Were Consumer Mistakes Related to Changes in Financial Obligations Burdens?

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The purpose of this paper is to examine whether the increase in the proportion of U.S. households with financial obligations greater than 40% of income was due to mistakes or over-optimism. The proportion of households paying more than 40% of income for debt, rent, vehicle leases, property taxes, and homeowners insurance, which we refer to as having a heavy burden, increased from 17% in 1992 to 26% in 2007. Multivariate analyses performed for renters and for homeowners indicate that even controlling for other factors, the proportions with high burdens for renters and for homeowners were much higher in 2007 than in 1992. Education was positively related to having a heavy burden, suggesting that having a heavy burden is not simply a cognitive error. The general optimism by both households and lenders during most of the period from 1992 to 2007, possibly combined with relaxed regulations, may have led to the substantial increases in the proportions of households having high burdens.

Introduction

Yuh and Hanna (2010) reported on the substantial increase between 1992 and 2007 in the proportion of households with financial obligations over 40% of income. The patterns over time for the proportion of U.S. households with financial obligations over 40% of income were generally opposite of the unemployment rate (Figure 1), with the proportion increasing when the unemployment rate was decreasing and decreasing when the unemployment rate was increasing. This paper extends their analysis by examining renters and homeowners separately. (For details on the literature and methods related to the financial obligations burden, contact the first author for the latest version of the 2010 paper.)
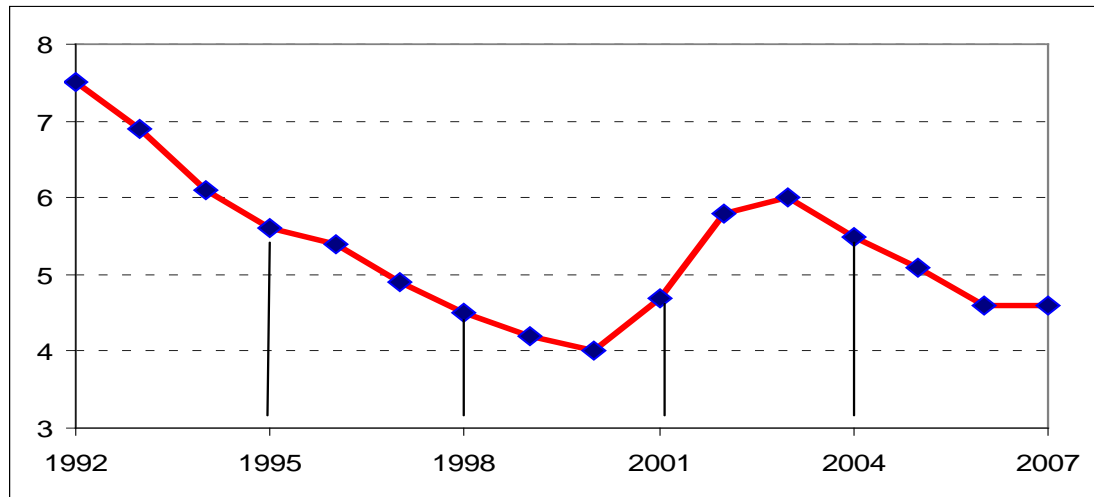

Figure 1. US unemployment rate 2002-2007. Created by authors with information from bls.gov, "Employment status of the civilian noninstitutional population, 1941 to date, persons 16 and over.

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Data and Sample Selection

The data analyzed in this study are from the 1992, 1995, 1998, 2001, 2004 and 2007 cross-sectional datasets for the U.S. Survey of Consumer Finances, sponsored by the Federal Reserve Board (Bucks et al., 2009). In order to obtain a better understanding of households' financial obligations ratios over time, we combine all households from these datasets. The sample sizes are 3,906 in 1992, 4,299 in 1995, 4,305 in 1998, 4,442 in 2001, 4,519 in 2004, and 4,418 in 2007 with a total of 25,889 households.

