

Household Finance: The Liability Side

Session Organizer's Introduction

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Objective:

1. Provide introductory facts on household liabilities:
 - Balance sheets
 - Differences across households.
 - Trends in debt and securitization
2. Describe current/potential areas of research:
 - Normative advice to households: Optimal debt choice and management
 - Positive studies of how well households do
 - Asset pricing studies
 - Policy studies.
3. A couple of things I am working on.

Fact 1: Households have a lot of debt

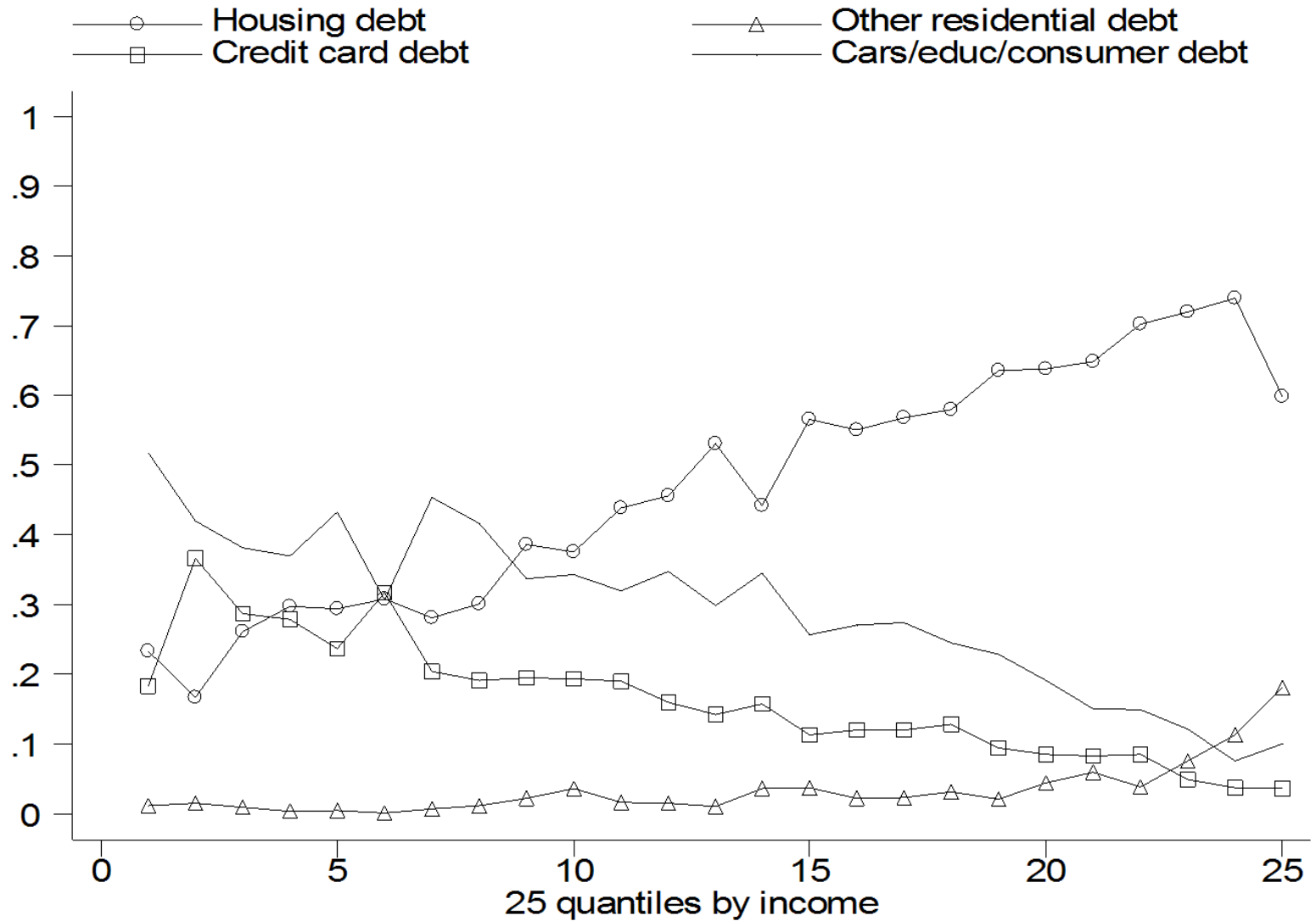
U.S. Flow of Funds Accounts, Household Balance Sheet

	\$ billion				Percent of assets			
	1945	1965	1985	2006	1945	1965	1985	2006
Assets	742	2,868	16,572	68,920	100	100	100	100
Tangible assets	181	913	6,634	26,804	24	32	40	39
Real estate	135	697	5,299	22,642	18	24	32	33
Cons. durables, other	47	217	1,335	4,162	6	8	8	6
Financial assets	560	1,954	9,938	42,115	76	68	60	61
Liabilities	30	352	2,360	13,293	4	12	14	19
Home mortgages	19	219	1,442	9,676	3	8	9	14
Consumer credit	7	97	611	2,438	1	3	4	4
Other	5	35	308	1,180	1	1	2	2
Net worth	711	2,516	14,211	55,626	96	88	86	81

