p-value = 0.03)—driven by increased activity in liquid accounts (point estimate = 5.4 percentage points, p-value < 0.01) – than those with manageable debt loads.

Much like the heterogeneity based on spending behavior, the relative improvement in financial situation for individuals carrying unmanageable debt loads is driven by stimulus receipt. Stimulus receipt for individuals who were carrying unmanageable debt loads in 2019 is associated with significantly larger increases in financial stability than for those with manageable debt (Table 35). In fact, the effect of the stimulus is concentrated entirely on those with unmanageable debt loads—we see no significant associations between stimulus receipt and financial satisfaction, financial stress, or financial fragility for individuals with no debt or a manageable amount. We find broadly similar patterns with respect to savings activity (Table 36). Although there is no clear evidence of heterogeneity of stimulus receipt based on debt manageability for overall savings, stimulus receipt is associated with a 5.5 percentage point larger increase in the likelihood one is saving in liquid accounts in 2020 for individuals with unmanageable debt than a manageable amount.

All told, our analyses provide strong empirical support to the hypothesis that household financial experiences in the early months of the pandemic were heterogeneous. Specifically, we find that financial stability disproportionately improved among respondents who were more *economically vulnerable* pre-pandemic. Women, those with lower income and financial literacy, and individuals who were struggling with unmanageable debt or spending above their means before the pandemic hit all experienced differentially larger increases in financial stability and savings activity at the onset of the pandemic relative to their respective counterparts. We document that this differential improvement was driven at least in part by differential impacts of the stimulus payments. The estimated associations between

stimulus receipt and improvements in financial stability and savings behavior are considerably stronger for economically vulnerable segments of the population. Our evidence suggests that not only did the government stimulus help prevent widening inequality in financial stability, it may have helped close the gap, at least early in the life of the pandemic.

e. Retirement security

In addition to our three annual survey waves, we also draw data from three additional modules in the UAS that elicit Social Security retirement benefits claiming intentions and self-assessed financial preparedness for retirement. These modules were fielded in 2015/2016, 2017/2018, and beginning in April 2020, after the onset of the pandemic. Nearly 2,700 of our primary analysis sample respondents also completed all three waves of these surveys.[6]

Respondents indicate whether they are "Very well prepared," "Somewhat well prepared," "Not too prepared," or "Not at all prepared" financially for retirement. We create a binary indicator taking value 1 for "Somewhat well prepared" or "Very well prepared" and 0 otherwise. Just over half the sample indicates they are at least somewhat well prepared financially for retirement in the 2015/2016 wave. The claiming intentions question elicits the age at which respondents plan to claim Social Security retirement benefits if they have not already claimed. Due to non-response and prior claiming, less than half the sample responds to these questions. Of the provided responses, we winsorize to the 95th percentile, which corresponds to claiming at the latest possible age of 70 years old.

Table 37 shows that our respondents were more likely to indicate that they were financially well prepared for retirement after the onset of the pandemic. In particular, the likelihood one felt financially well prepared in 2020 increased 4.3 percentage points (p-value < 0.001) relative to 2016 and 2.2 percentage points (p-value = 0.02) relative to 2018. While it is notable that financial preparedness for retirement did not decrease after the onset of the pandemic, we would expect this metric to normally increase with age. We find similar increases between 2016–2018 and 2018–2020, suggesting that preparedness for retirement may have stayed more or less on trend, consistent with much of our previous evidence suggesting little change in retirement savings behavior after the onset of the pandemic.

Column 2 examines planned Social Security claiming ages. While the point estimate on our 2020 indicator is positive, we see little evidence of differences in intended claiming over time—the point estimate on both the 2018 and 2020 indicators are relatively small and not statistically significant. This is notable given that respondents who claim between 2016 and 2020 drop out of our sample, which may lead to mechanical increases in claiming ages as individuals who prefer to claim later become a larger fraction of the sample.

Next, we investigate the presence of heterogeneity in retirement behavior/preparedness by age. Columns 3 and 4 augment the specifications explored in Columns 1 and 2 by interacting our yearly dummy variables with indicators capturing whether respondents are 60 years of age or older at the time of the survey. For subjective financial retirement preparedness, we do not see any evidence of heterogeneity for older adults. We do, however, find some evidence that older adults may be more likely to delay claiming retirement benefits following the onset of the pandemic. In particular, relative to their younger counterparts, planned claiming ages rose by 0.66 years (p-value = 0.05) in 2020 relative to 2016 for adults aged 60 or above who had not yet claimed their Social Security retirement benefits. While our estimated heterogeneity in claiming ages is larger in 2020 than in 2018, the difference is not statistically significant, suggesting that this evidence is relatively weak overall.

4. Conclusion

The COVID-19 pandemic has had enormous effects on economic and daily life around the globe. In this paper, we examine how the pandemic has influenced American's financial stability and behavior soon after its onset using longitudinal survey data from a nationally representative internet panel, the Understanding America Study. Our primary analysis sample consists of respondents to three annual surveys fielded in May 2018, 2019, and 2020, spanning the first quarter of the pandemic. We also merge in data collected in other UAS surveys that elicit subjective financial preparedness for retirement and intended Social Security retirement benefit claiming ages.

We find that Americans' financial situations *improved*, on average, early after the onset of the pandemic.

6 Demographic characteristics of the merged sample are very similar to those of the overall sample and available from the authors upon request.

Notably, overall satisfaction with one's financial situation improved, while financial stress and financial fragility (i.e., an inability to cover a $400 shock with cash or an equivalent) decreased. We also document that our sample was more likely to be actively saving, particularly in liquid accounts during the pandemic than in prior years. Consistent with increased savings activity, we observe increased (self-reported) liquid account balances in 2020, particularly in checking and savings accounts. We find little difference in self-reported debt levels, though respondents are less likely to indicate that they feel their debt is unmanageable in the early months of the pandemic. Despite general increases in current measures of financial stability, there is no empirical evidence of changes in retirement savings behavior—the fraction of the sample actively saving for retirement and self-reported retirement balances remain statistically unchanged over time.