Dependent Variable

Our focus is on whether households have a high financial obligations ratio. It is somewhat arbitrary to use a particular cutoff point for the ratio, but the Federal Reserve Board over the years (e.g., Bucks, Kennickell, Mach, & Moore, 2009) has reported the proportion of households with a debt payments to income ratio over 40%. The 40% threshold is somewhat higher than the usual level recommended by experts (Greninger, Hampton, Kitt, & Achacoso, 1996), so the threshold plausibly represents a danger point for households, because if household income drops substantially, it may be very difficult for a household to keep up with obligations such as debt payments and rent. A popular personal financial textbook (Garman & Forgue, 2010, p. 80) suggested that households limit their debt payments to less than 40% of income. Consistent with the 40% guideline, Armstrong and Schulman (1990) found that an obligation ratio of 40-70% is an indicator of financial strain among farm households. Therefore we focus on whether a household has total monthly financial obligations over 40% of pre-tax monthly income.

In order to have comparability between homeowners and renters in the fixed payments related to both debt payments and shelter payments, we follow Dynan, Johnson, and Pence (2003) in defining financial obligations to include rent, vehicle leases, debt payments, real estate taxes on the household's residence, and homeowners insurance. Rent payments include the monthly rent on a home, site, or farm/ranch, and lease payments include all monthly lease payments on vehicle. (For more details on the methods, contact the first author.)

The dependent variable is a dichotomous variable for whether the household has a heavy financial burden. We define a heavy burden as having a ratio of monthly financial obligations over 40% of pretax income and code the variable as 1 if the ratio is over 40% and 0 otherwise. If a household has zero income the ratio is computed as the monthly obligation amount divided by 1. A very small proportion of households, 0.6%, have zero or negative income. This is possible because the SCF uses an income definition related to the U.S. federal income tax, and a household operating a small business could have business income losses. Some households may have taken on financial obligations when income was higher, then experienced an income decrease, in some cases to the point where financial obligations are higher than income, so it is possible for the ratio to exceed 100%.

Independent Variables

The independent variables for the multivariate analysis include survey year, racial/ethnic identification of the respondent, marital status (married couple, unmarried couple, single male, single female), whether current income is higher or lower than normal income, highest education level of the head, age of the head, whether the home is owned, whether there is a dependent child under the age of 19, whether the head is self-employed, retired, or works for a salary, health status, income growth expectations, expectations for the economy, household income, net worth, and whether everybody in the household is covered by health insurance. The SCF codebook for each survey year (e.g., Kennickell, 2009) describes the components of variables we use in creating some variables. Household composition is defined based on the SCF definitions of the primary economic unit. The racial/ethnic categories are self-reported based on choices offered to respondents. The SCF public dataset includes four categories, white, black, Hispanic and other. It is likely that about 80% of the "other" respondents are Asians or Pacific Islanders (Hanna and Lindamood, 2008).

Statistical Methods and Research Model

For descriptive and multivariable analyses reporting statistical tests, we use "repeated-imputation inference" (RII) techniques suggested in the SCF codebook (Kennickell, 2009) to obtain estimates of variances that more closely represent the true variances than would be obtained by using just one implicate (Kennickell and Woodburn,1999; Lindamood *et al.*, 2007; Montalto and Sung, 1996). We do not weight the regression analysis, based on Deaton (1997), who stated that weighting regression procedures using endogenous weights might result in biased estimates.

We use a logistic regression (logit) with the dichotomous dependent variable having a financial obligations ratio over 40%. As we discuss in the results section, the extremely high value of the ratio for a small number of households results in very high values of the mean of the ratio, and therefore limits the usefulness of a regression on the ratio itself. We obtained somewhat similar results using alternative regression techniques, for

instance, on the ratio rather than on the dichotomous variable of having a heavy burden, but the results we report are the easiest to discuss.

