

Impact of financial debt on borrower's health based on gender

Running title: Health impact of debt

Authors: Gengxuan Chen^{1,2}, Qinmin Jia³, Pankaj K Maskara^{4*}, Albert Williams⁴

¹Institute of Economics, Sichuan Academy of Social Sciences, Chengdu, China

²Guanghua School of Management, Peking University, Beijing, China

³School of Finance, Southwestern University of Finance and Economics, Chengdu, China

⁴Huizenga College of Business and Entrepreneurship, Nova Southeastern University, Fort Lauderdale, USA

*Correspondence:

Pankaj Maskara, Carl DeSantis Bldg., Nova Southeastern University, 3301 College Avenue, Fort Lauderdale, FL 33314, USA

Tel: +1 954 262 5362

Email: pmaskara@nova.edu

Authorship:

All authors have made substantial contributions to this paper. Author names are in alphabetical order.

Conflict of interest:

None

Funding information:

None

This article has been accepted for publication and undergone full peer review but has not been through the copyediting, typesetting, pagination and proofreading process, which may lead to differences between this version and the [Version of Record](#). Please cite this article as [doi: 10.1111/IJCS.12632](#)

This article is protected by copyright. All rights reserved

Data source:

Data required to replicate this study is available in the public domain and can be accessed from <https://chrr.osu.edu/projects/consumer-finance-monthly>

Acknowledgments:

All co-authors thank Xin Wei for his work on earlier draft of the paper. There is no financial interest to report.

Impact of financial debt on borrower's health based on gender

Abstract: This study investigated whether self-reported impact of financial debt on health is different for women as compared to men. We found that female respondents are more likely to report that debt has affected their health. The results persisted when the analysis was performed on subsamples of employed individuals, married households, and those with underwater mortgage (i.e. outstanding balance on mortgage is higher than the current value of the home). Prior studies have found that for a given level of debt, females are more likely to perceive higher levels of stress. When we controlled for stress perception, the health impact of debt was not higher for females. Some types of debt like credit card debt, student debt, and loans from friends and family are known to result in higher levels of stress. Our findings persisted when we limited our sample to top users of credit card debt, to those with student debt, or to those with loan(s) from friends and family. Prior studies have shown that mortgage debt is associated with lower levels of stress as compared to other types of debt. We found that in households with underwater mortgage, health impact of debt was higher for females even after we accounted for gender differential in stress perception. Our findings suggest that women's tendency to experience higher levels of stress for a given level of debt mediates the increased likelihood of women reporting that debt has affected their health. However, there exists a possibility that some types of debt in some situations impact health of women more than men for reasons other than debt-related stress.

Keywords: consumer finance; debt stress; health impact; stress perception; gender difference; underwater mortgage

1. Introduction

Debt is associated with higher stress and lower general health (Sweet et al, 2013). Debt stress, also referred to as financial stress / distress, is defined as a reaction to the condition of one's personal financial state (Prawitz et al., 2006). Higher levels of debt stress involve preoccupation with issues such as unpaid debt and bills or calls from debt collectors. Individuals perceive and react to their financial conditions differently. Two people with same levels of income and financial resources can have different levels of perceived financial distress (O'Neill et al., 2006). Negative financial events, also known as stressor events, contribute to perception of financial stress (Kim, Garman, and Sorhaindo, 2003). Examples of such events include receiving overdue notices from creditors and collection agencies, insufficient funds to cover checks already written, falling behind on bills and mortgage payments, and family money squabbles. Women report higher levels of debt stress than males (Dunn and Mirzaie, 2016). Given the direct association between stress and general health of an individual, it is conceivable that financial debt impacts the health of females differently than that of males. Hence we study the impact of indebtedness on health across gender.

Large number of studies have documented the relationship between debt and mental health (Brown, Taylor, and Price, 2005; Jenkins et al., 2008; Bridges & Disney, 2010; Drentea & Reynolds, 2012). Drentea & Reynolds (2012) find that indebtedness is more consistently associated with mental health than any other single traditional socioeconomic factor. Some have also investigated the association between indebtedness and physiological and general health measures (O'Neill et al., 2006; Sweet et al., 2013; Weida et al., 2020). However, no study has explicitly investigated the impact of debt on health across gender.

We find that women are more likely to report that the debt of their household has affected their health. Prior studies have documented that employed individuals and married people enjoy

Accepted Article

better health (Repetti et al., 1989; Schoenbom, 2004; Koball et al., 2010). The positive impact of employment on health is same for both sexes (Ross and Mirowsky, 1995). Yet when we limit our analysis to currently employed respondents and married households we continue to find that women are more likely to report that debt has impacted their health. However, when we account for the possibility that given a household's level of debt, females are more likely to *perceive* higher stress than their male counterparts, the health impact of financial debt does not differ based on gender. Since Dunn and Mirzaei (2016) has shown that credit card debt, student debt, and loans from friends and family are among the most stressful we also analyze subsamples based on these debt types. All of our results persist in such subsamples. Our findings thus suggest that the differential health impact of debt among women is primarily explained by tendency of women to perceive higher levels of stress for a given level of debt.

However, when we limit our analysis to households with underwater mortgage (that is, amount owed on the mortgage loan is higher than the current value of the home), we find that females not only perceive higher level of stress associated with their financial situation but they also report higher impact of such stress on their health. This finding leaves open the possibility that in some situations financial debt may elicit not only different psychological response but also different physiological outcome in women compared to men.

This paper is organized as follows. In the following section, we review the literature, develop our hypotheses, and present a theoretical framework to demonstrate the impact of household debt on the health of an individual. In section 3 we discuss our data sources and methodology. We present the results of our empirical investigation in section 4. In section 5 we highlight the contributions of our study and discuss the practical implications of our findings. We also note the limitations of our investigation and identify avenues for further research. Section 6

concludes.

2. Theoretical Background and Hypotheses Development

2.1 Background

Debt as a stressor weakens one's ability to deal with situations at hand and results in cumulative disadvantage over time (Ferraro & Shippee, 2009). People with high levels of debt relative to income and/or assets are victim of the vicious cycle of debt where they continue to have to take on more debt to meet their prior debt obligations. They also face higher health costs and lower productivity. Financial stress is associated with higher levels of absenteeism (Kim, Sorhaindo, and Garman, 2006). Individuals experiencing financial issues spend more time handling personal finances, which decreases their time at work, thereby reducing their income and further propagating the debt stress cycle.

At the same time excessive debt is harmful to psychological well-being because it wears away at one's mental health (Drentea & Reynolds, 2012). Fitch, Hamilton, Bassett, and Davey (2011) focus on the impact of personal debt on mental health and review the literature from 1980 to 2009. They conclude that while methodological limitations make it difficult to definitively demonstrate whether indebtedness causes poorer mental health, plausible data exist which indicate that indebtedness contributes to the development of mental health problems. Other studies have documented relationship between financial debt and general health (Drentea and Lavrakas, 2000; Kim, Garman, and Sorhaindo, 2003; O'Neill et al., 2005; O'Neill et al., 2013; Sweet et al., 2013).

Personal debt comprises of several types of debt, including credit card debt, student debt, auto loans, payday loans, installment loans, home equity line of credit, and mortgage debt, among

others. The consequences of non-payment or falling behind on payments differ across different types of debt. Hence, personal or household debt may not be homogenous in terms of its impact on stress and general health. Therefore, researchers have explored individual components of personal debt also. Many studies have focused on stress impact of credit card debt (Norvilitis, Szablicki and Wilson, 2003; Ross, Cleland, and McCloud, 2006; Grable and Joo, 2006; Norvilitis et al., 2006; Nelson, Lust, and Story, 2008). Brown, Taylor, and Price (2005) focused on the psychological stress of mortgage debt while others have focused on the impact of student debt on mental health (Cooke et al., 2006; Muirhead and Locker, 2007).

Studies on indebtedness have also investigated the role of demographic and socio-economic characteristics as contributors of financial stress (Worthington, 2006; O'Neill et al., 2006; Dunn & Mirzaie, 2016). Characteristics examined have included family structure and composition, source and level of household income, age, gender, marital status, ethnic background, housing value, and debt repayment. Researchers have shown that families from ethnic minorities, like African Americans and Hispanics, exhibit higher levels of financial stress (Grable and Joo, 2006; Worthington, 2006; Dunn and Mirzaie, 2016). Similarly, debt stress is higher in families with more children, while it is lower in families with higher disposable incomes and housing values (Worthington, 2006). Drentea (2000) finds that overall level of debt accounts for a small portion of the age effect on anxiety. Women report higher debt stress and anxiety even when they might have lower levels of debt (Dunn and Mirzaei, 2016; Archuleta, Dale and Spann, 2013). This is despite the fact that gender is not a unique predictor of debt (Norvilitis et al., 2006) and consumer attitudes towards the financial act of borrowing, different types of credit products, and creditors do not differ based on gender (Bialowolski et al., 2020).

2.2 Hypotheses Development

Prior studies provide multiple possible reasons to suggest that financial debt can have disproportional impact on the health of women. First, high levels of debt relative to income may indicate relatively little income is available to meet day-to-day needs and unexpected expenses, thereby reducing the household's access to healthcare (Drentea and Lavrakas, 2000). Prior studies have shown that health outcomes are strongly related to medical adherence (Epping-Jordan et al., 2001). Financial barriers significantly impact an individual's capability to afford or access recommended health maintenance practices and health care services (O'Neill et al., 2005; Hanghoj and Boisen, 2014; Kocher, Emanuel, and DeParle, 2010). An overdue medical debt can result in delayed or inadequate medical treatment (O'Neill et al., 2006). Given that healthcare costs per capita are significantly higher for females than males (Cylus et al., 2011), financial limitations are more likely to impact access to healthcare for females than males.

Second, two people with same levels of income and financial resources can have different levels of perceived financial stress (O'Neill et al., 2006). Prior study has shown that given the same level of household debt women experience higher levels of stress than men (Dunn & Mirzaie, 2016). To the extent that stress negatively impacts general health of people, it would imply that debt would adversely impact health of female more than males.

Third, women are biologically different from men. Wang et al., (2007) have shown that gender is an important biological determinant of health consequences of psychosocial stress. They find limited overlap in neural network response to stress across men and women. Different types of external stimuli result in different body responses among women than men (Verma, Balhara, and Gupta, 2011). Women generally report higher levels of effect to negative psychosocial stressors while men report higher effect to positive stimuli (Kelly et al., 2008; Stroud, Salovey,

and Epel, 2002). It is therefore possible that some negative financial events and other debt related stressors elicit stronger responses in women thereby resulting in poorer health outcomes.