A natural possible explanation for the increase in short-term financial stability, despite huge interruptions to the labor market and a sharp rise in public health risk, is that the relatively robust government stimulus response helped offset some of the pandemic's adverse effects. We find evidence consistent with this explanation. Stimulus receipt accounts for nearly all of the reductions in financial stress and financial fragility that we observe in our sample. Stimulus receipt also explains nearly all of the observed increase in liquid account balances. However, the stimulus is not the whole story, as it has little influence on the boost in savings activity. Rather, the increased likelihood of actively saving after the onset of the pandemic may be driven by precautionary motives as a result of rising uncertainty and/or to reduced ability to spend with closed businesses and travel restrictions. We also find that the stimulus does not explain all of the improvement in overall financial satisfaction—even after controlling for stimulus receipt, financial satisfaction was higher in 2020 relative to its pre-pandemic levels. It is possible that the increase in financial satisfaction is in part driven by this increased savings activity.

Average improvements in the population may mask important heterogeneity in outcomes. For example, consumers who were more economically vulnerable pre-pandemic may have been disproportionately negatively affected by its onset. Actually, our results suggest the opposite is true: financial stability disproportionately improved among respondents who were more *economically vulnerable* pre-pandemic. Women, those with lower income and financial literacy, and individuals who were struggling with unmanageable debt or spending above their means pre-pandemic all experienced differentially larger improvements in their financial situations relative to their respective counterparts. Such improvements appear to be driven at least in part by differential impacts of the stimulus payments. We find considerable stronger associations between stimulus receipt and increases in financial stability and saving activity for more economically vulnerable consumers. Our empirical findings suggests that not only did the government stimulus help prevent widening inequality in financial stability, it may have helped close the gap, at least early in the life of the pandemic.

Finally, using additional survey modules in the UAS fielded in 2015/2016, 2017/2018 and starting in April 2020, we examine how the pandemic may have influenced financial preparedness for retirement and intended Social Security claiming ages. We find that levels of self-assessed financial preparedness for retirement increased in the early months of the pandemic, though grew by similar amounts as observed in year-over-year changes pre-pandemic. This is consistent with our other results suggesting little changes in retirement savings behavior. Intended Social Security claiming ages did not change over time for the overall sample, though there is some weak indication that adults ages 60 and above who had not already claimed their benefits may delay claiming by about 0.6 years.

In summary, our evidence suggests that rather than experiencing large reductions in financial stability, Americans' financial situations improved during the first months of the pandemic, particularly for individuals who were previously economically vulnerable. Much of the overall, and differential, increase appears attributable to the economic stimulus, which was particularly impactful for those with lower financial stability. Although our results are intuitive and consistent with other work examining the early effects of the pandemic and its policy responses, it is important to note that our evidence is descriptive and that we cannot establish causality. Additionally, our latest round of surveys was fielded early in the pandemic's lifecycle, and shortly after approximately half our sample had received their stimulus payments. While this helps us investigate the immediate impacts of the stimulus, we are unable to assess how quickly the observed increases in financial stability may dissipate, nor can we explore the pandemic's longer-term effects. Both of these questions remain important inquiries for future research.

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Table 1. Sample summary statistics

Age	51.54
Female	0.57
White	0.86
Married	0.59
Education	
High school or less	0.23
Some college	0.39
Bachelor's or more	0.38
Household Income	
< $30,000	0.25
$30,000–$59,999	0.27
$60,000–$99,999	0.24
> $100,000	0.24
Working	0.62
Poor health	0.15
N	3,785

Table 2. Descriptive statistics over time

	2018	2019	2020
Financial Satisfaction	3.06	3.03	3.13
High Financial Stress	0.42	0.38	0.34
Financially Fragile	0.41	0.42	0.40
Currently Saving (Liquid or Retirement)	0.78	0.74	0.81
Currently Saving (Liquid)	0.74	0.71	0.79
Currently Saving (Retirement)	0.48	0.45	0.46
Working	0.62	0.60	0.54

Notes: Data are weighted. High Financial Stress is coded as 1 if a respondent indicates that they are experiencing a "High" or "Moderate" amount of stress due to their financial situation. Financial Resilient is coded as 1 if a respondent indicated that they could cover a $400 shock with cash or a cash equivalent. Currently Saving (Liquid or Retirement) captures whether a respondent reports saving in a checking account, saving account, cash, or other form (Liquid) or an employer-sponsored retirement account or an IRA (Retirement).

Table 3. Savings and debt balances over time

	p10	p25	p50	p75
	LIQUID ACCOUNT BALANCE			
2018	15	550	6,000	41,000
2019	10	491	4,912	34,384
2020	49	981	5,024	29,437
	CHECKING/SAVINGS BALANCE			
2018	10	500	3,000	14,000
2019	7	405	2,976	13,753
2020	25	687	3,729	13,737
	RETIREMENT ACCOUNT BALANCE			
2018	0	0	6,000	90,000
2019	0	0	4,126	83,505
2020	0	0	2,944	68,688
	TOTAL DEBT			
2018	0	250	30,000	128,450
2019	0	0	18,666	106,101
2020	0	0	23,059	112,844
	NON-MORTGAGE DEBT			
2018	0	0	8,000	30,000
2019	0	0	4,912	23,578
2020	0	0	5,888	27,475
	CREDIT CARD DEBT			
2018	0	0	0	3,000
2019	0	0	0	1,965
2020	0	0	0	1,962

Notes: Data are weighted and indexed to 2018 dollars.

Table 4. Subjective measures and financial fragility

Variables	(1) Financial Satisfaction	(2) High Financial Stress	(3) Financially Fragile
2019	-0.017	-0.039***	-0.002
	(0.015)	(0.010)	(0.009)
2020	0.090***	-0.075***	-0.031***
	(0.016)	(0.011)	(0.010)
Constant	2.498***	0.567***	0.545***
	(0.153)	(0.075)	(0.080)
Includes Covariates	Yes	Yes	Yes
Includes Individual Fixed Effects	Yes	Yes	Yes
Observations	11,355	11,352	11,324
R-squared	0.773	0.651	0.709

Notes: Each specification includes the (time varying) demographic and financial characteristics listed in Table 1. Robust standard errors in parentheses. Standard errors are clustered at the individual level. *** p<0.01, ** p<0.05, * p<0.1.