Results

Descriptive Analyses

Table 1 shows the cumulative distribution of selected levels of the financial obligations ratio in 2007 for all households, for renter households, and for homeowner households. Even though the median level of the ratio for all households is only 0.26, the 95th percentile is 0.87, and the maximum level is 27,085, which is for a household with zero income, so that the ratio is calculated as the monthly obligations. The median level of the ratio for renter households is 0.32, and the 95th percentile is 0.98, whereas for homeowner households the median level is 0.23 and the 95th percentile is 0.74.

Table 1

Distribution of Financial Obligations Ratio, 2007

Level	Cumulative Distribution of Financial Obligations Ratio		
	All households	Renters	Homeowners
Median	0.26	0.32	0.23
75th %tile	0.41	0.49	0.37
90th %tile	0.61	0.71	0.54
95th %tile	0.81	0.98	0.74
maximum	27,085	4,312	27,085

Note. Analyses are weighted, averaged over five implicates.

Figure 2 shows the proportions of households with financial obligations over 40% of income, for all households, for renters, and for homeowners. Table 2 shows means tests for the proportion of households with financial obligations ratios over 40% by survey year. Households in the 2007 survey year had a much higher proportion having a heavy burden than households in other years, with 26.0% in 2007 compared to 16.5% in 1992. The trend for homeowners was similar to the overall trend, with 14.6% in 1992 and 21.7% in 2007 having financial obligations over 40% of income. However, for renters, the trend toward higher proportions was more dramatic, with an increase from 20.0% in 1992 to 35.4% in 2007.

Table 2

Means Test of Financial Obligations Ratio Over 40% of Income by Survey Year

	All households		Renters		Homeowners	
	Mean	Sig. level	Mean	Sig. level	Mean	Sig. level
All	20.83%	NA	27.99%	NA	17.28%	NA
1992	16.52%	NA	19.99%	NA	14.56%	NA
1995	19.50%	<.0001	25.26%	<.0001	16.35%	<.0001
1998	21.81%	<.0001	28.73%	<.0001	18.28%	<.0001
2001	19.67%	<.0001	28.60%	0.8753	15.41%	<.0001
2004	20.99%	0.0005	30.29%	0.0372	16.83%	0.0006
2007	26.01%	<.0001	35.36%	<.0001	21.73%	<.0001

Note: Analyses are weighted, based on 1992, 1995, 1998, 2001, 2004 and 2007 SCF datasets, N=25,889. Tests of significant difference between the level for each survey year and the previous year are performed based on RII procedures.
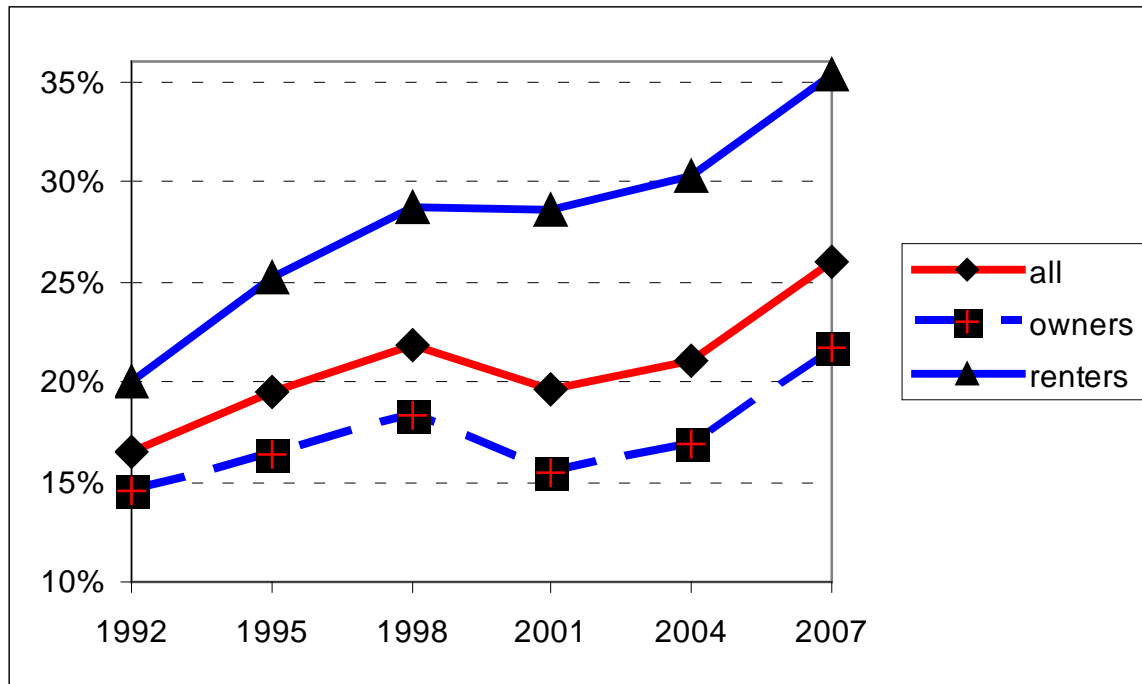
Figure 2. Rates of Having a Financial Obligations Ratio Over 40%, for All households, Renter Households, and Homeowner Households, By Survey Year.
Notes. Created by authors. Weighted rates of having financial obligations over 40% of pretax income, based on analyses of 1992, 1995, 1998, 2001, 2004, and 2007 Surveys of Consumer Finances (Table 2)

