WORKING PAPER

Determinants of Consumer Debt Stress: Differences by Debt Type and Gender

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Abstract

This research examines the phenomenon of psychological stress from debt among consumers in the U.S. It uses unique data from an ongoing national-level monthly survey, the *Consumer Finance Monthly*. The period covered in this paper is 2005 through 2011. We focus on stress from different types of debt and on gender differences in debt stress. Payday loans, credit cards and loans from family and friends are the most stressful types for both genders, while mortgage debt ranks at or near the bottom. Women in the sample are found to be subject to significantly more stress from their debts than men, even controlling for debt-to-income ratio. This raises questions about possible differences in collection procedures and penalties by gender. Additionally, the data show substantial impacts from debt on health, family life and job performance, producing unmeasured costs which need to be addressed along with the more obvious economic impacts of debt.

JEL Codes: D12, D14, D18

KEY WORDS: Consumer Debt, Psychological Stress, Gender

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I. Introduction

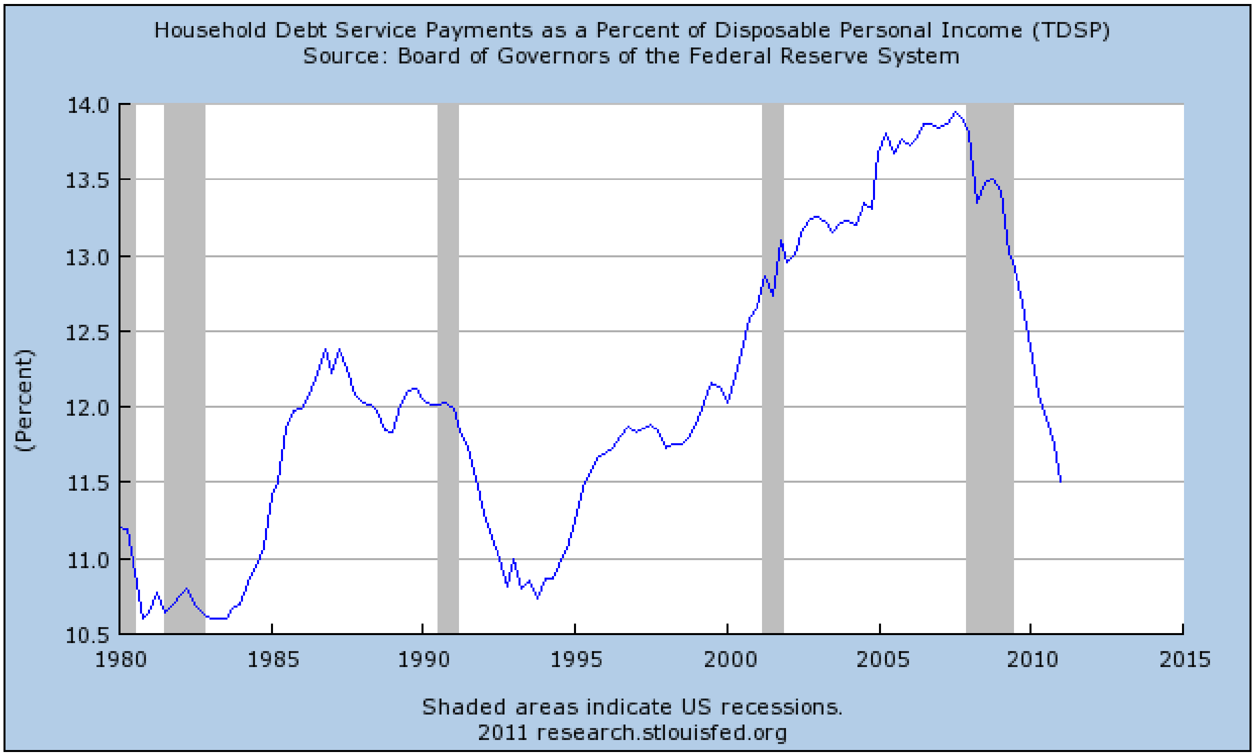
Consumer debt has risen to unprecedented levels among the U.S. population in recent years. Along with this there has been an upsurge in anecdotal reports coming from financial and family counselors, health care professionals, the clergy, and others pointing to a wide range of problems for American households arising from this increase in debt. While the concept of debt stress is familiar to researchers as it is captured for financial institutions (e.g., the St. Louis Federal Reserve Bank's Financial Stress Index), it is a relatively new concept at the level of the individual consumer. This paper will examine the consumer psychological debt stress phenomenon empirically using a new nationwide survey of household finances known as the *Consumer Finance Monthly (CFM)*. In addition to getting complete balance sheet information from respondents, this survey also elicits several categories of psychological stress associated with their debts, as well as information about the impact of debt on respondents' health, family life and job performance. The survey of debt stress levels has been taken on a monthly basis since November 2005. It thus provides a series of readings on consumer stress from debt in a broad range of economic circumstances, going through the collapse in the subprime housing market and ensuing recession up to the current period. Here we will examine the impact of debt to see how it varies with different types of debt and socioeconomic characteristics. In particular, we find that women consistently exhibit greater stress from debt than comparable males for all types of debt.