Table 5. Savings behavior

Variables	(1) Saving	(2) Saving - Liquid	(3) Saving - Retirement
2019	-0.007	-0.012	-0.012
	(0.008)	(0.009)	(0.008)
2020	0.054***	0.066***	0.009
	(0.008)	(0.009)	(0.009)
Constant	0.606***	0.561***	0.261***
	(0.080)	(0.076)	(0.068)
Includes Covariates	Yes	Yes	Yes
Includes Individual Fixed Effects	Yes	Yes	Yes
Observations	11,185	11,226	11,270
R-squared	0.682	0.671	0.775

Notes: Each specification includes the (time varying) demographic and financial characteristics listed in Table 1. Robust standard errors in parentheses. Standard errors are clustered at the individual level. *** p<0.01, ** p<0.05, * p<0.1.

Table 6. Savings balances

Variables	(1) Liquid Acct Bal	(2) Check/ Saving Bal	(3) Retirement Bal
2019	0.001	0.063	-0.042
	(0.051)	(0.043)	(0.079)
2020	0.277***	0.371***	-0.120
	(0.055)	(0.047)	(0.086)
Constant	8.815***	7.776***	5.353***
	(0.473)	(0.405)	(0.682)
Includes Covariates	Yes	Yes	Yes
Includes Individual Fixed Effects	Yes	Yes	Yes
Observations	9,729	10,834	10,384
R-squared	0.874	0.847	0.869

Notes: Balances have been transformed using the inverse hyperbolic sine function. Sample sizes vary across specification due to item non-response. Each specification includes the (time varying) demographic and financial characteristics listed in Table 1. Robust standard errors in parentheses. Standard errors are clustered at the individual level. *** p<0.01, ** p<0.05, * p<0.1.

Table 7. Debt levels

Variables	(1) Total Debt	(2) Non-mortgage Debt	(3) Credit Card Debt	(4) Debt Unmanageable
2019	-0.251***	-0.393***	-0.560***	-0.005
	(0.085)	(0.083)	(0.074)	(0.008)
2020	-0.215**	-0.385***	-0.457***	-0.039***
	(0.089)	(0.092)	(0.078)	(0.009)
Constant	8.021***	6.582***	4.381***	0.227***
	(0.802)	(0.789)	(0.630)	(0.078)
Includes Covariates	Yes	Yes	Yes	Yes
Includes Individual Fixed Effects	Yes	Yes	Yes	Yes
Observations	10,608	10,696	11,053	11,311
R-squared	0.813	0.796	0.785	0.713

Notes: Balances have been transformed using the inverse hyperbolic sine function. Sample sizes vary across specification due to item non-response. Each specification includes the (time varying) demographic and financial characteristics listed in Table 1. Robust standard errors in parentheses. Standard errors are clustered at the individual level. *** p<0.01, ** p<0.05, * p<0.1.

Table 8. Subjective measures and financial Fragility – Stimulus

Variables	(1) Financial Satisfaction	(2) High Financial Stress	(3) Financially Fragile
Stimulus	0.070**	-0.060***	-0.040**
	(0.028)	(0.018)	(0.016)
2019	-0.016	-0.038***	-0.003
	(0.015)	(0.010)	(0.009)
2020	0.055**	-0.043***	-0.011
	(0.022)	(0.014)	(0.012)
Constant	2.521***	0.561***	0.536***
	(0.153)	(0.075)	(0.080)
Includes Covariates	Yes	Yes	Yes
Includes Individual Fixed Effects	Yes	Yes	Yes
Observations	11,244	11,242	11,231
R-squared	0.773	0.651	0.709

Notes: Each specification includes the (time varying) demographic and financial characteristics listed in Table 1. Robust standard errors in parentheses. Standard errors are clustered at the individual level. *** p<0.01, ** p<0.05, * p<0.1.

Table 9. Savings behavior and stimulus receipt

Variables	(1) Saving	(2) Saving - Liquid	(3) Saving - Retirement
Stimulus	0.010	0.021	0.017
	(0.013)	(0.014)	(0.014)
2019	-0.007	-0.012	-0.013
	(0.008)	(0.009)	(0.008)
2020	0.050***	0.056***	-0.000
	(0.011)	(0.012)	(0.011)
Constant	0.608***	0.564***	0.265***
	(0.079)	(0.076)	(0.068)
Includes Covariates	Yes	Yes	Yes
Includes Individual Fixed Effects	Yes	Yes	Yes
Observations	11,097	11,137	11,181
R-squared	0.685	0.673	0.777

Notes: Each specification includes the (time varying) demographic and financial characteristics listed in Table 1. Robust standard errors in parentheses. Standard errors are clustered at the individual level. *** p<0.01, ** p<0.05, * p<0.1.

Table 10. Savings balances and stimulus receipt

Variables	(1) Liquid Acct Bal	(2) Check/ Saving Bal	(3) Retirement Bal
Stimulus	0.440***	0.419***	0.220
	(0.088)	(0.077)	(0.142)
2019	0.003	0.065	-0.034
	(0.051)	(0.043)	(0.079)
2020	0.041	0.148**	-0.234**
	(0.076)	(0.066)	(0.111)
Constant	8.869***	7.861***	5.388***
	(0.472)	(0.405)	(0.682)
Includes Covariates	Yes	Yes	Yes
Includes Individual Fixed Effects	Yes	Yes	Yes
Observations	9,672	10,762	10,320
R-squared	0.875	0.849	0.870

Notes: Balances have been transformed using the inverse hyperbolic sine function. Sample sizes vary across specification due to item non-response. Each specification includes the (time varying) demographic and financial characteristics listed in Table 1. Robust standard errors in parentheses. Standard errors are clustered at the individual level. *** p<0.01, ** p<0.05, * p<0.1.