For renters, the increases in the proportion from 1992 to 1995 and from 1995 to 1998 were significant, but the proportion in 2001 was not significantly different from 1998. The proportion in 2004 was significantly higher than in 2001, and the proportion in 2007 was significantly higher than in 2001. For homeowners, the proportions increased significantly from 1992 to 1995 and from 1995 to 1998, then decreased significantly from 1998 to 2001. The proportion increased significantly from 2001 to 2004 and from 2004 to 2007.

Table 3

Logistic Regression on Likelihood Ratio Is Over 40%, for Renters and for Homeowners

Variable	Renters		Homeowners	
	coefficient	p-value	coefficient	p-value
Survey year [1992]				
1995	0.3131	0.009	0.223	0.0164
1998	0.5012	<.0001	0.4751	<.0001
2001	0.6804	<.0001	0.3423	0.0002
2004	0.6788	<.0001	0.2601	0.0028
2007	1.0834	<.0001	0.7709	<.0001
Highest education level of head [< high school]				
High school	0.2597	0.0063	0.487	<.0001
Some college	0.4522	<.0001	0.7794	<.0001
Bachelor's degree	0.6152	<.0001	0.8969	<.0001
Post-bachelor degree	0.5574	0.0008	0.8902	<.0001

	Renters		Homeowners	
Variable	coefficient	p-value	coefficient	p-value
Expectations for household income [sure income will grow faster than prices]				
Sure same	-0.0349	0.756	-0.1142	0.1526
Sure less	-0.0453	0.7005	-0.2019	0.0141
Not sure	-0.0161	0.8673	0.0353	0.6324
Expectations for the economy [stay the same]				
Better	0.0434	0.5624	0.1766	0.0024
Worse	0.0371	0.6332	0.0606	0.3615
Age of head	-0.0087	0.0013	-0.0166	<.0001
Presence of a dependent child under age 19	0.0481	0.5081	0.2897	<.0001
Health status [Excellent]				
Good	-0.0509	0.5579	-0.0712	0.2442
Fair	-0.0672	0.5118	-0.2515	0.0028
Poor	-0.0044	0.9745	-0.1445	0.2414
Log of Income	-0.9575	<.0001	-0.9377	<.0001
Log of net worth	-0.0292	<.0001	-0.0234	0.0227
Racial/ethnic group [White]				
Black	-0.242	0.0034	0.2173	0.0202
Hispanic	0.2557	0.0091	0.7124	<.0001
Asian/other	0.0422	0.0033	0.5092	<.0001
Self-employed	0.3862	0.0016	0.8003	<.0001
Retired	0.2384	0.1604	-0.2402	0.0183
All in household covered by health insurance	-0.1323	0.0857	-0.0411	0.5601
Current income relative to normal income [Same]				
Higher	-0.3631	0.0079	-0.378	0.0004
Lower	0.5757	<.0001	0.6976	<.0001
Marital status [Married couple]				
Partner	-0.0345	0.7732	0.0276	0.8129
Single head male	-0.1206	0.2381	-0.1167	0.1767
Single head female	0.1062	0.2173	-0.0963	0.2194
Intercept	8.0824	<.0001	8.5165	<.0001