In light of above we present our first hypothesis below:

Hypothesis H1: Women are more likely to report that their household debt has impacted their health

Multiple studies have documented positive relationship between financial debt and general psychological and mental disorders (Brown, Taylor, and Price, 2005; Jenkins et al., 2008; Bridges & Disney, 2010; Drentea & Reynolds, 2012; Richardson et al., 2017). Stress over time results in physiological changes, contributing to disease processes, especially those involving metabolic and cardiovascular systems (McEwen, 2004). Some examples of stress-related illness are headaches, anxiety, hives, insomnia, fatigue, low back pain, stiff neck and shoulders, chest pains, and irritability (O'Neill et al., 2006). Stress also impacts health indirectly by causing unfavorable changes in factors known to impact health, like diet, physical activity, and substance use (Kobasa, Hilker, and Maddi, 1979; McEwen and Seeman, 1999). Consequently, debt impacts general health of an individual (Sweet et al., 2013).

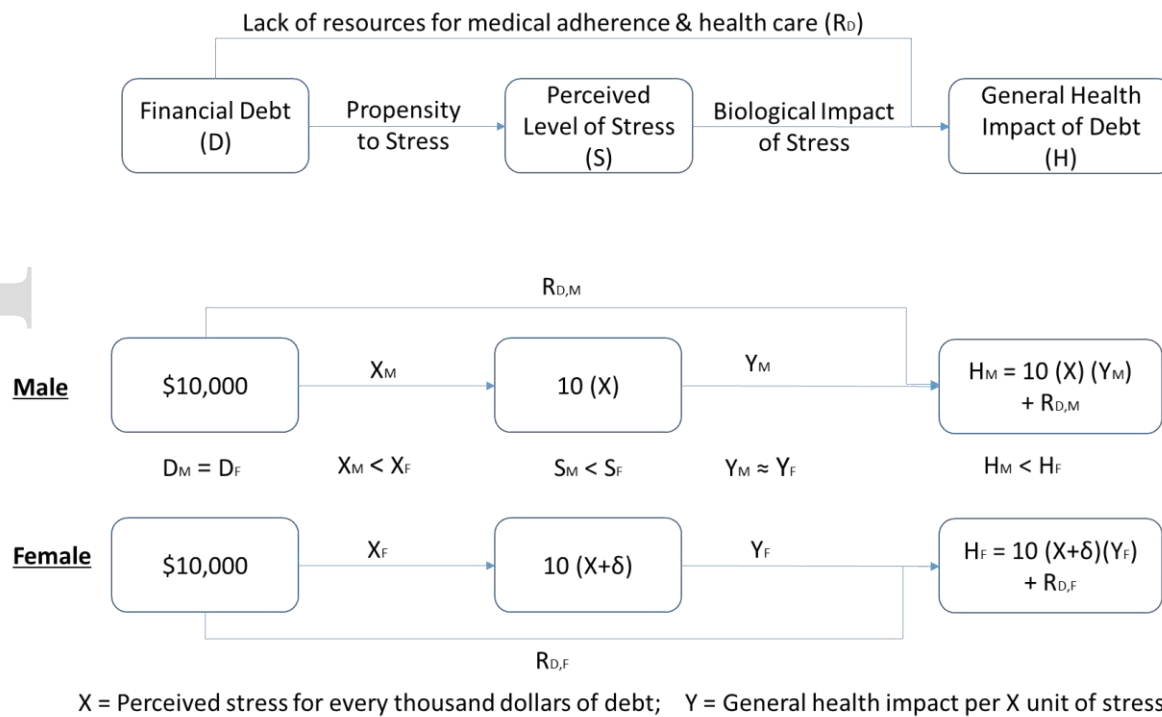
Women have lower levels of employment (Blau & Kahn, 2013). Even when employed, despite making educational gains and pursuing high-wage majors, women still earn less than men and are paid less compared to men (Carnevale, Smith, and Gulish, 2018). Lower levels of employment and income potential suggest relatively lower levels of control for women when faced with adverse financial situations. One of the determinants of stress is the perception of control. Perceived control reduces emotional stress (Dracup et al., 2003). Hence, women with higher household debt experience higher levels of emotional distress. In addition, women

have higher risk aversion and experience higher levels of stress from negative events associated with financial debt, like calls from collection agencies (Dunn & Mirzaie, 2016). Given the direct relationship between emotional stress and health, higher debt-related stress among women suggests higher impact of debt on the health of females. This lead to our second hypothesis below:

Hypothesis H2: The relationship between gender and health impact of debt is due to positive relationship between gender and debt stress.

2.3 Theoretical Framework

Exhibit 1



We present our theoretical framework in Exhibit 1 above. The level of financial debt (D) impacts general health (H) through a direct channel by impacting the level of resources (R) available for medical adherence and healthcare. For a given level of Debt the negative impact of $R_{D,F}$ on females (F) is at least as much as $R_{D,M}$ for males (M). Debt also impacts H via an indirect channel. It causes psychological stress (S) which has negative impact on H . The perceived level of stress for a given level of financial debt is a function of an individual's propensity to experience stress. Health impact of stress depends on biological mechanisms (Y) that cause physiological manifestation of psychological stress.

In the exhibit above D is \$10,000 for both genders. Dunn & Mirzaei (2016) show that for the same level of debt females experience higher level of psychological stress. Therefore, females experience $10(X+\delta)$ units of stress while males experience $10X$. In other words, females have higher propensity to experience financial stress and δ is positive. Our Hypothesis 1 states that the general health impact of debt (H) is higher for females than males. To the extent that $R_{D,F}$, the health impact of debt on females through the direct channel is no less than $R_{D,M}$ and the biological impact of S on H is not lower for females, H_F will be greater than H_M . Hypothesis 2 contends that the health impact of debt is higher for females primarily because of their higher level of S , not because Y is higher for females or because of differential impact of R on H across gender.

3. Methodology

We use data from the *Consumer Finance Monthly* (CFM) survey conducted by the center for human resource research (CHRR). This is the same entity that coordinates and supervises the

sample design and data collection for the National Longitudinal Survey (NLS) sponsored by the Bureau of Labor Statistics of the U.S. Department of Labor (see chrr.osu.edu/projects). CFM survey is a monthly household telephone survey that uses random digit dialing techniques. It is not panel but represents a time series of cross-sectional observations. The same questions were asked from randomly selected people each month. CFM contains financial and demographic information on a large cross-section of individuals and households across the US for the period 2005-2013. However, the survey initiated coverage on some of the variables used in this study on 4/11/2007 only, therefore our analysis is limited to the 2007-2013 period.

The survey was guided by researchers at the Federal Reserve Board and some of the largest banks in the United States, among others. The stated goals of the study were to 1) determine how people choose and use credit cards; 2) understand how they manage their loans and liabilities; 3) measure their asset holdings. CFM also collected household income data to measure how debt payments compared to income and to determine how difficult it was for consumers to manage their debts. Consequently, CFM has been used primarily for studies on credit card usage (Shen, Sam, and Jones, 2014; Schuh, Shy, and Stavins, 2010; Jiang and Dunn, 2013; Jambulapati and Stavins, 2013; Fulford, 2015) and indebtedness (Chakrabarti et al., 2011; Dunn and Olsen, 2014). However, the data from the survey have also been used to study other topics like credit union membership (Maskara and Neymotin, 2019) and financial literacy (Huston, 2012; Finke, Howe, and Huston, 2017).

Though many studies (including Dunn and Mirzaei, 2016) and the official brochure of CFM (available at cfmonthly.org) claim that the CFM sample is nationally representative, some studies have documented that the CFM is not representative of the US population on four key characteristics namely: age, income, race, and homeownership status (Jambulapati and Stavins,

2013; Jones, Loibl and Tennyson, 2015). However, this does not impact the suitability of the survey for our study. The focus of our study is to understand the differential impact of household debt on health across gender. The nature of our study requires us to limit the sample to only such observations where the respondents were asked if debt has impacted their health. This implicitly excludes all households that did not have debt. Hence, the composition of our sample is bound to be different from that of the US population on many dimensions. Moreover, we control for age, race, and income in our regression analysis and use subsamples based on home ownership.

We further note that several studies on household debt and financial stress have used data from the Survey of Consumer Finances (SCF) (Bernstein, 2004; Lyons and Yilmazer, 2005; Scott, 2009; Fulford, 2015; Bricker and Thompson, 2016; Elliott and Lewis, 2015; Xiao and Yao, 2014; Bricker et al., 2017). SCF is a triennial cross-sectional survey sponsored by the Federal Reserve Board that collects detailed information on the finances of US families. It collects data from a dual sample – a geographically stratified random sample and a high-income sample constructed from tax information. Like the CFM, the SCF also collects assets and debt data at the family level. However, unlike in CFM, the individual characteristics are captured for the head of the household rather than the respondent. Consequently it has overrepresentation of males (76%) compared to the US population (49%) (Jiang and Dunn, 2013). Additionally, its financial distress measures are at the household level. Olsen and Dunn (2010) specifically compared the CFM and SCF and concluded that data from the CFM track the data from the SCF fairly closely. They state “the CFM yields a balance sheet for American households that is reasonably well-matched to the SCF and gives researchers access to current information on critical trends in household financial conditions.” Jiang and Dunn (2013) also compared the data in CFM with that in SCF. They also found the mean value of variables like age, race (white), income, education, borrowing

costs, and homeownership to be comparable across the two surveys.

The hypotheses of our study revolve around gender difference in reported impact of debt on health. After asking a range of questions regarding the demographic characteristics of the respondent and the household, the CFM survey collected information on usage of credit cards and other types of debt. The interviewer then proceeded with the following statement “We've talked about your household loans and debt. Now we would like to ask you a few questions about how this is affecting you overall” and asked a series of questions. Two of those questions have been used in this study. They are:

1. “How much stress does the total debt you are carrying cause to you?” The respondents were asked to answer on a scale of one to five where five represented “great deal of stress” while zero represented “no stress”.
2. “To what extent has debt affected your health?” As in previous question, five represents “very much affected” while one represents “not at all affected.”

Our analysis is limited to observations where the respondents were asked if debt stress has affected their health (hereafter, the *Health* question). Households determined to have no debt based on answers to prior questions in the survey were never asked the *Health* question. The majority of the respondents (5,919) in our data stated that debt stress had not impacted their health at all. Only 547 and 419 respondents stated that their health had been “very much affected” and “quite affected,” respectively. There were 40 respondents who responded to the *Health* question stating that they did not have debt, presumably because they considered their small amount of debt relative to their income to be irrelevant, especially in the context of such debt affecting their health. Such observations were not included in our study. However, we also performed all of our analysis

including these 40 observations, treating them as “not at all affected” for the *Health* variable. Our results were robust to this change, both in magnitude and statistical significance.