Perspective:

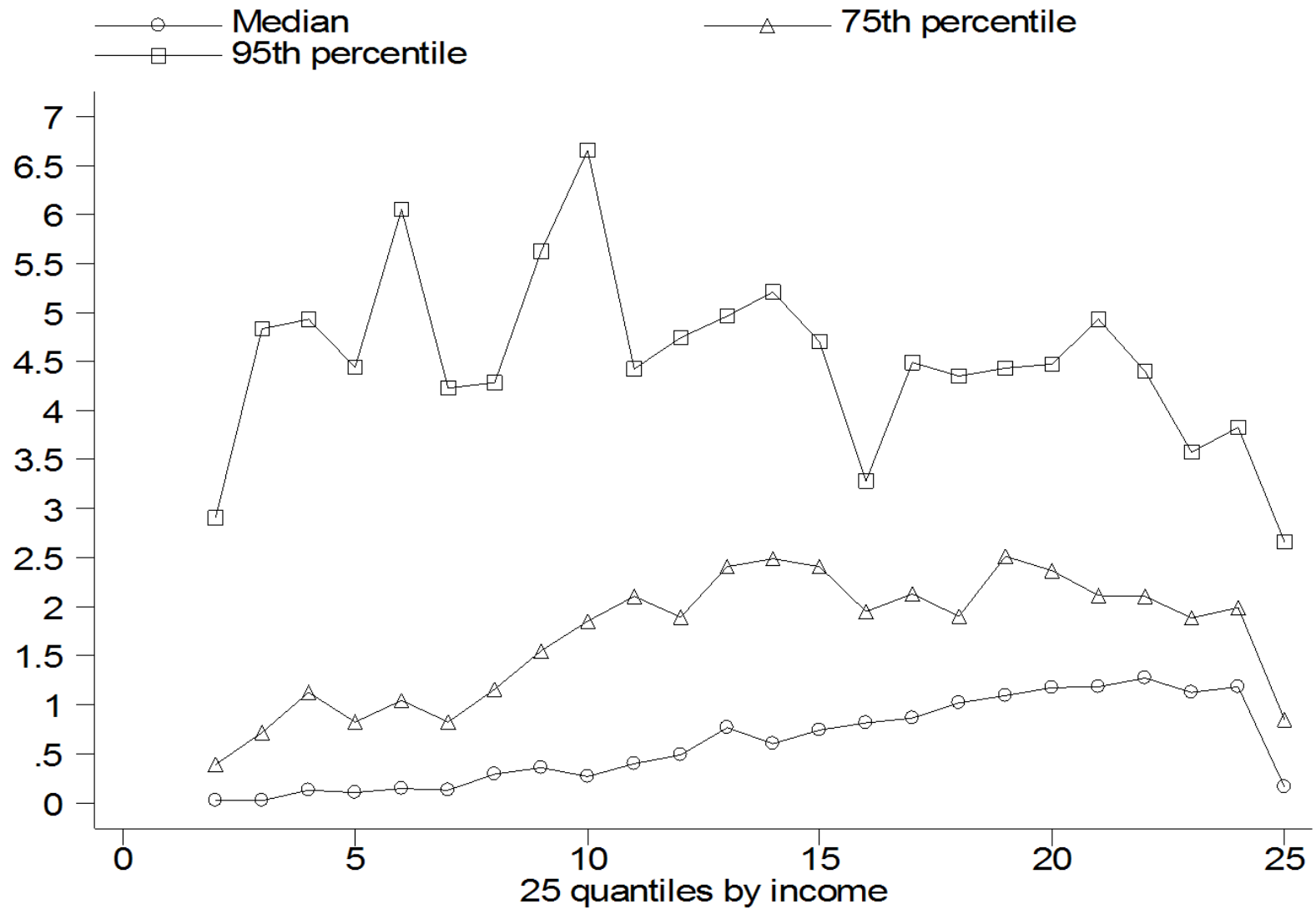
- Mortgages exceed corporate debt in value
- Mortgages far exceed Treasuries in value
- Consumer credit (includes auto loans and student loans) is larger than the private equity industry
- There are more payday lenders in California than McDonalds stores.

