

# Household Balance Sheets, Consumption, and the Economic Slump

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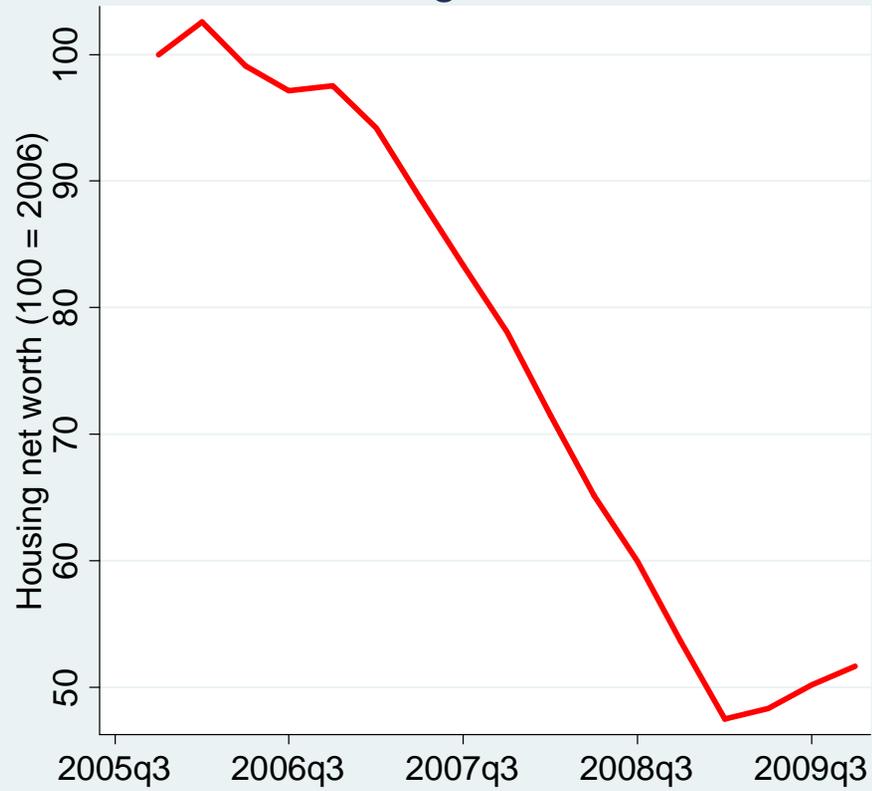
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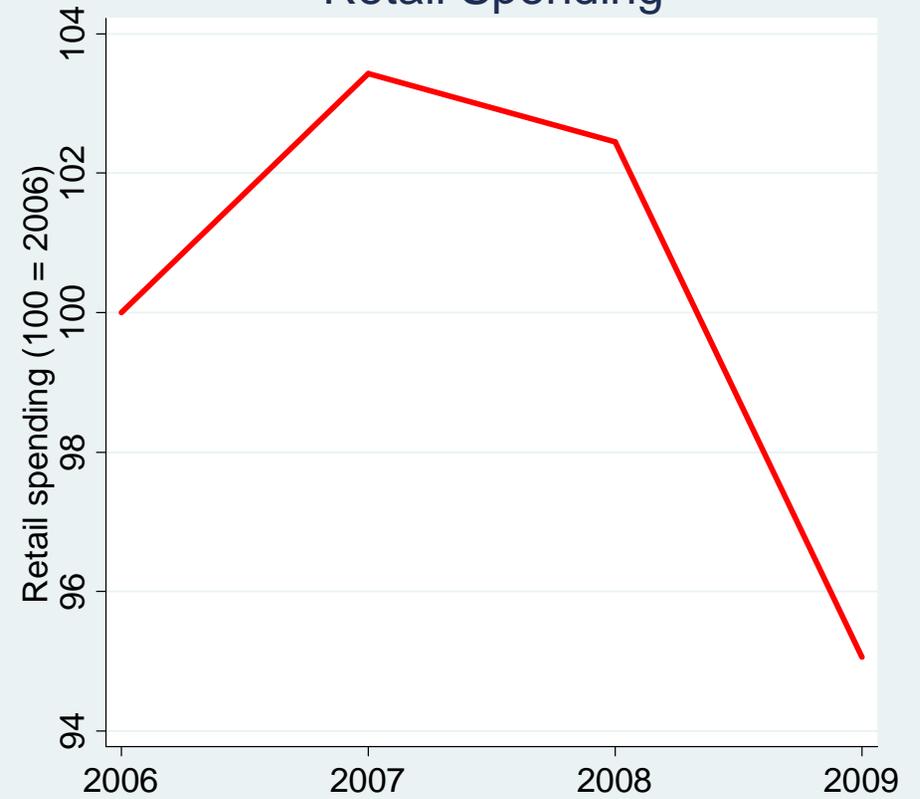
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# Motivation