We perform OLS regression to test our hypotheses. The dependent variable is *Health*. It measures the respondent’s answer to the *Health* question on a Likert scale of one to five with five representing high impact. Norman (2010) and Sullivan & Artino (2013) have shown that ordinal variables with five or more categories can be used as continuous without any adverse consequences. Recent studies on financial attitudes and well-being used OLS regression with dependent variables measured on a Likert scale (Xiao & O’Neill, 2018; Utkarsh et al., 2020). To test hypothesis H1, we estimate the following model,

$$H_i = \alpha + \beta.Gender_i + \lambda.Fin + \rho.HH + \varphi.P_i + \theta.ST + \varepsilon_i$$

Where,

H_i = Health impact of Debt on respondent i .

Fin = Matrix of household level debt, income, and net worth related financial variables

HH = Matrix of household characteristics like number of kids, negative home value, employment status, payment history.

P_i = Matrix of personal characteristics like age, race, marital status, education, and bankruptcy history.

ST = Matrix of state-level housing market variables

To test Hypothesis H2, we estimate the model below that also includes $Stress_i$, the reported stress level of the respondent due to debt

$$H_i = \alpha + \beta.Gender_i + \gamma.Stress_i + \lambda.Fin + \rho.HH + \varphi.P_i + \theta.ST + \varepsilon_i$$

We categorize the control variables into three broad categories based on the level at which the data was gathered, namely, individual, household, and state. At the individual level we account for age, marital status, education, bankruptcy history, and race. Health is known to have direct relationship with race, age, and marital status (Sweet et al., 2013.) and education is related to debt levels and the capability of individuals to pay such debt (Kim & Xiao, 2020). Those with prior experience with personal bankruptcy are expected to experience different levels of stress for a given debt level than those without such experience. Reported impact of debt on health and perceived level of debt stress are also measured at the individual level. However, indebtedness is measured at household level. Dunn and Mirzaei (2016) found that the most reliable way to measure indebtedness for studies related to debt stress is to lump all debts together. They found that respondents cannot separate their debt from that of their spouse / partner. Similarly, we measure the net worth of the family as the residual value of all assets of the respondents and the spouse after all debts are paid off. The survey asked the following question “Suppose you (and your spouse) were to sell all of your major possessions (including your home), turn all of your investments and other assets into cash, and pay all of your debts. Would you have something left over, break even, or be in debt?” We also account for income, number of dependent kids, and bill payments history at the household level. We classify households with income greater than \$100,000 as high income households. Number of dependent kids is associated with higher debt stress levels (Worthington, 2006). Higher income allows households to better manage their debt obligations and is associated with lower debt stress while late payments captured in the bill payments history reflect the financial strain on the household.

Along with demographic and financial variables we also include state level variables in the analysis. The emotional well-being of an individual is impacted not only by the financial situation of his/her household but that of the overall economy, the emotional state of friends and family, and his/her future outlook. In order to capture the likely economic environment and the housing market in the respondent's state of residence we measure the annual change in the home price index. We also calculate two binary variables called "decline" and "severe decline". *Severe Decline* takes unit value when the home price index declined during the year by eight percent or more, whereas *Decline* takes unit value when the home prices declined but by less than eight percent. We chose the cutoff at 8 percent to roughly coincide with the 10th percentile for housing price change variable in census bureau dataset for our sample period. Our results are not dependent on our choice of the cutoff level. Forty two percent of the observations in our sample are from judicial states. About eighty percent of the observations in our sample experienced housing price changes between zero and minus eight percent. We also create a binary variable called "judicial state" that takes unit value for 20 states that have judicial foreclosure. Judicial states require the lender to initiate the foreclosure process in the court of law demonstrating a default on the mortgage. The court then issues decree, stipulates that the lender issue notices to the borrower, and oversees the foreclosure process. In other states the liquidation of the property takes place through power-of-sale and is handled by a trustee. This makes the process go much faster in non-judicial states (Dagher and Sun, 2014). Judicial states afford higher protection to borrowers and grant them opportunity to rectify the default, often allowing borrowers to continue living in their homes for a much longer period of time than is possible in non-judicial states.

All of our models include a set of dummy variables designed to capture information of categorical nature. The base categories are 'White' for race, "less than high school" for education,

and ‘never late’ for payment history. We include year fixed effect in all of our model estimations.

4. Results

We present descriptive statistics for our data sample in Table 1. In Panel A, we show count, mean, and different levels of percentile cutoff points for the continuous variables. We present the composition of the sample across different categorical variables in Panel B. We note that the average for number of kids residing in the same household with the respondent is 0.69. Given the average age of the respondents in our sample, we would not expect many kids to be living in the same household, though there does exist an observation with as many as 13 kids living in the same household. The average annual household income for our data sample is \$68,000. This is slightly above average for the US population. However, given the age distribution of respondents in our sample and the underrepresentation of blacks, this slightly higher average for the household income is to be expected.

[TABLE 1 ABOUT HERE]

The median net worth of households is \$173,000. This is markedly lower than the mean value of \$422,000 and it reflects the biased nature of wealth distribution in our society (Bricker et al., 2017). The wide disparity in the mean and median measures of income also exists in the SCF data. Eighteen percent of the households in our sample are dual income households. The average respondent had an equity of \$75,000 in his home based on the market value at the time of the survey. Nineteen percent of the respondents had household income greater than \$100,000. The average credit card to income ratio was 28% and HELOC (home equity line of credit) to income ratio was 50%. Seventeen percent of the respondents reported negative equity in their home. That is, the value of the home at the time of the survey was lower than the outstanding balance on the

mortgage loan. Such households are referred to as being underwater on their mortgage. Eighty seven percent of the respondents reported not being late on any loan or credit card in the six months period prior to the survey. Six percent reported being late once or twice while 7 percent reported being late three times or more.

In Panel C of Table 1 we present the Pearson correlation coefficients. The highest correlation coefficient (0.65) is between the dependent variable *Health* and *Debt Stress*. We note that the correlation among the different control variables is generally low. None of the control variable pairs have correlation coefficient above 0.50. The data suggest that dual income households are more likely to have household income in excess of \$100,000 and home equity constitutes a significant portion of a household's net worth.

In Table 2 we present the results of OLS regression. We find that individuals from high income households, those with higher education, and those with an employed member in the household are less likely to report health issues emanating from debt problems. Age has positive association with the *Health* variable. However, the relationship is not linear, but rather concave in nature. Those with history of bankruptcy, recently late on their loans, with negative home equity, residing in a state with declining home prices, and those with high credit card debt to income ratio are more likely to report that debt has impacted their health. Most importantly, when we include the female variable in Model 2, we find highly significant positive relationship between the *Health* variable and *female* while the estimates and significance of the other variables remain similar. The results suggest that females are more likely to report that debt has impacted their health. This supports our hypothesis H1.

[TABLE 2 ABOUT HERE]

The employment status of an individual can have an impact on the physical and mental

well-being of an individual separate from the impact of employment on the financial state of the household (Choi et al., 2020). When employed, an individual is busy during the day performing his job duties. This facilitates distraction, an effective coping mechanism for economic-related stressors (Wadsworth & Berger, 2006). Additionally, employment results in increased social support from co-workers and supervisors thereby resulting in beneficial health effects (Repetti et al. 1989). Given that female employment is lower than that of males (Blau & Kahn, 2013), it is possible that our observed differential in reported impact of debt on health for females is a reflection of the employment status of the respondent. Even though we included employment status of the household in model 2, it is conceivable that unemployed women are more likely to experience debt-related adverse health outcomes even when their spouses are gainfully employed. We therefore include an additional variable in the regression in Model 3 to account for the employment status at the respondent level. Given that the survey started capturing the employment status of the respondent separate from that of the household in 2010, we have fewer observations for this model.

As expected, we find that employed individuals are less likely to report debt related health issues. We note that despite our reasoning behind inclusion of the respondent's employment status in the regression we cannot infer any causal relationship between employment status and the *Health* variable. The observed results could easily be a manifestation of the fact that unhealthy individuals are less likely to be employed. Irrespective, our results for all other variables, especially the *female* variable does not change on inclusion of the respondent's employment status in the model. We continue finding support for H1. To test the robustness of our findings, we performed collinearity diagnostics on all of our empirical models in Table 2. The results confirmed that our model estimates were not impacted by multicollinearity related issues.

To better understand the relationship of the *Health* variable with gender, in model 1 of Table 3 we restrict our analysis to respondents that were employed at the time of the survey. We find that even when employed, females are more likely than males to report that debt has impacted their health, all else equal. The sign and significance for the other variables remain the same as in the full sample.

[TABLE 3 ABOUT HERE]

People who are married enjoy better physical and mental health than those who are not (Koball et al., 2010; Schoenborn, 2004). Married people are able to share their worries and concerns and have an invaluable support structure which can help alleviate stress. At the same time the perceived responsibility of raising kids and demands on the time of the parent is significantly different for single parents as compared to those for married individuals. It is conceivable that our results are manifestation of higher instances of single mothers in the sample than single fathers. A larger proportion of respondents in our sample (56.6%) are females and only 62.4% of the female respondents are married as compared to 71.1% of the males. We therefore limit our analysis to married individuals to ensure that our observed results are not a result of preponderance of single mothers in our sample. It is conceivable that single mothers likely face higher pressures to meet the needs of their family and have less time available to tend to their health needs. In Model 2 of Table 3 we present the model estimates for married individuals only. We find that even when married, females continue to report higher health impact of debt compared to their male counterparts.

We next explore the mechanisms that likely mediate the observed relationship between reported impact of debt on health across gender. We estimate the level of reported debt stress as a function of financial conditions and other demographic variables. As reported in Table 4 we find

that females are likely to report higher level of debt stress, all else equal. That is, given similar level of debt and comparable levels of net worth and income a female is likely to report higher level of debt stress than male. We note that the sign and significance for other control variables are in line with expectations. In Model 2 of Table 4 we restrict our analysis to employed respondents to sidestep any impact of employment status (other than through income) on the debt stress variable. We continue to find highly positive significant coefficient for the female variable.

[TABLE 4 ABOUT HERE]

Having established that females perceive stress differently than males, we now address hypothesis H2. In table 5 we report the estimates of a model that predicts the reported health impact of debt based on gender and other control variables, including reported debt stress. We no longer find statistically positive coefficient for the female variable. In model 2 we restrict our analysis to respondents employed at the time of the survey. We fail to find significant coefficient for the female variable once again. The insignificant coefficient for the female variable on inclusion of reported debt stress in the model shows that women perceive stress from financial conditions differently but for a given level of perceived stress, the health impact of debt is no different for females than males.