The paper proceeds as follows. We first discuss recent changes in household debt and present some new evidence on specific areas that have been impacted by debt stress, along with findings of previous research. We will then discuss the survey and how the concept of debt stress is measured for the present research. We present our empirical analysis of the determinants of debt stress, further probe factors that are found to be important in this, how it affects consumption.

II. Background to Consumer Debt Stress

Changes in Household Debt

Figure 1 below plots household debt service payments as a percent of disposable U.S. personal income beginning from 1980 as calculated by the Federal Reserve Board. We see there that debt service payments rose from the mid-1990s on through 2007, when the beginning of the recent financial crisis caused this trend to reverse. Many factors were involved in the rise in debt holding among U.S. households. These include greater access to credit with the introduction of new financial products such as credit cards and home equity lines of credit, changing attitudes toward debt, and macroeconomic factors.



Previous Research

Since the beginning of organized study in the health fields, health problems have been linked to poor economic circumstances. The connection between psychological well-being and economic status also emerged as a research focus in the late twentieth century. Among the researchers who have examined this relationship are Ross and Huber (1985), Anderson and Armstead (1995), Mirowsky and Ross (1986, 1995), Williams (1990).

As household debt began to rise with the spreading use of credit cards, the popular press began to focus on the consequences of debt that were not strictly economic. Various efforts to quantify and analyze the psychological impact of debt were undertaken. There has been a major effort in the UK to understand the relationship between debt and psychological well-being. A unique survey of customers of a public utility company in the UK whose debt status to the company was known was utilized by Lea, Webley, Levine (1993) and Lea, Webley, Walker (1995). Both of these studies suggest that debt is associated with complex psychological and socioeconomic variables and that it is linked to a more general psychology of poverty. Brown, Taylor, and Price (2005) have examined this relationship using the *British Household Panel Survey* from 1995 and 2000. They find that measures of general psychological well-being (not specifically aimed at debt) of household heads are significantly lower for those with some debt as opposed to those with no debt. This was true both at the individual level where the head him/herself had the debt and at the household level where the debt existed within the household. The effect was found to be coming from unsecured non-mortgage debt, as there was not a significant effect for mortgage debt. The quantity of outstanding debt involved was also found to have an impact. In another

UK study, Bridges and Disney (2010) find a positive relationship between depressed psychological states and self-reported problems of indebtedness.

While these studies established a link between indebtedness and psychological well-being, most of their stress measures are not specifically tied to debt in the survey instrument. One of the first significant efforts to connect stress directly to debt in a survey question came from Paul Lavrakas, who developed a set of questions to identify stress coming from debt in the late 1990s. Lavrakas and Drentea (2000); Lavrakas, et al. (2002). Lavrakas and Tompson (2009) relate debt stress to a variety of other health problems; Lavrakas and Tompson (2008) have also examined debt stress as it is related to survey question order.

Credit card debt in particular has been signaled out for study in relation to stress and anxiety. Drentea (2000) has studied credit card debt and anxiety by age group. Nelson, et. al. (2007) found credit card debt to be related to stress and health risk behaviors among college students. Neuroscientists have associated credit card debt with prefrontal system dysfunction and, in particular, find that credit card debt is associated with the Executive Dysfunction scale (Spinella, Yang, and Lester (2004)).

III. The New Survey

The Data

The *Consumer Finance Monthly* was begun in 2005.[2] It is a national-level household telephone survey that uses random digit dialing techniques. Its data are taken on a monthly basis, and they are weighted using information from the *Current Population Survey* to reflect national socioeconomic characteristics. Through December 2011, a total of approximately 9,200 completed cases have been obtained on debt stress measures. The survey also asks a wide range of questions pertaining to household finances, including all categories of debt, income, assets, and savings.