Note. Analysis of combined 1992, 1995, 1998, 2001, 2004 and 2007 SCF datasets. Unweighted RII analyses.

Multivariate Analyses

The logistic regressions for renters and for homeowners show the effects of independent variables on the likelihood of having a heavy burden (Table 3). Each survey year is represented by a dummy variable, with the reference year set at 1992. We calculated the likelihood of having financial obligations over 40%, at the mean values of the other independent variables[1]. For renters, the calculated likelihood of having a heavy burden in 2007

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[1] Note that differences in likelihoods are not equivalent to the odds ratio. For instance, in the renter logistic regression, the coefficient for 2007 is 1.0834, so the odds ratio is exp (1.0834) = 2.955. However, if we transform the coefficient to a likelihood, and adjust the intercept so that at the mean of all variables we obtain the mean likelihood, then the predicted likelihood for 2007 is 2.17 times the predicted likelihood for 1992

is 40.2%, 2.17 times as high as the 1992 calculated likelihood of 23.7%. The predicted levels are in effect showing what the rates would be if all other independent variables had remained at their mean levels during the period. The result that the calculated change is larger than the actual change is partially an artifact of controlling for real net worth and income, which is substantially higher in 2007 than in 1992. For homeowners, the calculated likelihood of having a heavy burden in 2007 is 23.1%, 1.88 times as high as the 1992 calculated likelihood of 12.8%.

For both renter and for homeowner households, compared to households with educational attainment of less than high school, households a high school degree and those with college education are more likely to have financial obligations over 40% of income. The likelihood of having a high burden decreases with age, income, net worth and retirement status self-employment is associated with a higher likelihood. Health status has a weak effect on having a high burden. Expectations about future household income growth and about the economy also have weak effects on the likelihood of having a high burden. For homeowners, those that expect the economy to be better in the next five years are slightly more likely to have financial obligations over 40% of income than those who expect the economy to be the same.

Discussion

During one of the longest periods of prosperity in U.S. history, interrupted only by a short recession, the proportion of households with monthly financial obligations over 40% of pretax income (Table 2) increased from 1992 to 1998, dropped slightly by 2001, increased in 2004, and then increased strongly in 2007. Only the recession of 2001 interrupted the increases in the proportions with heavy burdens. There is no strong evidence that households were making cognitive mistakes in 2007, given that controlling for income, income expectations, age, and other characteristics, college educated households were more likely to have a heavy burden than households with no college. The optimistic expectations of consumers, as measured by respondent expectations about their household income growth and about the economy, have weak effects on having a heavy burden. The time trend, however, suggests that households were much more likely to take on heavy burdens by 2007, so it is possible that more relaxed lending standards (Hunt, 2007), and the fact that as of 2007 the last severe recession was almost 25 years in the past, led both lenders and consumers to ignore the risks of heavy burdens. The proportion of households with financial obligations ratios over 40% of income increased during times of prosperity and decreased during the one mild recession during the 1992 to 2007 period we analyzed. The positive association between having a heavy burden and educational attainment makes it less plausible that households with high ratios were making cognitive mistakes, though obviously in hindsight the optimism was not justified**.**

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