

Debt and Financial Vulnerability on the Verge of Retirement

Annamaria Lusardi

The George Washington University School of Business

Olivia S. Mitchell

The Wharton School of the University of Pennsylvania

Noemi Oggero

University of Turin

4-27-19

The authors thank Carlo de Bassa Scheresberg, Ana Gazmuri, and Yong Yu for expert programming and research assistance. Additionally, for suggestions and comments they thank Barbara Butrica, Carolina Fugazza, Elizabeth Llanes, Melinda Morrill, Karen Pence, participants at the 2018 TIAA Institute Fellows Symposium, the 2018 American Economic Association in Philadelphia, the 15th Annual Joint Conference of the Retirement Research Consortium, the 2016 Working Longer and Retirement conference at SIEPR/Stanford University, and the CMV/OECD Seminar on Emerging Trends in Financial Education, Rio de Janeiro, Brazil. The research was supported by a grant from the US Social Security Administration (SSA) to the Michigan Retirement Research Center (MRRC) as part of the Retirement Research Consortium (RRC). Support was also provided by the TIAA Institute and the Pension Research Council/Boettner Center of the Wharton School at the University of Pennsylvania. The findings and conclusions are solely those of the authors and do not represent the views of SSA, any agency of the Federal Government, the MRRC, or any other institutions with which the authors are affiliated. ©2019 Lusardi, Mitchell, and Oggero.

Debt and Financial Vulnerability on the Verge of Retirement

Annamaria Lusardi, Olivia S. Mitchell, and Noemi Oggero

Abstract

We analyze older individuals' debt and financial vulnerability using data from the Health and Retirement Study (HRS) and the National Financial Capability Study (NFCS). In the HRS, we compare three groups of people age 56-61 in 1992, 2004, and 2010, to assess cross-cohort changes in debt over time. Two waves of the NFCS (2012 and 2015) are employed to gain additional insights into debt management and older individuals' capacity to shield themselves against shocks. We conclude that recent cohorts hold more debt and face more financial insecurity in retirement than in the past. This will render them particularly vulnerable to forecasted interest rate increases.

Annamaria Lusardi

The George Washington University School of Business
Duques Hall, Suite 450E
2201 G Street, NW Washington, DC 20052
Tel: (202) 994-8410
E-mail: alusardi@gwu.edu

Olivia S. Mitchell

The Wharton School of the University of Pennsylvania
3620 Locust Walk, Steinberg Hall-Dietrich Hall
Philadelphia, PA 19104
Tel: (215) 898-0424
E-mail: mitchelo@wharton.upenn.edu

Noemi Oggero

University of Turin
Piazza Arbarello 8
10122 Torino (TO) Italy
E-mail: noemi.oggero@unito.it

Debt and Financial Vulnerability on the Verge of Retirement

The United States has witnessed a steady rise in access to financial credit and opportunities to borrow over time, yet many individuals lack the financial know-how to manage the complex new financial products increasingly available in the financial marketplace.¹ As a consequence, it is key to learn more about how people borrow and manage debt in the modern economy. In particular, older persons today appear more likely to enter retirement in debt than in past decades. Importantly, the greater indebtedness of people on the verge of retirement has several macroeconomic implications. For example, higher debt levels make older individuals more sensitive to increases in interest rates. Moreover, retirees may need to devote a rising proportion of their incomes to servicing their debt. This paper evaluates the factors associated with older Americans' debt patterns and debt management practices to trace how these patterns have changed over time and to evaluate whether these practices leave people particularly vulnerable in old age.

To this end, we examine older individuals' debt patterns using the Health and Retirement Study (HRS) and the National Financial Capability Study (NFCS). With the HRS, we compare three different cohorts of people on the verge of retirement (age 56-61) as well as people slightly older (age 62-66). We study the determinants of debt and how debt across the cohorts has evolved. We also discuss the potential consequences of our findings regarding indebtedness on the verge of retirement.² With the 2012 and 2015 NFCS, we explore rich new information on debt and debt management among the same age groups (56-61 and 62-66), highlighting many signs of financial distress among individuals who should be close to the peak of their wealth accumulation profiles.

¹ See Lusardi and Mitchell (2007, 2008, 2011a, b, c, 2014); and Lusardi, Mitchell, and Curto (2014).

² Our prior work examined saving and asset building among those age 50+ (Lusardi and Mitchell, 2007, 2011a).

The NFCS data also enable us to examine the determinants of financial fragility and over-indebtedness of individuals on the cusp of retirement.³

Our focus on debt is important for several reasons. First, debt typically grows at interest rates higher than those which can be earned on investments. For this reason, debt management is vital for those seeking to manage their retirement assets conservatively. Second, consumer credit such as credit card borrowing has become more accessible, and this type of unsecured borrowing has risen over time. This trend can have both micro- and macroeconomic implications. Third, high-cost alternative financial services including payday loans, pawn shops, auto title loans, and rent-to-own shops, have proliferated in many states (Lusardi and de Bassa Scheresberg, 2013). Fourth, it is important to identify financially fragile families which can be sensitive to shocks during retirement. Finally, the 2008-2010 financial and economic crisis was largely driven by borrowing behavior, so understanding debt may help avoid a repeat of past errors.

Our paper is organized as follows: We first provide a conceptual framework to overview the reasons for the increase in debt. We then examine HRS data to document the increase in debt among the most recent cohort of pre-retirees and assess the determinants of debt. We next turn to data from the NFCS to complement the empirical analysis and assess the importance of financial literacy in explaining debt close to retirement. In a final section, we offer remarks about the implications of our findings for policy and programs.

A Conceptual Framework for Understanding Older Americans' Rising Debt

American households were incurring increasing amounts of debt well before the financial crisis (Federal Reserve Bank of New York, 2016). Also, after the 2008-09 crisis and Great

³ As academic advisors to these surveys, we have helped design the key questions in both the HRS and NFCS.

Recession, aggregate household debt again rose quickly, almost reaching the pre-crisis level by the end of 2016 (just 0.8% below the all-time peak). This rise in household debt emerged for several reasons, some deriving from the supply side of credit, some from the demand side, and some from both sides. We summarize these in Table 1. First, with regard to the supply side, the availability of mortgage credit grew rapidly from 2002 to 2005, unrelated to people's economic circumstances (e.g., Mian and Sufi, 2017; Levitin and Wachter, 2012). As families gained easier access to home mortgages and home equity lines of credit compared to the past,⁴ they made smaller down payments when buying homes. In tandem, as sub-prime mortgages proliferated, credit became increasingly accessible to consumers with low credit scores, little income, and few assets. Second, the growth of easier mortgages was paired with a rapid rise in housing prices during the 2000s (Christelis, Ehrmann, and Georgarakos, 2015; Dynan and Kohn, 2007; Mian and Sufi, 2011), which encouraged borrowing. The rising cost of housing in the face of greater income inequality was also suggested as an explanation for the rapid rise in debt (Kumhof, Ranciere, and Winant, 2015). Third, non-collateralized debt including credit card borrowing and high-cost alternative financial services, became more accessible in many states (Lusardi and de Bassa Scheresberg, 2013).

The shift from defined benefit to defined contribution pension schemes also made it feasible for people to borrow from their 401(k) plans. Beshears, Laibson, and Madrian (2012) report that most (90%) of 401(k) participants were in plans offering a loan option. Moreover, about one in five eligible 401(k) plan participants had loans outstanding (Lu et al., 2017). Recent work has shown that some portion of retirement savings induced by automatic enrollment is, in fact, offset by higher consumer borrowing outside the retirement plan, in particular auto and mortgage

⁴ Lower interest rates reduced the effective cost of accessing home equity (Hurst and Stafford, 2004).

debt (Beshears et al., 2017). Thus, the increasing practice of auto-enrolling people into 401(k)s may have also induced people to go into debt.

In addition to these supply aspects, other factors acted on the demand side and contributed to the rise in debt. A major reform of US bankruptcy law that took effect in 2005 preserved the non-recourse status of mortgages, incentivizing people to hold on to mortgage debt. Indeed, as shown by Nam and Oh (2017), non-recourse laws exacerbated swings in housing prices by encouraging speculative investments during housing market booms. An unintended consequence of the bankruptcy reform which raised the cost of filing and reduced the amount of discharged debt, was to raise mortgage defaults by closing off a popular procedure that previously helped financially distressed homeowners pay their mortgages.⁵ Moreover, structural changes in the mortgage market made homeowners more inclined to refinance in the 1990s than previously; for instance, Bennett, Peach and Peristiani (2001) showed that the propensity to refinance increased over time, due to a decline in transactions costs or frictions. In particular, households experiencing an unemployment shock and who had limited initial liquid assets to draw on were more likely to refinance in the 1990s than before (Hurst and Stafford, 2004).

When credit became more plentiful, people struggled to understand and manage their debt. Several studies have documented that many Americans have scant knowledge of the costs of borrowing (Lusardi and Mitchell, 2014; Lusardi and Tufano, 2009, 2015). This in turn could affect the amount people borrow, particularly when opportunities to do so increase dramatically. For example, studies have found a strong link between overindebtedness and financial literacy, though few of these studies have focused explicitly on older persons. We do know that the least financially

⁵As Li, White, and Zhu (2011) have argued, credit card debt and other types of unsecured debt are discharged in bankruptcy, so filing for bankruptcy allows homeowners to shift funds from paying other debts to paying their mortgages.

literate incur high fees and have trouble judging their debt positions (Lusardi and Tufano, 2015). The financially unsophisticated are also more likely to borrow from their 401(k) accounts (Lu et al., 2017; Utkus and Young, 2011), and more likely to use high-cost methods of borrowing such as payday loans (Lusardi and de Bassa Scheresberg, 2013). Others have noted that managing debt and other financial matters is especially problematic for older adults (Agarwal et al. 2009). Pottow (2012) showed that the age 65+ demographic was the fastest-growing in terms of bankruptcy filings, which stood at 2% in 1991 but rose by more than three times by 2007. Credit card interest and fees were the most-cited reasons for bankruptcy filings, for two-thirds of those filing.

Moreover, the cost of having children has changed and, in particular, the cost of education has increased substantially over time. This has affected the transfers (including those related to debt, for example student loans) that older people can give or receive from their offspring.

Additional explanations for the rapid run-up in Americans' debt arise from both the supply and demand sides of credit markets. One such factor is the fact that changes in the lending market induced risk-based pricing, reduced distribution costs, and contributed to other innovations making it easier for households to borrow (Dynan, 2009; Edelberg, 2006). Improvements in the technology of persuasion through nonlinear contracts and uninformative sales tactics have also "shrouded" customers' understanding of financial contracts and, in turn, boosted total amounts borrowed (Gabaix and Laibson, 2006; Agarwal et al., 2016; Bertrand et al., 2010; Gine, Martinez Cuellar, and Mazer, 2014; Gurun, Matvos, and Seru, 2016).