The set of survey questions designed to quantify psychological stress from debt are those first developed and tested by a research team under the leadership of Paul J. Lavrakas (Lavrakas, et.al., 2000).[3] See Appendix A for details of the survey and the exact wording of the questions.

Why Debt Stress Matters – the Operational Impact

In addition to special debt stress measures that will be discussed below, the *CFM* survey also probes several critical aspects of life in the U.S. which have been impacted by debt. These questions help us to understand the avenues by which debt is creating stress for consumers, what its costs are, and why professionals in a variety of health and counseling fields should be alert to

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[2] The Consumer Finance Monthly is administered by the Center for Human Resource Research at the Ohio State University.

[3] Lavrakas and his associates incorporated these questions into an earlier version of an index known as the Debt Stress Index by aggregating the measures. The individual components were found to have a high level of internal consistency and face validity. These stress measures have been periodically reported in conjunction with an Associated Press Poll (Lavrakas and Tompson, 2008, 2009).

debt issues that may have previously been overlooked. In Table 1 below we summarize the impact of debt on (1) family life; (2) job performance; and (3) health. Here we present the percentage of the sample who report that their life has been affected in these areas in the top three impact categories on a 5-point scale, indicating that it is a medium, large, or extreme problem in their lives.

Table 1: Impact of Debt on Key Aspects of Life

Category Impacted	**Percentage with High Negative Impact**	**Percentage with High Negative Impact**	**Percentage with High Negative Impact**	**Percentage with High Negative Impact**	**Percentage with High Negative Impact**	**Percentage With High Negative Impact**
	2006	**2007**	**2008**	**2009**	**2010**	**2011**
Family Life	14.5 %	18.2 %	23.3 %	27.9 %	23.9 %	26.1%
Job Performance	7.5	8.6	9.5	13.2	10.2	11.6
Health*	NA	NA	16.6	23.8	21.4	20.4

* See Appendix A for exact question wording. Some questions were not available in all periods of the survey.

The survey questions used here cover stress from all consumer debt sources including mortgages, credit cards, home equity loans, car loans, student loans, payday loans, etc. The figures in Table 1 show that the impact of debt in the areas of family life, job performance, and health peaked in 2009. The impacts lessened slightly in 2010 but have not yet receded to their pre-recession levels.

Health impacts from debt have been explored in more detail by Lavrakas and Tompson (2008, 2009), who found that stress from debt is related to such health conditions as ulcers, heart attacks, and severe depression. Nelson, et al (2007) associate credit card debt with unhealthy conditions for college students, including binge drinking, overweight, and substance abuse. Using the *Survey of Consumer Finances*, Lyons and Yilmazer (2005) find that poor health contributes to financial strain, but the reverse causality only holds for lower income groups. Currie and Tekin (2011) find that mortgage foreclosures are associated with increased hospital visits for a broad array of mental and physical health conditions. The finding reported above suggest that there is a large unmeasured cost associated with debt that needs to be addressed.