## Housing Net Worth



## Retail Spending



## What We Do

- We utilize U.S. county-level data on shocks to net worth and spending to answer two fundamental questions in macroeconomics:
  1. Do households cut spending in response to a shock to their net worth?
  2. Do households respond to the same decline in home value differentially based on balance sheet position?

## What We Do

- We utilize U.S. county-level data on shocks to net worth and spending to answer two fundamental questions in macroeconomics:
  1. Do households cut spending in response to a shock to their net worth?
    - Yes, and effects are very large
  2. Do households respond to the same decline in home value differentially based on balance sheet position?
    - Yes, poorer and more levered households cut back significantly more for same dollar decline in wealth

## Implications

- Households respond aggressively to household-specific net worth shocks, which implies a failure of consumption risk-sharing in the aggregate
- We must therefore appreciate heterogeneity in macroeconomic models – representative agent frameworks cannot explain decline in spending
- Differential MPCs means the distribution of wealth and debt matters
- If a collapse in asset prices concentrates losses on poor and levered households, effect on aggregate consumption will be more severe

## Defining Shocks to Net Worth

- Suppose we write household net worth as follows:

$$NW_{i,t} = S_{i,t} + B_{i,t} + H_{i,t} - D_{i,t}$$

- % shock to net worth in Great Recession can be written as:

$$\Delta NW_{i,t} = \Delta P_{i,t}^s * \frac{S_{i,t-1}}{NW_{i,t-1}} + \Delta P_{i,t}^b * \frac{B_{i,t-1}}{NW_{i,t-1}} + \Delta P_{i,t}^h * \frac{H_{i,t-1}}{NW_{i,t-1}}$$

- Housing net worth shock (our focus) can be rewritten:

$$H_{i,t-1} * \Delta P_{i,t}^h * \frac{1}{(1 - LTV_{i,t-1})} \quad \text{where} \quad LTV_{i,t-1} = \frac{D_{i,t-1} - (S_{i,t-1} + B_{i,t-1})}{H_{i,t-1}}$$