Table 1 here

In sum, our reading of the literature is that in a low interest rate environment such as that experienced since 2008, and in light of the many changes in credit markets, it is not surprising that older Americans have become more indebted over time. Yet as interest rates rise, near-retirees and

retirees will become increasingly stressed by their high levels of debt. In what follows, we document the rising debt across older cohorts and show how people on the verge of retirement are becoming increasingly financially vulnerable to rising interest rates. While taking into account the credit supply view, our analysis focuses mostly on demand side factors associated with financial vulnerability at older ages.

An Analysis of Debt among Older Americans in the HRS

The existing literature offers useful insights regarding the overall rise in debt, yet relatively little research has evaluated *older* Americans' debt patterns. Moreover, few extant studies look at the determinants of indebtedness close to retirement. For this reason, in what follows, we contribute to the literature with new empirical analyses of debt and debt management among older Americans.

Our first set of analyses use the Health and Retirement Study (HRS), a nationally-representative panel of the older US population. Using the rich information derived from the HRS, we have assembled extensive and comparable asset and debt information for six groups of people on the verge of retirement. First we examine persons age 56-61 in a HRS Baseline cohort, a War Babies cohort, and an Early Boomers cohort; next, to examine how debt differs for older persons, we examine those age 62-66 in the same three cohorts.⁶ The difference in time periods and age

⁶ Specifically, the HRS Baseline cohort was born 1931–1941; the War Babies group was born 1942–1947; and the Early Boomer group was born 1948–1953. The 56–61 age group was surveyed in 1992 for the Baseline HRS cohort, in 2004 for the War Babies, and in 2010 for the Early Boomers. The 62–66 age group was surveyed in 1998 for the Baseline HRS cohort, in 2008 for the War Babies, and in 2014 for the Early Boomers. We also note that the survey included different numbers of respondents per cohort, since the 1992 HRS survey was substantially larger than the subsequent groups. Results reported below use weighted data and all dollar values are expressed in 2015 dollars.

groups allows us to examine how the financial crisis affected the amount of debt that individuals held as they neared and entered retirement.

Cross-Sectional Results

Table 2 describes the evolution of total debt, where we focus first on respondents age 56-61.⁷ Total debt is measured in the HRS as the value of mortgages and other loans on the household's primary residence, other mortgages, and other debt (including credit card debt, medical debt, etc.). The percentage of people age 56-61 on the verge of retirement with debt rose from 64% in the HRS Baseline group to 71% among Early Boomers. Additionally, the value of debt held rose sharply across cohorts. While the median (p50) amount of debt in the Baseline group was about \$6,800, it more than quadrupled among War Babies and almost quintupled among Early Boomers (respectively \$31,200 and \$32,700, all in \$2015). We also see that the debt distribution appears to have changed across cohorts over time. The top quartile (p75) of the debt distribution in the Baseline group held around \$51,000 in debt, while this same quartile of the population held more than double (\$106,000) and almost triple (\$146,800) that amount in the two more recent cohorts. Additionally, the top 10 percent of the debt distribution (p90) reported debt of over \$272,000, more than double what had been seen for respondents in this same age range 18 years earlier. Depending on the interest rate charged on this debt, these families are very likely to face sizeable monthly debt repayments and to carry debt well into retirement. As debt levels increase, borrowers' ability to repay becomes progressively more sensitive to drops in income as well as increases in interest rates. For a given shock, the higher the debt, the higher the probability of

⁷ The analysis attributes household assets and debt to each age-eligible individual in the HRS sample. This, in effect, implies that all household assets and liabilities influence married and single respondents when they make economic decisions. An alternative approach might seek to allocate assets and liabilities between members of a couple, but this is difficult if not impossible to do and it would not affect the debt ratios examined below.

defaulting (Cecchetti, Mohanty, and Zampolli, 2011). Moreover, most households entering retirement age with a mortgage do not fully pay the debt in retirement. In fact, only about 25-35 percent of older homeowners with a mortgage in 1992 had paid off their mortgage by the year prior to their death (Mayer, 2017).

Table 2 here

One factor driving this increase in debt across time is the rise in people's primary residence mortgages. In the second panel of Table 2, we see that the percentage of people age 56–61 having mortgage debt grew by 8 percentage points, from 41% in the Baseline group to 49% among Early Boomers. Moreover, mortgage debt amounts grew as well. For instance, looking at the third quartile (p75) of the mortgage debt distribution in the whole sample (not conditional on having a mortgage), we see that mortgage debt more than tripled among Early Boomers compared to the Baseline group. The third panel shows that over the same period, the percentage of respondents with loans on their primary residences grew from 11% to 17%, an increase of 50%. Here too, people's mortgage values rose.

A possible explanation for these differences is that each cohort was exposed to different debt environments during their lifetimes, and such differences can predict changes in expectations and behaviors (e.g., Malmendier and Nagel, 2016). For example, Early Boomers interviewed in 2010 experienced much easier mortgage terms than prior cohorts. Yet this learning from experience effect is mitigated in our work, as we focus only on homeowners' debts for their primary residences. Early Boomers age 56-61 surveyed in 2010 averaged 10 years in their current residence, indicating that they bought their homes prior to the growth of easier mortgages.⁸ It is also possible that individuals holding considerable debt amounts are those expecting more

⁸ Moreover, data from the NFCS (to be discussed below) show that 70 percent of people age 56-61 in 2012 bought their current homes well before 2003.

generous pensions. However, the share of individuals with more generous defined benefit plans decreased across cohorts, due to the shift to defined contribution pension schemes occurred in the last decades. In fact, the fraction of households qualifying for a defined benefit pension plan other than Social Security fell from 43% in 1989 to 32% in 2007 (Dynan, 2009).

The fourth panel of Table 2 indicates that the mean value of other mortgages (e.g., on secondary residences) also increased, though relatively few households (4–6%) held this type of debt. In sum, the housing debt incurred during the leadup to the Great Recession remains on many older households' balance sheets today. The fifth panel of Table 2 indicates that other debt for persons on the verge of retirement also rose across cohorts, from 37% for the HRS Baseline group to 42% for the Early Boomers. Debt distributions have also become more skewed over time. For instance, those in the 90th (p90) decile of the distribution of other debt had about \$8,000 in debt in the Baseline group, while the War Baby and Early Boomer cohorts in the same decile held over \$17,000 and almost \$22,000, respectively. Because this category includes non-collateralized debt (which normally charges high interest rates), our results indicate that older Americans are increasingly likely to face high monthly payments to service their debt.⁹ After years of keeping nominal interest rates to record low levels (Schmidt, 2013), the government is now allowing short-term interest rates to rise (Cox, 2018). This will stress older households' financial situations as a result.

Additional insight into older adults' financial situations is provided by the ratios of debt to assets, reported in Table 3. Total assets here include all checking and savings accounts, CDs, money market funds, T-bills, bonds/bond funds, stocks/stock market funds, IRAs, 401(k)s, and Keoghs, the value of primary residence and other real estate, vehicles, business equity, and other

⁹ For example, it takes a monthly payment of \$547 to pay off a debt of \$21,000 with an associated annual percentage rate (APR) of 20% in five years; see also Butrica and Karamcheca (2013).

savings.¹⁰ We also consider the ratio of housing debt (including home mortgages and other home loans) to the value of the house, and the ratio of other debt to the value of liquid assets (where the latter includes the sum of checking and savings accounts, CDs, money market funds, T-bills, bonds/bond funds, and stocks/stock market funds). These ratios allow us to evaluate older adults' leverage ratios and to assess how much of their home loans they have paid off. This, in turn, shows whether people will enter retirement having to make monthly mortgage payments.

Table 3 here

Comparing Tables 2 and 3, we see that it is not just the *value* of debt that has increased over time, but also the *proportion of debt to assets*. Thus, Americans age 56-61 today are much more leveraged than were their counterparts in the past. For example, the first panel of Table 3 shows that the median value of total debt over total assets was rather small for the HRS Baseline cohort (only about 4%), but this ratio rose to 11% and 15% for the War Baby and Early Boomer cohorts.¹¹ Moreover, a sizable fraction of Early Boomers had ratios over 50% and some held debt worth as much as 90% of total assets. Of course, debt may not be problematic if homeowners have sufficient assets to repay the debt. Yet debt has risen not only as a share of home values among the older population, but also relative to financial assets (Mayer, 2017).

The accumulation of residential debt across cohorts is underscored in the second panel of Table 3. Here we see that many Early Boomers nearing retirement (age 56–61) were far more leveraged on their homes than were the War Baby and HRS Baseline cohorts. At the median, the ratio of primary mortgage to home value rose from 5% to 30%, and for the top ten percentile (p90)

¹⁰ We use the measure of wealth provided in the RAND HRS, with wealth values winsorized at the top and bottom 1%.

¹¹ Ratios are defined only for those who have a strictly positive value of total assets.

of the group, it went from 63% to 92%. This means that Early Boomers on the verge of retirement must continue servicing their mortgages well into retirement.

Mortgage debt rose in part because the more recently-surveyed cohorts purchased more expensive homes than did their predecessors. For instance, the median HRS Baseline respondent in his or her late 50's had a home worth about \$144,000; by 2004, the median War Baby household of the same age owned a home worth \$187,000 (fourth panel of Table 3 in \$2015). Home values for the median Early Boomer were even higher in 2010, at \$218,000, even after the shock to housing values in the Great Recession. The trend toward buying more expensive homes also meant that the percentage of total assets accounted for by peoples' homes grew over time. Thus, at the median of the debt ratio distribution, the Baseline cohort held about 46% of its total assets in primary residences, but for the Early Boomers the percentage was 50% (third panel of Table 3).

The fifth panel of Table 3 indicates that non-mortgage debt also rose as a percentage of liquid asset values, and for some people, it rose a great deal.¹² A much higher proportion of Early Boomer households held such debt worth the same as, or more, than their liquid assets: at the mean (p50), the ratios rose by 10 times. Again, this implies that older people will increasingly need to borrow or sell other (less) liquid assets to pay for this non-collateralized debt. Furthermore, it is interesting that a large fraction of respondents held liquid assets even while carrying debt. Since debt is likely to incur higher interest rates than bank accounts pay on savings, some families may be overlooking opportunities to better manage their balance sheets.¹³

¹² Table 3 reports these ratios conditional on the respondent having strictly positive liquid assets.

¹³ In results not detailed here, we have also traced the time pattern of debt ratios for the baseline HRS cohort over time. We do see that this cohort benefited from the housing boom, as the median value of their primary residences grew from \$100,000 in 1998 to a high of \$175,000 in 2006 and 2008, and its debt exposure declined gradually from 1992. Yet though the debt position of the baseline cohort improved due to the housing boom, its financial vulnerability indexes decreased well before the boom began.

An additional diagnostic of changes in indebtedness over time is available from an analysis of the ratio of total debt to total income, which is another indicator of peoples' ability to repay debt. The sixth panel of Table 3 indicates that the debt to income ratio also rose across cohorts, with the median ratio growing from 14% to 45-50% across the three cohorts. This trend is confirmed by other studies (e.g., Dynan and Kohn, 2007), even though some decline in the median debt to income ratio was observed in the aftermath of the financial crisis. Bricker et al. (2014) found that, in 2013, the median debt-to-income ratio for debtors declined from the level in 2010, to close to that witnessed in 2004. In our data, we can see that the ratio slightly increased for the cohort surveyed in 2010, compared to the War Baby cohort (surveyed in 2004), notwithstanding the deleveraging after the Great Recession. This increase in debt to income ratios makes older households more vulnerable to shocks and rising interest rates.