Fact 2: Different types of debt matter for different households

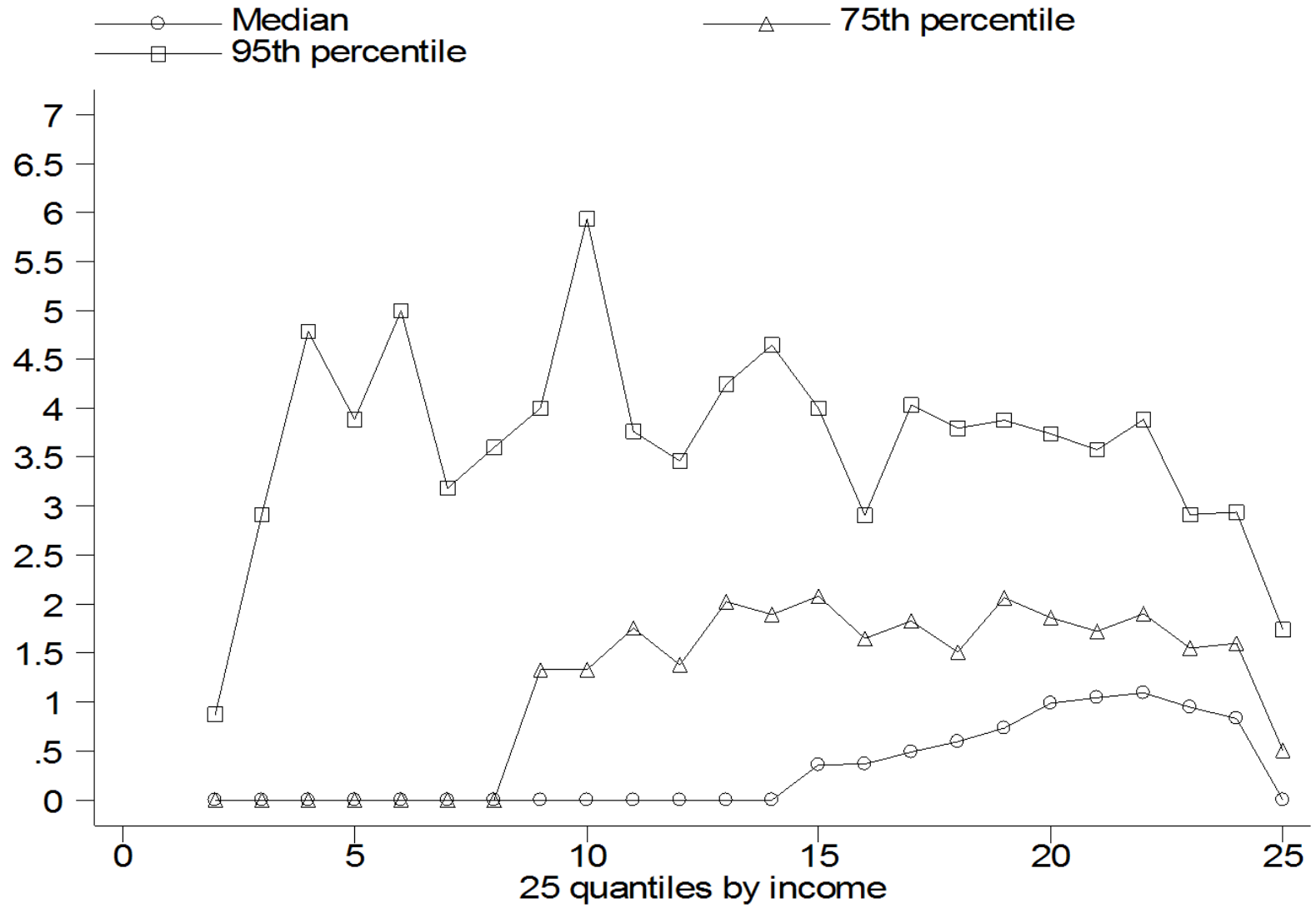