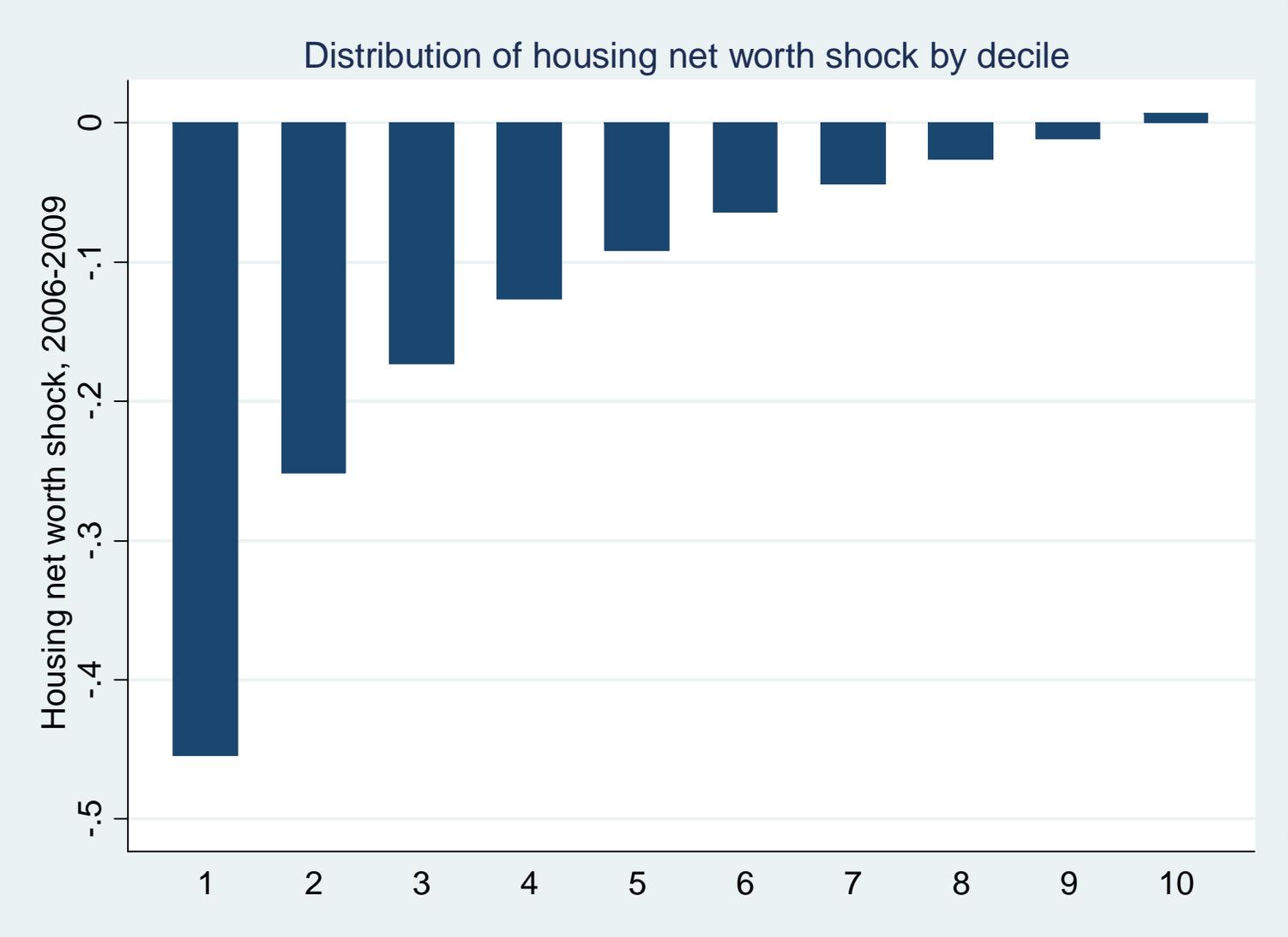
## The Housing Net Worth Shock

- The crucial variable is the housing net worth shock

$$H_{i,t-1} * \Delta P_{i,t}^h * \frac{1}{(1 - LTV_{i,t-1})}$$

- It can be interpreted as the percentage change in total net worth coming from the shock to home equity
- Notice, it is the product of two critical factors:
  - The collapse in house prices
  - The “leverage multiplier”
- Leverage exacerbates effect of house price declines on net worth!

# Variation across Country in Housing Net Worth Shock



## Empirical Approach

- Use variation across U.S. counties in the housing net worth shock during the Great Recession
- Estimate the effect of housing net worth shocks on spending using this variation
- Then see whether this effect varies by 2006 net worth or leverage
- In everything that follows, a unit of observation is a county

# Housing Net Worth Shock and Spending



# Housing Net Worth Shock and Spending

Dependent variable:	(1)	(2)	(3)	(4)	(5)	(6)
	Total spending growth, 2006 to 2009					
				IV	State FE	Excluding AZ, CA, FL, NV
Housing net worth shock, 2006-2009	0.634** (0.125)	0.613** (0.122)	0.590** (0.130)	0.774** (0.239)	0.457** (0.101)	0.869** (0.148)
Financial net worth shock, 2006-2009		-0.595 (1.032)				
Construction employment share (2006)			-0.448** (0.150)	-0.287 (0.216)	-0.171 (0.127)	-0.288 (0.160)
Tradable employment share (2006)			0.051 (0.067)	0.011 (0.092)	0.042 (0.066)	-0.027 (0.065)
Other employment share (2006)			-0.025 (0.038)	-0.045 (0.050)	-0.057 (0.037)	-0.058 (0.039)
Non-tradable employment share (2006)			0.193 (0.157)	0.095 (0.167)	0.228 (0.137)	0.106 (0.158)
Ln(income per household, 2006)			-0.002 (0.033)	0.024 (0.047)	-0.006 (0.046)	0.028 (0.045)
Ln(net worth per household, 2006)			-0.028 (0.018)	-0.035 (0.023)	-0.023 (0.020)	-0.034 (0.025)
Constant	-0.034* (0.015)	-0.092 (0.099)	0.167* (0.077)	0.147 (0.092)	0.120 (0.090)	0.132 (0.087)
N	944	944	944	540	944	833
R <sup>2</sup>	0.298	0.301	0.355	0.319	0.547	0.230