Movements in market rates also alter the terms of new borrowing, as well as the burden imposed by previous borrowing. When debts are large relative to incomes, this effect is accentuated, so a given rise in interest rates will have a larger effect on debt service and thus on the funds available for consumption (Dynan and Kohn, 2007). The increased indebtedness makes the household sector more exposed to interest rate risk, particularly given variable rate mortgages which have grown over time (Debelle, 2004). Furthermore, the easing of liquidity constraints and peoples' rising indebtedness over time imply that household consumption, and hence the economy, are likely to be more sensitive to forecasted interest rate increases (Bloomberg, 2018).

Next we turn to several *financial vulnerability indicators* that offer an assessment of how older individuals have fared as they neared retirement.¹⁴ Adults close to retirement would be

¹⁴ The bulk of the present analysis excludes pension and Social Security wealth. These are important components of total wealth, but many in the cohorts we examine still have defined benefit plans which tend to restrict taking lump sums. Of course Social Security wealth is not liquid.

anticipated to be at or near the peak of their wealth accumulation process, and one important decision they must make is how to decumulate wealth throughout their older years. As noted above, however, recent cohorts will also need to manage and pay off their rising debt burdens in retirement. This is made more difficult by the fact that older persons often alter their portfolios away from risky and toward fixed income assets as they age. If equity returns also fall in the future (Horneff, Maurer, and Mitchell, 2018), it will be important for current older cohorts to manage their assets and liabilities wisely and pay off some of their higher-interest debt first. Accordingly, cohorts entering retirement will need to ensure that their income and asset drawdowns suffice not only to cover their target consumption streams but also service their mortgage and other debt. This is made increasingly complex by older workers' lack of flexibility in adjusting mortgage payments, apart from selling their homes, moving to smaller homes, or engaging in reverse mortgages.¹⁵

Table 4 underscores the fact that the prevalence of financial vulnerability has risen over time. As shown in the first panel, fewer than 10% of the HRS Baseline respondents approached retirement with debt to asset ratios above 0.5, but over one-fifth (22%) of Early Boomers did so.¹⁶ Moreover, this tendency was already in place before the financial crisis, since the ratio of debt to assets was already higher for War Babies (15%) than for the Baseline group. As noted earlier, part of the debt increase can be attributed to easier home mortgages, leading later cohorts to take on far higher ratios of mortgage debt to home values than in the past. This also helps explain why the housing market collapse exacerbated the role of mortgages and other loans in driving near-retirement debt.

Table 4 here

¹⁵Nevertheless, older cohorts have traditionally been unwilling to do so, at least until very late in their lifetimes (Venti and Wise, 1990, 1991; Hurd, 1990).

¹⁶ These values refer only to those with strictly positive assets.

The second panel of Table 4 shows that only about 16% of the HRS Baseline group (age 56-61) had loan/value ratios on their primary residences greater than 0.5, compared to 26% of the War Babies and almost 35% of the Early Boomers. The third panel confirms that non-mortgage debt to asset ratios also rose rapidly across cohorts. Accordingly, Early Boomers are more exposed to the negative consequences of interest rate increases than their earlier counterparts.

The last panel of Table 4 focuses on measured changes in the prevalence of very low wealth, defined here as having less than \$25,000 in savings. We focus on this cutoff as it is about half of median household income, and it is not very high relative to a health shock or some other costly surprise. Our results show that only 15-16% had such low net worth in the HRS Baseline and War Baby cohorts, while 24% of the Early Boomer cohort had such low wealth. Accordingly, savings have shrunk and debt has ballooned for Americans on the verge of retirement.

Debt Patterns in Perspective

Our analysis so far shows that, in recent years, cohorts of people age 56-61 have taken on substantially more debt and are more financially vulnerable than their predecessors, often because they purchased more expensive homes with smaller down payments. A closer look at debt burdens of older persons is available from our results on respondents age 62-66 for same three cohorts.

The evolution of debt and debt ratios for people age 62-66 appears in the rightmost panels of Tables 2-4. In line with the younger group, each cohort's indebtedness also rose over time. For example, Table 2 shows that the percentage of people age 62-66 with debt rose from 52% in the HRS Baseline, to 64% among Early Boomers; median debt grew from \$580 in the HRS Baseline to \$8,800 (15 times) among War Babies and \$12,000 (21 times) among Early Boomers (all in \$2015).

Table 2 also shows that older people generally held less debt than did the slightly younger age group. For instance, in the HRS Baseline cohort, 64% of those age 56-61 were debt holders, but the percentage was lower (52%) among those age 62-66. This difference persists for the later cohorts, with 71% of Early Boomers age 56-61 having debt, versus 64% of Early Boomers age 62-66. Moreover, older debt holders also held less debt. Among Early Boomers, the median total debt of the age 62-66 group was only about a third of the median debt level of those age 56-61 (\$12,000 versus \$32,700). The fact that indebtedness drops off a bit as people age most likely means that debt continues to be repaid in old age, or it might also indicate that today's older people were more conservative about taking on debt near retirement than today's younger generation. In any event, diminished financial stability due to greater debt is likely to continue, as recent cohorts are nearing retirement age with greater debt than in the past.

The ratios of debt to assets for those age 62-66 reported in Table 3 also show that debt ratios rose across cohorts. For instance, the median ratio of primary mortgage to home value rose from 0% in the HRS Baseline to 13% among Early Boomers. Nevertheless, leverage ratios decline with age for the Early Boomer cohort: median debt to income ratios, indicative of potential problems repaying debt, were twice as large among persons age 56-61 compared to those age 62-66. We interpret the evidence as suggesting that Boomers will need to manage a great deal of debt at older ages, with possibly unfortunate implications for retirement security. The higher debt to income ratio means that people on the verge of retirement will be more exposed to shocks and will remain exposed for longer than in the past (DeBelle, 2004). Consistent with the results discussed above, individuals in the older group (62-66) are less financially vulnerable, even though their vulnerability indicators such as high debt to asset ratios and low wealth have risen over time (Table 4).

Multivariate Regression Analysis

To better understand the factors associated with financial vulnerability among older Americans, Table 5 summarizes results from multivariate regression analyses on the four outcomes just discussed, for the 56-61 and 62-66 age groups separately. Here the multivariate analysis shows which factors are associated with having (a) a total debt/asset ratio >0.5 , (b) a ratio of primary residence loans to home value >0.5 ; (c) a debt/liquid asset ratio >0.5 ; and (d) total net worth $< \$25,000$.

Table 5 here

Confirming our earlier tabular results, all of the cohort indicators are statistically significant and positive for all four dependent variables (the reference group is the HRS Baseline). This implies that both the War Babies and Early Boomers ages 56-61 and 62-66 were more likely to be in debt and financially vulnerable relative to the HRS Baseline reference group. Moreover, results show that for all three debt-to-asset measures, the Early Boomers held significantly more debt and were significantly more financially vulnerable compared to the War Babies.

Even more important, the directional conclusions from Tables 2-4 are supported even after including controls for potential cross-cohort differences in socio-demographic factors (e.g., age, marital status, sex, number of children ever born, race, educational attainment, income, and whether they reported being in poor health). Additionally, to indicate whether children were drawing down their parents' finances, we include a question from the HRS indicating whether respondents had provided a monetary transfer of at least \$500 to their children in the past two years (*KidHelp* is coded as =1 the respondents answered they had, and 0 if not).

As indicated in Table 5, several of the control variables are significantly associated with respondent financial vulnerability. Not surprisingly, being unmarried, nonwhite, less educated, and

having lower income rendered respondents more likely to be financially vulnerable. Interestingly, self-reported poor health was also a strong predictor of financial vulnerability, particularly for the older age group (62-66).¹⁷ Another factor significantly associated with greater vulnerability is the number of children people had: in particular, those having more children were more likely to report having higher debt to asset ratios, and more debt relative to liquid assets. Interestingly, parents who reported giving \$500+ to offspring in the past two years did not hold significantly more debt; moreover, those who did give such transfers to their children were less likely to have low net worth. In other words, the lifetime impact of having more children is more predictive of parental debt, whereas recent monetary transfers are more likely to be given by better-off parents.

Since cohorts may have different risk preferences,¹⁸ we also conducted robustness analysis by incorporating a proxy for risk aversion in the set of covariates (see the Appendix). These are elicited in the HRS with questions about hypothetical lifetime income gambles and measured on a 4-point scale (1 for least risk averse and 4 for most risk averse). Previous research has confirmed that this risk measure does predict risky behaviors, including failing to have insurance, choosing risky employment, and holding risky assets (Barsky et al., 1997). We find that this risk aversion measure falls only slightly across cohorts, and our main results do not change. Moreover, including risk attitudes has no statistically significant impact on the dependent variables. In robustness

¹⁷ For the 56–61 age group, we also performed a multivariate regression analysis on the same four outcomes for those married/living with a partner at the time of the survey, versus for the non-married subset alone (results are available on request). Both single and partnered Early Boomers age 56–61 were significantly more vulnerable than their HRS baseline counterparts. Additionally, we found interesting associations with specific correlates. For instance, poor health was a strong predictor of high debt ratios for the full sample (in particular, non-mortgage debt ratios) and low wealth holdings close to retirement, perhaps because of medical debt. This association proved to be quantitatively more important for singles than for couples. Similarly, singles did better when they had higher income compared to those with partners. The role of education also differed: compared to high school dropouts, singles with a college degree were markedly wealthier and less likely to have substantial debt.

¹⁸ See, for instance, Bernile, Bhagwat, and Rau (2017).

analysis we include all these controls as well as an indicator of the number of years a respondent lived in his current residence; this may flag whether an older respondent had purchased a home for investment instead of residency, as discussed in our review of the reasons for the increase in debt. Nevertheless, including that variable does not change our findings (see the Appendix).

As a final robustness analysis, we examined whether respondents who had a bad mortgage experience during the financial crisis were more or less likely to be in financial straits at the time we examine their financial frailty. We capture this notion by investigating whether HRS respondents who were underwater with their mortgages in 2008, and separately, who had a higher loan to value ratio on the primary residence in 2008, were more or less financially fragile in 2014. In results available on request, we find that both variables are positively associated with who was financially fragile at the later date. Accordingly we conclude that people having had a bad mortgage experience in 2008 were not in better shape by 2014. In separate models, we also included controls for HRS respondents' defined benefit (DB) and defined contribution (DC) wealth (results available on request). Interestingly, in the younger group, those having more DC wealth were somewhat less financially vulnerable, by all three measures used in Table 5. For the older group, DC wealth was never statistically significant, and those with more DB wealth were very slightly (<1 percentage point) more likely to be financially vulnerable.