Fact 3: Substantial heterogeneity in indebtedness

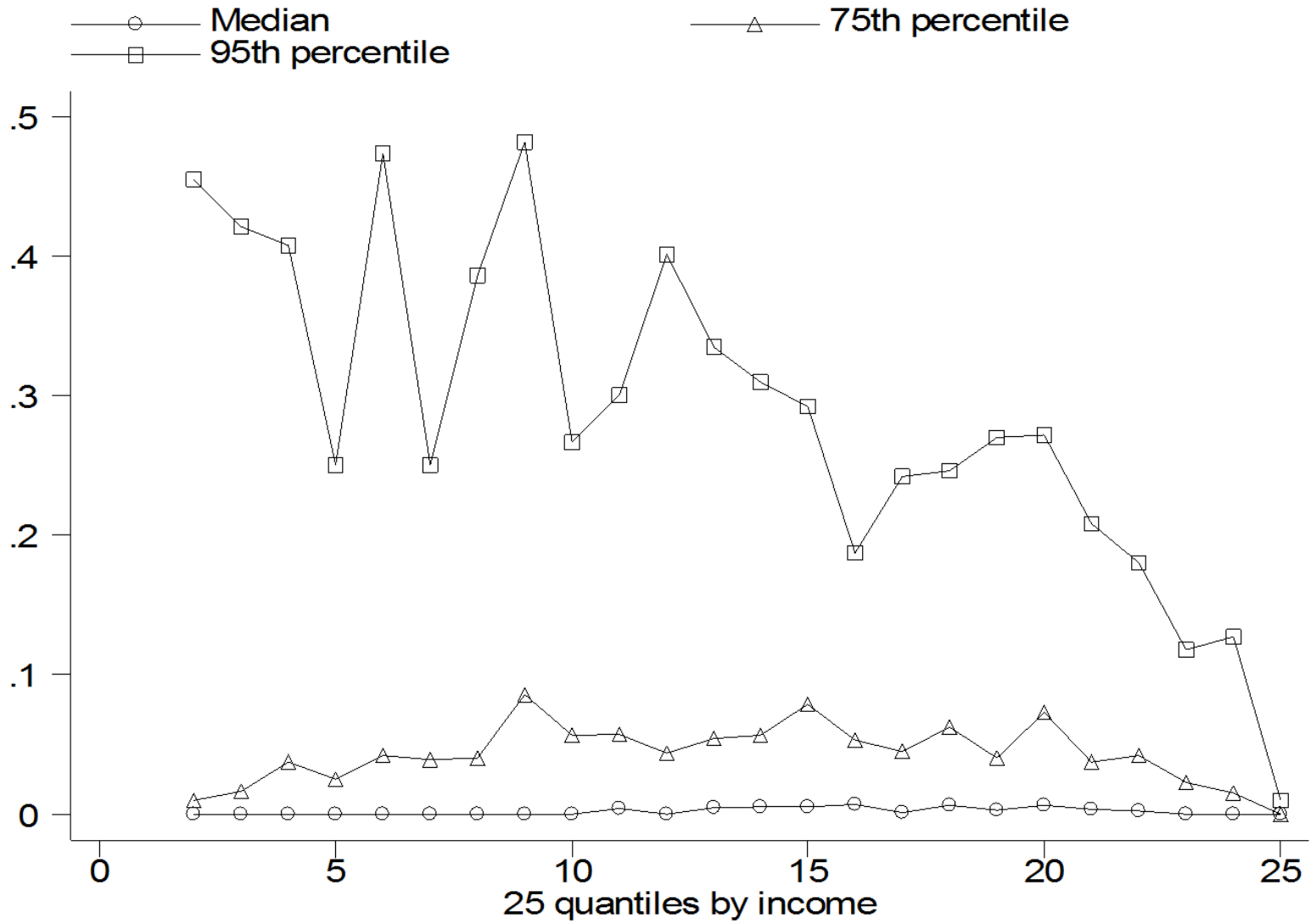
All types of debt