## The Role of Credit Constraints

- Why is spending sensitive to housing net worth shocks?
- One explanation is credit constraints
- Decline in home value leads to difficulties borrowing via home equity, lower credit card limits, lower credit scores, inability to refinance into lower interest rates
- We find strong evidence that credit constraints matter
- We construct a “credit constraints factor” which captures the observed decline in credit card and home equity limits

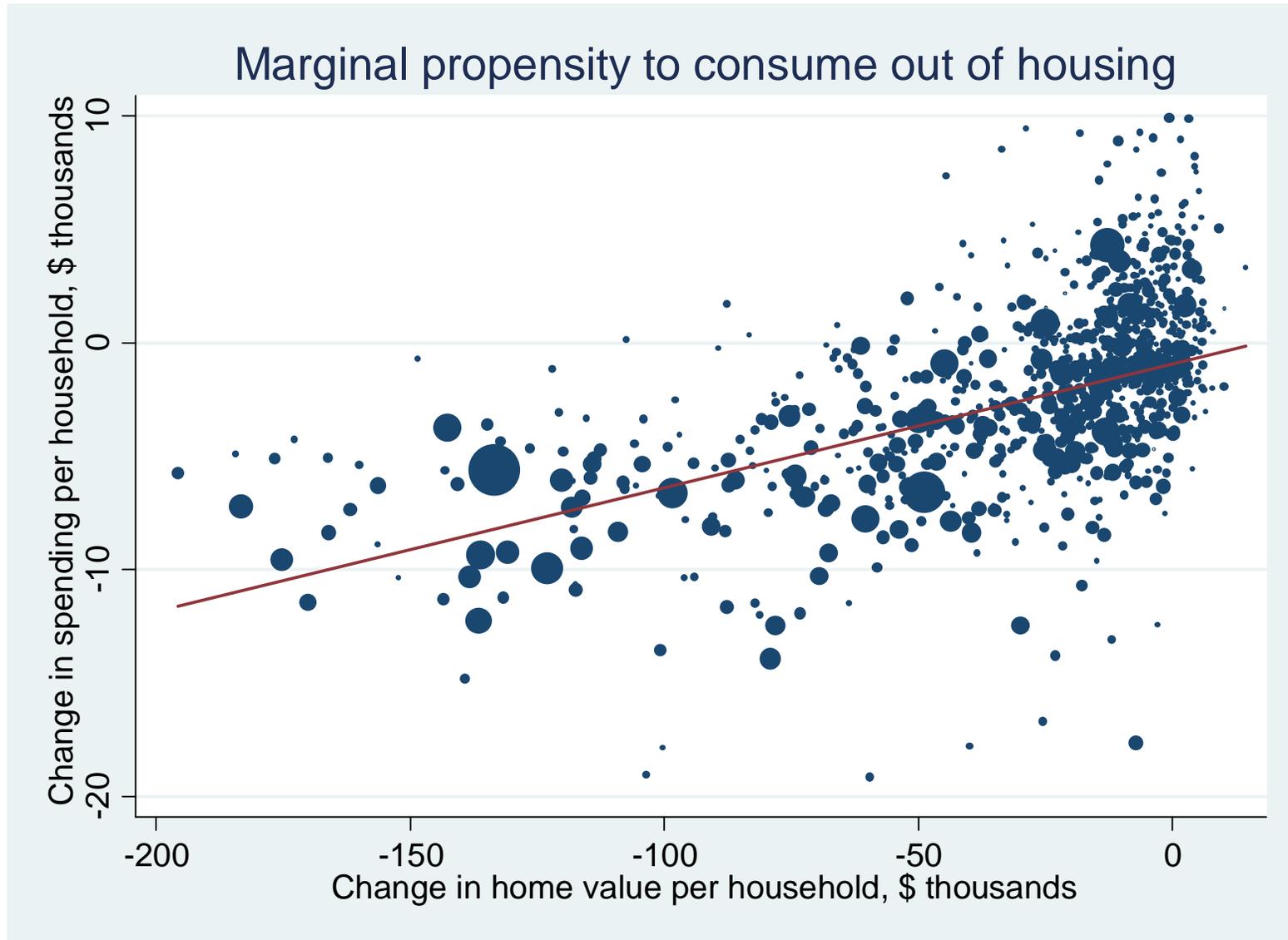