Table 11. Debt levels and stimulus receipt

Variables	(1) Total Debt	(2) Non-mortgage Debt	(3) Credit Card Debt	(4) Debt Unmanageable
Stimulus	0.187	0.036	-0.127	-0.026*
	(0.147)	(0.152)	(0.130)	(0.014)
2019	-0.239***	-0.392***	-0.554***	-0.005
	(0.085)	(0.084)	(0.075)	(0.008)
2020	-0.312**	-0.401***	-0.382***	-0.026**
	(0.123)	(0.124)	(0.099)	(0.011)
Constant	8.027***	6.589***	4.363***	0.223***
	(0.801)	(0.790)	(0.630)	(0.078)
Includes Covariates	Yes	Yes	Yes	Yes
Includes Individual Fixed Effects	Yes	Yes	Yes	Yes
Observations	10,543	10,630	10,976	11,229
R-squared	0.814	0.795	0.784	0.714

Notes: Balances have been transformed using the inverse hyperbolic sine function. Sample sizes vary across specification due to item non-response. Each specification includes the (time varying) demographic and financial characteristics listed in Table 1. Robust standard errors in parentheses. Standard errors are clustered at the individual level. *** p<0.01, ** p<0.05, * p<0.1.

Table 12. Subjective measures and financial fragility – Heterogeneity by age

Variables	(1) Financial Satisfaction	(2) High Financial Stress	(3) Financially Fragile
2019	-0.017	-0.039***	-0.002
	(0.015)	(0.010)	(0.009)
2020	0.096***	-0.086***	-0.033***
	(0.020)	(0.013)	(0.012)
2020 * 60+	-0.019	0.033*	0.006
	(0.028)	(0.018)	(0.016)
Constant	2.498***	0.566***	0.543***
	(0.153)	(0.075)	(0.080)
Includes Covariates	Yes	Yes	Yes
Includes Individual Fixed Effects	Yes	Yes	Yes
Observations	11,349	11,346	11,318
R-squared	0.773	0.651	0.709

Notes: Each specification includes the (time varying) demographic and financial characteristics listed in Table 1. Robust standard errors in parentheses. Standard errors are clustered at the individual level. *** p<0.01, ** p<0.05, * p<0.1.

Table 13. Savings behavior – Heterogeneity by age

Variables	(1) Saving	(2) Saving - Liquid	(3) Saving - Retirement
2019	-0.007	-0.012	-0.012
	(0.008)	(0.009)	(0.008)
2020	0.056***	0.074***	0.009
	(0.009)	(0.010)	(0.010)
2020 * 60+	-0.006	-0.025	-0.002
	(0.015)	(0.015)	(0.016)
Constant	0.607***	0.563***	0.260***
	(0.079)	(0.076)	(0.068)
Includes Covariates	Yes	Yes	Yes
Includes Individual Fixed Effects	Yes	Yes	Yes
Observations	11,179	11,220	11,264
R-squared	0.683	0.671	0.775

Notes: Each specification includes the (time varying) demographic and financial characteristics listed in Table 1. Robust standard errors in parentheses. Standard errors are clustered at the individual level. *** p<0.01, ** p<0.05, * p<0.1.

Table 14. Subjective measures and financial fragility – Heterogeneity by race

Variables	(1) Financial Satisfaction	(2) High Financial Stress	(3) Financially Fragile
2019	-0.017	-0.039***	-0.002
	(0.015)	(0.010)	(0.009)
2020	0.089**	-0.089***	-0.055**
	(0.043)	(0.026)	(0.024)
White * 2020	-0.001	0.017	0.027
	(0.045)	(0.027)	(0.025)
Constant	2.487***	0.571***	0.545***
	(0.153)	(0.075)	(0.080)
Includes Covariates	Yes	Yes	Yes
Includes Individual Fixed Effects	Yes	Yes	Yes
Observations	11,316	11,313	11,285
R-squared	0.773	0.651	0.711

Notes: Each specification includes the (time varying) demographic and financial characteristics listed in Table 1. Robust standard errors in parentheses. Standard errors are clustered at the individual level. *** p<0.01, ** p<0.05, * p<0.1.

Table 15. Savings behavior – Heterogeneity by race

Variables	(1) Saving	(2) Saving - Liquid	(3) Saving - Retirement
2019	-0.006	-0.011	-0.013
	(0.008)	(0.009)	(0.008)
2020	0.113***	0.129***	0.039*
	(0.021)	(0.022)	(0.020)
White * 2020	-0.067***	-0.072***	-0.036*
	(0.022)	(0.023)	(0.021)
Constant	0.611***	0.566***	0.262***
	(0.080)	(0.077)	(0.068)
Includes Covariates	Yes	Yes	Yes
Includes Individual Fixed Effects	Yes	Yes	Yes
Observations	11,147	11,188	11,231
R-squared	0.683	0.672	0.776

Notes: Each specification includes the (time varying) demographic and financial characteristics listed in Table 1. Robust standard errors in parentheses. Standard errors are clustered at the individual level. *** p<0.01, ** p<0.05, * p<0.1.

Table 16. Savings behavior – Heterogeneity by race and stimulus receipt

Variables	(1) Saving	(2) Saving - Liquid	(3) Saving - Retirement
2019	-0.006	-0.012	-0.013
	(0.007)	(0.009)	(0.008)
2020	0.050***	0.056***	-0.001
	(0.009)	(0.012)	(0.011)
Stimulus	0.065***	0.087***	0.071**
	(0.024)	(0.031)	(0.033)
Stimulus * White	-0.062***	-0.075**	-0.061*
	(0.024)	(0.031)	(0.033)
Constant	0.611***	0.568***	0.267***
	(0.063)	(0.077)	(0.068)
Includes Covariates	Yes	Yes	Yes
Includes Individual Fixed Effects	Yes	Yes	Yes
Observations	11,059	11,099	11,142
R-squared	0.685	0.673	0.778

Notes: Each specification includes the (time varying) demographic and financial characteristics listed in Table 1. Robust standard errors in parentheses. Standard errors are clustered at the individual level. *** p<0.01, ** p<0.05, * p<0.1.