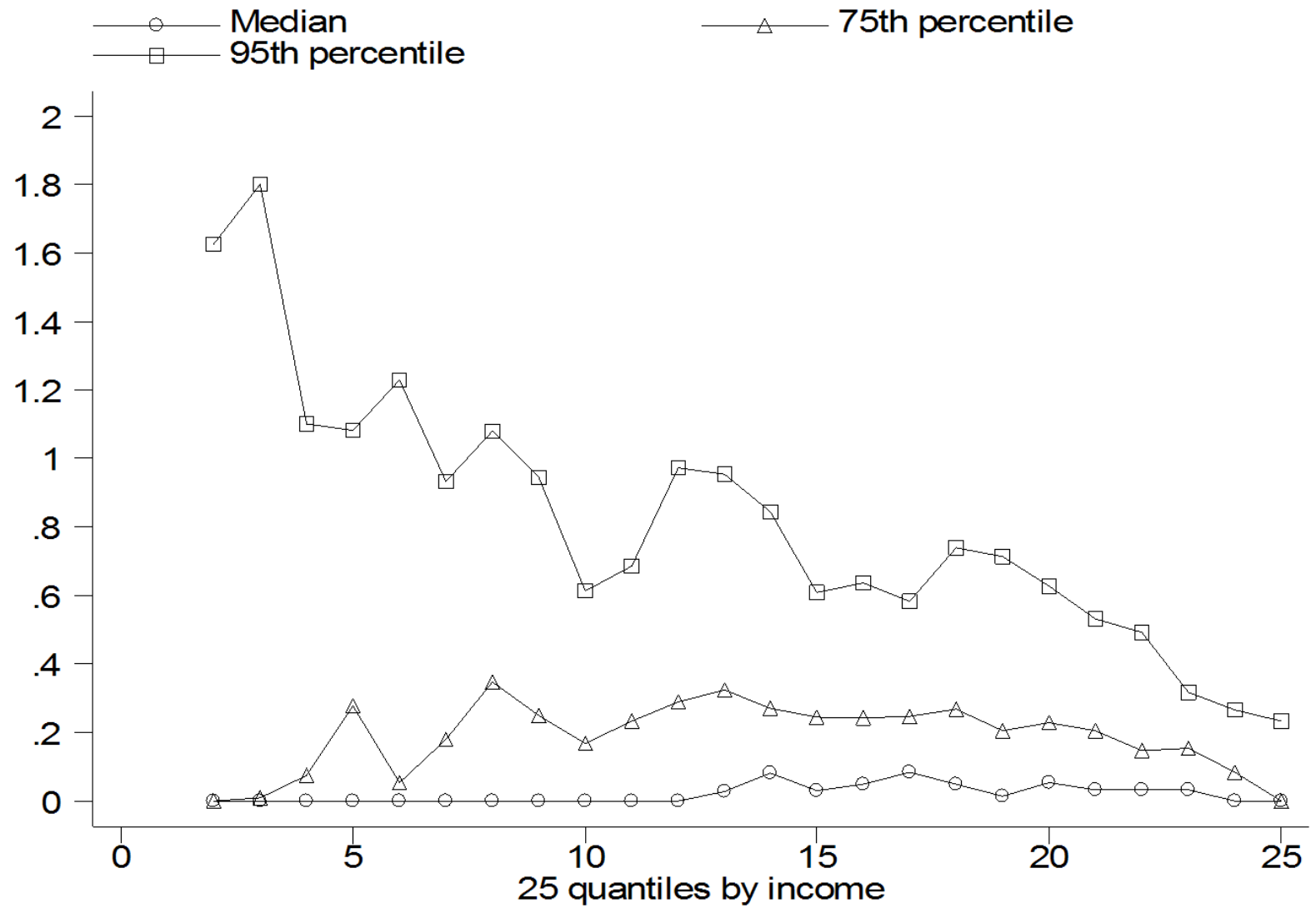
Housing debt



Credit card debt

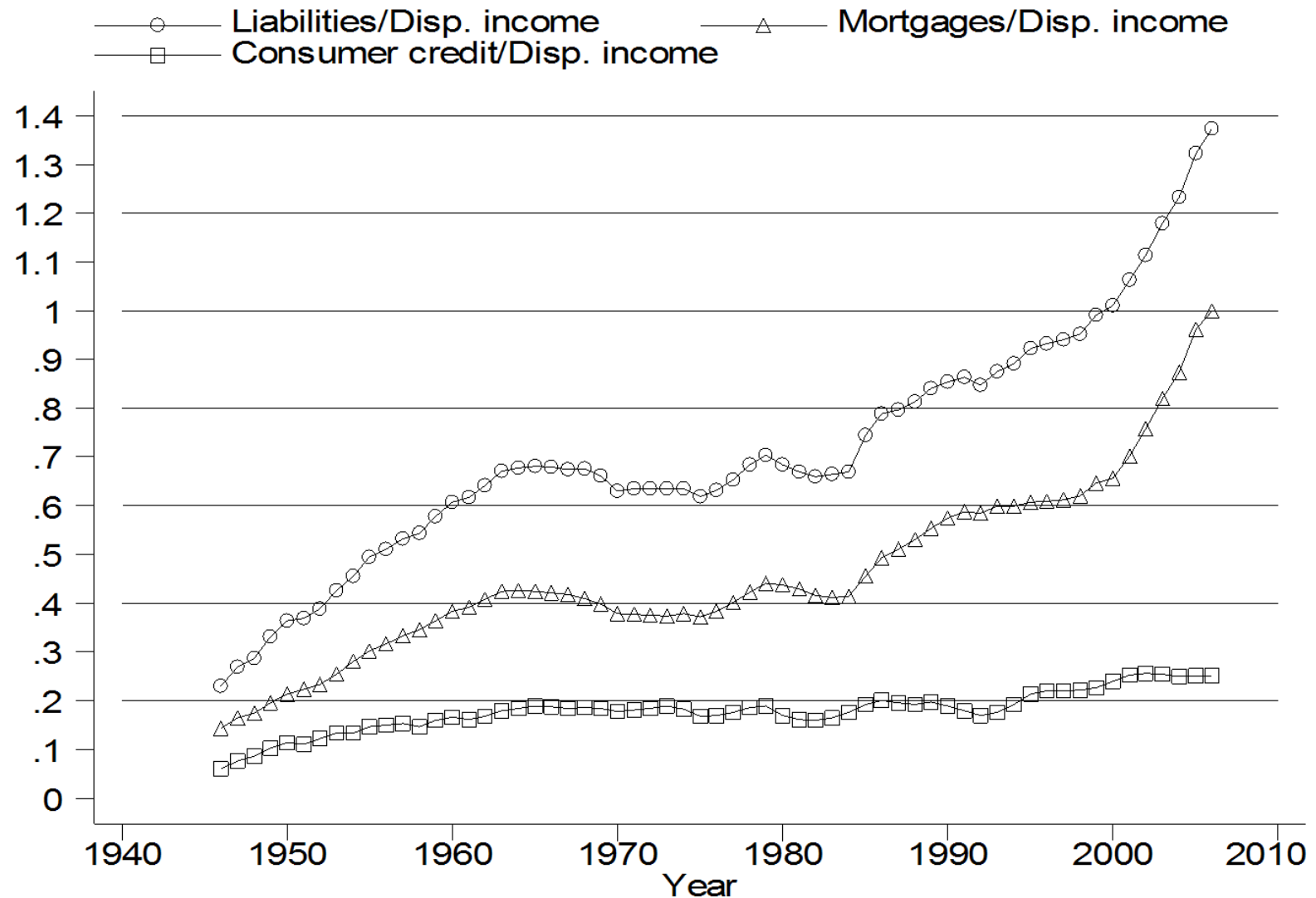


