

Wealth Shocks, Unemployment Shocks and Consumption in the Wake of the Great Recession

Dimitris Christelis

SHARE, CSEF and CFS

Dimitris Georgarakos

Goethe University Frankfurt and CFS

Tullio Jappelli

University of Naples Federico II, CSEF and CEPR

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- Work in progress
- Comments are very welcome
- Working paper available at <http://www.csef.it/WP/wp279.pdf>

Main Idea

- In 2008 US household suffered capital losses of 13,6 trillion dollars, on a disposable income of 11 trillion dollars
- Unemployment in the US doubled between early 2008 and late 2009 (from 5% to 10%)
- How much was household spending during 2008-2009 affected by capital losses and unemployment?
- **Results.** Elasticity of consumption with respect to financial losses is about 0.09, with respect to housing losses about 0.056. Semi-elasticity with respect to unemployment is 10 percent

Theoretical Issues

- Are wealth shocks transitory or permanent? Anticipated or non-anticipated?
- Housing gains/losses should have different effects on homeowners compared to renters
- Capital gains could have effects by affecting the ability to borrow
- Differential reaction to negative and positive shocks
- Unemployment shock and unemployment insurance

Empirical Issues

- Data on capital losses needed at the household level. Should we worry about how well actual losses are measured? Maybe not, perceived losses are what matters.
- Data on losses should cover both housing and risky assets
- Data on expenditure needed at the household level
- It's better to disentangle losses from changes in values due to investments
 - Housing: buying/selling, home improvements (lack thereof, depreciation)
 - Risky assets: buying/selling

Data

- Health and Retirement Study (HRS) – Biennial household survey of the 50+ in the US
- Modules on demographics, employment, income, assets, expectations, physical and mental health, cognition, social activities, financial transfers etc.
- First wave in 1992. We use the 2008 wave, conducted between February 2008 and February 2009
- Sample size: 11,187 households, 16,477 individuals

- HRS Internet Survey of 2009 – Random subsample of the 2008 HRS, plus some households interviewed in previous waves of the Internet Survey
- 3,438 households, 4,415 individuals
- Questions on spending:
 - Percentage change in spending in the last year
 - Spend less, about the same, more compared to previous year
 - Detailed questions on specific spending items (few households answer all questions, some major items like housing costs omitted).

- Question on percent losses (not gains) since September 2008 in the following financial assets:
 - Directly held stocks
 - Mutual funds
 - Employer-provided pension plans
 - Individual retirement accounts (IRAs)
 - Trusts
 - Stocks held in any other form
- Question on percent gain/loss in housing since summer of 2006
- Question on employment (retirement, unemployment)
- Self-reported health

- Expectation about prices of blue chip stocks in one year
- Various other questions on how households affected by the crisis (e.g. difficulties paying debts)
- Third source of information: Consumption and Activities Mail Survey (CAMS). Biennial, conducted one year after the main HRS survey. Has detailed questions on consumption.
- Relatively few households (about 300) with complete expenditure information are in both the Internet Survey and in CAMS

Changes in Consumption

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Gains in Assets	Percentage Change in Consumption (Unconditional)				Qualitative Change in Consumption		
	25 th quantile	50 th quantile	75 th quantile	Mean	Lower	Same	Higher
Panel A. Housing							
1 st quartile	-0.150	0.000	0.000	-0.044	0.292	0.479	0.229
2 nd quartile	-0.125	0.000	0.000	-0.041	0.278	0.535	0.187
3 ^d quartile	-0.100	0.000	0.000	-0.029	0.222	0.566	0.212
4 th quartile	0.000	0.000	0.000	-0.021	0.202	0.569	0.229
Panel B. Total Financial Assets							
1 st level	-0.150	0.000	0.000	-0.060	0.272	0.559	0.170
2 nd level	-0.100	0.000	0.000	-0.042	0.245	0.549	0.206
3 ^d level	-0.050	0.000	0.000	-0.025	0.193	0.561	0.246
4 th level	-0.005	0.000	0.000	-0.024	0.214	0.533	0.253

Capital Losses

	(1)	(2)	(3)	(4)	(5)	(6)
Asset	Ownership Prevalence	Prevalence of Losses, Conditional on Ownership	Quantiles of Losses, Conditional on Having Any			
			25 th quantile	50 th quantile	75 th quantile	Mean
Panel A. Main Residence and All Financial Assets						
Main Residence	0.890	0.534	-0.260	-0.183	-0.105	-0.199
Financial Assets	0.659	0.935	-0.354	-0.266	-0.162	-0.271
Panel B. Financial Assets in Detail						
Employer-Provided Pension Plans	0.348	0.865	-0.400	-0.300	-0.200	-0.304
Individual Retirement Accounts	0.387	0.910	-0.400	-0.300	-0.200	-0.303
Mutual Funds	0.422	0.915	-0.400	-0.300	-0.200	-0.294
Directly Held Stocks	0.312	0.834	-0.400	-0.288	-0.193	-0.312
Trusts	0.116	0.836	-0.350	-0.250	-0.150	-0.265
Other Assets Invested in Stocks	0.238	0.743	-0.350	-0.225	-0.150	-0.258