[TABLE 5 ABOUT HERE]

All debt is not created equal. The consequences of being late or defaulting on unsecured debt like credit card loan differ significantly from those resulting from default on secured debt like home mortgage (Letkiewicz & Heckman, 2019). Defaulting on a mortgage loan can result in home foreclosure. The emotional attachment of people to their home is usually significantly higher than that with other assets. Losing a home causes a major disruption in the life of a family. It results in

children being uprooted from their school and friends, and families losing their social standing, among others. The mere possibility of such disruption causes stress at a level much different from all others. We therefore limit our analysis to a subsample of observations where respondents were underwater on their mortgage. That is, the individual reported higher outstanding balance on their mortgage loan than the current value of the house. Such households have higher odds of facing home foreclosure (Schaffer, 2014).

Women are more attached to their homes than men (Hidalgo and Hernandez, 2001; Rollero and DePiccoli, 2010; Anton & Lawrence, 2014). A home contributes to the identity of a woman as a mother and also as a wife (Larsson, 1996). The possibility of being foreclosed upon can have different impact on the well-being of a female because of the direct impact of such adversity on the well-being of the kids and a mother's emotional bond with her children. The mere thought of having to see one's child in emotional pain can conceivably have material adverse impact on the mental, possibly physical, health of a mother.

In Table 6 we report the results of our analysis for a subsample restricted to respondents with underwater mortgage. As expected, when we do not include the debt stress variable in the model we observe significantly positive coefficient for the female variable (see Model 1). However, unlike in prior results, we continue to find significant positive coefficient for the female variable even after inclusion of the debt stress variable in Model 2. This finding suggests that some types of debt in some situations can have differential health impact on females than males apart from the differential debt stress impact. However, these results are suggestive in nature only and are more suited for further investigation.

[TABLE 6 ABOUT HERE]

In Table 7 we report the results of our analysis based on credit card debt, student debt,

Accepted Article

and loans from friends and family, debt types shown by Dunn and Mirzaei (2016) to be most stressful. In models 1 and 2 we restrict the sample to respondents with credit card to loan ratio in the top decile of all respondents. In models 3 and 4 the sample is limited to households with loans from friends and family. Models 5 and 6 are restricted to households with student debt. Consistent with our results for the full sample, we find positive coefficient for *female* when we estimate the impact of debt on health based on gender in models 1, 3, and 5. This supports our H1 that women are more likely to report that debt has impacted their health. However, when we include reported debt stress in models 2, 4, and 6, the coefficient for the female variable becomes insignificant. This change in the significance of the female variable supports our H2 that the relationship between health impact of debt stress and gender is mediated by the relationship between gender and debt stress perception.

[TABLE 7 ABOUT HERE]

5. Discussion

In our analyses we find that households with high income are less likely to report stress and health impact of debt. This is in accordance with findings of O'Neill, Prawitz, Sorhaindo, Kim, and Garman (2006) that impact of indebtedness on health factors is not redundant with other socioeconomic factors. It is also consistent with Choi et al. (2020) who document that the negative relationship between financial stress and income is stronger for higher income groups. Similarly, we find significant relationship between employment status, both at the respondent and household level, and health status. This observation confirms observation of Choi et al. (2020) that impact of employment on financial well-being only partly reflects the impact of employment on stress. We also find that both health and debt stress have positive relationship with age but the association is

not linear. We observe concave relationship between debt stress and age. The level of debt related stress increases with age up to a certain point but decreases thereafter. This explains why prior studies have observed weak relationship between measures of debt stress and age (Drentea, 2000). Many studies have not had enough representation of older people (Norvilitis, Szablicki, and Wilson, 2003; Norvilitis et al., 2006; Ross, Cleland, and Macleod, 2006; Sweet et al., 2013) while others did not have sufficient representation of the young (Drentea & Reynolds, 2012).

As it pertains to indebtedness, prior studies have shown that those with higher debt relative to their income and assets are more likely to report that debt has impacted their health (Drentea & Lavrakas, 2000; Sweet et al., 2013). We observe the same in our data. However, we note that the inclusion of the gender variable increases the explanatory power of the model even though the magnitude and significance of the variables related to indebtedness (i.e. net worth, negative home value, credit card to income ratio, and Heloc to income ratio) remain the same. This suggests that the impact of debt on the health of women differs from that on men. Our results also confirm that the observed differential in the impact of indebtedness on health across gender is not a reflection of differences in the employment levels among women. Inclusion of the respondent's employment status in the models does not reduce the significance of the gender variable and our results persist when sample is limited to employed respondents.

Though we find positive relationship between measures of indebtedness and reported impact of debt on health it remains an open question whether it is the actual debt or the level of perceived financial stress that actually impacts health. Drentea (2000) finds that stress increases with debt. Drentea and Lavrakas (2000) finds that debt and debt stress are associated with health. O'Neill et al. (2006) shows that debt is significantly related to worse physical health. Our results suggest that debt is associated with both higher levels of debt stress and lower physical health.

We also show that debt results in higher stress for women. Dunn and Mirzaei (2016) finds similar results and attribute their findings to lower levels of risk aversion among women and show that negative debt-related events like call from collection agencies cause more stress for women. However, an additional explanation also exists for the observed relationship between gender and debt stress. The sample period for our study and that of Dunn and Mirzaei (2016) coincides with the great financial crisis of 2008. Floro and Dymski (2000) provides a channel through which financial crisis can have disproportionate impact on women. They argue that women's access to the formal sector employment encourages the growth of household credit for the acquisition of labor-saving household assets. This can lead to higher financial risk. A financial crisis can force the household to bear heavy adjustment costs that may be borne disproportionately by women, who become more economically vulnerable during such times.

Our study further demonstrates that women's propensity to stress more over debt explains the observed relationship between gender and self-reported health impact of debt. On inclusion of the debt stress variable the gender variable becomes insignificant in our regressions. We find our results to be generally true across different debt types. However, when restricting the sample to households with underwater mortgage we continue to find significant coefficient for the *female* variable. Brown, Taylor, and Price (2005) also finds significant relationship between debt stress and non-mortgage outstanding credit obligations but no relationship between stress and mortgage debt. Similarly, Dunn & Mirzaie (2016) documents that mortgage debt is the least stressful among all types of personal debt.

5.1 Theoretical contributions and implications

Two studies are of special relevance to the present analysis. First, like us, Sweet, Nandi, Adam, and McDade (2013) explore household financial debt and its impact on mental and physical

health using survey data. They show that high financial debt relative to available assets is associated with higher perceived stress and depression, worse self-reported general health, and higher diastolic blood pressure. However unlike us they do not delve into gender issues, nor do they attempt to establish the mediation role of debt stress in the relationship between indebtedness and health. In fact, they state “our measure of subjective relative debt does not capture individual psychological perceptions, such as attitudes towards debt and feelings of indebtedness and financial stress, which may be important to the way in which debt impacts health” They recommend future researchers to tease apart the effect of having debt from the perception of being in debt and its associated emotional responses. This is precisely what the CFM survey allows us to do unlike the National Longitudinal Study of Adolescent Health (NLSAH) data they use. Given their data constraints their measures of debt and assets excludes mortgages and home equity, key forms of debt and assets. In addition, their study is confined to survey of respondents in the 24-32 years of age cohort. This severely limits the generalizability of their observed results.

Second, Dunn and Mirzaie (2016) use the CFM survey, like us, to study the stress associated with financial debt during the financial crisis. However the principal focus of their study is to investigate the changes in the household debt holdings during the financial crisis and the associated increase in psychological debt stress. They do not study the health impact of household debt or stress. Rather they focus on the change in the composition of household debt during the crisis and the differential impact of collateralized debt vs noncollateralized debt on psychological stress. The different types of debt studied include payday loans, credit card loans, student loans, installment loans, bank loans, loans from family and friends, mortgage loans, and home equity lines of credit (HELOC). In line with the findings of Brown, Taylor, and Price (2005) they find that payday loans, credit card loans, and loans from family and friends are the most stressful while

mortgage loans are the least stressful.

However, in their regression analyses Dunn and Mirzaie (2016) also find persistent differences in debt stress across gender. They conclude that women have higher levels of debt stress and all forms of debt contribute to stress. They contend that higher debt stress among women is likely a result of their higher risk aversion. They find that the negative impact of collection agency encounters is significantly higher for females than males. Our study extends the literature a step further and documents the relationship between debt and health while accounting for the relationship between debt and psychological stress. In our study the dependent variable is the health impact of debt, while debt stress, the dependent variable of Dunn and Mirzaie (2016), is the independent variable.

Our study contributes to the literature in several ways. First, using slightly different measure of debt stress and a different methodology we provide confirming evidence for gender related hypotheses of Dunn & Mirzaie (2016). We show that in a given financial situation, women perceive higher levels of stress than men, all else equal. Second, we show that given the financial situation of a household women are more likely to report that that debt has impacted their health. Third, we demonstrate that the differential in the reported impact of debt on health across gender is primarily mediated by the gender differential in the stress perception of debt. This also helps explain findings of Selenko and Batinic (2011) that the perceived financial stress is related to an individual's mental health, whereas the objective amount of debt is not. Fourth, we show that our findings are consistent across different types of household debt, especially those that have been shown to be among the most stressful. Fifth, we find that in specific situations where a household faces higher threat of home foreclosure, higher perception of debt-related stress may not be the only mediator for gender differential in reported health impact of debt.

5.2 Implications for Practice

Our study has several practical implications. First, it has been shown that participation in debt counselling programs results in health improvements over time with lower financial stress and greater financial well-being (O'Neill et al., 2006). The positive benefits of financial counselling differ along demographic variables like age, employment, family relationship, and income (Xiao, Sorhaindo, and Garman, 2006; Son and Park, 2019). Our study adds another dimension to this list – the gender. Our findings suggest that debt counseling and stress management programs can be aimed at females for higher marginal impact. Additionally, given that women have lower levels of financial literacy than men (Ergun 2018), it might also be helpful to have more financial literacy programs targeted towards women.

Second, healthcare costs per capita are significantly higher for females than males (Cylus et al., 2011). We show that financial debt has higher impact on the health of women and this impact is primarily mediated by higher levels of debt stress. Our findings thus suggest that a part of the higher healthcare costs per capita for females could be explained by higher levels of debt stress experienced by women. Baicker, Cutler, and Song (2010) found that workplace-based disease prevention and health promotion programs provide significant benefits in terms of healthcare costs and productivity. Our findings thus imply that corporations and public health organizations alike could possibly fine tune their wellness programs to include stress management workshops designed specifically for women facing financial stress and get higher marginal impact for their healthcare dollars.

Third, a recent study by Utkarsh, Ashta, Spiegelman, and Sutan (2020) showed that attitudes towards money formed based on financial discussions with parents during childhood have significant positive impact on financial well-being. Agnew and Cameron-Agnew (2015) document

that males have their first financial discussion in the home at a much younger age than females, which over time contributes to differential financial literacy knowledge levels between the genders. Our findings suggest that financial literacy programs encouraging people to have financial conversations with their daughters at an early stage would not just enhance financial well-being but also have long term positive impact on women's health down the road.