Table 17. Subjective measures and financial fragility – Heterogeneity by gender

Variables	(1) Financial Satisfaction	(2) High Financial Stress	(3) Financially Fragile
2019	-0.017	-0.039***	-0.002
	(0.015)	(0.010)	(0.009)
2020	0.048**	-0.050***	-0.019
	(0.022)	(0.014)	(0.013)
2020 * Female	0.075***	-0.045**	-0.022
	(0.028)	(0.018)	(0.016)
Constant	2.501***	0.568***	0.545***
	(0.154)	(0.075)	(0.080)
Includes Covariates	Yes	Yes	Yes
Includes Individual Fixed Effects	Yes	Yes	Yes
Observations	11,353	11,350	11,322
R-squared	0.773	0.651	0.709

Notes: Each specification includes the (time varying) demographic and financial characteristics listed in Table 1. Robust standard errors in parentheses. Standard errors are clustered at the individual level. *** p<0.01, ** p<0.05, * p<0.1.

Table 18. Savings behavior – Heterogeneity by gender

Variables	(1) Saving	(2) Saving - Liquid	(3) Saving - Retirement
2019	-0.007	-0.012	-0.012
	(0.008)	(0.009)	(0.008)
2020	0.040***	0.048***	-0.008
	(0.011)	(0.012)	(0.012)
2020 * Female	0.025*	0.033**	0.029**
	(0.013)	(0.014)	(0.015)
Constant	0.605***	0.560***	0.253***
	(0.080)	(0.076)	(0.068)
Includes Covariates	Yes	Yes	Yes
Includes Individual Fixed Effects	Yes	Yes	Yes
Observations	11,183	11,224	11,268
R-squared	0.683	0.671	0.775

Notes: Each specification includes the (time varying) demographic and financial characteristics listed in Table 1. Robust standard errors in parentheses. Standard errors are clustered at the individual level. *** p<0.01, ** p<0.05, * p<0.1.

Table 19. Subjective measures and financial fragility – Heterogeneity by gender and stimulus receipt

Variables	(1) Financial Satisfaction	(2) High Financial Stress	(3) Financially Fragile
2019	-0.016	-0.038***	-0.003
	(0.015)	(0.010)	(0.009)
2020	0.056**	-0.043***	-0.011
	(0.022)	(0.014)	(0.012)
Stimulus	0.030	-0.041*	-0.021
	(0.036)	(0.022)	(0.020)
Female * Stimulus	0.068*	-0.033	-0.033
	(0.039)	(0.025)	(0.024)
Constant	2.526***	0.562***	0.536***
	(0.154)	(0.075)	(0.080)
Includes Covariates	Yes	Yes	Yes
Includes Individual Fixed Effects	Yes	Yes	Yes
Observations	11,242	11,240	11,229
R-squared	0.774	0.651	0.709

Notes: Each specification includes the (time varying) demographic and financial characteristics listed in Table 1. Robust standard errors in parentheses. Standard errors are clustered at the individual level. *** p<0.01, ** p<0.05, * p<0.1.

Table 20. Savings behavior – Heterogeneity by gender and stimulus receipt

Variables	(1) Saving	(2) Saving - Liquid	(3) Saving - Retirement
2019	-0.007	-0.012	-0.013
	(0.008)	(0.009)	(0.008)
2020	0.050***	0.056***	-0.001
	(0.011)	(0.012)	(0.011)
Stimulus	0.006	0.010	-0.000
	(0.016)	(0.018)	(0.019)
Female * Stimulus	0.007	0.019	0.029
	(0.017)	(0.019)	(0.021)
Constant	0.608***	0.564***	0.258***
	(0.080)	(0.076)	(0.068)
Includes Covariates	Yes	Yes	Yes
Includes Individual Fixed Effects	Yes	Yes	Yes
Observations	11,095	11,135	11,179
R-squared	0.685	0.673	0.777

Notes: Each specification includes the (time varying) demographic and financial characteristics listed in Table 1. Robust standard errors in parentheses. Standard errors are clustered at the individual level. *** p<0.01, ** p<0.05, * p<0.1.

Table 21. Subjective measures and financial fragility – Heterogeneity by income

Variables	(1) Financial Satisfaction	(2) High Financial Stress	(3) Financially Fragile
2019	-0.017	-0.039***	-0.002
	(0.015)	(0.010)	(0.009)
2020	0.050**	-0.046***	-0.021*
	(0.020)	(0.013)	(0.012)
2020 * HHI < $60K	0.081***	-0.058***	-0.021
	(0.029)	(0.018)	(0.017)
Constant	2.493***	0.571***	0.546***
	(0.152)	(0.075)	(0.080)
Includes Covariates	Yes	Yes	Yes
Includes Individual Fixed Effects	Yes	Yes	Yes
Observations	11,355	11,352	11,324
R-squared	0.773	0.652	0.709

Notes: Each specification includes the (time varying) demographic and financial characteristics listed in Table 1. Robust standard errors in parentheses. Standard errors are clustered at the individual level. *** p<0.01, ** p<0.05, * p<0.1.

Table 22. Savings behavior – Heterogeneity by income

Variables	(1) Saving	(2) Saving - Liquid	(3) Saving - Retirement
2019	-0.007	-0.012	-0.012
	(0.008)	(0.009)	(0.008)
2020	0.024***	0.040***	0.006
	(0.008)	(0.009)	(0.012)
2020 * HHI < $60K	0.061***	0.053***	0.005
	(0.014)	(0.015)	(0.015)
Constant	0.602***	0.557***	0.261***
	(0.079)	(0.076)	(0.068)
Includes Covariates	Yes	Yes	Yes
Includes Individual Fixed Effects	Yes	Yes	Yes
Observations	11,185	11,226	11,270
R-squared	0.684	0.672	0.775

Notes: Each specification includes the (time varying) demographic and financial characteristics listed in Table 1. Robust standard errors in parentheses. Standard errors are clustered at the individual level. *** p<0.01, ** p<0.05, * p<0.1.