# The Role of Credit Constraints



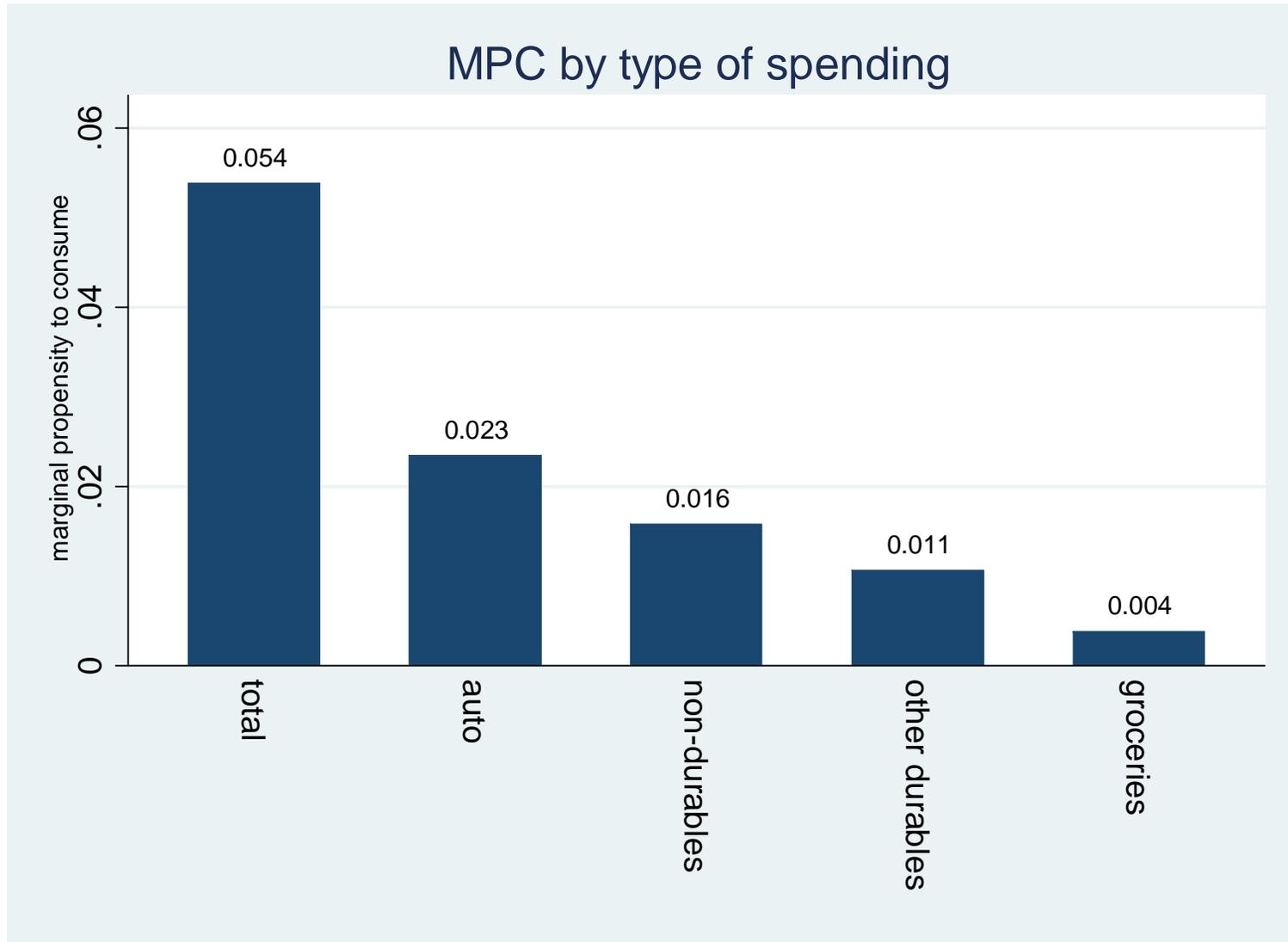
## Switching to MPCs

- So far we have been estimating *elasticities*: a 10% decline in net worth due to the housing shock leads to a 6% decline in spending
- A marginal propensity to consume measures the dollar response in spending to a \$1 decline in home value
- Theories on the importance of wealth distribution have a very specific prediction on MPCs:
  - MPCs should be higher for poorer households
  - This could be true either because of precautionary saving or because of liquidity constraints