Debt among Older Americans in the NFCS

Next we turn to an analysis of the 2012 and 2015 NFCS surveys,¹⁹ since these data nicely complement the HRS analysis in two key ways. First, they include a uniquely rich set of questions about debt and debt management for similar age groups of people; second, they offer the

¹⁹ For more information on the NFCS, see Lusardi (2011).

opportunity to evaluate more recent information. The 2012 wave may be readily aligned with the 2010 wave of HRS respondents to show that the two data sources yield similar conclusions. The 2015 NFCS is more current and includes additional questions about debt and indicators of retirement preparedness.²⁰ Nevertheless, this survey does not report information about debt levels.

A first set of results on debt distress and financial vulnerability is provided in Table 6, focusing first on people age 56-61. Once again, we see that mortgages and other debt are problematic for many near-retirees. In 2012, about 17% of homeowners (8% of respondents) reported being underwater, owing more on their homes than they thought they could sell them for. Outcomes improved by 2015, but 9% of homeowners were still underwater. Moreover, 16% of near-retirees had been late with mortgage payments at least once in 2012 (the percentage improved by 2015), and about 3% had faced a home foreclosure in 2012.²¹

Table 6 here

As far as non-mortgage debt is concerned, many near-retirees in both waves reported that they did not pay off credit card balances in full when they had them; in fact, over half of all credit card holders carried credit card debt in 2012, a percentage that decreased by 2015 only slightly, to 46%. About one-third of credit card holders engaged in costly borrowing behaviors such as paying only the minimum due or using the card for cash advances; they also paid late fees and exceeded their credit limits. Among respondents age 56-61, 23% had unpaid medical bills in 2012, a percentage that fell only slightly to 20% by 2015. Accordingly, these statistics indicate that delaying payments is a fairly common form of borrowing. Moreover, nearly one-fifth of borrowers

²⁰ In the NFCS, age is reported in brackets rather than as a continuous variable. Nevertheless, the 2009 NFCS data align well with the 2008 HRS for respondents 57–62 years old. For example, over half of NFCS homeowners were nearing retirement still carrying a mortgage. Moreover, the same decline in down payments and the same rise in older respondents paying only the minimum on their credit cards is evident in the NFCS over time (Lusardi and Mitchell, 2013).

²¹ This information is not available in the 2015 NFCS.

age 56-61 used very high-cost methods such as rent-to-own stores, pawn shops, payday loans, or auto title loans. Turning to other indicators, 6-7% of those who had retirement accounts borrowed on them, and 5-6% took hardship withdrawals. Evidently, these data confirm that many older Americans are exposed to illiquidity and face problems in debt management as they approach retirement, when their wealth should be at its peak.

The final two rows of Table 6 report two indicators of financial vulnerability which illustrate near-retirees' perception of their financial situations. The NFCS does not report levels of respondent assets and debts, but survey does ask respondents to evaluate their debts and their capacity to deal with financial shocks. Specifically, the following question was asked to evaluate people's perceptions of their debt positions:

How strongly do you agree or disagree with the following statement: "I have too much debt right now." Please give your answer from a scale from 1 to 7, where 1=strongly disagree, 7=strongly agree and 4=neither agree nor disagree. *Possible answers:* 1-7; don't know; prefer not to say.

A second measure of households' financial position probed how people judged their ability to deal with a financial shock. This is our measure of household's financial fragility,²² and the wording of the question is as follows:

How confident are you that you could come up with \$2,000 if an unexpected need arose within the next month?

Possible answers: I am certain I could come up with the full \$2,000, I could probably come up with \$2,000, I could probably not come up with \$2,000, I am certain I could not come up with \$2,000, don't know, prefer not to say.

The \$2,000 amount was selected to represent a medium-sized shock such as a car or house repair, or an out-of-pocket medical bill. This question is particularly informative because, in other

²² For detail, see Lusardi, Schneider, and Tufano (2011).

research, we have found that it is related to having precautionary savings and to households' borrowing capacity and debt situation.

Other research has suggested that average households often borrow imprudently and accumulate too much debt (Hyytinen and Putkuri, 2018). A similar pattern obtains for our older sample: about 40% of people age 56-61 indicated they had too much debt²³ in 2012, and the percentage fell only slightly, to 36%, in 2015. As shown in Figure 1, the proportion of individuals saying they had too much debt is hump-shaped with age, yet it remains quite high for the near-retirees. Accordingly, managing and paying down debt at older ages will continue to be a concern in the future.

Figure 1 here

The last panel of Table 6 shows that one-third (33-35%) of respondents age 56-61 stated they probably or certainly could not come up with \$2,000 in a month's time, confirming respondents' sense of vulnerability against financial shocks. The age profile in Figure 1 shows that fragility declines initially with age, but it increases in mid-life—perhaps because of child-related expenses—and it declines again later in life. As for debt, however, financial fragility is still high near retirement.

Table 7 reports additional information useful in gauging retirement readiness as well as debt and financial vulnerability. Only two-fifths (41-44%) of respondents age 56-61 said they were saving, and fewer than half had ever tried to figure out how much to save for retirement. This latter finding is of concern as we have shown that planners are much more likely to have retirement wealth; moreover, those who do plan arrive at retirement with much higher wealth levels than non-planners (Lusardi and Mitchell 2007, 2011b, c, 2014, 2017). It is thus not surprising that over half

²³ They answered 5, 6, or 7 to the question: “How strongly do you agree or disagree with the following statement: ‘I have too much debt right now.’”

(57%) of these respondents age 56-61 worried about running out of money in retirement in the 2015 NFCS. Moreover, borrowers who have debt or lack a retirement plan are far less confident in their ability to fund their retirements (Helman, Copeland, and Vanderhei, 2015).

Table 7 here

The evidence so far clearly shows that many older Americans are increasingly burdened by debt, leaving them financially vulnerable in retirement. To dig more deeply into debt and debt concerns of persons closer to retirement, we compare NFCS respondents age 56-61 to those age 62-66. Consistent with the HRS analysis, again we see that the older age group is slightly better off. The last two columns of Table 6 show that the older group was less likely to report expensive behaviors such as carrying credit card debt, incurring credit card fees, and using high-cost borrowing methods, compared to their younger counterparts, and they reported lower levels of financial vulnerability. Nevertheless, still more than a fourth (26%) of the group stated they had too much debt in 2015, and more than a fifth (23%) believed themselves to be financially fragile. Thus, while people's financial situations improved a bit with age, many in the older group remained financially distressed. Among those age 62-66, close to half (47%) worried about running out of money in retirement, and only slightly over half (55%) had engaged in retirement planning.

Multivariate Regression Analysis

Tables 8 and 9 explore the NFCS data in more detail, using a multivariate analysis of debt and financial fragility indicators. As noted above, respondents were asked if they thought they had too much debt (responses range from 1 to 7), which we use as a proxy for debt problems (in place of the ratios used in the HRS analysis). We also constructed an indicator of financial frailty, equal to 1 for those who said they could probably or certainly not come up with \$2,000 within a month,

in an emergency (and 0 otherwise). We also explore variation in these indicators using the same socio-demographic controls employed in the HRS analysis. One additional variable indicates whether respondents said they had experienced a large and unexpected drop in income in the previous year. Unlike the HRS, the NFCS also includes an invaluable set of questions on financial literacy, permitting us to assess respondents' basic financial literacy.²⁴ We therefore controlled on respondents' financial literacy score, constructed as the number of correct answers to five financial literacy questions. As all variables are measured similarly in both waves, we pool the surveys together and use a year dummy to test for time differences.

Tables 8 and 9 here

Results for the self-assessed debt measure are provided in Table 8: here, results are similar for both the 56-61 and 62-66 age groups. The evidence shows that older and higher income persons were less likely to report being in debt, while those with more children and African-Americans reported excessive debt. Those who had experienced a large and unexpected income drop in the previous year also agreed they were over-indebted, suggesting that shocks play a role in debt accumulation close to retirement. Finally, financial literacy is negatively related to reports of excessive debt. We conclude that shocks do predict debt accumulation among older Americans, but having resources is not enough. People also need the capacity to manage those resources if they are to stay out of debt as they head into retirement.²⁵

In Table 9, we explore the factors associated with respondents' stated ability to come up with \$2,000 within a month (the HRS reports whether respondents have less than \$25,000 in

²⁴ For detail on the five questions on respondent numeracy, knowledge of inflation, risk diversification, mortgages, and basic asset pricing concepts, see Lusardi (2011).

²⁵ One could argue that financial literacy is a choice variable and may be measured with error, in which case linear regression results may be misstated. Yet in other work, we have shown that OLS estimates actually provide a lower bound on the full effect of financial literacy (Lusardi and Mitchell, 2014).

savings, which is roughly the monthly value of \$2,000 multiplied by 12). Confirming our HRS findings, the NFCS results show that men and those with higher income are more likely to have access to such liquidity. Also as in the HRS, gender plays a role just for the younger group. Minorities like African-Americans and Hispanics were more likely to say they could not come up with \$2,000 within 30 days. Table 9 confirms that the number of dependent children is positively associated with financial fragility for people age 56-61 but not for the older group, suggesting some potential for a “catch-up” after children leave home.²⁶ Additionally, after experiencing an income shock, respondents were more likely to report being financially fragile, by 14-15 percentage points. Education also plays an important role here: those with high school or more education were substantially less likely to be financially vulnerable. Nevertheless, education is only a part of the story, as Table 9 shows that financial literacy is also a key factor enhancing resilience. Being able to answer one additional financial literacy question correctly was associated with a lower probability (by 3-4 percentage points) of being financially fragile. In other words, financial literacy has an independent effect on reducing financial frailty, above and beyond the role of education.

Conclusions and Policy Relevance

Prior to the 2008-09 financial crisis and ensuing Great Recession, consumer credit and mortgage borrowing in the United States expanded rapidly, leaving relatively unsophisticated consumers in the historically unusual position of being able to decide how much they could afford to borrow. This paper has shown how older cohorts’ indebtedness and financial vulnerability changed in the wake of the economic crisis, to illuminate possible future consequences. Debt

²⁶ The NFCS does not include a question similar to that described above in the HRS about recent monetary transfers to offspring.

among older persons may increasingly be a factor in elder bankruptcy, and even in determining lifetime wealth sufficiency and retirement security.

We have gleaned several valuable insights into older persons' debt patterns using data from the HRS and the NFCS. Specifically, current near-retirees have taken on substantially more debt than in the past, often due to having purchased more expensive homes with smaller down payments. Consequently, retirement is likely to bring somewhat more financial insecurity than in the past.

The rise in older Americans' debt and financial vulnerability was the result of several factors, some on the supply side and others on the demand side of the credit market. We note changes in the supply of credit, but we focus mainly on the demand side in this study. We conclude that recent cohorts hold more debt and face more retirement financial insecurity than in the past, partly because they bought more expensive homes with smaller down payments. This has left them particularly vulnerable to forecasted interest rate increases. Several factors contribute to these larger amounts of debt, and key among them is the cost of having children. Moreover, financial vulnerability for those nearing retirement appears to be the greatest for those in poor health, and for those who experience unexpected large income drops. Evidently, shocks do play a role in peoples' debt accumulation profiles as they near retirement, yet having resources is insufficiently protective. In particular, people also need the capacity to manage those resources if they are to stay out of debt as they head into retirement. This finding complements other analysis finding that financial literacy can explain 30-40% of wealth inequality (Lusardi, Michaud, and Mitchell, 2017). There is some attenuation in indebtedness in later life, particularly among the higher income, better-educated, and more financial literate.