Table 23. Subjective measures and financial fragility – Heterogeneity by income and stimulus receipt

Variables	(1) Financial Satisfaction	(2) High Financial Stress	(3) Financially Fragile
2019	-0.016	-0.038***	-0.002
	(0.015)	(0.010)	(0.009)
2020	0.055**	-0.043***	-0.011
	(0.022)	(0.014)	(0.012)
Stimulus	0.040	-0.031	-0.028
	(0.032)	(0.021)	(0.019)
Stimulus * HHI < $60K	0.065	-0.064**	-0.026
	(0.040)	(0.026)	(0.025)
Constant	2.521***	0.562***	0.536***
	(0.153)	(0.075)	(0.080)
Includes Covariates	Yes	Yes	Yes
Includes Individual Fixed Effects	Yes	Yes	Yes
Observations	11,244	11,242	11,231
R-squared	0.774	0.652	0.709

Notes: Each specification includes the (time varying) demographic and financial characteristics listed in Table 1. Robust standard errors in parentheses. Standard errors are clustered at the individual level. *** p<0.01, ** p<0.05, * p<0.1.

Table 24. Savings behavior – Heterogeneity by income and stimulus receipt

Variables	(1) Saving	(2) Saving - Liquid	(3) Saving - Retirement
2019	-0.007	-0.012	-0.013
	(0.008)	(0.009)	(0.008)
2020	0.050***	0.056***	-0.000
	(0.011)	(0.012)	(0.011)
Stimulus	-0.019	-0.009	0.020
	(0.013)	(0.015)	(0.017)
Stimulus * HHI < $60K	0.064***	0.065***	-0.007
	(0.019)	(0.021)	(0.021)
Constant	0.607***	0.562***	0.265***
	(0.079)	(0.076)	(0.068)
Includes Covariates	Yes	Yes	Yes
Includes Individual Fixed Effects	Yes	Yes	Yes
Observations	11,097	11,137	11,181
R-squared	0.686	0.673	0.777

Notes: Each specification includes the (time varying) demographic and financial characteristics listed in Table 1. Robust standard errors in parentheses. Standard errors are clustered at the individual level. *** p<0.01, ** p<0.05, * p<0.1.

Table 25. Subjective measures and financial fragility – Heterogeneity by financial literacy

Variables	(1) Financial Satisfaction	(2) High Financial Stress	(3) Financially Fragile
2019	-0.017	-0.039***	-0.002
	(0.015)	(0.010)	(0.009)
2020	0.116***	-0.110***	-0.055***
	(0.025)	(0.015)	(0.015)
2020 * High Fin Lit	-0.048*	0.063***	0.043**
	(0.029)	(0.018)	(0.017)
Constant	2.502***	0.562***	0.541***
	(0.153)	(0.075)	(0.080)
Includes Covariates	Yes	Yes	Yes
Includes Individual Fixed Effects	Yes	Yes	Yes
Observations	11,355	11,352	11,324
R-squared	0.773	0.652	0.709

Notes: Each specification includes the (time varying) demographic and financial characteristics listed in Table 1. Robust standard errors in parentheses. Standard errors are clustered at the individual level. *** p<0.01, ** p<0.05, * p<0.1.

Table 26. Savings behavior – Heterogeneity by financial literacy

Variables	(1) Saving	(2) Saving - Liquid	(3) Saving - Retirement
2019	-0.007	-0.012	-0.012
	(0.008)	(0.009)	(0.008)
2020	0.077***	0.093***	0.004
	(0.013)	(0.013)	(0.012)
2020 * High Fin Lit	-0.041***	-0.047***	0.009
	(0.014)	(0.015)	(0.015)
Constant	0.609***	0.564***	0.260***
	(0.079)	(0.076)	(0.068)
Includes Covariates	Yes	Yes	Yes
Includes Individual Fixed Effects	Yes	Yes	Yes
Observations	11,185	11,226	11,270
R-squared	0.683	0.672	0.775

Notes: Each specification includes the (time varying) demographic and financial characteristics listed in Table 1. Robust standard errors in parentheses. Standard errors are clustered at the individual level. *** p<0.01, ** p<0.05, * p<0.1.

Table 27. Subjective measures and financial fragility – Heterogeneity by financial literacy and stimulus receipt

Variables	(1) Financial Satisfaction	(2) High Financial Stress	(3) Financially Fragile
2019	-0.016	-0.038***	-0.003
	(0.015)	(0.010)	(0.009)
2020	0.055**	-0.043***	-0.011
	(0.022)	(0.014)	(0.012)
Stimulus	0.088**	-0.103***	-0.082***
	(0.037)	(0.023)	(0.023)
Stimulus * High Fin Lit	-0.033	0.076***	0.074***
	(0.039)	(0.025)	(0.025)
Constant	2.524***	0.556***	0.530***
	(0.153)	(0.075)	(0.079)
Includes Covariates	Yes	Yes	Yes
Includes Individual Fixed Effects	Yes	Yes	Yes
Observations	11,244	11,242	11,231
R-squared	0.773	0.652	0.709

Notes: Each specification includes the (time varying) demographic and financial characteristics listed in Table 1. Robust standard errors in parentheses. Standard errors are clustered at the individual level. *** p<0.01, ** p<0.05, * p<0.1.

Table 28. Savings behavior – Heterogeneity by financial literacy and stimulus receipt

Variables	(1) Saving	(2) Saving - Liquid	(3) Saving - Retirement
2019	-0.007	-0.012	-0.013
	(0.008)	(0.009)	(0.008)
2020	0.050***	0.056***	-0.000
	(0.011)	(0.012)	(0.011)
Stimulus	0.027	0.044**	0.016
	(0.018)	(0.019)	(0.019)
Stimulus * High Fin Lit	-0.031*	-0.042**	0.002
	(0.018)	(0.020)	(0.021)
Constant	0.610***	0.567***	0.265***
	(0.079)	(0.076)	(0.068)
Includes Covariates	Yes	Yes	Yes
Includes Individual Fixed Effects	Yes	Yes	Yes
Observations	11,097	11,137	11,181
R-squared	0.685	0.673	0.777

Notes: Each specification includes the (time varying) demographic and financial characteristics listed in Table 1. Robust standard errors in parentheses. Standard errors are clustered at the individual level. *** p<0.01, ** p<0.05, * p<0.1.