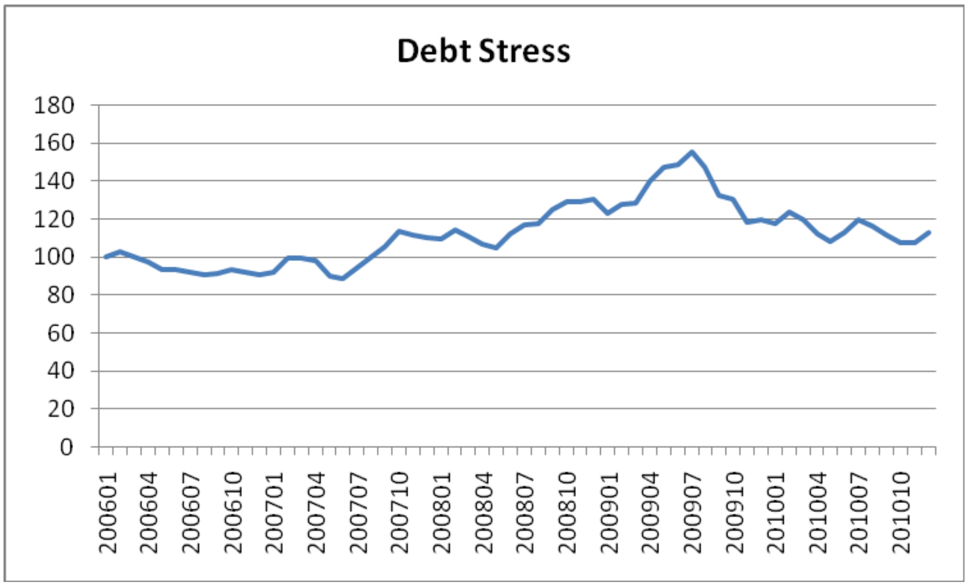
Measuring the Concept of Debt Stress

We now turn to the *CFM* survey questions which directly quantify debt stress on four specific stress categories. Again, the questions refer to stress from all types of debt. Using a five-point scale, the survey questions elicit the following: (a) frequency of worry over debt; (b) amount of stress from debt; (c) extent of expected problems from debt over the next five years; and (d) concern about the inability to ever pay off debt. In the analysis below, we will use an individual-level measure derived from the four stress questions to indicate debt stress levels or *scores* for the sample. Using a point system which assigns numbers from zero (meaning no debt stress) to four (the highest level of debt stress) for each of the stress questions, we average stress values for the individual respondent across the four stress categories to derive a debt stress score for that person. These simple scores will form the dependent variables in the statistical fits that follow.

The Historic Path of the Consumer Debt Stress Scores

In Figure 1 below we present a graph of the consumer debt stress scores aggregated over the sample across time.[4] For ease of interpretation, we have incorporated these scores into an index based to the period January 2006 so that the index has a value of 100 in that period. Subsequent movements can then be tracked relative to that base value. The computation of this index is presented in Appendix B.

Figure 1: OVERALL CONSUMER DEBT STRESS



Looking at the path of consumer debt stress, we see that it remained fairly low in the early years of the survey, with values hovering around the January 2006 base value of 100 throughout most of 2006 and the first quarter of 2007. Consumer debt stress in indexed form in this survey was at its historic low point 88 in June 2007. The collapse of the subprime mortgage market brought a turnaround of consumer debt stress in the third quarter of 2007 and a subsequent upward trend. In September 2007, consumer debt stress in the nation had jumped to a value of 105. Thereafter debt stress fluctuated, but on an upward trajectory as shown in Figure 1 above, as the economy slide into recession and consumers struggled to manage their debts in the midst of the worse economic downturn since the Great Depression. Another discernible up-tick in consumer debt stress for U.S. households was recorded in the early fall of 2008 amid the turmoil in financial markets brought about by the bankruptcy of Lehman Brothers and a general tightening of credit conditions. Debt stress as measured in this survey reached its historic peak in July 2009 at a value 155, as debt-burdened consumers fought to stabilize their finances in the midst of a high-unemployment economy. This means that consumers were experiencing 55 percent more debt

[4]For Figures 1 and 2 only, we have used weighted three-month rolling averages of the data.

stress in July 2009 than they were in January 2006. Subsequently, as consumers began to pay off their debts, debt stress trended downward. This downward trend continued with signs that the economy was beginning to recover. It is also important to note that consumers began to reign in their debt (and especially credit card debt) during this period, as indicated in the Household Debt Service Payments graph presented above, which is a natural and welcome response to the stressful situation seen in 2009. As of December 2011, consumer debt stress nationally stood at 112, only about 12 percent higher than that encountered in January 2006.

IV. Determinants of Debt Stress

The Econometric Model

In order to investigate factors that may give rise to differences in debt stress across the population, we will examine the debt stress scores in a regression model where we include various socioeconomic and demographic factors. We control for financial factors in the household that may affect stress, in particular, debt-to-income ratio and also the level of household assets, as well as relevant socioeconomic and demographic variables. (Variables used in our fits are defined in Appendix C.)

Thus we have the following empirical model for our investigation.

$$\begin{aligned} \textit{Debt Stress Score} \;=\; & \alpha + \beta_1\, \textit{Gender} \; + + \beta_2\, \textit{Age} + B_3\, \textit{MaritalStatus} + B_4\, \textit{ChildrenPresent} + \\ & \beta_5\, \textit{Education} + \beta_6\, \textit{Ethnic/Race} + \beta_7 \textit{LogAssets}\, \Sigma_i \; + \\ & \beta_{8,i}\, (\textit{Debt Type})_i\, \textit{-to-Income} + \; \Sigma_i\, \beta_{9,i}\, \textit{Year}_i + \; \varepsilon \qquad (1) \end{aligned}$$

Empirical Results

Our empirical results from the fit of equation 1 are presented in Table 2 below. After controlling for debt-to-income ratio, we find that there are substantial and persistent differences between the genders with regard to debt stress, which will be explored further below. Stress is higher among married consumers and higher when children under the age of 18 are present in the household. Various specifications were tried interacting marital status with presence of children and number of children. The critical factor in all cases was found to be presence of children. Number of children made no further difference, and contrary to some popular sentiment, the single parent with children was no more stressed than the married parent with children.