It is interesting that most theoretical models of household portfolios to date have tended to focus on household portfolio patterns without devoting much attention to debt at older ages (e.g., Lusardi, Michaud, and Mitchell, 2017; Delavande, Rohwedder, and Willis, 2008; Chai et al., 2011). Yet our research suggests that analysts and policymakers explore ways to enhance debt management practices as they evaluate the factors driving retirement insecurity. The fact that interest rates charged on debt are usually much higher than rates that people can earn on their savings is generally not taken into account in such models. Moreover, researchers have tended to overlook the fact that interest rates individuals face may depend on their behavior. Our paper thus motivates additional research on key aspects of debt and debt management to inform future policy. Finally, the larger stock of household debt at older ages is likely to have important macroeconomic consequences, inasmuch as interest rate hikes are rendering those on the verge of retirement much more vulnerable than before.

References

- Agarwal, Sumit, John C. Driscoll, Xavier Gabaix, and David Laibson. (2009). “The Age of Reason: Financial Decisions over the Life-cycle with Implications for Regulation.” *Brookings Papers on Economic Activity*. Fall, 51-117.
- Agarwal, Sumit, Gene Amromin, Itzhak Ben-David, and Douglas D. Evanoff. (2016). “Loan Product Steering in Mortgage Market.” NBER Working Paper 22696.
- Barsky, Robert B., F. Thomas Juster, Miles S. Kimball, and Matthew D. Shapiro. (1997). “Preference Parameters and Behavioral Heterogeneity: An Experimental Approach in the Health and Retirement Study.” *Quarterly Journal of Economics*. 112(2), 537-579.
- Bennett, Paul, Richard Peach, and Stavros Peristiani. (2001). “Structural Change in the Mortgage Market and the Propensity to Refinance.” *Journal of Money, Credit and Banking*. 33(4), 955-975.
- Bernile, Gennaro, Vineet Bhagwat, and P. Raghavendra Rau. (2017). “What Doesn't Kill You Will Only Make You More Risk-Loving: Early-Life Disasters and CEO Behavior.” *Journal of Finance*. 72 (1), 167-206.
- Bertrand, Marianne, Dean Karlan, Sendhil Mullainathan, Eldar Shafir, and Jonathan Zinman. (2010). “What’s Advertising Content Worth? Evidence from a Consumer Credit Marketing Field Experiment.” *Quarterly Journal of Economics*. 125(1), 263-305.
- Beshears, John, David Laibson, and Brigitte C. Madrian. (2012). “The Availability and Utilization of 401(k) Loans.” In *Investigations in the Economics of Aging*, edited by David A. Wise, pp. 145-172. Chicago: University of Chicago Press.
- Beshears, John, David Laibson, Brigitte C. Madrian, and William L. Skimmyhorn. (2017). “Borrowing to Save? The Impact of Automatic Enrollment on Debt.” Harvard University Working paper.
- Bloomberg (2018). “Federal Reserve Raises Rates - and Forecasts Steeper Hikes as Economy Soars.” March 21. <http://fortune.com/2018/03/21/fed-lifts-rates-forecasts-hikes/>
- Bricker, Jesse, Lisa J. Dettling, Alice Henriques, Joanne W. Hsu, Kevin B. Moore, John Sabelhaus, Jeffrey Thompson, and Richard A. Windle. (2014). “Changes in U.S. Family Finances from 2010 to 2013: Evidence from the Survey of Consumer Finances.” *Federal Reserve Bulletin*. 100(4), 1-41.

- Cecchetti, Stephen G., Madhusudan Mohanty, and Fabrizio Zampolli. (2011). "The Real Effects of Debt." BIS Working Papers 352.
- Chai, Jingjing, Wolfram Horneff, Raimond Maurer, and Olivia S. Mitchell. (2011). "Optimal Portfolio Choice over the Life Cycle with Flexible Work, Endogenous Retirement, and Lifetime Payouts." *Review of Finance*. 15(4), 875-907.
- Christelis, Dimitris, Michael Ehrmann, and Dimitris Georgarakos. (2015). "Exploring Differences in Household Debt across Euro Area Countries and the US." Bank of Canada Working Paper 2015-16.
- Copeland, Craig. (2013). "Debt of the Elderly and Near Elderly, 1992-2010." *EBRI Notes*. February 34(2), 2-15.
- Cox, Jeff. (2018). "Chances of a Fourth Rate Hike This Year Just Took a Big Jump Higher." CNBC.com, April 23. <https://www.cnbc.com/2018/04/23/the-market-is-now-pricing-in-almost-a-5050-chance-of-four-rate-hikes-this-year.html>
- Debelle, Guy. (2004). "Macroeconomic Implications of Rising Household Debt." BIS Working Papers 153.
- Delavande, Adeline, Susann Rohwedder, and Robert Willis. (2008). "Preparation for Retirement, Dynan, Karen E. (2009). "Changing Household Financial Opportunities and Economic Security." *Journal of Economic Perspectives*. 23(4), 49-68.
- Dynan, Karen E., and Donald L. Kohn. (2007). "The Rise in U.S. Household Indebtedness: Causes and Consequences." Finance and Economics Discussion Series Divisions of Research & Statistics and Monetary Affairs. *Federal Reserve Board Working Paper*. 37, 1-36.
- Edelberg, Wendy. (2006). "Risk-Based Pricing of Interest Rates for Consumer Loans." *Journal of Monetary Economics*. 53(8), 2283-2298.
- Federal Reserve Bank of New York. (2016). *Quarterly Report on Household Debt and Credit*. https://www.newyorkfed.org/medialibrary/interactives/householdcredit/data/pdf/HHDC_2016Q1.pdf.
- Gabaix, Xavier, and David Laibson. (2006). "Shrouded Attributes, Consumer Myopia, and Information Suppression in Competitive Markets." *Quarterly Journal of Economics*. 121(2), 505-540.

- Gine, Xavier, Cristina Martinez Cuellar, and Rafael Keenan Mazer. (2014). "Financial (Dis-) Information: Evidence from an Audit Study in Mexico." World Bank Policy Research Working Paper 6902.
- Gurun, Umit, G., Gregor Matvos, and Amit Seru. (2016). "Advertising Expensive Mortgages." *The Journal of Finance* 71(5), 2371-2416.
- Helman, Ruth, Craig Copeland, and Jack Vanderhei. (2015). "The 2015 Retirement Confidence Survey: Having a Retirement Savings Plan a Key Factor in Americans' Retirement Confidence." *EBRI Issue Brief*. 413, April.
- Horneff, Vanya, Raimond Maurer, and Olivia S. Mitchell. (2018). "How Will Persistent Low Expected Returns Shape Household Behavior?" NBER Working Paper No. 24311.
- Hurd, Michael D. (1990). "Research on the Elderly: Economic Status, Retirement, Consumption, and Saving," *Journal of Economic Literature*. 28(2), 565-637.
- Hurst, Erik, and Frank P. Stafford. (2004). "Home is Where the Equity Is: Mortgage Refinancing and Household Consumption." *Journal of Money, Credit, and Banking*. 36(6), 985-1014.
- Hyttinen, Ari, and Hanna Putkuri. (2018). "Household Optimism and Overborrowing." *Journal of Money, Credit, and Banking*. 50(1), 55-76.
- Kumhof, Michael, Romain Rancière, and Pablo Winant. (2015). "Inequality, Leverage, and Crises." *American Economic Review*. 105(3), 1217-45.
- Levitin, Adam J., and Susan M. Wachter. (2012). "Explaining the Housing Bubble." *The Georgetown Law Journal*. 100(4), 1177-1258.
- Li, Wenli, Michelle J. White, and Ning Zhu. (2011). "Did Bankruptcy Reform Cause Mortgage Defaults to Rise?" *American Economic Journal: Economic Policy*. 3(4), 123-147.
- Lu, Timothy, Olivia S. Mitchell, Stephen P. Utkus, and Jean A. Young. (2017). "Borrowing from the Future: 401(k) Plan Loans and Loan Defaults." *National Tax Journal*. 70(1), 77-110.
- Lusardi, Annamaria (2011). "Americans' Financial Capability." NBER Working Paper 17103.
- Lusardi, Annamaria, and Carlo de Bassa Scheresberg. (2013). "Financial Literacy and High-Cost Borrowing in the United States." NBER Working Paper 18969.
- Lusardi, Annamaria, Pierre-Carl Michaud, and Olivia S. Mitchell. (2017). "Optimal Financial Literacy and Wealth Inequality." *Journal of Political Economy*. 125 (2), 431-477.

- Lusardi, Annamaria, and Olivia S. Mitchell. (2007). "Baby Boomer Retirement Security: The Roles of Planning, Financial Literacy and Housing Wealth." *Journal of Monetary Economics*. 54(1), 205-224.
- Lusardi, Annamaria, and Olivia S. Mitchell. (2008). "Planning and Financial Literacy: How Do Women Fare?" *American Economic Review*. 98(2), 413-417.
- Lusardi, Annamaria, and Olivia S. Mitchell. (2011a). "The Outlook for Financial Literacy." In *Financial Literacy: Implications for Retirement Security and the Financial Marketplace*, edited by Olivia S. Mitchell and Annamaria Lusardi, pp. 1-13. Oxford, UK: Oxford University Press.
- Lusardi, Annamaria, and Olivia S. Mitchell. (2011b). "Financial Literacy and Planning: Implications for Retirement Wellbeing." In *Financial Literacy: Implications for Retirement Security and the Financial Marketplace*, edited by Olivia S. Mitchell and Annamaria Lusardi, pp. 17-39. Oxford, UK: Oxford University Press.
- Lusardi, Annamaria, and Olivia S. Mitchell. (2011c). "Financial Literacy and Retirement Planning in the United States." *Journal of Pension Economics and Finance*. 10(4), 509-525.
- Lusardi, Annamaria, and Olivia S. Mitchell. (2013). "Debt and Debt Management among Older Adults." GFLEC Working Paper 2013-2.
- Lusardi, Annamaria, and Olivia S. Mitchell. (2014). "The Economic Importance of Financial Literacy: Theory and Evidence." *Journal of Economic Literature*. 52(1), 5-44.
- Lusardi, Annamaria, and Olivia S. Mitchell. (2017). "How Ordinary Consumers Make Complex Economic Decisions: Financial Literacy and Retirement Readiness." *Quarterly Journal of Economics*. 7(3).
- Lusardi, Annamaria, Olivia S. Mitchell, and Vilsa Curto. (2014). "Financial Literacy and Financial Sophistication among the Older Population." *Journal of Pension Economics and Finance* 13(4), 347-366.
- Lusardi, Annamaria, Daniel J. Schneider, and Peter Tufano. (2011). "Financially Fragile Households: Evidence and Implications." *Brookings Papers on Economic Activity* Spring, 83-134.
- Lusardi, Annamaria, and Peter Tufano. (2009). "Teach Workers about the Peril of Debt." *Harvard Business Review* 87(11), 22-24.