Fourth, we find that women report higher impact of debt on health when faced with the prospects of home foreclosure and associated disruption in social life. This suggests that stress associated with some types of debt may impact health of women differently from men. Medical researchers can investigate the differential biological impact of different types of financial stressors across gender, possibly resulting in new medical technology and advancements.

5.3 Limitations and future research directions

We used secondary data in our study. This limited our capacity to design and administer instruments that could have captured health impact of debt in more detail. Future studies could design instruments to capture specific health issues, possibly some specific to women's health to better understand the differential impact of debt stress across gender. Additionally, measures could be separated along physical and mental aspects of health. In addition, the CFM data is limited to the 2007-2013 period. Future studies could use other data sources with more current data.

Even though we found higher health impact of debt for women in households with underwater mortgage, we are unable to pinpoint the exact channel(s) through which such indebtedness manifests itself in the health of the respondent. Future research may ask the respondent about specific concerns contributing to the overall financial stress and analyze the relationship between health and individual worry factors across gender.

We tested our hypotheses using the full sample and subsamples based on debt type (credit

card loans, underwater mortgage debt, student debt, and loans from friends and family). Dunn and Mirzaie (2016) found payday loans, credit card debt, and loans from friends and family to be the most stressful. Due to limited number of respondents with payday loans in our sample we were unable to test our hypotheses for subsample across this dimension. In addition to formal sources of debt discussed in our study, households may borrow from informal sources like loan sharks. Such debt may induce relatively higher stress. Future studies could specifically explore the impact of debt on health for households with payday loans and those borrowing from informal sources.

6. Conclusion

Prior studies have documented relationship between debt and health. We extend this literature and investigate the impact of debt on the health of individuals across gender. We find that female respondents are more likely to report that their household debt has affected their health. This finding is consistent across different subsamples based on employment and marital status. However, when we account for the possibility that for a given level of debt women are more likely to experience debt stress, the health impact of debt does not differ based on gender.

We also analyze the reported impact of debt on health for subsamples based on debt type. Prior studies have found that credit card debt, loans from friends and family, and student loans are among the most stressful while mortgage debt is the least stressful (Dunn and Mirzaie, 2016; Brown, Taylor, and Price, 2005). We find that women in households with high levels of credit card debt are more likely to report that debt has impacted their health. However, much like for the full sample, this difference in reported health impact is due to higher perception of stress by females for similar levels of debt. We find the same results when limiting our analysis to households with loans from friends and family or to households with student debt.

Accepted Article

However, when we limit our analysis to households with underwater mortgage, we find that higher reported impact of debt on health among women persists even after we account for the gender differential in perception of debt stress. This gives rise to the possibility that some kinds of debt in some situations impact health of women differently than men. We posit that the differential impact of financial debt as stressor on a female in a household with underwater mortgage is likely a response to the possibility of emotional impact on her children of being uprooted from the community as a result of looming home foreclosure. Females are likely more attached to their homes. The prospects of losing her home impacts a woman differently than a man. We take our findings as preliminary evidence that justifies further medical studies of differential impact of financial stressors across gender.

References

- Agnew, S. & Cameron-Agnew, T. (2015). The influence of consumer socialization in the home on gender differences in financial literacy. *International Journal of Consumer Studies*, 39, 630-638.
- Anton, E. & Lawrence, C. (2014). Home is where the heart is: The effect of place of residence on place attachment and community participation. *Journal of Environmental Psychology*, 40, 451-461.
- Archuleta, K., Dale, A., & Spann, S. (2013). College students and financial distress: exploring debt, financial satisfaction, and financial anxiety. *Journal of Financial Counseling and Planning*, 24(2), 50-62,91,93.
- Baicker, K., Cutler, D., & Song, Z. (2010). Workplace wellness programs can generate savings. *Health Affairs*, 29 (2), 304-311.
- Bernstein, D. (2004). Household debt and IRAs: Evidence from the survey of consumer finances. *Financial Counseling and Planning*, 15 (1), 63-72.
- Białowolski P., Cwynar A., Cwynar W., & Węziak-Białowolska D. (2020). Consumer debt attitudes: The role of gender, debt knowledge and skills *International Journal of Consumer Studies*, 44, 191-205.
- Blau, F. D. & Kahn, L. M. (2013). Female labor supply: Why is the United States falling behind? *American Economic Review: Papers and Proceedings* 103 (3), 251-256.
- Bricker, J. & Thompson, J. (2016). Does education loan debt influence household financial distress? An assessment using the 2007-2009 survey of consumer finances panel. *Contemporary Economic Policy*, 34 (4), 660-677.

- Accepted Article
- Bricker, J., Dettling, L. J., Henriques, A., Hsu, J. W., Jacobs, L., Moore, K. B., Pack, S., Sabelhaus, J., Thompson, J., & Windle, R. A. (2017) Changes in U.S. Family Finances from 2013 to 2016: Evidence from the Survey of Consumer Finances, *Federal Reserve Bulletin*, 103 (3).
- Bridges, S. & Disney, R. (2010). Debt and Depression. *Journal of Health Economics*, 29, 388-403.
- Brown, S., Taylor, K., & Price, S. W. (2005). Debt and distress: evaluating the psychological cost of credit, *Journal of Economic Psychology*, 26, 642-663.
- Carnevale, A. P., Smith, N., & Gulish, A. (2018). Women can't win: Despite making educational gains and pursuing high-wage majors, women still earn less than men. Washington DC: Georgetown University Center on Education and the Workforce.
- Chakrabarti, R., Donghoon, L, van der Klaauw, W., & Zafar, B. (2011). Household debt and saving during the 2007 recession. *Federal Reserve Bank Staff Report No. 482*.
- Choi, S. L., Heo, W., Cho, S. H., & Lee, P. (2020). The links between job insecurity, financial well-being and financial stress: A moderated mediation model. *International Journal of Consumer Studies*, 2020;00:1–8. <https://doi.org/10.1111/ijcs.12571>
- Cooke, R., Barkham, M., Audin, K., Bradley, M., & Davy, J. (2006). Student debt and its relation to student mental health. *Journal of Further and Higher Education*, 28(1), 53-66.
- Cylus, J., Hartman, M., Washington, B., Andrews, K., & Catlin, K. (2011). Pronounced gender and age differences are evident in personal health care spending per person, *Health Affairs*, 30 (1), 153-160.
- Dagher, J. & Sun, Y., (2014). Borrower Protection and the Supply of Credit: Evidence from Foreclosure Laws. *International Monetary Fund (IMF) working paper series*.

- Dracup, K., Westlake, C., Erickson, V. S., Moser, D. K., Caldwell, M. L., Hamilton, M. A. (2003). Perceived control reduces emotional stress in patients with heart failure. *The Journal of Heart and Lung Transplantation*, 22 (1), 90-93.
- Drentea, P. (2000). Age, Debt and Anxiety. *Journal of Health and Social Behavior*, 41 (4), 437-450.
- Drentea, P. & Lavrakas, L. J. (2000). Over the limit: the association among health, race and debt. *Social Science & Medicine*, 50(4), 517-529.
- Drentea, P. & Reynolds, J. R. (2012). Neither a borrower nor a lender be: the relative importance of debt and SES for mental health among older adults. *Journal of Aging and Health*, 24, 673-695.
- Dunn, L. & Olsen, R. (2014). US Household Real Net Worth Through the Great Recession and Beyond: Have we Recovered? *Economics Letters*, 122, 272-275.
- Dunn, L. & Mirzaie, I. (2016). Consumer debt stress, changes in household debt, and the great recession. *Economic Inquiry*, 54(1), 201–214.
- Elliott, W. & Lewis, M. (2015). Student debt effects on financial well-being: Research and policy implications. *Journal of Economic Surveys*, 29 (4), 614-636.
- Epping-Jordan, J., Bengoa, R., Kavar, R., Sabate, E. (2001). The challenge of chronic conditions: WHO responds, *BMJ* 323:947.
- Ergun, K. (2018). Financial literacy among university students: A study in eight European countries. *International Journal of Consumer Studies*, 42, 2-15.
- Ferraro, K. F. & Shippee, T. P. (2009). Aging and cumulative inequality: How does inequality get under the skin? *The Gerontologist*, 49 (3), 333-343.

- Accepted Article
- Finke, M. S., Howe, J. S., & Huston, S. J. (2017). Old age and the decline in financial literacy. *Management Science*, 63 (1), 213-230.
- Fitch, C., Hamilton, S., Bassett, P., & Davey, R. (2011). The relationship between personal debt and mental health: a systematic review. *Mental Health Review Journal*, 16(4), 153-166.
- Floro, M. & Dymski, G. (2000). Financial Crisis, Gender, and Power: An Analytical Framework. *World Development*, 28(7), 1269-1283.
- Fulford, S. (2015). How important is variability in consumer credit limits? *Journal of Monetary Economics*, 72, 42-63.
- Grable, J. & Joo, S. (2006). Student racial differences in credit card debt and financial behaviors and stress. *College Student Journal*, 40(2), 400-408.
- Hanghoj, S., Boisen, K. A. (2014). Self-reported barriers to medication adherence among chronically ill adolescents: A systematic review, *Journal of Adolescent Health*, 54 (2), 121-138.
- Hidalgo, M. C. & Hernandez, B. (2001). Place attachment: Conceptual and empirical questions. *Journal of Environmental Psychology*, 21, 273-281.
- Huston, S.J. (2012). Financial Literacy and the Cost of Borrowing. *International Journal of Consumer Studies*, 36, 566-572.
- Jambulapati, V. & Stavins, J. (2013). The Credit CARD Act of 2009: What Did Banks Do? *Federal Reserve Bank of Boston Working Paper* 13-7.
- Jenkins, R., Bhugra, D., Bebbington, P., Brugha, T., & Farrell, M. (2008). *Psychological Medicine*, 38, 1485-1493.
- Jiang, S. S. & Dunn, L. F. (2013). New Evidence on Credit Card Borrowing and Repayment