Debt stress is found to decrease with the age of the respondent. Young people have incurred significant amounts of student loan debt in recent years, in addition to their rising credit card debt (Jiang and Dunn, 2012). Furthermore, the persistent high level of unemployment in the economy in recent years has affected the young more severely. The debts of the young have been

Table 2: Determinants of Consumer Debt Stress

Variable	Coefficient (S.E.)
Intercept	2.64*** (0.14)
Gender (Male = 1)	-0.26*** (0.031)
Age	-0.02*** (0.0013)
Marital Status (Married=1)	0.16*** (0.034)
Children Present	0.19*** (0.04)
Education Years	-0.01 (0.006)
African American	0.068 (0.061)
Hispanic	0.22** (0.07)
Other Ethnic/Racial Groups	-0.13** (0.07)
Log Assets	-0.09*** (0.01)
Mortgage /Income	0.20*** (0.01)
Heloc /Income	-0.072** (0.03)
Credit Card/Income	0.79*** (0.06)
Student Loan/Income	.044*** (0.05)
Installment (auto, appliance, etc.)/Income	0.42*** (0.05)
Bank, Insurance, Brokerage/Income	0.33*** (0.08)
Payday Loan/Income	2.25*** (0.66)
Family & Friends/Income	0.33*** (0.10)

*** Significant at less than 1 percent level
** Significant at 5 percent level
* Significant at 10 percent level
n = 4,301 for females; n = 3,675 for males
Year dummy results available from authors upon request.

found to interfere with first home buying, as well as marriage and family formation (Shand, 2008). These factors have obviously resulted in more stress for young people.

Among the ethnic groups, Hispanics are found to be subject to more debt stress, although just at the 10 percent significance level. Other ethnic/racial groups, which consists Asians, Native Americans, Pacific Islanders, etc., show somewhat less stress overall.

Results by Debt Type

Table 3. Rank of Stress by Debt Type

1. Payday Loan
2. Credit Cards
3. Student Loans
4. Installment (Auto, Appliance, etc.)
5. Bank Loans (including Insurance, Brokerage)
6. Family & Friends
7. Mortgage
8. Heloc