Other sample statistics

Variable	Statistic
Age	65.63
Household Size	2.14
Becomes Unemployed Between 2008 and 2009	0.04
Becomes Retired Between 2008 and 2009	0.13
Health Deterioration Between 2008 and 2009	0.08
Couple	0.75
High School Education	0.51
More than High School	0.47
Self-reported Health Fair or Bad	0.25
Numeracy Score (max. 5)	4.50
Working	0.50
Retired	0.45
White	0.87
Household net real assets (median)	195,378
Household net financial assets (median)	88,922
Household income (median)	62,394

Specification

- Start with a specification for consumption in logs

$$\log C_{it} = \alpha \log HW_{it} + \beta \log FW_{it} + \gamma \mathbf{X}_{it} + \varepsilon_{it}$$

- Take first differences

$$\Delta \log C_{it} = \alpha \Delta \log HW_{it} + \beta \Delta \log FW_{it} + \gamma \Delta \mathbf{X}_{it} + \Delta \varepsilon_{it}$$

- $\Delta \log C_{it}, \Delta \log HW_{it}, \Delta \log FW_{it}$ are percentage changes and α, β elasticities

- Squared terms in levels become linear terms in first differences
- We use four basic specifications, i.e. on top of capital gains we add as forcing variables:
 - Age, household size
 - +transitions into unemployment, retirement, bad health
 - +income and net worth in 2008
 - +more variables from 2008: being in a couple, education numeracy score, employment status (working, retired, unemployed)

Baseline Results

Variable	Model 1		Model 2		Model 3		Model 4	
	Marg. Eff.	Std. Error	Marg. Eff.	Std. Error	Marg. Eff.	Std. Error	Marg. Eff.	Std. Error
<u>Panel A. Regression Estimates</u>								
Becomes Unemployed			-0.1014	0.0277 ***	-0.1018	0.0277 ***	-0.0990	0.0277 ***
Becomes Retired			-0.0267	0.0123 **	-0.0278	0.0124 **	-0.0241	0.0128 *
Percentage Change in Value of the Main Residence	0.0578	0.0305 *	0.0537	0.0307 *	0.0572	0.0309 *	0.0541	0.0308 *
Percentage Change in Value of Financial Assets	0.0887	0.0277 ***	0.0862	0.0279 ***	0.0997	0.0290 ***	0.0838	0.0294 ***
Number of Observations	1,915		1,883		1,883		1,881	
<u>Panel B. Marginal Propensities to Consume</u>								
Implied Marginal Propensity to Consume with Respect to the Value of the Main Residence	0.0094	0.0050 *	0.0090	0.0051 *	0.0094	0.0052 *	0.0091	0.0050 *
Implied Marginal Propensity to Consume with Respect to the Value of Financial Assets	0.0323	0.0102 ***	0.0319	0.0107 ***	0.0370	0.0110 ***	0.0321	0.0112 ***

Marg. propensity to consume = elasticity*(consumption/asset)

Aggregate implications

- Percent capital loss in housing for the US household sector between summer 2006 and 1st quarter 2009: about 29%.
Implied reduction in spending: 1.6%
- Percent capital loss in financial assets for the US household sector between September 2008 and 1st quarter 2009: about 25%. Implied reduction in spending: 2.2%
- Caveat: our sample consists of older households, which should have a higher response of spending to wealth shocks due to their shorter life horizon

Disaggregated financial assets

Variable	Model 1		Model 2		Model 3		Model 4	
	Marg. Eff.	Std. Error	Marg. Eff.	Std. Error	Marg. Eff.	Std. Error	Marg. Eff.	Std. Error
Becomes Unemployed			-0.1005	0.0263 ***	-0.1008	0.0263 ***	-0.0994	0.0263 ***
Percentage Change in Value of the Main Residence	0.0704	0.0285 **	0.0665	0.0289 **	0.0692	0.0290 **	0.0668	0.0288 **
Percentage Change in Value of Employer-Provided Pension Plans	0.0107	0.0274	0.0126	0.0277	0.0171	0.0282	0.0119	0.0283
Percentage Change in Value of IRAs	0.0372	0.0277	0.0329	0.0275	0.0417	0.0276	0.0316	0.0274
Percentage Change in Value of Mutual Funds	0.0208	0.0288	0.0136	0.0286	0.0218	0.0288	0.0179	0.0289
Percentage Change in Value of Stocks Directly Held	0.0880	0.0252 ***	0.0776	0.0251 ***	0.0830	0.0252 ***	0.0785	0.0254 ***
Percentage Change in Value of Trusts	-0.0181	0.0403	-0.0029	0.0413	-0.0008	0.0414	-0.0014	0.0421
Percentage Change in Value of Other Assets Invested in Stocks	0.0052	0.0345	0.0100	0.0352	0.0103	0.0353	0.0044	0.0349
Number of Observations	2,235		2,193		2,193		2,191	