- Patterns. *Economic Inquiry*, 51(1), 394-407.
- Jones, L. E., Loibl, C. & Tennyson, S. (2015). Effects of informational nudges on consumer debt repayment behaviors. *Journal of Economic Psychology*, 51, 16-33.
- Kelly, M. M., Tyrka, A. R., Anderson, G. M., Price, L. H., & Carpenter, L. (2008). Sex differences in emotional and physiological responses to the Trier Social Stress Test. *Journal of Behavior Therapy and Experimental Psychiatry*, 39 (1), 87-98.
- Kim, J., Garman, E. T., & Sorhaindo, B. (2003). Relationships among credit counseling clients' financial wellbeing, financial behaviors, financial stressor events, and health. *Journal of Financial Counseling and Planning*, 14 (2).
- Kim, J., Sorhaindo, B. & Garman, E. T. (2006). Relationship between financial stress and workplace absenteeism of credit counseling clients. *Journal of Family and Economic Issues*, 27 (3), 458–478
- Kim, K. T., & Xiao, J. J. (2020). Racial/ethnic differences in consumer financial capability: The role of financial education. *International Journal of Consumer Studies*, <https://doi.org/10.1111/ijcs.12628>
- Koball, H. L., Moiduddin, E., Henderson, J., Goesling, B., Besculides, M. (2010). What do we know about the link between marriage and health? *Journal of Family Issues*, 31 (8), 1019-1040.
- Kobasa, S. C., Hilker, R. R. J., & S. R. Maddi (1979) Who stays healthy under stress? *Journal of Occupational Medicine* 21 (9), 595-598.
- Kocher, R., Emanuel, E. J., & DeParle, N. M. (2010) The Affordable Care Act and the future of clinicial medicine: The opportunities and challenges, *Annals of Internal Medicine*, 153 (8),

- Larsson, A. E. (1996). The importance of housing in the lives of women: The case of Botswana, In: Dandekar (H. C.) ed. *Shelter, Women, and Development: First and Third World Perspectives*, 106-115.
- Letkiewicz, J.C., Heckman S.J. (2019) Repeated payment delinquency among young adults in the United States. *International Journal of Consumer Studies*, 43, 417–428.
- Lyons, A. C. & Yilmazer, T. (2005). Health and financial strain: Evidence from the survey of consumer finances. *Southern Economic Journal*, 71 (4), 873-890.
- Maskara P. K. & Neymotin, F. (2019) Credit unions during the crisis: Did they provide liquidity? *Applied Economic Letters*, 26(3) 174-179.
- McEwen, B. S. (2004). Protection and damage from acute and chronic stress: allostasis and allostatic overload and relevance to the pathophysiology of psychiatric disorders. *Annals of the New York Academy of Sciences*, 1032, 1-7.
- McEwen, B. S. & Seeman, T. (1999). Protective and damaging effects of mediators of stress. Elaborating and testing the concepts of allostasis and allostatic load. *Annals of the New York Academy of Sciences*, 896, 30-47.
- Muirhead, V. & Locker, D. (2007). Canadian Dental Students' Perceptions of Stress. *Journal of Canadian Dental Association*, 73(4).
- Nelson, M., Lust, K., & Story, M. (2008). Credit Card Debt, Stress and Key Health Risk Behaviors among College Students. *American Journal of Health Promotion*, 22(6), 400-406.
- Norman, G. (2010). Likert Scales, Level of Measurement and the “Laws” of statistics. *Advances in Health Sciences Education*, 15(5), pp. 625-632.

- Norvilitis, J., Szablicki, P., Wilson, S. (2003). Factors Influencing Levels of Credit-Card Debt in College Students. *Journal of Applied Social Psychology*, 33(5), 935–947.
- Norvilitis, J. M., Merwin, M. M., Osberg, T. M., Roehling, P. V., Young, P., & Kamas, M. M. (2006). Personality Factors, Money Attitudes, Financial Knowledge, and Credit-Card Debt in College Students. *Journal of Applied Social Psychology*, 36(6), 1395–1413
- Olsen, R. & Dunn, L. (2010). Housing price declines and household balance sheets. *Economic Letters*, 107 (2), 161-164.
- O'Neill, B., Sorhaindo, B., Xiao, J. J., & Garman, E. T. (2005). Negative health effects of financial stress. *Consumer Interests Annual*, 51, 260-262.
- O'Neill, B., Prawitz, A., Sorhaindo, B., Kim, J., & Garman, E. T. (2006). Changes in health, negative financial events, and financial distress/financial well-being for debt management program clients. *Journal of Financial Counseling and Planning*, 17 (2), 46-62.
- O'Neill, B., Sorhaindo, B., Xiao, J. J. & Garman, E. T. (2013). Financially Distressed Consumers: Their Financial Practices, Financial Well-Being, and Health. *Journal of Financial Counseling and Planning*, 16(1).
- Prawitz, A. D., Garman, E. T., Sorhaindo, B., O'Neill, B., Kim, J., & Drentea, P. (2006). The InCharge financial distress/financial well-being scale: Development, administration, and score interpretation. *Financial Counseling and Planning*, 17(1), 34-50.
- Repetti, R. L., Matthews, K. A., & Waldron, I. (1989). Employment and women's health: Effects of paid employment on women's mental and physical health. *American Psychologist*, 44(11), 1394–1401
- Richardson, T., Elliott, P., Roberts, R. & Jansen, M. (2017). A Longitudinal Study of Financial Difficulties and Mental Health in a National Sample of British Undergraduate Students.

- Community Mental Health Journal*, 53(3), 344-352.
- Rollero, C. & De Piccoli, N. (2010). Place attachment, identification and environment perception: An empirical study. *Journal of Environment Psychology*, 30, 198-205.
- Ross, S., Cleland, J., & Macleod, M. (2006). Stress, debt and undergraduate medical student performance. *Medical Education*, 40(6), 584–589
- Ross, C. E. & Mirowsky, J. (1995). Does employment affect health? *Journal of Health and Social Behavior*, 36 (3), 230-243
- Schaffer, M., (2014). Stemming the Tide of Foreclosure: Evaluating the Use of Eminent Domain to Relieve Underwater Homeowners, *Columbia Business Law Review* 215.
- Schoenborn, C.A. (2004). Marital status and health: United States, 1999-2002. *Advance Data*, No. 351.
- Schuh, S., Shy, O, & Stavins, J. (2010). Who Gains and Who Loses from Credit Card Payments? Theory and Calibrations. *Federal Reserve Bank of Boston Working Paper* 10-03.
- Scott, P. R . (2009). Consumer Debt and the Measurement of Poverty and Inequality in the US. *Review of Social Economy*, 67 (2), 127-148.
- Selenko, E. & Batinic, B. (2011). Beyond debt. A moderator analysis of the relationship between perceived financial strain and mental health. *Social Science & Medicine*, 73(12), 1725-1732.
- Shen, S., Sam, A.G., & Jones, E. (2014). Credit Card Indebtedness and Psychological Well-Being Over Time: Empirical Evidence from a Household Survey. *The Journal of Consumer Affairs*, 48(3), 431-456.
- Son J. & Park J. (2019) Effects of financial education on sound personal finance in Korea: Conceptualization of mediation effects of financial literacy across income classes.

International Journal of Consumer Studies, 43, 77–86.

Stroud, L. R., Salovey, P., & Epel, E. S. (2002). Sex differences in stress responses: social rejection versus achievement stress, *Biological Psychiatry*, 52 (4), 318-327.

Sullivan, G. & Artino Jr., A. R. (2013). Analyzing and Interpreting Data from Likert-Type Scales. *Journal of Graduate Medical Education*, 5(4), pp. 541-542.

Sweet, E., Nandi, A., Adam, E., & McDade, T. (2013). The high price of debt: Household financial debt and its impact on mental and physical health. *Social Science & Medicine*, 91, 94–100.

Utkarsh, Pandey, A., Ashta, A. Spiegelman, E. & Sutan, A. (2020). Catch them young: Impact of financial socialization, financial literacy and attitude towards money on financial well-being of young adults. *International Journal of Consumer Studies*, 2020:00:1-11.
<https://doi.org/10.1111/ijcs.12583>

Verma, R., Balhara, Y. P. S., & Gupta, C. S. (2011). Gender differences in stress response: Role of developmental and biological determinants. *Industrial Psychiatry Journal*, 20 (1), 4-10.

Wadsworth , M.E. , & Berger , L.E . (2006). Adolescents coping with poverty-related family stress: Predictors of coping and psychological symptoms. *Journal of Youth and Adolescence*, 35 , 57 – 70.

Wang, J., Korczykowski, M., Rao, H., Fan, Y., Pluta, J., Gur, R. C., McEwen, B. S., & Detre, J. A. (2007). Gender differences in neural response to psychological stress, *Social Cognitive and Affective Neuroscience*, 2 (3), 227-239.

Weida, E. B., Phojanakong, P., Patel, F., & Chilton, M. (2020) Financial health as a measurable social determinant of health. *PLoS ONE* 15(5): e0233359.

Accepted Article

Worthington, A. (2006). Debt as a source of financial stress in Australian households. *International Journal of Consumer Studies*, 30(1), 2-15.

Xiao J. J. & O'Neill, B. (2018). Propensity to plan, financial capability, and financial satisfaction. *International Journal of Consumer Studies*, 42 (5), 501–512.

Xiao, J. J., Sorhaindo, B., & Garman, E. T. (2006). Financial behaviours of consumers in credit counselling. *International Journal of Consumer Issues*, 30 (2), 108–121.

Xiao, J. J. & Yao, R. (2014), Consumer debt delinquency by family lifecycle categories, *International Journal of Bank Marketing*, 32 (1), 43-59.

Table1: Descriptive statistics

Panel A									
	N	Mean	Min	5th Pctl	25th Pctl	median	75th Pctl	95th Pctl	Max
Respondent level									
Age	9,373	55.73	18	33	46	56	65	80	95
Debt stress affecting health	9,559	1.81	1	1	1	1	2	5	5
Stress	9,527	2.42	1	1	1	2	3	5	5
Household level variables									
Number of kids living in household	9,544	0.69	0	0	0	0	1	3	13
Household Income ('000s)	9,559	68.11	1	1	14	42	86	199	13873
Household net worth ('000s)	9,559	422.35	1	1	28	173	420	1345	78560
Natural log net worth	9,559	4.39	0	0	3.32	5.15	6.04	7	11
Equity in home ('000s)	8,715	124.64	-1575	-41	1	75	175	400	9000
Natural log of household income	9,559	3.30	0.00	0.00	2.64	3.74	4.45	5	10
Credit card debt to income ratio	9,267	0.28	0	0	0	0.015	0.075	1	100
Heloc debt to Income ratio	9,302	0.50	0	0	0	0	0	1	100
State level variables									
Annual change in home price index (%)	9,559	-3.641	-23.05	-11.07	-5.11	-2.94	-1.38	0.84	15.1