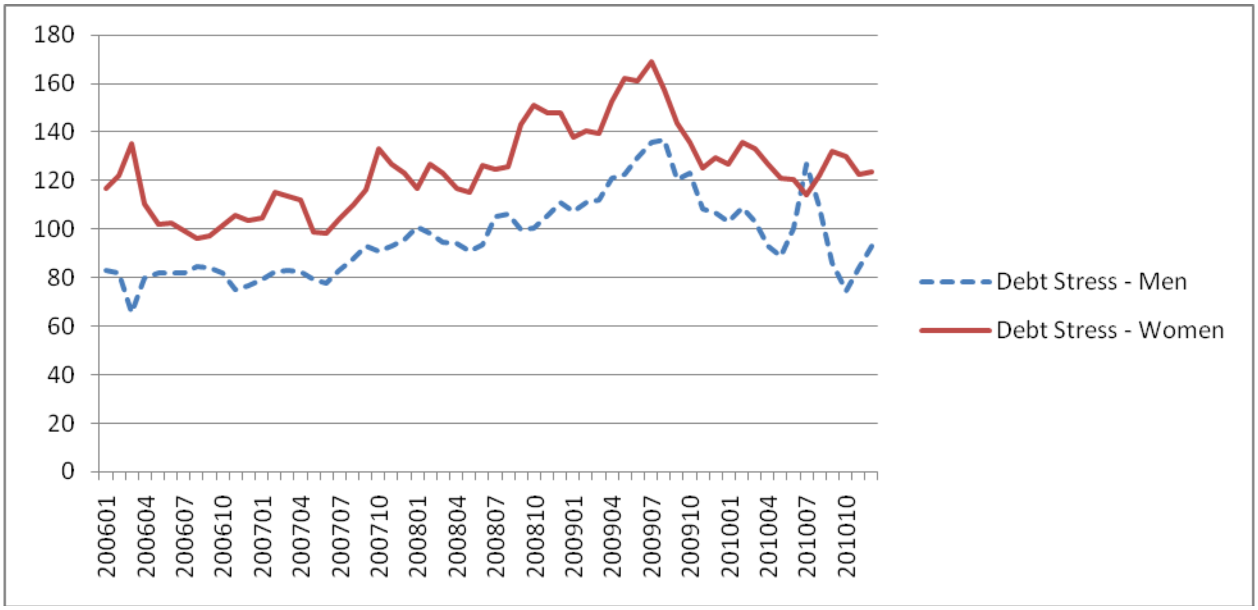
Results by Gender

We have plotted the debt stress of men and women in our sample across time, again in indexed form based to January 2006, in Figure 2. The plot is for the period starting in January 2006 and running through December 2011. While the plots of both men and women show the same general pattern that was exhibited in the plot of overall debt stress, the level of debt stress for women throughout this period is persistently highly than that of men[5]. Thus in general, while both genders respond in similar ways to economic conditions, the response is greater for women. Note that women carry only slightly less than debt men, but they have significantly less income so that their debt-to-income ratio is higher. However, our result was obtained controlling for the ratio of debt-to-income so that dollar for dollar, women exhibit more stress. While one could speculate that the observed gender difference may result from the fact that women express their feelings and emotions more freely than men, previous research which adjusts for these factors concludes that the differences in distress expressed by women are indeed genuine (Mirowsky and Ross, 1995).

Our findings here raise concerns about the position and treatment of women in U.S. credit markets. While there are regulatory efforts to see that women are not subjected to higher interest rates and less credit line than comparable men, the statues are sometimes difficult to enforce. Enforcing equality in penalties and collections procedures would be even more problematic, and these are clearly areas where further investigation is warranted.

[5] July 2010 is the only month where men show higher debt stress than women.

FIGURE 2. DEBT STRESS BY GENDER



Various specifications were examined where gender was interacted with marital status and also with presence of children. In spite of traditional thinking about the stresses of single female-headed household, these fits revealed that marital status is not significantly different in its impact between men and women. The most significant stressful family structure variable for both genders is the presence of children.

V. Results for Non-Marrieds Only

Finally, we should address the point that these data are taken from a household survey. While the stress measures represent the attitude of the survey respondent only, the questions refer to stress over the debt of the household which is difficult to separate in the case of spouses. Hence we have examined the two genders for non-married respondents only to take out any confounding family-related issues. Table 4 below presents our regressions on the sub-population of non-marrieds only. It is noteworthy that single males with children show a level of debt stress that is not statistically different from the debt stress of single females with children, despite the focus on problems for single mothers in the popular press.

Table 4: Debt Stress by Gender for Non-Marries Only

Variable	Women	Men
Intercept	2.29*** (0.32)	2.11*** (0.36)
Age	-0.029*** (0.0028)	-0.022*** (0.0032)
Children Present	0.25*** (0.094)	0.24** (0.12)
Education Years	- 0.0094 (0.014)	-0.0034 (0.0017)
African American	-0.032 (0.11)	0.32** (0.16)
Hispanic	0.29* (0.17)	0.23 (0.21)
Other Ethnic/Racial Groups	-0.11 (0.19)	0.28 (0.18)
Log Assets	-0.041** (0.0201)	-0.102*** (0.025)
Mortgage /Income	0.20*** (0.020)	0.31*** (0.030)
Heloc /Income	- 0.34*** (0.065)	0.24* (0.13)
Credit Card/Income	0.85*** (0.11)	0.57*** (0.11)
Student Loan/Income	0.29*** (0.074)	0.60*** (0.15)
Installment (auto, appliance, etc.)/Income	0.29** (0.12)	0.34*** (0.12)
Bank, Insurance, Brokerage/Income	0.54*** (0.18)	0.22 (0.14)
Payday Loan/Income	7.74*** (2.78)	2.19** (0.93)
Family & Friends/Income	0.43** (0.19)	0.28** (0.14)

*** Significant at less than 1 percent level
** Significant at 5 percent level
* Significant at 10 percent level
n = 1,937 for females; n = 1,237 for males
Year dummy results available from the authors upon request.

Results by Debt Type

Table 4 presents the rank ordering of the magnitude of stress associated with different types of debt for both genders, as indicated by the regression coefficients.