# Estimating the MPC out of Home Value Changes



# MPC by Product



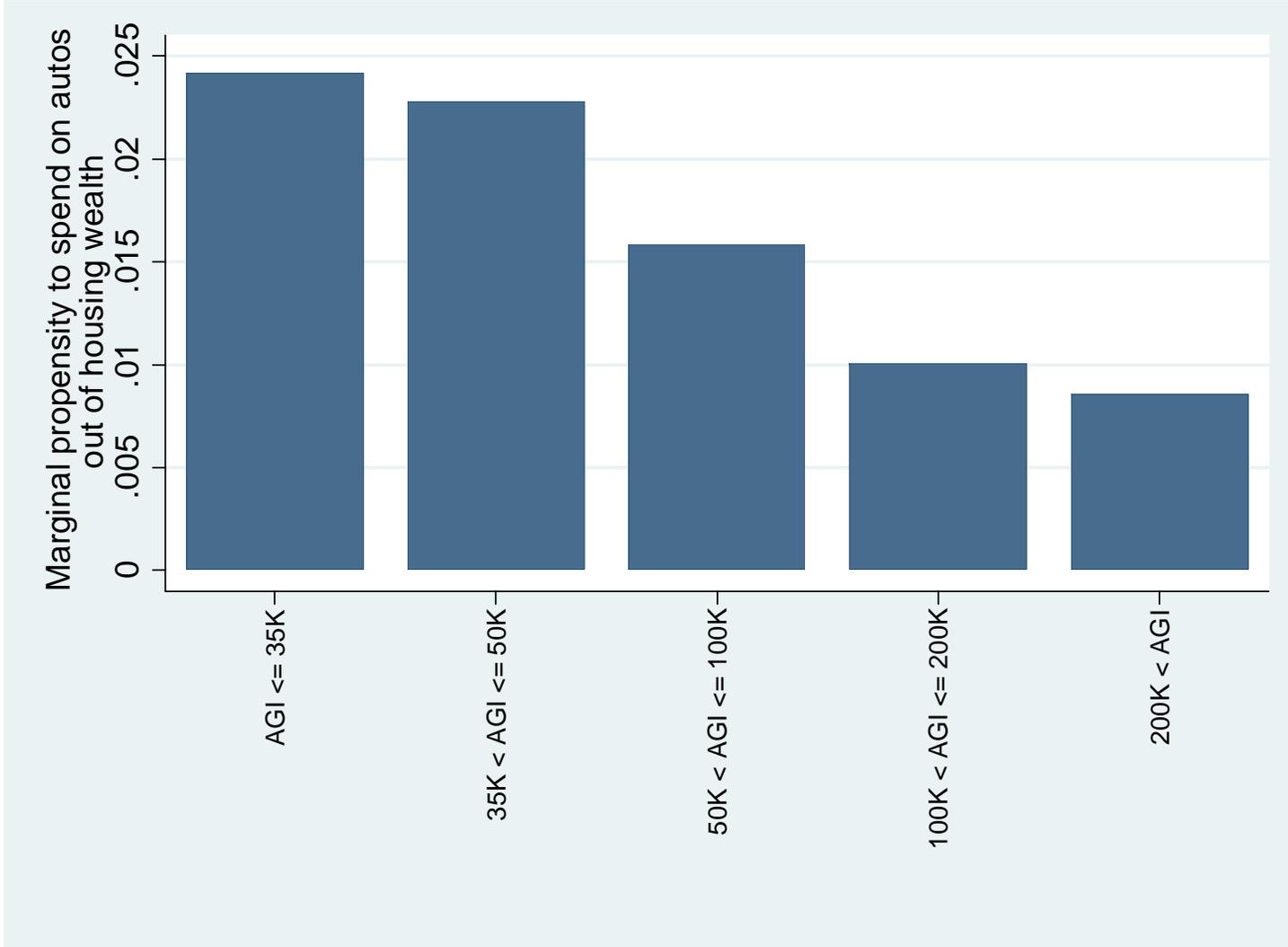
## Interpreting the MPC

- MPC estimation shows that households cut spending by about 6 cents per \$1 of home value decline
- From 2006 to 2009, home values in the United States fell by \$5.6 trillion
- Then, the MPC estimate implies a drop in household spending of  $0.06 * \$5.6 \text{ trillion} = \$333 \text{ billion}$  due to the housing net worth shock
- Total decline in spending relative to pre-trend: \$870 billion
- Our MPC estimate suggests ~40% of spending decline during Great Recession due to housing net worth shock