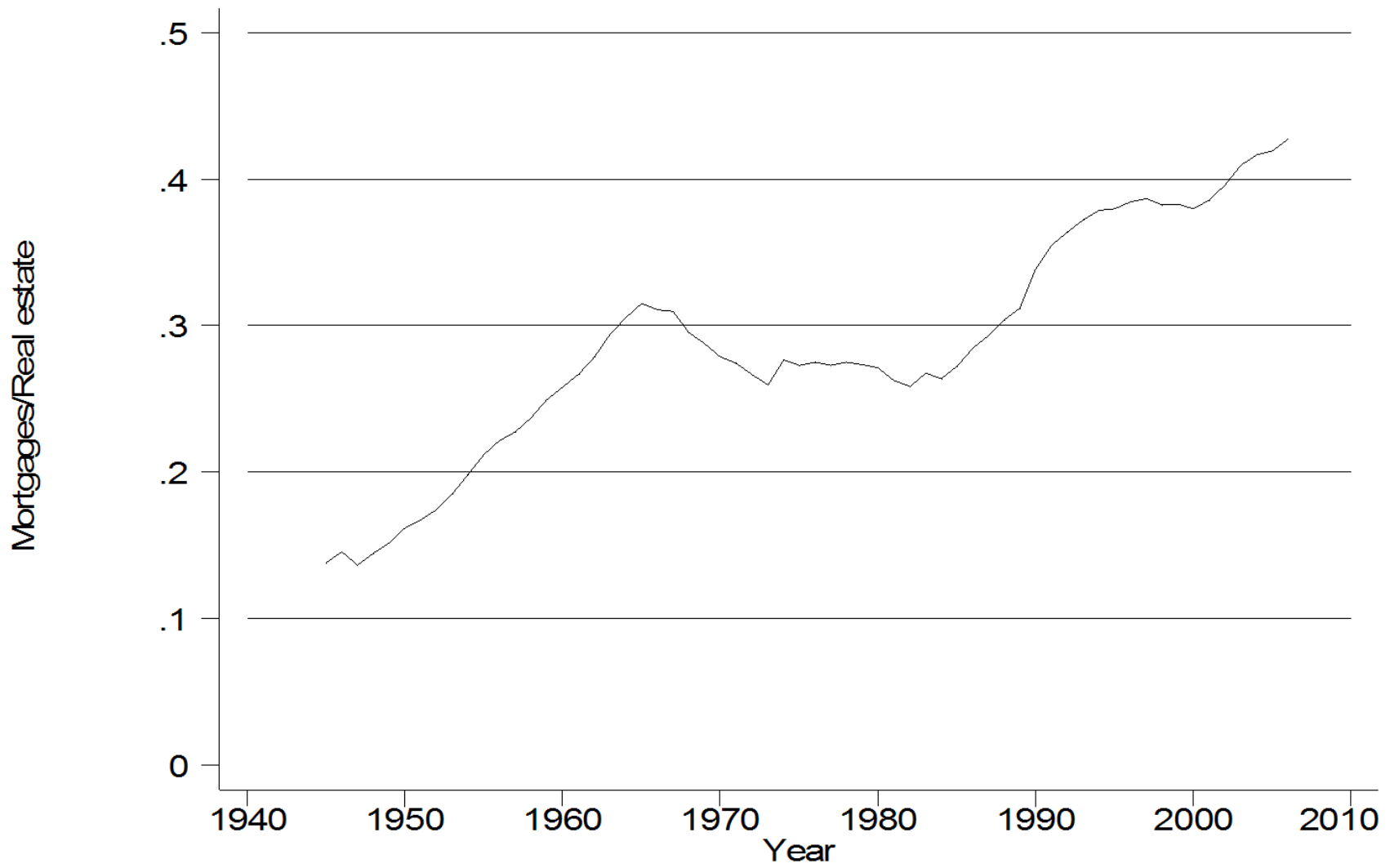
Car/education/consumer debt



Fact 4: Household debt has increased dramatically