Table 4. Rank of Debt Type Stress by Gender – Non-Marrieds Only

Women	Men
1. Payday Loan	1. Payday Loan
2. Credit Cards	2. Student Loans
3. Bank Loans (including Insurance, Brokerage)	3. Credit Cards
4. Family & Friends	4. Installment (Auto, Appliance, etc.)
5. Student Loan	5. Mortgage
6. Installment (Auto, Appliance, etc.)	6. Family & Friends
7. Mortgage	7. Heloc
8. Heloc (No stress)	8. Bank Loans (including Insurance, Brokerage)

The results show that payday loans are by far the most stressful type of debt for both genders. This type of loan is not a common occurrence in our sample, but the circumstances surrounding this type of debt are very stressful. After payday loans, the second most stressful type of debt for women is credit card, followed by bank loans and then loans from family and friends. For men, student loans are the second most stressful type of debt, followed by credit cards. Again, remember that although women carry more credit card debt than men, the results here show the stress *per dollar* of credit card debt relative to income.

It is noteworthy that mortgage loans rank relatively low in stress for both men and women. This is probably connected with the many protections that a consumer has for a house mortgage compared to credit card debt. Foreclosure is a lengthy process, whereas being late on a credit card bill will lead to a collections process in a relatively short period of time. Hence there is lower stress associated with mortgage debt. Our results here are also in line with findings from surveys in Great Britain (Brown, Taylor, and Price (2005)).

VI. Summary and Discussion

Debt is obviously a problem for many American households, not only economically but also psychologically. While there has been much research on the effect of American indebtedness on financial institutions, there has been relatively little work on the human toll involved with rising debt. This research probes stress from debt using data from a new nationwide survey, the *Consumer Finance Monthly*, with unique questions which examine the psychological impact of debt on the population since 2005. The measures developed from these questions show debt stress moving in step with economic conditions over the period from late 2005 through 2011, peaking in July 2009 and abating as the recovery from the recession began to take hold and consumers cut back on debt. Additional information gathered in the *CFM* survey shows that debt has also had substantial impacts on the health, family life and job performance, undoubtedly producing large unmeasured costs for society.

This research finds a persistent difference in debt stress between the genders, with women showing higher stress than men. This is true even after controlling for debt-to-income ratio and other socioeconomic variables. Among different racial/ethnic groups, stress is found to be higher for Hispanics.

Both marital status and the presence of children are significant determinants of debt stress, with married consumers and those with children showing more stress. The interaction of marital status and presence of children, however, is not found to be significant. Therefore the stereotypical view of greater stress for single parents is not consistent with our findings where the presence of children induces equally serious debt stress for both genders regardless of marital status. Furthermore, looking at the subsample of non-marrieds only, we also find there is not a statistically significant difference between the stress of single female parents and single male parents. These results regarding the presence of children may indicate inadequate support networks for parents throughout the society, especially in the areas of health and child care.

Debt stress is greater among younger people of both genders. This is understandable when they are burdened with debts associated with education at a time when employment opportunities are shrinking for the young.

Looking at the stress associated with different specific types of debt, we find that, dollar for dollar, payday loan debt is by far the most stressful type of debt for both genders. Credit card debt and bank loans are the next most stressful for women. For men, student loans and credit card debt are the next most stressful for men. Bank loans rank at the bottom for men. Differences in repayment enforcement mechanisms and consequences probably account for differences in stress between the genders for bank loans.

The troubling finding on greater debt stress among women in general raises questions about the position and treatment of women in credit markets. This is especially true in the case of bank loans. Further research is needed to determine if women are more likely to be subject to stricter collections procedures and/or higher late fees and penalties than their male counterparts.

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Appendix A

The *Consumer Finance Monthly* is a national telephone survey based on Random Digit Dialing techniques which began in February 2005 and is on-going. It is specifically aimed at collecting household financial information and covers all consumer debt instruments as well as complete asset/income information and a wide range of demographic variables. About 200-300 new cases are added each month. For descriptive statistics, the data are weighted to adjust for variations in the sample from U.S. population related to various demographic and socioeconomic factors.

Survey Questions

The wording of the survey questions is presented below.

1. Overall, how often do you worry about the total amount you (and your spouse/partner) owe in overall debt? Would you say you worry (a) all of the time; (b) most of the time; (c) some of the time; (d) hardly ever; or (e) not at all?

2. How much stress does the total debt you (and your spouse/partner) are carrying cause to you? It is (a) a great deal of stress; (b) quite a bit; (c) some stress; (d) not very much; or (e) no stress at all?

3. Now, thinking ahead over the next five years, how much of a problem, if any, will the total debt you (and your spouse/partner) have taken on be for you? Will it be (a) an extreme problem; (b) a large problem; (c) medium problem; (d) small problem; or (e) no problem at all?