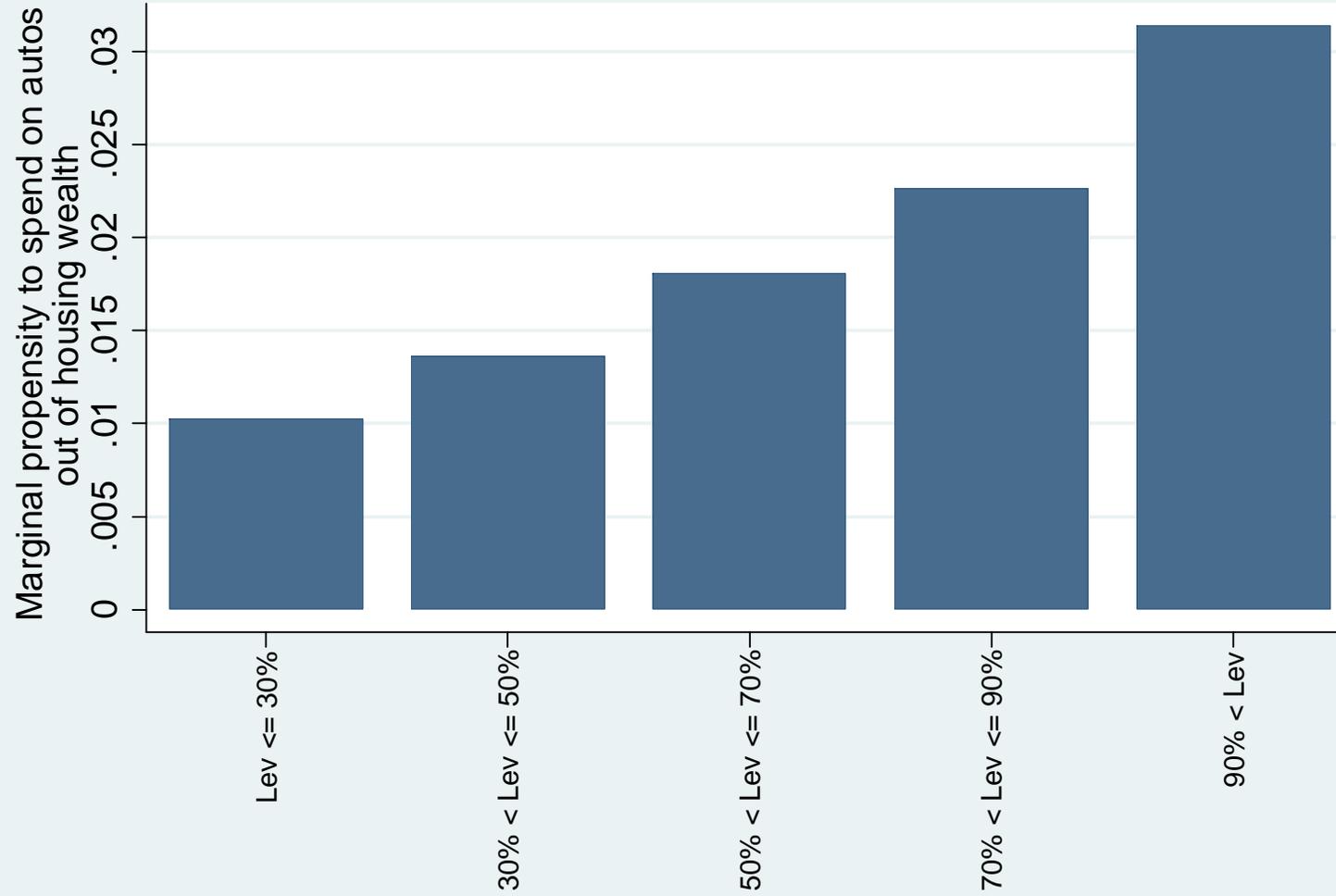
## Does the MPC Vary by Net Worth or Leverage?

- The answer to this question is based on an interaction effect, which requires a lot of statistical power to estimate
- We are asking the question: for the same dollar decline in house prices, do rich and poor counties cut spending differently?
- Unfortunately, there is not enough variation in net worth across counties to precisely estimate the interaction term
- We must move to zip code level data, where we have much more variation in net worth
- But the drawback is that we only have auto spending available at zip code level