Table 29. Subjective measures and financial fragility – Heterogeneity by 2019 spending behavior

Variables	(1) Financial Satisfaction	(2) High Financial Stress	(3) Financially Fragile
2019	-0.018	-0.038***	-0.002
	(0.015)	(0.010)	(0.009)
2020	0.028	-0.047***	-0.011
	(0.020)	(0.013)	(0.011)
2020 * Spent >= Inc in 2019	0.136***	-0.060***	-0.047***
	(0.029)	(0.018)	(0.017)
Constant	2.505***	0.562***	0.543***
	(0.154)	(0.076)	(0.080)
Includes Covariates	Yes	Yes	Yes
Includes Individual Fixed Effects	Yes	Yes	Yes
Observations	11,322	11,319	11,298
R-squared	0.773	0.651	0.709

Notes: Each specification includes the (time varying) demographic and financial characteristics listed in Table 1. Robust standard errors in parentheses. Standard errors are clustered at the individual level. *** p<0.01, ** p<0.05, * p<0.1.

Table 30. Savings behavior – Heterogeneity by 2019 spending behavior

Variables	(1) Saving	(2) Saving - Liquid	(3) Saving - Retirement
2019	-0.007	-0.012	-0.012
	(0.008)	(0.009)	(0.008)
2020	0.034***	0.042***	0.012
	(0.009)	(0.010)	(0.011)
2020 * Spent >= Inc in 2019	0.044***	0.054***	-0.009
	(0.014)	(0.015)	(0.015)
Constant	0.607***	0.562***	0.264***
	(0.080)	(0.077)	(0.068)
Includes Covariates	Yes	Yes	Yes
Includes Individual Fixed Effects	Yes	Yes	Yes
Observations	11,159	11,200	11,244
R-squared	0.683	0.672	0.775

Notes: Each specification includes the (time varying) demographic and financial characteristics listed in Table 1. Robust standard errors in parentheses. Standard errors are clustered at the individual level. *** p<0.01, ** p<0.05, * p<0.1.

Table 31. Subjective measures and financial fragility – Heterogeneity by 2019 spending behavior and stimulus receipt

Variables	(1) Financial Satisfaction	(2) High Financial Stress	(3) Financially Fragile
2019	-0.018	-0.038***	-0.003
	(0.015)	(0.010)	(0.009)
2020	0.055**	-0.042***	-0.012
	(0.022)	(0.014)	(0.012)
Stimulus	-0.005	-0.035*	-0.008
	(0.032)	(0.021)	(0.018)
Stimulus * Spent >= Inc in 2019	0.157***	-0.054**	-0.070***
	(0.039)	(0.025)	(0.024)
Constant	2.531***	0.556***	0.533***
	(0.156)	(0.076)	(0.080)
Includes Covariates	Yes	Yes	Yes
Includes Individual Fixed Effects	Yes	Yes	Yes
Observations	11,212	11,210	11,205
R-squared	0.773	0.651	0.709

Notes: Each specification includes the (time varying) demographic and financial characteristics listed in Table 1. Robust standard errors in parentheses. Standard errors are clustered at the individual level. *** p<0.01, ** p<0.05, * p<0.1.

Table 32. Savings behavior – Heterogeneity by 2019 spending behavior and stimulus receipt

Variables	(1) Saving	(2) Saving - Liquid	(3) Saving - Retirement
2019	-0.007	-0.012	-0.013
	(0.008)	(0.009)	(0.008)
2020	0.051***	0.056***	-0.001
	(0.011)	(0.012)	(0.011)
Stimulus	-0.017	-0.012	0.023
	(0.014)	(0.015)	(0.017)
Stimulus * Spent >= Inc in 2019	0.056***	0.070***	-0.012
	(0.018)	(0.020)	(0.021)
Constant	0.610***	0.566***	0.267***
	(0.080)	(0.076)	(0.068)
Includes Covariates	Yes	Yes	Yes
Includes Individual Fixed Effects	Yes	Yes	Yes
Observations	11,071	11,111	11,155
R-squared	0.685	0.673	0.776

Notes: Each specification includes the (time varying) demographic and financial characteristics listed in Table 1. Robust standard errors in parentheses. Standard errors are clustered at the individual level. *** p<0.01, ** p<0.05, * p<0.1.

Table 33. Subjective measures and financial fragility – Heterogeneity by manageability of 2019 debt

Variables	(1) Financial Satisfaction	(2) High Financial Stress	(3) Financially Fragile
2019	-0.018	-0.039***	-0.002
	(0.015)	(0.010)	(0.009)
2020	0.041**	-0.047***	-0.006
	(0.018)	(0.012)	(0.010)
2020 * Unmanageable Debt in 2019	0.172***	-0.099***	-0.092***
	(0.033)	(0.021)	(0.020)
Constant	2.524***	0.568***	0.540***
	(0.153)	(0.076)	(0.081)
Includes Covariates	Yes	Yes	Yes
Includes Individual Fixed Effects	Yes	Yes	Yes
Observations	11,298	11,295	11,279
R-squared	0.774	0.652	0.710

Notes: Each specification includes the (time varying) demographic and financial characteristics listed in Table 1. Robust standard errors in parentheses. Standard errors are clustered at the individual level. *** p<0.01, ** p<0.05, * p<0.1.

Table 34. Savings behavior – Heterogeneity by manageability of 2019 debt

Variables	(1) Saving	(2) Saving - Liquid	(3) Saving - Retirement
2019	-0.006	-0.011	-0.012
	(0.008)	(0.009)	(0.008)
2020	0.043***	0.050***	0.004
	(0.009)	(0.009)	(0.010)
2020 * Unmanageable Debt in 2019	0.036**	0.054***	0.015
	(0.016)	(0.018)	(0.016)
Constant	0.612***	0.567***	0.264***
	(0.081)	(0.077)	(0.069)
Includes Covariates	Yes	Yes	Yes
Includes Individual Fixed Effects	Yes	Yes	Yes
Observations	11,142	11,182	11,226
R-squared	0.683	0.672	0.775

Notes: Each specification includes the (time varying) demographic and financial characteristics listed in Table 1. Robust standard errors in parentheses. Standard errors are clustered at the individual level. *** p<0.01, ** p<0.05, * p<0.1.