4. How concerned are you that you (and your spouse/partner) will *never* be able to pay off these debts? Are you (a) very much concerned; (b) quite concerned; (c) somewhat concerned; (d) not very concerned; or (e) not at all concerned?

Questions for Additional Areas of Impact for Debt Stress – Not Part of Debt Stress Score

1. How much of a problem, if any, has your debt caused for your family life? Is it an extreme problem, a large problem, a medium problem, a small problem, or no problem at all?

2. How much of a problem, if any, has your debt caused for your job performance? Is it an extreme problem, a large problem, a medium problem, a small problem, or no problem at all?

3. To what extent has your debt affected your health. Very much affected, quite affected, somewhat affected, not much affected, or not at all affected?

Appendix B: Construction of Debt Stress Index and Survey Questions

The Debt Stress Index is based upon four survey questions which are presented below. The five possible response categories are coded from zero to four with zero being the lowest stress category, as well as the category that contains respondents with no debt. Each month the four response numbers $X_{i,j}$ for each individual respondent are averaged.[6] To obtain the "raw score" for the index from the individual scores, we next average across the n individuals in the sample for that month. Finally, we incorporate a base period.

Incorporating a base period into the construction of an index is critical for allowing a given period's index value to be compared to the value of the index from another period of interest. For example, the Index of Consumer Sentiment computed by the Survey Research Center at the University of Michigan chooses 1966 as its base year and constructs its index to have a value of 100 in that year. For the Debt Stress Index presented here, the initial period of available data, January 2006, was chosen as the base period, and the raw score value of the index in that period is 0.9460. Dividing each period's raw score by this base period (and multiplying by 100), the base period is thus defined to have the value of 100 and subsequent monthly periods are defined relative to that initial period.

The computation of the index, referred to as the DSI, can thus be represented as follows:

$$DS_i = \frac{1}{4}\left(X_{i,1} + X_{i,2} + X_{i,3} + X_{i,4}\right)$$

$$DSI = \frac{100}{0.946} \times \frac{1}{n}\sum_{i=1}^{n} DS_i$$

To enhance the statistical reliability of the index, we have used a rolling three-month technique whereby the index is based on three months of data, with data from the most recent month added and data from the oldest month dropped in a rolling fashion. Thus, for example, the September index is based on data from July, August, and September.

[6] The responses of the sample are weighted using U.S. Census data to more accurately reflect the socioeconomic make-up of the general population.

Appendix C

Variable Definitions and Summary Statistics

Variable	Variable Definition
Debt/Income	Total debt to total household income
Assets	Total household assets (physical + financial)
Gender	Male = 1; Female = 0
Marital Status	Married = 1; Non-married = 0
Children Present	Presence of children < 18 years = 1; no children = 0
Education Years	Respondent's years of schooling
Age	Age of respondent in years
African American	1 if respondent is African American; 0 otherwise
Hispanic	1 if respondent is Hispanic; 0 otherwise
Other ethnic/racial groups	1 if respondent is other; 0 otherwise
Mortgage Debt to Income	Mortgage debt to total household income
HELOC Debt to Income	HELOC debt to total household income
Credit Card Debt to Income	Credit card debt to total household income
Student Loan Debt to Income	Student loan debt to total household income
Installment Debt to Income	Auto, appliances, furniture, and other debt to total household income
Bank Loan Debt to Income	Loans from banks, insurance policies or brokers to total household income
Payday Loan Debt to Income	Payday loans to total household income
Family/Friends Debt to Income	Loans from family, friends, etc. to total household income

In Table A below, we present the household debt levels for different types of debt across time beginning in 2005, using data from the *CFM.* These figures are presented for the total sample and also for the male/female subcategories.

Table A: Means of Variables across Gender*

Variables	All	Female	Male
Average Debt Stress Score	1.02	1.14	0.88
Assets	478,751	407,203	565,485
Savings	45,856	37,625	56,338
Annual Income	69,699	62,238	79,343
Total Debt	65,878	63,503	68,881
Debt-to-Income	1.01	1.07	0.94
Credit Card Debt	6,713	6,188	7,519
Mortgage Debt	132,396	128,585	137,181
Heloc Debt	31,753	29,785	34,099
Student Loan Debt	20,707	19,635	22,351
Installment Debt	12,259	12,121	12,437
Bank Loan Debt	19,168	14,788	24,503
Payday Loan Debt	1,523	1,610	1,346
Other Debt	3,914	7,143	7,345

*****Means for debt types refer only to that group of respondents who hold that type of debt.
n = 12,961