Panel B: Categorical Variables

Respondent level	N			N			N	
High school dropout	9,559	6.0%	Female	9,559	56.6%	Asian	9,448	1.5%
High school graduate	9,559	21.2%	Married	9,533	66.1%	White	9,448	86.6%
Some college education	9,559	27.4%	Hispanic	9,519	4.1%	Currently employed	6,375	53.6%
College graduate	9,559	45.5%	Black	9,448	7.3%	Ever bankrupt	9,522	10.3%
Household level variables			N			N		
Employed	9,559	67.9%	Never late on credit cards or other loans			9,559	87.0%	
Dual income household	9,421	18.3%	Late on any loan payment once or twice			9,559	5.9%	
Household Income greater than \$100K	9,559	19.0%	Late on any loan 3 times or more			9,559	7.1%	
Negative equity in home	9,559	17.4%						
State level variables			N					
Higher protection to borrowers from foreclosures	9,559	42.3%	home price decline in top 10 percentile			9,559	10.3%	
home price decline but not in top 10 percentile	9,559	79.9%						

Panel C: Pearson Correlation Coefficient

column	1	2	3	4	5	6	7	8	9	10	11	12
--------	---	---	---	---	---	---	---	---	---	----	----	----

Ref													
1	Age	1.00											
2	Number of kids living in household	(0.50)	1.00										
3	Household Income ('000s)	(0.08)	0.05	1.00									
4	Household net worth ('000s)	0.05	(0.04)	0.18	1.00								
5	Employed	(0.48)	0.21	0.14	0.02	1.00							
6	Dual income household	(0.28)	0.16	0.20	0.03	0.31	1.00						
7	Equity in home ('000s)	0.10	(0.05)	0.12	0.46	(0.00)	0.00	1.00					
8	Household Income greater than \$100K	(0.16)	0.12	0.36	0.15	0.25	0.41	0.09	1.00				
9	Debt stress affecting health	(0.10)	0.05	(0.06)	(0.08)	(0.03)	(0.05)	(0.11)	(0.12)	1.00			
10	Debt stress affecting job performance	(0.12)	0.07	(0.03)	(0.04)	0.08	(0.01)	(0.07)	(0.06)	0.53	1.00		
11	Credit card debt to income ratio	(0.01)	0.01	(0.04)	0.02	(0.00)	(0.05)	0.09	(0.06)	0.06	0.06	1.00	
12	Heloc debt to Income ratio	0.02	(0.02)	(0.04)	0.02	0.01	(0.04)	0.08	(0.05)	0.01	0.03	0.29	1.00
13	Stress	(0.25)	0.15	(0.02)	(0.10)	0.10	0.04	(0.12)	(0.05)	0.64	0.46	0.06	0.03

Significant at **1% level**; 5% level.

Table 2: Dependent variable – Debt affecting health of the respondent

The table below shows the model estimates for OLS regression predicting the response of an individual to the following question “To what extent has debt affected your health”. The response is measured on 5-point Likert scale with five representing “very much affected” and one representing “not at all affected”. All models include year fixed effects.

	Model 1			Model 2			Model 3		
	Coeff	Std. Err		Coeff	Std. Err		Coeff	Std. Err	
Intercept	0.520	1.065		0.351	1.062		0.747	0.223	***
High income	-0.141	0.036	***	-0.137	0.036	***	-0.173	0.042	***
High school grad	-0.160	0.053	***	-0.159	0.053	***	-0.182	0.069	***
Some college	-0.201	0.052	***	-0.201	0.052	***	-0.229	0.068	***
College grad	-0.330	0.052	***	-0.326	0.051	***	-0.332	0.067	***
Age	0.059	0.006	***	0.059	0.006	***	0.066	0.007	***
Age squared	-0.001	0.000	***	-0.001	0.000	***	-0.001	0.000	***
Hispanic	-0.002	0.059		0.000	0.059		-0.016	0.074	
Black	-0.028	0.046		-0.039	0.045		-0.021	0.059	
Asian	0.465	0.099	***	0.482	0.098	***	0.390	0.127	***
Female				0.153	0.023	***	0.129	0.028	***
Number of kids	0.013	0.012		0.011	0.012		0.010	0.014	
Married	-0.049	0.027	*	-0.041	0.026		-0.050	0.032	
Employed HH	-0.174	0.031	***	-0.168	0.031	***	0.027	0.046	
Ln(net worth)	-0.095	0.006	***	-0.094	0.006	***	-0.101	0.007	***
Ln(HH income)	0.007	0.009		0.012	0.009		0.018	0.011	
Dual income HH	-0.028	0.034		-0.027	0.034		0.050	0.043	
Late once or twice	0.355	0.045	***	0.342	0.045	***	0.379	0.056	***
Late more than 3 times	0.956	0.049	***	0.946	0.049	***	0.914	0.062	***
Ever bankrupt	0.292	0.038	***	0.292	0.038	***	0.318	0.047	***
HELOC to income ratio	0.002	0.003		0.002	0.003		0.004	0.003	
Credit card to income ratio	0.023	0.006	***	0.024	0.006	***	0.017	0.008	**
Negative value of home	0.087	0.034	**	0.090	0.034	***	0.090	0.040	**
Home price change state	0.004	0.005		0.004	0.005		0.000	0.008	

Home price decline state	0.087	0.052	*	0.087	0.052	*	0.099	0.065
Home price severe decline state	0.155	0.091	*	0.156	0.090	*	0.117	0.117
Employed respondent							-0.224	0.038 ***
N	8,648			8,648			5,783	
F-value	59.71			59.46			44.83	
Adj R-sq	0.1692			0.1733			0.1802	

*** Significant at 1% level; ** significant at 5% level; *significant at 10% level.

Table 3: Dependent variable – Debt affecting health of employed and married respondents

The table below shows the model estimates for OLS regression predicting the response of an individual to the following question “To what extent has debt affected your health”. The response is measured on 5-point Likert scale with five representing “very much affected” and one representing “not at all affected”. The sample for Model 1 is limited to respondents employed at the time of survey. Model 2 includes married respondents only. All models include year fixed effects.

	Model 1			Model 2		
	Coe	Std.			Std.	
	ff	Err		Coeff	Err	
Intercept	0.2	0.32		0.316	0.28	
	71	1			7	
High income	-	0.04	*	-0.212	0.04	*
	0.247	8	**		5	**
High school grad	-	0.10		-0.208	0.09	*
	0.101	8			2	*
Some college	-	0.10		-0.254	0.09	*
	0.069	6			1	**
College grad	-	0.10		-0.378	0.08	*
	0.147	3			9	**
Age	0.0	0.01	*	0.077	0.01	*
	66	2	**		0	**
Age squared	-	0.00	*	-0.001	0.00	*
	0.001	0	**		0	**
Hispanic	0.0	0.08		0.000	0.08	
	15	7			9	
Black	-	0.07		0.011	0.08	
	0.011	8			5	
Asian	0.3	0.15	*	0.341	0.13	*
	15	0	*		9	*
Female	0.1	0.03	*	0.070	0.03	*
	11	5	**		3	*
Number of kids	0.0	0.01		0.022	0.01	
	13	7			6	
Married	-	0.04				

	0.022	3				
Ln(net worth)	-	0.00	*	-0.099	0.00	*
	0.079	9	**		9	**
Ln(HH income)	0.0	0.01		0.034	0.01	*
	28	5	*		4	*
Dual income HH	0.0	0.04		0.028	0.04	
	28	4			4	
Late once or twice	0.3	0.06	*	0.273	0.06	*
	42	5	**		8	**
Late more than 3 times	0.8	0.07	*	0.932	0.07	*
	74	2	**		4	**
Ever bankrupt	0.2	0.06	*	0.399	0.06	*
	60	1	**		1	**
HELOC to income ratio	0.0	0.00		0.004	0.00	
	07	4	*		3	
Credit card to income ratio	-	0.01		0.004	0.01	
	0.008	3			3	
Negative value of home	0.0	0.04		0.102	0.04	*
	76	9			7	*
Home price change state	0.0	0.01		0.006	0.00	
	03	0			9	
Home price decline state	0.1	0.07		0.109	0.07	
	01	9			6	
Home price severe decline	0.2	0.15		0.123	0.13	
state	31	0			9	
Employed HH				0.047	0.05	
					8	
Employed respondent				-	0.04	*
				0.18628	37	**
N	310			3793		
	3					
F-value	22.			31.28		
	12					
Adj R-sq	0.1			0.182		

*** Significant at 1% level; ** significant at 5% level; *significant at 10% level.

Table 4: Dependent variable – Debt stress

The table below shows the model estimates for OLS regression predicting the response of an individual to the following question “How much stress does the total debt you are carrying cause to you”. The response is measured on 5-point Likert scale with five representing “a great deal of stress” and one representing “not at all”. All models include year fixed effects.

	Model 1		Model 2	
	Coeff	Std. Err	Coeff	Std. Err
Intercept	1.0	1.12	1.203	0.36
	52	9		6
High income	-	0.03	-	0.05
	0.148	8	0.197	4
High school grad	-	0.05	0.099	0.12
	0.105	7		4
Some college	-	0.05	0.102	0.12
	0.123	5		1
College grad	-	0.05	0.088	0.11
	0.175	5		8
Age	0.0	0.00	0.057	0.01
	46	6		3
Age squared	-	0.00	-	0.00
	0.001	0	0.001	0
Hispanic	0.0	0.06	0.029	0.09
	52	3		9
Black	-	0.04	-	0.08
	0.186	8	0.202	9
Asian	0.1	0.10	0.129	0.17
	37	6		3
Female	0.2	0.02	0.198	0.03
	31	5		9
Number of kids	0.0	0.01	0.042	0.02
	42	2		0
Employed HH	-	0.03		
	0.034	3		

Married	-	0.02		0.027	0.04	
	0.047	8	*		9	
Ln(net worth)	-	0.00	*	-	0.01	*
	0.118	6	**	0.128	1	**
Ln(HH income)	0.0	0.01	*	0.057	0.01	*
	48	0	**		8	**
Dual income HH	0.0	0.03	*	0.058	0.05	
	78	6	*		0	
Late once or twice	0.5	0.04	*	0.550	0.07	*
	16	7	**		4	**
Late more than 3 times	1.1	0.05	*	1.100	0.08	*
	09	2	**		2	**
Ever bankrupt	0.3	0.04	*	0.289	0.07	*
	00	1	**		0	**
HELOC to income ratio	0.0	0.00	*	0.010	0.00	*
	08	3	**		4	*
Credit card to income ratio	0.0	0.00	*	0.012	0.01	
	24	7	**		5	
Negative value of home	0.1	0.03	*	0.115	0.05	*
	16	6	**		6	*
Home price change state	-	0.00		-	0.01	
	0.006	6		0.004	1	
Home price decline state	0.0	0.05		-	0.09	
	68	5		0.004	1	
Home price severe decline	0.0	0.09		0.127	0.17	
state	96	6			1	
N						
	8,624			3,100		
F-value	82.					
	55			31.51		
Adj R-sq	0.2					
	27			0.210		

*** Significant at 1% level; ** significant at 5% level; *significant at 10% level.

Table 5: Debt affecting health conditional on stress perception

The table below shows the model estimates for OLS regression predicting the response of an individual to the following question “To what extent has debt affected your health”. The response is measured on 5-point Likert scale with five representing “very much affected” and one representing “not at all affected”. All models include year fixed effects. In model 2 only observations where the respondent was employed at the time of survey are included. The models include year fixed effects.