- Lusardi, Annamaria, and Peter Tufano. (2015). "Debt Literacy, Financial Experiences, and Overindebtedness." *Journal of Pension Economics and Finance* 14(4), 332-368.
- Malmendier, Ulrike, and Stefan Nagel. (2016). "Learning from Inflation Experiences." *The Quarterly Journal of Economics* 131(1), 53-87.
- Mayer, Christopher. (2017). "Housing, Mortgages, and Retirement." In *Evidence and Innovation in Housing Law and Policy*, edited by Lee Fennell and Benjamin Keys, pp. 203-230. Cambridge: Cambridge University Press.
- Mian, Atif, and Amir Sufi. (2011). "House Prices, Home Equity-Based Borrowing, and the US Household Leverage Crisis." *American Economic Review* 101(5), 2132-2156.
- Mian, Atif, and Amir Sufi. (2017). "Household Debt and Defaults from 2000 to 2010: The Credit Supply View." In *Evidence and Innovation in Housing Law and Policy*, edited by Lee Fennell and Benjamin Keys, pp. 257-288. Cambridge: Cambridge University Press.
- Nam, Tong-yob, and Seungjoon Oh. (2017). "Non-Recourse Mortgage Law and Housing Speculation." Available at SSRN: <http://dx.doi.org/10.2139/ssrn.2316539>.
- Pottow, John A.E. (2012). "The Rise in Elder Bankruptcy Filings and Failure of U.S. Bankruptcy Law." *The Elder Law Journal* 19(1), 119-157.
- Schmidt, Sebastian. (2013). "Optimal Monetary and Fiscal Policy with a Zero Bound on Nominal Interest Rates." *Journal of Money, Credit, and Banking* 45(7), 1335-1350.
- Securian. (2013). Retirement Time Bomb: Mortgage Debt. Securian Investments. www.securiannews.com/sites/securian.newshq.businesswire.com/files/research/file/RetDebtSummary-Apr2013-F78685-1_pod.pdf.
- Utkus, Stephen P., and Jean A. Young. (2011). "Financial Literacy and 401(k) Loans." In *Financial Literacy: Implications for Retirement Security and the Financial Marketplace*, edited by Olivia S. Mitchell and Annamaria Lusardi, pp. 59-75. Oxford, UK: Oxford University Press.
- Venti, Steven F., and David A. Wise. (1990). "But They Don't Want to Reduce Housing Equity." In *Issues in the Economics of Aging*. Edited by David A. Wise, pp. 13-32. Chicago: University of Chicago Press.
- Venti, Steven F., and David A. Wise. (1991). "Aging and the Income Value of Housing Wealth." *Journal of Public Economics* 44(3), 371-397.

Table 1. Factors contributing to the increase in debt and financial vulnerability among older Americans.

<i>Supply side factors</i>	
Expansion of mortgage credit	In the 2000s mortgages became increasingly accessible to peoples with low credit scores, little income, and few assets. Households gained easier access to home mortgages and home equity lines of credit also due to lower interest rates.
Increase in house prices	The growth of easier mortgages was paired with a rapid rise in housing prices during the 2000s, and the rising cost of housing has also been suggested as an explanation for the rapid rise in debt.
Rise in access to consumer credit	Consumer credit such as credit card borrowing has expanded rapidly, and high-cost alternative financial services including payday loans, pawn shops, auto title loans, tax refund loans, and rent-to-own shops, have proliferated in many states.
<i>Demand side factors</i>	
Bankruptcy reform	The 2005 reform of US bankruptcy law preserved the non-recourse status of mortgages, incentivizing people to hold on to mortgage debt, and encouraging speculative investments during housing market booms.
Refinancing	Structural changes in the mortgage market made homeowners more inclined to refinance in the 1990s than previously. The propensity to refinance rose over time also due to reduced transaction costs and frictions.
Limited financial literacy	Many Americans have little financial literacy, even at an advanced age, but people need the capacity to manage their resources if they are to stay out of debt as they head into retirement.
Number of children	Children and the increase in cost of education can affect debt at older ages as parents and grand-parents continue to support offspring.
<i>Both</i>	
Computerized transactions	Changes in the lending market induced risk-based pricing, reduced distribution costs, and contributed to other innovations that made it easier for households to borrow.
Technology of persuasion	Improvements in the technology of persuasion through nonlinear contracts and uninformative sales tactics have “shrouded” customers’ understanding of financial contracts and boosted total amounts borrowed.

Table 2. Levels and Distribution of Cohort Total Debt (\$) and Debt Components (%) in the Health and Retirement Study (HRS).

	Age group 56-61							Age group 62-66						
	% Debt holders	p10	p25	p50	p75	p90	Mean	% Debt holders	p10	p25	p50	p75	p90	Mean
1. Total debt (\$)														
HRS Baseline	64.04%	0	0	6,760	50,700	119,990	38,941	51.85%	0	0	580	41,325	108,750	32,445
War Babies	69.76%	0	0	31,250	106,250	212,500	74,473	62.47%	0	0	8,800	96,800	220,000	67,086
Early Boomers	71.43%	0	0	32,700	146,833	272,500	99,405	64.11%	0	0	12,000	109,000	210,500	71,806
2. Value of all mortgages/land contracts (\$; 1ry residence)														
HRS Baseline	40.76%	0	0	0	33,800	92,950	27,493	30.13%	0	0	0	21,750	87,000	22,424
War Babies	49.00%	0	0	0	87,500	181,250	56,398	40.52%	0	0	0	71,500	176,000	51,989
Early Boomers	48.67%	0	0	0	109,000	218,000	73,923	40.54%	0	0	0	75,000	185,000	51,499
3. Value of other home loans (\$; 1ry residence)														
HRS Baseline	11.18%	0	0	0	0	6,760	3,593	9.64%	0	0	0	0	0	2,449
War Babies	15.24%	0	0	0	0	18,750	5,943	13.06%	0	0	0	0	12,650	4,994
Early Boomers	17.40%	0	0	0	0	27,250	9,151	11.66%	0	0	0	0	7,000	4,981
4. Value of all mortgages/land contracts (\$; 2ndry residence)														
HRS Baseline	5.97%	0	0	0	0	0	2,992	3.26%	0	0	0	0	0	1,656
War Babies	3.69%	0	0	0	0	0	3,281	3.67%	0	0	0	0	0	4,013
Early Boomers	4.30%	0	0	0	0	0	5,042	5.12%	0	0	0	0	0	7,252
5. Value of other debt (\$)														
HRS	36.72%	0	0	0	2,535	8,450	3,123	27.98%	0	0	0	725	7,250	3,226
War Babies	39.17%	0	0	0	4,750	17,500	5,467	38.14%	0	0	0	3,300	13,200	4,044
Early Boomers	42.04%	0	0	0	5,450	21,800	7,726	38.44%	0	0	0	4,000	16,000	5,416

Note: The sample includes all age-eligible individuals age 56-61 and 62-66 in the cohort indicated. For 56-61 age group, the HRS Baseline cohort was observed in 1992; the War Babies in 2004; and the Early Boomers in 2010. For 62-66 age group, the HRS Baseline cohort was observed in 1998; the War Babies in 2008; and the Early Boomers in 2014. Total debt includes the value of mortgages and other loans on the household's primary residence, other mortgages, and other debt (including credit card debt, medical debt, etc.). All dollar values in \$2015. Data are weighted.

Table 3. Levels and Distribution of Cohort Total Debt Ratios and Debt Ratio Components (%; HRS).

	Age group 56-61						Age group 62-66					
	p10	p25	p50	p75	p90	Mean	p10	p25	p50	p75	p90	Mean
1. Total debt/Total assets												
HRS Baseline	0	0	0.04	0.22	0.47	0.45	0	0	0.00	0.14	0.42	12.93
War Babies	0	0	0.11	0.34	0.61	2.26	0	0	0.05	0.27	0.58	2.13
Early Boomers	0	0	0.15	0.47	0.89	10.40	0	0	0.08	0.33	0.71	22.64
2. All Iry res. loans/Iry res. value												
HRS Baseline	0	0	0.05	0.36	0.63	0.21	0	0	0.00	0.26	0.57	0.17
War Babies	0	0	0.22	0.53	0.73	3.42	0	0	0.08	0.40	0.72	0.24
Early Boomers	0	0	0.30	0.67	0.92	0.40	0	0	0.13	0.54	0.78	0.33
3. Value of Iry res./total assets												
HRS Baseline	0	0.20	0.46	0.73	0.91	0.47	0	0.17	0.41	0.71	0.90	0.44
War Babies	0	0.24	0.52	0.79	0.92	0.50	0	0.23	0.47	0.79	0.94	0.49
Early Boomers	0	0.20	0.50	0.79	0.94	0.49	0	0.17	0.43	0.77	0.93	0.46
4. Value of Iry residence (\$)												
HRS Baseline	54,080	87,880	143,650	236,600	354,900	188,749	58,000	94,250	145,000	232,000	362,500	195,058
War Babies	62,500	106,250	187,500	325,000	562,500	269,101	60,500	110,000	198,000	341,000	638,000	305,173
Early Boomers	76,300	130,800	218,000	348,691	599,500	306,623	65,000	115,000	190,000	330,000	550,000	267,528
5. Other debt/Liquid assets												
HRS Baseline	0	0	0	0.12	1.60	4.86	0	0	0	0.01	1.40	10.55
War Babies	0	0	0	0.32	5.00	29.36	0	0	0	0.20	3.40	11.84
Early Boomers	0	0	0	0.75	11.00	50.38	0	0	0	0.38	7.50	36.38
6. Total debt/Total income												
HRS Baseline	0	0	0.14	0.73	1.68	0.68	0	0	0.01	0.70	1.82	0.69
War Babies	0	0	0.45	1.26	2.37	7.17	0	0	0.19	1.18	2.85	2.06
Early Boomers	0	0	0.50	1.58	3.62	3.65	0	0	0.26	1.38	2.82	14.38

Note: Total assets include all checking and savings accounts, CDs, money market funds, T-bills, bonds/bond funds, stocks/stock market funds, IRAs, 401(k)'s and Keoghs, the value of primary residence and other real estate, vehicles, business equity, and other savings. Housing debt includes home mortgages and other home loans. Liquid assets are defined as the sum of checking and savings accounts, CDs, money market funds, T-bills, bonds/bond funds, and stocks/stock market funds. See also notes to Table 2.

Table 4. Levels of Cohort Total Debt/Asset Ratios, and Debt Component/Asset Ratios (HRS).