Changes in Expectations

- It should make a difference whether capital losses are considered temporary or permanent. The response of consumption should be larger in the latter case
- We use the question on the probability that stock market prices will rise in a year's time
 - Change in reported probability between 2008 and 2009 (≤ 0 permanent, > 0 transitory)
 - Expectation in 2008 ($\leq 50\%$ permanent, $> 50\%$ transitory)

Variable	Model 1		Model 2		Model 3		Model 4	
	Marg. Eff.	Std. Error	Marg. Eff.	Std. Error	Marg. Eff.	Std. Error	Marg. Eff.	Std. Error
<u>Panel A1. Negative or zero change in the reported probability of a rise in stock prices</u>								
Percentage Change in Value of Financial Assets	0.1192	0.0359 ***	0.1129	0.0357 ***	0.1291	0.0363 ***	0.1214	0.0367 ***
Number of Observations	1,015		1,001		1,001		1,000	
<u>Panel A2. Positive change in the reported probability of a rise in stock prices</u>								
Percentage Change in Value of Financial Assets	0.0739	0.0537	0.0799	0.0546	0.0643	0.0576	0.0665	0.0555
Number of Observations	483		473		473		472	
<u>Panel B1. Reported probability in 2008 of a rise in stock prices equal to .5 or lower</u>								
Percentage Change in Value of Financial Assets	0.1390	0.0394 ***	0.1403	0.0394 ***	0.1369	0.0414 ***	0.1195	0.0414 ***
Number of Observations	916		904		904		903	
<u>Panel B2. Reported probability in 2008 of a rise in stock prices higher than .5</u>								
Percentage Change in Value of Financial Assets	0.0378	0.0398	0.0335	0.0399	0.0536	0.0406	0.0496	0.0414
Number of Observations	765		748		748		747	

Quartiles of percentage capital gains

Variable	Model 1		Model 2		Model 3		Model 4	
	Marg. Eff.	Std. Error	Marg. Eff.	Std. Error	Marg. Eff.	Std. Error	Marg. Eff.	Std. Error
Becomes Unemployed			-0.1008	0.0277 ***	-0.1017	0.0278 ***	-0.0982	0.0278 ***
2 nd Quartile of Percentage Change in Value of the Main Residence	0.0023	0.0154	0.0032	0.0155	0.0023	0.0156	0.0039	0.0155
3 ^d Quartile of Percentage Change in Value of the Main Residence	0.0216	0.0152	0.0212	0.0155	0.0214	0.0155	0.0234	0.0155
4 th Quartile of Percentage Change in Value of the Main Residence	0.0307	0.0138 **	0.0305	0.0138 **	0.0327	0.0138 **	0.0329	0.0137 **
2 nd Level of Percentage Change in Value of Financial Assets	0.0260	0.0118 **	0.0254	0.0118 **	0.0247	0.0118 **	0.0234	0.0119 **
3 ^d Level of Percentage Change in Value of Financial Assets	0.0378	0.0117 ***	0.0373	0.0117 ***	0.0371	0.0117 ***	0.0358	0.0117 ***
4 th Level of Percentage Change in Value of Financial Assets	0.0346	0.0126 ***	0.0331	0.0126 ***	0.0401	0.0134 ***	0.0305	0.0137 **
Number of Observations	1,915		1,883		1,883		1,881	

Change in consumption (categorical)