	Model 1			Model 2		
	Coeff	Std err		Coeff	Std err	
Intercept	-0.220	0.874		-0.314	0.269	
High income	-0.057	0.029	*	-0.153	0.040	**
High school grad	-0.104	0.044	*	-0.148	0.091	
Some college	-0.136	0.043	**	-0.115	0.089	
College grad	-0.232	0.042	**	-0.188	0.086	*
Age	0.035	0.005	**	0.039	0.010	**
Age squared	0.000	0.000	**	0.000	0.000	**
Hispanic	-0.027	0.048		0.001	0.073	
Black	0.063	0.037	*	0.086	0.065	
Asian	0.419	0.082	**	0.288	0.127	*
Female	0.028	0.019		0.017	0.029	
Number of kids	-0.012	0.010		-0.008	0.014	
Married	-0.017	0.022		-0.033	0.036	

Employed HH	-0.148	0.0	*			
		25	**			
Ln(net worth)	-0.031	0.0	*	-0.018	0.0	*
		05	**		08	*
Ln(HH income)	-0.015	0.0		0.002	0.0	
		08	*		13	
Dual income HH	-0.068	0.0	*	-0.001	0.0	
		28	*		37	
Late once or twice	0.067	0.0		0.079	0.0	
		37	*		55	
Late more than 3 times	0.356	0.0	*	0.348	0.0	*
		41	**		62	**
Ever bankrupt	0.126	0.0	*	0.121	0.0	*
		32	**		51	*
HELOC to income ratio	-0.002	0.0		0.002	0.0	
		02			03	
Credit card to income ratio	0.011	0.0	*	-0.013	0.0	
		05	*		11	
Negative value of home	0.028	0.0		0.024	0.0	
		28			41	
Home price change state	0.007	0.0		0.005	0.0	
		04	*		08	
Home price decline state	0.048	0.0		0.105	0.0	
		43			67	
Home price severe decline state	0.105	0.0		0.174	0.1	
		74			26	
Respondent stress level	0.536	0.0	*	0.477	0.0	*
		08	**		13	**
N	8,624			3,100		
F-value	213.33			76.62		
Adj R-sq	0.441			0.406		

*** Significant at 1% level; ** significant at 5% level; *significant at 10% level.

Table 6: Debt affecting health (underwater mortgage subsample)

The table below shows the model estimates for OLS regression predicting the response of an individual to the following question “To what extent has debt affected your health”. The response is measured on 5-point Likert scale with five representing “very much affected” and one representing “not at all affected”. Judicial states are those that provide higher protection to borrowers from foreclosures. Sample is limited to households with negative equity in their home. Model 2 includes reported stress level. Both models include year fixed effects.

	Coe	Std.		Coe	Std.	
	ff	Err		ff	Err	
Intercept	-	0.64		-	0.50	*
	0.185	9		1.193	6	*
High income	-	0.12	*	-	0.09	
	0.368	3	**	0.136	6	
High school grad	-	0.21		-	0.16	
	0.149	4		0.082	6	
Some college	-	0.21		-	0.16	
	0.251	0		0.125	3	
College grad	-	0.20	*	-	0.15	
	0.457	6	*	0.301	9	*
Age	0.10	0.02	*	0.08	0.01	*
	5	1	**	0	7	**
Age squared	-	0.00	*	-	0.00	*
	0.001	0	**	0.001	0	**
Hispanic	0.04	0.19		-	0.14	
	6	0		0.102	7	
Black	-	0.14	*	-	0.11	
	0.315	5	*	0.131	2	
Asian	0.15	0.36		0.33	0.30	
	6	8		6	1	
Female	0.25	0.07	*	0.10	0.06	
	7	9	**	5	2	*
Number of kids	-	0.03		-	0.02	
	0.014	6		0.024	8	
Married	-	0.09		-	0.07	
	0.106	1		0.073	1	

Employed HH	-	0.13		-	0.10	
	0.024	6		0.066	6	
Ln(net worth)	-	0.01	*	-	0.01	
	0.042	6	**	0.011	2	
Ln(HH income)	0.05	0.02	*	0.01	0.02	
	5	7	*	0	1	
Dual income HH	0.16	0.12		0.07	0.09	
	1	3		3	6	
Late once or twice	0.44	0.14	*	0.02	0.11	
	4	0	**	6	0	
Late more than 3 times	1.04	0.13	*	0.32	0.11	*
	6	7	**	7	2	**
Ever bankrupt	0.29	0.11	*	-	0.09	
	4	7	*	0.061	3	
HELOC to income ratio	0.00	0.00		0.00	0.00	
	2	6		5	5	
Credit card to income ratio	0.02	0.01	*	0.01	0.00	
	4	1	*	2	9	
Home price change state	0.01	0.02		0.00	0.01	
	8	0		2	6	
Home price decline state	-	0.19		-	0.15	
	0.138	6		0.216	4	
Home price severe decline	-	0.33		-	0.25	
state	0.087	2		0.352	9	
Employed respondent	-	0.10	*	-	0.08	*
	0.399	4	**	0.323	1	**
Judicial state	0.03	0.07		0.03	0.06	
	9	9		7	1	
Respondent stress level				0.61	0.02	*
				3	54	**
N	913			908		
F-value	8.77			35.5		
				5		
Adj R-sq	0.19			0.51		
	81			84		

*** Significant at 1% level; ** significant at 5% level; *significant at 10% level.

Table 7: Debt affecting health (subsamples based on debt type)

The table below shows the model estimates for OLS regression predicting the response of an individual to the following question “To what extent has debt affected your health”. The response is measured on 5-point Likert scale with five representing “very much affected” and one representing “not at all affected”. Sample for models 1 and 2 is limited to households with credit card debt to income ratio greater than 0.37, the 90th percentile cutoff point in our sample. Sample for models 3 and 4 is limited to those with loans from friends and family. Estimates for models 5 and 6 as based on sample of households with student debt. Models 2, 4, and 6 include reported debt stress level. All models include year fixed effects.

	Model 1			Model 2			Model 3			Model 4			Model 5			Model 6	
	Std.			Std.			Std.			Std.			Std.			Std.	
	Coeff	Err		Coeff	Err.		Coeff	Err.		Coeff	Err.		Coeff	Err.		Coeff	Err.
Intercept	0.771	0.888		-0.187	0.763		1.099	1.711		0.220	1.330		1.077	0.763		0.437	0.641
High income	-0.007	0.368		0.127	0.315		0.418	0.397		-0.036	0.312		-0.230	0.123	*	-0.106	0.104
High school grad	0.486	0.270	*	0.144	0.232		0.113	0.485		-0.062	0.377		-0.053	0.322		0.040	0.270
Some college	0.283	0.260		0.122	0.223		-0.449	0.492		-0.258	0.382		-0.328	0.293		-0.114	0.246
College grad	0.188	0.255		0.001	0.219		-0.542	0.477		-0.501	0.370		-0.202	0.287		-0.026	0.240
Age	0.071	0.028	**	0.042	0.024	*	0.064	0.063		-0.010	0.049		0.036	0.031		0.005	0.026
Age squared	-0.001	0.000	***	0.000	0.000	*	0.000	0.001		0.000	0.000		0.000	0.000		0.000	0.000
Hispanic	0.079	0.258		-0.034	0.221		1.229	1.021		0.035	0.802		-0.285	0.208		-0.316	0.175
Black	0.002	0.202		0.122	0.174		0.451	0.462		0.410	0.358		-0.040	0.152		0.028	0.128
Asian	0.829	0.522		0.615	0.447		2.274	0.876	**	1.528	0.684	**	0.539	0.357		0.268	0.300
Female	0.307	0.101	***	0.140	0.088		0.513	0.240	**	0.257	0.188		0.210	0.091	**	0.009	0.077
Number of kids	0.000	0.052		0.018	0.044		0.010	0.109		0.012	0.084		0.045	0.039		0.019	0.033
Married	-0.208	0.112	*	-0.129	0.096		0.444	0.279		0.236	0.218		-0.096	0.113		-0.064	0.095
Employed HH	0.038	0.154		-0.027	0.132		-0.505	0.352		-0.335	0.274		-0.404	0.202	**	-0.234	0.169

Ln(net worth)	-0.102	0.022	***	-0.043	0.019	**	-0.138	0.046	***	-0.038	0.037		-0.103	0.020	***	-0.030	0.017	*
Ln(HH income)	0.200	0.034	***	0.056	0.031	*	-0.049	0.131		-0.024	0.101		0.028	0.046		-0.042	0.039	
Dual income HH	-0.301	0.276		-0.139	0.236		-0.347	0.369		-0.167	0.287		0.033	0.117		-0.003	0.098	
Late once or twice	0.306	0.174	*	0.045	0.150		0.360	0.383		-0.203	0.304		0.623	0.141	***	0.327	0.119	***
Late > 3 times	0.352	0.173	**	-0.068	0.153		0.754	0.298	**	0.043	0.243		1.147	0.138	***	0.626	0.120	***
Ever bankrupt	0.305	0.174	*	0.119	0.149		0.499	0.268	*	0.346	0.208	*	0.234	0.127	*	0.168	0.106	
HELOC to income	0.004	0.005		-0.002	0.004		0.104	0.219		-0.191	0.173		-0.008	0.012		-0.010	0.010	
Credit card to income	0.015	0.010		0.012	0.008		0.022	0.081		0.000	0.063		0.017	0.031		-0.030	0.026	
Employed resp.	-0.425	0.131	***	-0.332	0.112	***	-0.014	0.286		-0.072	0.222		-0.151	0.122		-0.205	0.102	*
Home price chg. St.	-0.002	0.026		0.005	0.023		0.039	0.058		0.049	0.045		0.029	0.025		0.019	0.021	
Decline state	0.489	0.277	*	0.426	0.237	*	0.340	0.541		0.575	0.420		-0.022	0.246		-0.047	0.206	
Severe decline state	0.729	0.416	*	0.593	0.356	*	-0.720	0.869		-0.227	0.676		-0.354	0.392		-0.373	0.329	
Resp. stress level				0.550	0.040	***				0.742	0.080	***				0.547	0.034	***
N	548			548			156			156			642			642		
F-value	7.2	***		16.120	***		2.410	***		6.810	***		7.970	***		19.940	***	
Adj R-sq	0.241			0.446			0.203			0.521			0.233			0.462		

*** Significant at 1% level; ** at 5% level; * at 10% level.