Table 35. Subjective measures and financial fragility – Heterogeneity by manageability of 2019 debt and stimulus receipt

Variables	(1) Financial Satisfaction	(2) High Financial Stress	(3) Financially Fragile
2019	-0.018	-0.038***	-0.003
	(0.015)	(0.010)	(0.009)
2020	0.055**	-0.042***	-0.012
	(0.022)	(0.014)	(0.012)
Stimulus	0.022	-0.029	0.002
	(0.030)	(0.019)	(0.017)
Stimulus * Unmanageable Debt 2019	0.154***	-0.102***	-0.137***
	(0.043)	(0.029)	(0.028)
Constant	2.544***	0.559***	0.524***
	(0.154)	(0.075)	(0.081)
Includes Covariates	Yes	Yes	Yes
Includes Individual Fixed Effects	Yes	Yes	Yes
Observations	11,197	11,195	11,192
R-squared	0.774	0.652	0.710

Notes: Each specification includes the (time varying) demographic and financial characteristics listed in Table 1. Robust standard errors in parentheses. Standard errors are clustered at the individual level. *** p<0.01, ** p<0.05, * p<0.1.

Table 36. Savings behavior – Heterogeneity by manageability of 2019 debt and stimulus receipt

Variables	(1) Saving	(2) Saving - Liquid	(3) Saving - Retirement
2019	-0.007	-0.012	-0.013
	(0.008)	(0.009)	(0.008)
2020	0.050***	0.056***	-0.001
	(0.011)	(0.012)	(0.011)
Stimulus	0.002	0.003	0.010
	(0.014)	(0.015)	(0.016)
Stimulus * Unmanageable Debt 2019	0.024	0.055**	0.021
	(0.021)	(0.023)	(0.023)
Constant	0.615***	0.572***	0.269***
	(0.081)	(0.077)	(0.068)
Includes Covariates	Yes	Yes	Yes
Includes Individual Fixed Effects	Yes	Yes	Yes
Observations	11,060	11,099	11,143
R-squared	0.685	0.673	0.777

Notes: Each specification includes the (time varying) demographic and financial characteristics listed in Table 1. Robust standard errors in parentheses. Standard errors are clustered at the individual level. *** p<0.01, ** p<0.05, * p<0.1.

Table 37. Retirement security

Variables	(1) Well Prepared	(2) Claiming Age	(3) Well Prepared	(4) Claiming Age
2018	0.021**	0.127	0.024*	0.121
	(0.011)	(0.129)	(0.014)	(0.146)
2018 * 60+			-0.014	0.244
			(0.020)	(0.275)
2020	0.043***	0.188	0.042***	0.113
	(0.011)	(0.146)	(0.015)	(0.167)
2020 * 60+			-0.006	0.655*
			(0.021)	(0.335)
Age 60+			0.031	-0.446
			(0.027)	(0.354)
Constant	0.485***	64.682***	0.475***	64.705***
	(0.065)	(0.910)	(0.066)	(0.911)
Includes Covariates	Yes	Yes	Yes	Yes
Includes Individual Fixed Effects	Yes	Yes	Yes	Yes
Observations	8,053	3,107	8,053	3,107
R-squared	0.774	0.782	0.774	0.782

Notes: Each specification includes the (time varying) demographic and financial characteristics listed in Table 1. Robust standard errors in parentheses. Standard errors are clustered at the individual level. Claiming Age has been winsorized at the 95% level, corresponding to the maximum possible age of 70. *** p<0.01, ** p<0.05, * p<0.1.

About the authors

Marco Angrisani is an Economist at the USC Center for Economic and Social Research and Assistant (Research) Professor at the USC Economics Department. His research interests span across household finance, labor economics, economics of aging, and applied microeconomics. Another strand of his work concerns data collection and different aspects of survey methodology, from sampling and weighting techniques, to questionnaire design and survey harmonization. Angrisani received an B.A. in political economy from University of Siena, an M.S. in economics from University College London, and a Ph.D. in economics from University College London.

Jeremy Burke is a Senior Economist at the University of Southern California's Center for Economic and Social Research and Director of USC's Behavioral Economics Studio. His main fields of research are behavioral economics and consumer financial decision making. Currently, he is leading multiple field experiments testing behaviorally informed approaches to improve consumer financial stability, particularly by reducing high interest debt burdens. In other research, Jeremy is examining the impacts of the COVID-19 pandemic on Americans' financial security, whether educational interventions can reduce adults' susceptibility to financial fraud, and how cognitive ability and cognitive aging influence debt accumulation late in life. Previously, he was an Economist at RAND, Associate Director of RAND's Center for Financial and Economic Decision Making, and a professor in the Pardee RAND Graduate School. Jeremy received his Ph.D. in economics from Duke University.

Arie Kapteyn Ph.D., is a Professor of Economics and the Executive Director of the Dornsife College of Letters Arts and Sciences Center for Economic and Social Research (CESR) at the University of Southern California. Before founding CESR at USC in 2013, Prof. Kapteyn was a Senior Economist and Director of the Labor & Population division of the RAND Corporation. He came to RAND after an almost twenty years stint at Tilburg University in the Netherlands, where he was professor of economics, dean, and founding director of several institutes.

Much of Prof. Kapteyn's recent applied work is in the field of aging and economic decision making, with papers on topics related to retirement, consumption and savings, pensions and Social Security, disability, economic well-being of the elderly, and portfolio choice. He is a pioneer in the development of new methods of data collection, using the Internet and mobile devices.

Dr. Kapteyn received an M.A. in econometrics from Erasmus University Rotterdam, an MA in agricultural economics from Wageningen University, and a Ph.D. from Leiden University, all in the Netherlands. He is a fellow of the Econometric Society and holds a knighthood in the order of the Netherlands Lion.

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