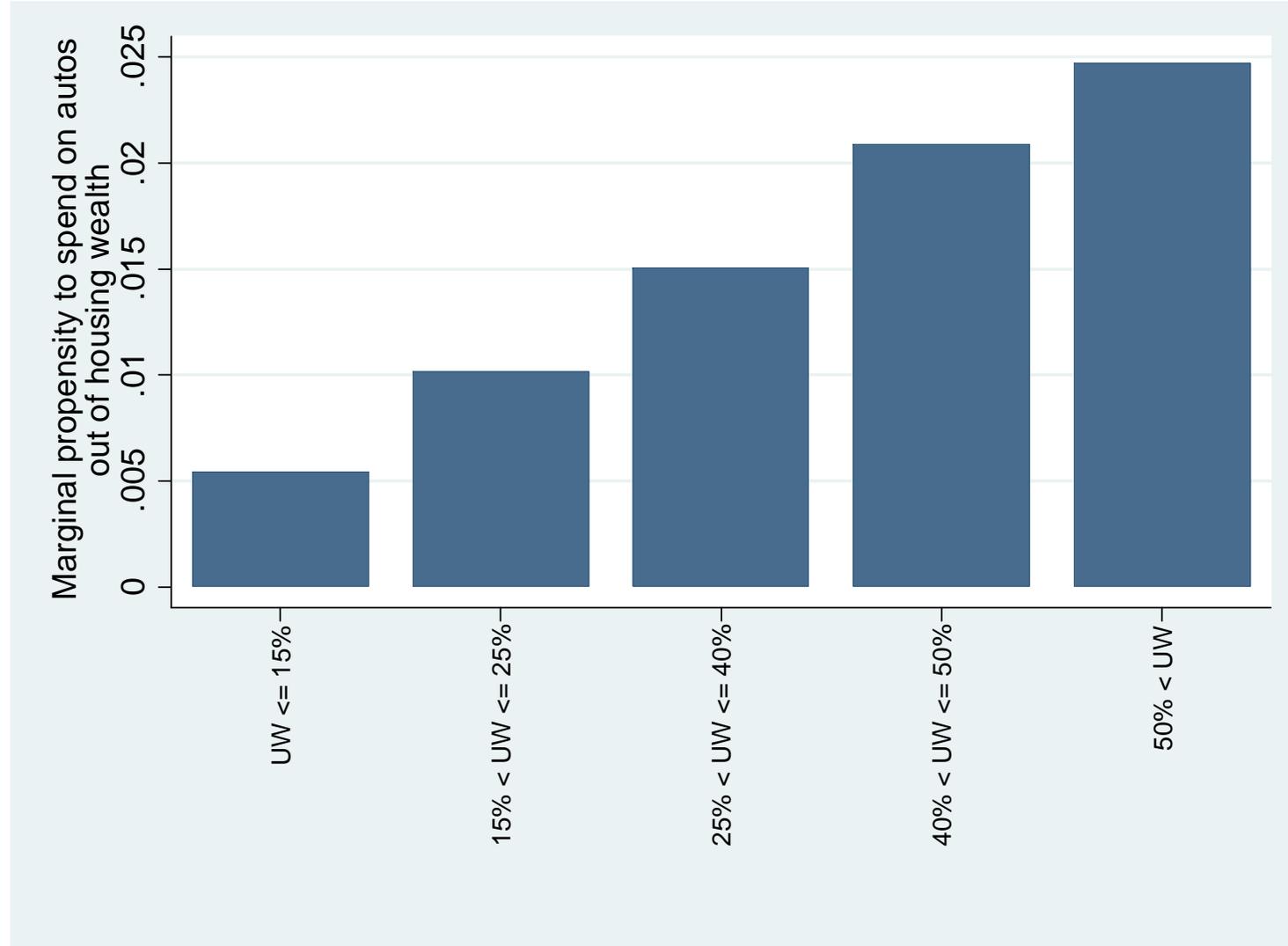
# MPCs Across the Income Distribution



# MPCs Across the Leverage Distribution



# MPCs by Fraction Underwater



## MPCs Vary Substantially!

- We find that MPCs vary substantially by both net worth and leverage
- Interestingly, these two effects are independent
  - Fixing net worth, more leverage leads to higher MPC
  - Fixing leverage, lower net worth leads to higher MPC
- Both lower net worth and higher leverage independently predict households being underwater on their mortgages
- MPC for zip codes with more than 50% underwater is **five times larger** than MPC for zip codes with fewer than 15% under water

## Conclusion

- Household-specific net worth shocks had dramatic effect on spending during the Great Recession
- The effect of housing net worth shocks on spending was much larger for poorer and more levered households
- The distribution of losses matters: if asset price declines concentrate losses on poor and levered households, the effects on spending will be much more severe
- Supports an old idea first put forth by Fisher (1933): debt matters for the macro-economy because of the distribution of losses when asset prices collapse