	Age group 56-61	Age group 62-66
	<i>% in the sample</i>	<i>% in the sample</i>
1. Total debt/Total assets > 0.5		
HRS Baseline	8.73%	8.00%
War Babies	15.36%	12.85%
Early Boomers	22.49%	16.55%
2. All Iry res. loans/Iry res. value >0.5		
HRS Baseline	16.23%	12.99%
War Babies	25.68%	19.75%
Early Boomers	34.60%	27.18%
3. Other debt/Liquid assets >0.5		
HRS Baseline	16.56%	13.51%
War Babies	22.16%	21.29%
Early Boomers	27.32%	23.13%
4. Respondents with < \$25K in savings		
HRS Baseline	14.63%	14.19%
War Babies	16.03%	15.71%
Early Boomers	24.49%	21.85%

Note: See notes to Tables 2 and 3.

Table 5. Multivariate Analysis of the Factors Associated with Financial Vulnerability, by Age Group (HRS).

	Age group 56-61				Age group 62-66			
	Tot. debt/Tot. assets > 0.5	1ry res. debt/asset > 0.5	Other debt/Liquid assets > 0.5	Total net wealth < \$25K	Tot. debt/Tot. assets > 0.5	1ry res. debt/asset > 0.5	Other debt/Liquid assets > 0.5	Total net wealth < \$25K
War Babies	0.073 ** (0.013)	0.105 ** (0.018)	0.075 ** (0.016)	0.025 * (0.011)	0.051 ** (0.014)	0.069 ** (0.018)	0.093 ** (0.018)	0.027 * (0.013)
Early Boomers	0.148 ** (0.014)	0.202 ** (0.019)	0.141 ** (0.017)	0.118 ** (0.012)	0.092 ** (0.014)	0.147 ** (0.020)	0.122 ** (0.018)	0.093 ** (0.013)
Age	-0.013 ** (0.003)	-0.020 ** (0.004)	-0.013 ** (0.004)	-0.010 ** (0.003)	-0.004 (0.004)	-0.005 (0.006)	0.002 (0.005)	0.000 (0.004)
Married	-0.048 ** (0.014)	-0.016 (0.019)	-0.016 (0.017)	-0.209 ** (0.014)	-0.029 * (0.014)	-0.004 (0.020)	-0.012 (0.018)	-0.227 ** (0.015)
Male	0.009 (0.009)	0.032 ** (0.011)	0.011 (0.010)	0.021 * (0.009)	0.002 (0.010)	0.007 (0.013)	-0.003 (0.013)	0.007 (0.011)
Number of children	0.010 ** (0.003)	0.022 ** (0.004)	0.015 ** (0.004)	0.016 ** (0.003)	0.006 (0.003)	0.014 ** (0.005)	0.012 ** (0.004)	0.012 ** (0.003)
White	-0.062 ** (0.017)	-0.027 (0.020)	-0.074 ** (0.020)	-0.133 ** (0.015)	-0.048 ** (0.018)	-0.008 (0.022)	-0.056 * (0.023)	-0.132 ** (0.017)
High school	-0.007 (0.015)	0.015 (0.018)	-0.034 (0.019)	-0.115 ** (0.015)	0.000 (0.017)	0.012 (0.021)	0.005 (0.022)	-0.103 ** (0.018)
Some college	-0.011 (0.018)	0.023 (0.023)	-0.063 ** (0.022)	-0.157 ** (0.017)	-0.027 (0.020)	0.013 (0.026)	-0.027 (0.025)	-0.152 ** (0.020)
College+	-0.019 (0.021)	0.061 * (0.029)	-0.049 (0.026)	-0.182 ** (0.019)	0.000 (0.025)	0.060 (0.031)	-0.041 (0.029)	-0.161 ** (0.023)
HH Income (\$10k)	-0.002 ** (0.000)	0.000 (0.001)	-0.004 ** (0.001)	-0.003 ** (0.000)	-0.001 ** (0.000)	0.000 (0.001)	-0.001 ** (0.001)	-0.001 * (0.000)
Poorhealth	0.059 ** (0.015)	0.011 (0.018)	0.105 ** (0.018)	0.148 ** (0.014)	0.094 ** (0.016)	0.038 (0.020)	0.167 ** (0.021)	0.155 ** (0.017)
KidHelp	0.003 (0.014)	0.025 (0.020)	0.009 (0.017)	-0.044 ** (0.010)	-0.025 (0.015)	0.004 (0.024)	0.005 (0.020)	-0.067 ** (0.013)
N	8,533	7,080	7,339	9,077	5,982	4,984	5,141	6,327
R-squared	0.051	0.045	0.056	0.247	0.044	0.027	0.061	0.242

Notes: Coefficient estimates from OLS regression, standard errors in parentheses. See Table 3 for definitions of dependent variables. Explanatory variables include age; indicators for married, male, white, 3 education categories (reference category high school dropout), poor health; household income, number of children, and indicator for having given \$500+ to offspring in last two years. See also notes to Tables 2 and 3. ** p<0.01, * p<0.05

Table 6. Level and Composition of Self-Reported Household Debt and Debt Concerns (%; NFCS).

	Age group 56-61		Age group 62-66	
	2012	2015	2012	2015
Mortgage debt				
Underwater with home value ^a	16.7	8.9	12.2	8.9
Late with mortgage payments, at least once ^a	16.2	10.6	10.6	6.0
Foreclosure process on their home ^a	2.6	N/A	1.7	N/A
Other types of debt				
Credit card debt ^a	52.4	46.5	43.0	40.6
Credit card fees, at least one type ^a	36.7	30.3	25.4	22.7
Unpaid medical bills	23.4	20.2	15.4	14.7
High-cost borrowing ^b	19.8	19.4	13.1	11.5
Student loan ^c	9.6	14.0	5.5	7.9
Borrowing from retirement accounts				
Loan from retirement accounts ^a	7.0	5.8	4.5	6.3
Hardship withdrawal from retirement accounts ^a	5.7	4.9	3.1	3.9
Indicators of financial vulnerability				
Too much debt	39.9	36.5	27.7	26.4
Cannot come up with \$2,000	35.5	32.8	22.9	23.3
<i>N</i>	2,983	2,942	2,567	2,851

Note: The sample includes all age-eligible individuals age 56-61 and 62-66; results use sample weights.

^a Values conditional on holding the asset or debt.

^b High-cost borrowing refers to the use of alternative financial services, such as payday loans, pawnshops, rent-to-own products, and auto title loans.

^c Direct comparisons between the statistics for 2012 and 2015 are not possible because the question was asked differently.

Table 7. Self-Reported Financial Behaviors and Perceptions (%; NFCS).

	Age group 56-61		Age group 62-66	
	2012	2015	2012	2015
Propensity to save				
Spending less than income	44.2	41.0	46.2	45.7
Planning for retirement				
Figure out how much to save for retirement	47.1	44.3	55.4	55.2
Additional measure of potential financial problems				
Worry about running out of money in retirement	N/A	56.8	N/A	47.3
<i>N</i>	2,983	2,942	2,567	2,851

Note: The sample includes all age-eligible individuals 56-61 and 62-66. Statistics weighted using sample weights.

Table 8. Multivariate Regression Model of Self-Assessed Debt by Age Group (NFCS 2012, 2015).

	Age group 56-61 Self-assessed debt	Age group 62-66 Self-assessed debt
Age	-0.074** (0.019)	-0.085** (0.024)
Single	0.020 (0.107)	0.039 (0.134)
Separated or divorced	0.004 (0.093)	0.176* (0.102)
Widow	0.082 (0.151)	-0.021 (0.126)
Male	0.007 (0.067)	0.236** (0.069)
Number of dependent children	0.197** (0.043)	0.346** (0.063)
Afro-American	0.184 (0.102)	0.590** (0.128)
Hispanic	-0.059 (0.149)	-0.028 (0.174)
Asian	-0.321 (0.181)	-0.238 (0.200)
Others	-0.034 (0.193)	0.223 (0.206)
High school	0.045 (0.184)	-0.265 (0.235)
Some college	0.060 (0.184)	-0.097 (0.236)
College or more	-0.081 (0.191)	-0.299 (0.240)
Income \$15-25K	-0.003 (0.143)	0.141 (0.165)
Income \$25-35K	-0.138 (0.151)	0.048 (0.172)
Income \$35-50K	-0.205 (0.141)	-0.136 (0.165)
Income \$50-75K	-0.459** (0.141)	-0.522** (0.162)
Income \$75-100K	-0.697** (0.156)	-0.756** (0.172)
Income \$100-150K	-0.780** (0.159)	-0.649** (0.181)
Income \$150K+	-1.371** (0.170)	-0.956** (0.202)
Income shock	0.863** (0.079)	1.122** (0.094)
FinLit index	-0.088**	-0.092**

	(0.026)	(0.029)
Year 2015	-0.239**	-0.167*
	(0.065)	(0.067)
Constant	8.559**	9.152**
	(1.140)	(1.550)
<hr/>		
N	5,852	5,107
R-squared	0.100	0.132

Note: The sample includes all age-eligible individuals 56-61 and 62-66 in the 2012 and 2015 NFCS; results use sample weights. The dependent variable is the response to the following question: "How strongly do you agree or disagree with the following statement? 'I have too much debt right now.'" Values range from 1 to 7, where 1 means "I strongly disagree" and 7 means "I strongly agree." Mean value of the dependent variable *Self-assessed Debt* is 3.78 for the 56-61 age group and 3.18 for the 62-66 age group. *FinLit index* is constructed as the number of correct answers to the five financial literacy questions. Including *FinLit index* among the regressors does not change much the estimate and significance of the other variables. Robust standard errors in parentheses. ** p<0.01, * p<0.05