Variable	Model 1		Model 2		Model 3		Model 4	
	Marg. Eff.	Std. Error	Marg. Eff.	Std. Error	Marg. Eff.	Std. Error	Marg. Eff.	Std. Error
Panel A. Using Percentage Changes in Assets								
<i>A.1 Probability that Consumption is lower</i>								
Becomes Unemployed	-.-	-.-	0.2107	0.0531 ***	0.2128	0.0534 ***	0.2063	0.0525 ***
Percentage Change in Value of the Main Residence	-0.0153	0.0068 **	-0.0149	0.0069 **	-0.0151	0.0070 *	-0.0146	0.0067 *
Percentage Change in Value of Financial Assets	-0.0240	0.0063 ***	-0.0227	0.0064 ***	-0.0246	0.0066 ***	-0.0204	0.0066 ***
<i>A.2 Probability that Consumption is the same</i>								
Becomes Unemployed	-.-	-.-	-0.0720	0.0303 **	-0.0732	0.0309 **	-0.0691	0.0295 **
Percentage Change in Value of the Main Residence	-0.0006	0.0008	-0.0008	0.0008	-0.0008	0.0009	-0.0008	0.0008
Percentage Change in Value of Financial Assets	-0.0015	0.0013	-0.0017	0.0013	-0.0020	0.0014	-0.0014	0.0012
<i>A.3 Probability that Consumption is higher</i>								
Becomes Unemployed	-.-	-.-	-0.1387	0.0241 ***	-0.1396	0.0238 ***	-0.1373	0.0243 ***
Percentage Change in Value of the Main Residence	0.0159	0.0073 **	0.0156	0.0075 **	0.0159	0.0075 **	0.0153	0.0072 **
Percentage Change in Value of Financial Assets	0.0255	0.0072 ***	0.0244	0.0073 ***	0.0266	0.0075 ***	0.0218	0.0073 ***
Number of Observations	1,940		1,907		1,907		1,905	

- Similar results when using quartiles of percentage changes

Variable	Model 1		Model 2		Model 3		Model 4	
	Marg. Eff.	Std. Error	Marg. Eff.	Std. Error	Marg. Eff.	Std. Error	Marg. Eff.	Std. Error
<i>Probability that Consumption is lower</i>								
Becomes Unemployed	-.-	-.-	0.2090	0.0513 ***	0.2109	0.0513 ***	0.2059	0.0510 ***
Percentage Change in Value of the Main Residence	-0.0146	0.0061 **	-0.0136	0.0063 **	-0.0139	0.0063 *	-0.0137	0.0060 *
Percentage Change in Value of Employer-Provided Pension Plans	-0.0033	0.0068	-0.0028	0.0070	-0.0029	0.0069	-0.0030	0.0069
Percentage Change in Value of IRAs	-0.0133	0.0067 **	-0.0128	0.0070 **	-0.0146	0.0068 *	-0.0119	0.0072 *
Percentage Change in Value of Mutual Funds	-0.0080	0.0075	-0.0056	0.0077	-0.0069	0.0075	-0.0050	0.0076
Percentage Change in Value of Stocks Directly Held	-0.0269	0.0064 ***	-0.0243	0.0063 ***	-0.0255	0.0065 ***	-0.0251	0.0063 ***
Percentage Change in Value of Trusts	0.0007	0.0123	-0.0042	0.0121	-0.0037	0.0126	-0.0032	0.0119
Percentage Change in Value of Other Assets Invested in Stocks	0.0020	0.0095	0.0008	0.0097	0.0009	0.0096	0.0013	0.0092
<i>Probability that Consumption is higher</i>								
Becomes Unemployed	-.-	-.-	-0.1392	0.0230 ***	-0.1400	0.0233 ***	-0.1379	0.0235 ***
Percentage Change in Value of the Main Residence	0.0154	0.0066 **	0.0145	0.0068 **	0.0147	0.0069 **	0.0146	0.0065 **
Percentage Change in Value of Employer-Provided Pension Plans	0.0035	0.0070	0.0030	0.0072	0.0031	0.0071	0.0032	0.0071
Percentage Change in Value of IRAs	0.0140	0.0073 *	0.0137	0.0077 **	0.0156	0.0075 **	0.0127	0.0078
Percentage Change in Value of Mutual Funds	0.0084	0.0080	0.0059	0.0081	0.0074	0.0079	0.0053	0.0080
Percentage Change in Value of Stocks Directly Held	0.0293	0.0075 ***	0.0266	0.0074 ***	0.0280	0.0077 ***	0.0275	0.0074 ***
Percentage Change in Value of Trusts	-0.0004	0.0124	0.0047	0.0127	0.0042	0.0131	0.0037	0.0123
Percentage Change in Value of Other Assets Invested in Stocks	-0.0018	0.0095	-0.0006	0.0099	-0.0007	0.0098	-0.0011	0.0093
Number of Observations	2,267		2,223		2,223		2,221	

Further robustness checks

- Similar results with unweighted financial gains
- No effect of liquidity constraints (interaction with capital gains terms is not significant)
- Restricting the sample to those below 65 makes the semi-elasticity of unemployment slightly larger (11%)
- Using a nonlinear model (fractional variable model by Papke and Wooldridge, 1996) leads to identical results

Conclusions

- US households aged 50+ adjust their spending after experiencing capital losses and unemployment
- The effect of a financial loss is stronger than that of the housing loss
- Results are pretty robust to a variety of specifications
- Questions on capital gains/losses in household surveys can be very informative