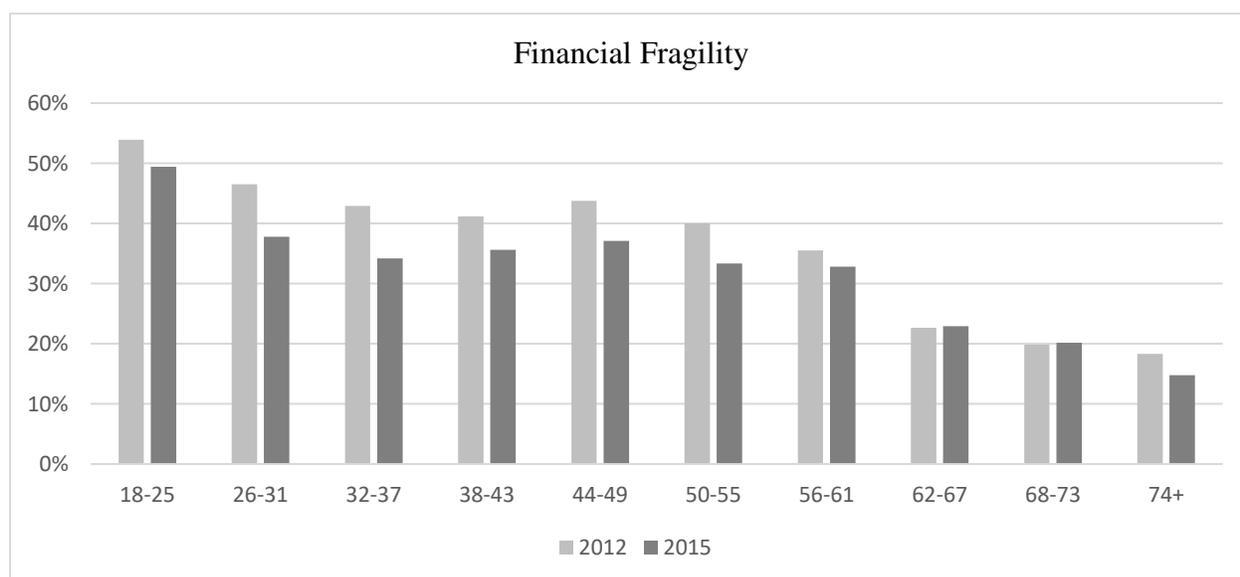
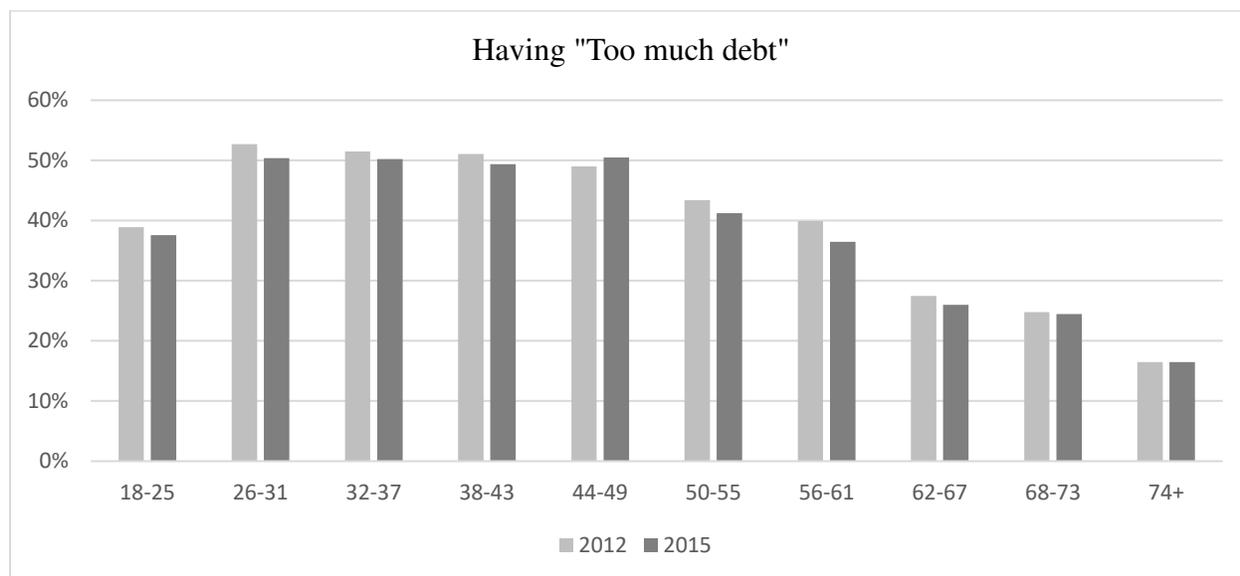
Table 9. Multivariate Regression Model of Financial Fragility by Age Group (NFCS 2012, 2015).

	Age group 56-61 Financial fragility	Age group 62-66 Financial fragility
Age	-0.007 (0.004)	-0.008 (0.004)
Single	0.001 (0.021)	0.034 (0.027)
Separated or divorced	-0.011 (0.019)	0.024 (0.020)
Widow	-0.024 (0.031)	0.035 (0.025)
Male	-0.026* (0.013)	0.018 (0.012)
Number of dependent children	0.021* (0.009)	0.016 (0.011)
Afro-American	0.117** (0.021)	0.155** (0.028)
Hispanic	0.052 (0.031)	0.065* (0.032)
Asian	-0.028 (0.032)	-0.018 (0.029)
Others	0.087* (0.034)	0.043 (0.038)
High school	-0.105** (0.034)	-0.105* (0.047)
Some college	-0.111** (0.035)	-0.115* (0.047)
College or more	-0.138** (0.036)	-0.153** (0.048)
Income \$15-25K	-0.153** (0.028)	-0.188** (0.035)
Income \$25-35K	-0.255** (0.031)	-0.327** (0.036)
Income \$35-50K	-0.374** (0.028)	-0.433** (0.034)
Income \$50-75K	-0.474** (0.028)	-0.538** (0.032)
Income \$75-100K	-0.550** (0.028)	-0.571** (0.032)
Income \$100-150K	-0.625** (0.027)	-0.579** (0.033)
Income \$150K+	-0.620** (0.029)	-0.577** (0.033)
Income shock	0.149** (0.016)	0.137** (0.018)
FinLit index	-0.037**	-0.034**

	(0.005)	(0.006)
Year 2015	-0.025 (0.013)	-0.019 (0.012)
Constant	1.332** (0.223)	1.346** (0.278)
<hr/>		
Observations	5,715	4,991
R-squared	0.313	0.333

Note: The sample includes all age-eligible individuals 56-61 and 62-66 in the 2012 and 2015 NFCS; results use sample weights. The dependent variable is a dummy variable response to the following question: "How confident are you that you could come up with \$2,000 if an unexpected need arose within the next month?" Outcome coded as 1 for those who certain or probably could not come up with \$2,000 and 0 for those who certain or probably could come up with \$2,000. Mean value of the dependent variable *Financial Fragility* is 0.35 for the 56-61 age group and 0.24 for the 62-66 age group. *FinLit index* is constructed as the number of correct answers to the five financial literacy questions. Including *FinLit index* among the regressors does not change much the estimate and significance of the other variables. Robust standard errors in parentheses.
 ** p<0.01, * p<0.05

Figure 1. The Evolution of Self-Assessed Debt and Financial Fragility over the Life Cycle (NFCS 2012, 2015).



Note: Results use sample weights. People are classified as having “too much debt” if, on a scale from 1 to 7, they answered 5, 6, or 7 to the question: “How strongly do you agree or disagree with the following statement: ‘I have too much debt right now,’” where 1 means “I strongly disagree” and 7 means “I strongly agree.” People are classified as financially fragile if they reported that they certainly or probably could not come up with \$2,000, in response to the following question: “How confident are you that you could come up with \$2,000 if an unexpected need arose within the next month?”

Appendix. Multivariate Analysis of the Factors Associated with Financial Vulnerability by Age Group (HRS) Including Additional Controls on Risk Aversion and Years Living in Current Residence.

	Age group 56-61				Age group 62-66			
	Tot. debt/Tot. assets > 0.5	lry res. debt/asset > 0.5	Other debt/Liquid assets > 0.5	Total net wealth < \$25K	Tot. debt/Tot. assets > 0.5	lry res. debt/asset > 0.5	Other debt/Liquid assets > 0.5	Total net wealth < \$25K
War Babies	0.048 ** (0.018)	0.058 * (0.025)	0.054 * (0.021)	0.018 (0.016)	0.048 * (0.020)	0.059 * (0.025)	0.102 ** (0.024)	0.048 * (0.019)
Early Boomers	0.131 ** (0.018)	0.204 ** (0.025)	0.127 ** (0.021)	0.137 ** (0.016)	0.100 ** (0.018)	0.163 ** (0.026)	0.138 ** (0.023)	0.120 ** (0.018)
Age	-0.012 ** (0.003)	-0.017 ** (0.004)	-0.013 ** (0.004)	-0.007 ** (0.003)	-0.005 (0.004)	-0.005 (0.006)	0.001 (0.005)	-0.001 (0.004)
Married	-0.032 * (0.014)	-0.001 (0.019)	-0.005 (0.017)	-0.125 ** (0.012)	-0.016 (0.014)	0.003 (0.020)	0.004 (0.018)	-0.163 ** (0.014)
Male	0.006 (0.009)	0.027 ** (0.010)	0.010 (0.010)	0.011 (0.008)	0.001 (0.010)	0.008 (0.013)	-0.004 (0.013)	0.001 (0.010)
Number of children	0.009 ** (0.003)	0.020 ** (0.004)	0.014 ** (0.004)	0.011 ** (0.003)	0.005 (0.003)	0.012 ** (0.005)	0.010 * (0.004)	0.008 * (0.003)
White	-0.055 ** (0.017)	-0.028 (0.020)	-0.069 ** (0.020)	-0.089 ** (0.014)	-0.034 (0.018)	-0.011 (0.022)	-0.041 (0.023)	-0.088 ** (0.016)
High school	-0.004 (0.015)	0.015 (0.018)	-0.032 (0.019)	-0.098 ** (0.013)	0.002 (0.017)	0.009 (0.021)	0.006 (0.022)	-0.092 ** (0.016)
Some college	-0.010 (0.018)	0.014 (0.023)	-0.061 ** (0.022)	-0.142 ** (0.015)	-0.024 (0.020)	0.009 (0.026)	-0.027 (0.025)	-0.129 ** (0.019)
College+	-0.018 (0.021)	0.048 (0.029)	-0.047 (0.026)	-0.166 ** (0.018)	0.003 (0.025)	0.053 (0.031)	-0.037 (0.029)	-0.135 ** (0.022)
HH Income (\$10k)	-0.002 ** (0.000)	0.000 (0.001)	-0.004 ** (0.001)	-0.003 ** (0.000)	-0.001 ** (0.000)	0.000 (0.001)	-0.001 ** (0.001)	-0.001 (0.000)
Poorhealth	0.057 ** (0.014)	0.017 (0.017)	0.104 ** (0.018)	0.129 ** (0.013)	0.091 ** (0.016)	0.041 * (0.020)	0.158 ** (0.021)	0.137 ** (0.015)
Risk aversion	0.001 (0.005)	-0.004 (0.007)	0.011 (0.006)	0.002 (0.004)	0.007 (0.005)	0.013 (0.007)	0.003 (0.007)	0.004 (0.005)
Years at current residence	-0.004 ** (0.001)	-0.010 ** (0.001)	-0.003 ** (0.001)	-0.012 ** (0.001)	-0.003 ** (0.001)	-0.005 ** (0.001)	-0.003 ** (0.001)	-0.009 ** (0.001)
KidHelp	0.003 (0.014)	0.019 (0.019)	0.010 (0.017)	-0.044 ** (0.010)	-0.023 (0.015)	0.005 (0.023)	0.005 (0.020)	-0.058 ** (0.013)
N	8,533	7,080	7,339	9,077	5,895	4,984	5,072	6,226
R-squared	0.059	0.078	0.059	0.371	0.057	0.043	0.067	0.326

Notes: Coefficient estimates from OLS regression, standard errors in parentheses. See Table 3 for definitions of dependent variables. Explanatory variables include

age, an indicator of being married, male, number of children, white, 3 educational attainment categories (high school, some college, college degree with reference category high school dropout), total household income (in 000), an indicator of poor health, a risk aversion measure, number of years at current residence, and an indicator for having given \$500+ to offspring in last two years. See also notes to Tables 2 and 3. Data weighted. ** $p < 0.01$, * $p < 0.05$