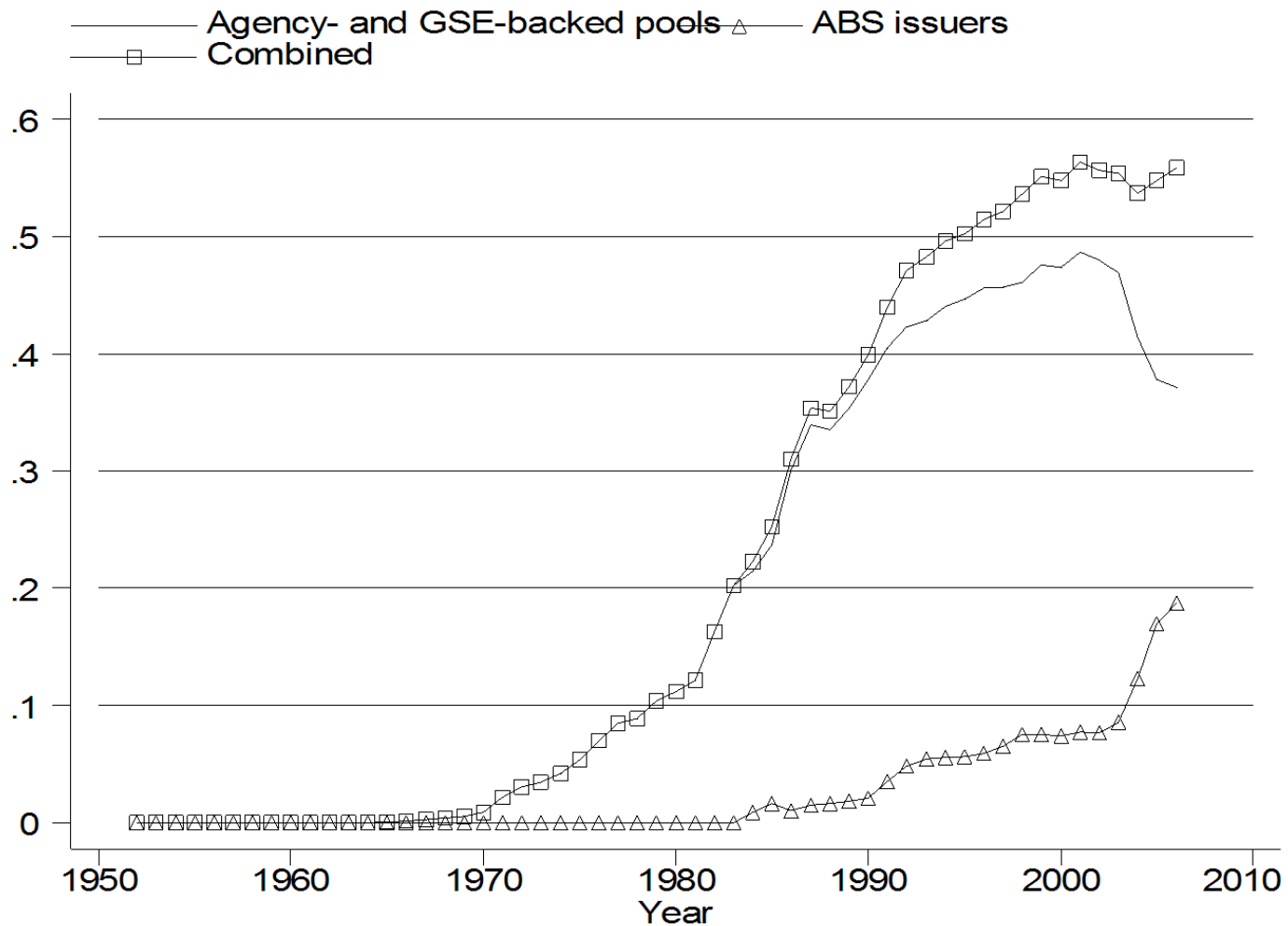
Very strong trends, both in the U.S. and many other countries:



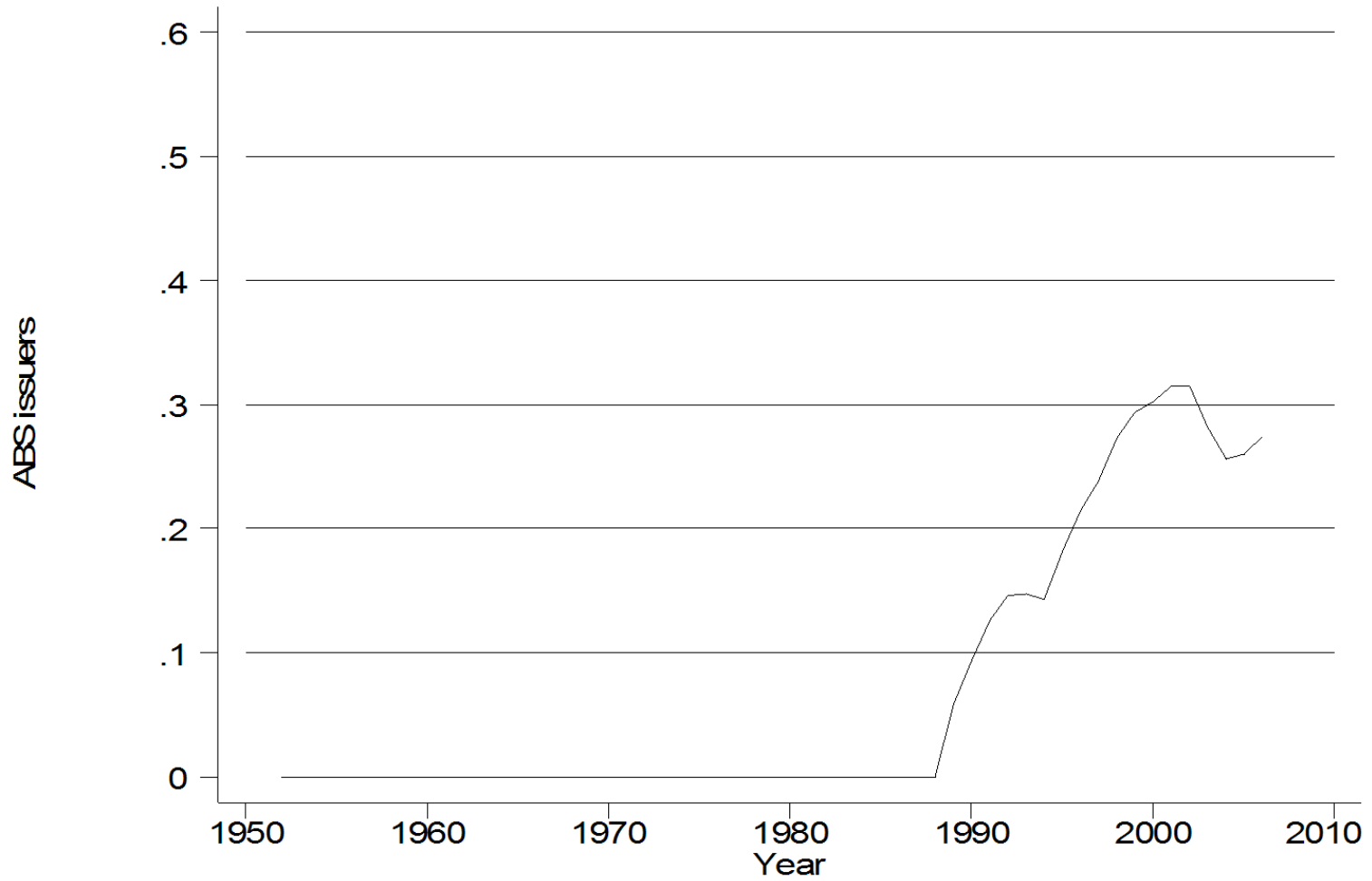


Fact 5: Household debt is increasingly securitized

Fraction of home mortgages owned by...



Fraction of consumer credit owned by ABS issuers



What research areas does this generate from a finance perspective?

1. Normative advice to households on debt choice and management:

- Optimal choice of mortgage type (fixed/variable rate, interest only or not, points/no point)
- Optimal size of down-payments
- Optimal refinancing
- Optimal repayment
- Optimal portfolio choice in the presence of debt.

“The Tradeoff Between Mortgage Prepayments and Tax-Deferred Savings”,
Amromin, Huang and Sialm.

2. Positive studies of how well households do relative to the optimum from baseline models

- Ability to solve complex problems.
- Do some households borrow too much?
- Behavioral biases?

“Interest Rates and Consumer Choice in the Residential Mortgage Market”, James Vickery.

“Payday Lenders: Heroes or Villains?”, Adair Morse.

3. Asset pricing studies necessary for working out the optimal advice:

- What are the "risk-return" features of (real) fixed-rate payments vs. variable-rate payments? How does this change over time?
- How does the pre-payment option affect these features? Do you pay a risk-premium to off-load some of the risk on a fixed-rate mortgage to the lender?

"Mortgage Timing", Kojien, Hemert and van Nieuwerburgh.

4. Asset pricing studies of the impact of boundedly rational behavior/behavior affected by biases on asset prices and returns:

- We already know the impacts are large. Forget stocks. Study mortgage-backed securities/asset-backed securities.
- Are some debt categories more affected?

5. **Asset pricing studies of the impact of securitization (risk sharing) on the cost of borrowing and on house prices.**

6. **Asset pricing studies of the particular features of household debt:**
 - Pricing of mortgage-backed securities: How to value the pre-payment option with suboptimal refinancing
 - What drives the cross-section of expected returns to MBSs and ABSs?
 - Are new pricing factors needed?
 - Is the compensation for taking on risk as in the Treasury market?
 - How can MBS arbitrage strategies be fine-tuned?

7. Policy studies of government intervention in debt markets:

- The cost to tax-payers of the various guarantees provided (against mortgage default, student loan default)
- Impact/desirability of regulating the pay-day loan market
- Impact/desirability of disclosure standards
- Impact/desirability of education standards.

8. Studies of how well markets work in generating efficient/welfare maximizing outcomes:

- Does the market deliberately generate confusion?
- Does securitization lead to too lax lending (too little screening)? Sub-prime loan market...
- Are kick-backs to universities common in return for preferential student loan lender status?

9. **Time-series studies:**

- What were the drivers of increased debt?
 - Sharp reduction in Treasuries/GDP during the 1950s and 1960s
 - Sharp reduction in interest rates since the 1980s
 - Price effects of securitization on interest rates and of banking deregulation
 - Price effects of government subsidies to borrowing
 - Innovation in credit rating systems
 - Increased willingness of households to borrow (post-depression generations)? Less precautionary savings?
- What were the drivers of securitization?

10. **Cross-country studies:**

- Why do mortgage markets differ so much across countries?
- Why is household liabilities/disposable income higher for developed countries?

From a **macroeconomic perspective**, there are also lots of good research questions just based on the trend in borrowing:

- Where did the money come from?
 - Less lending/investment in other sectors?
 - Funding from abroad? Relation to decreasing savings rates and current account deficits.
- How does increased access to credit impact the effectiveness of fiscal and monetary policy?
- How does increased access to credit impact the business cycle?
 - Home equity as “fuel”
 - Ability to consumption smooth.

A couple of things I am working on:

- A costly mistake: Repaying mortgage debt too slowly
- The cross-section of expected returns on fixed-rate mortgage-backed securities.

Table 1. Loss from not using "excessive" liquid asset holdings to repay mortgages

Assumption about liquid assets needed	For US homeowners with mortgage/heloc debt			For US homeowners with mortgage/heloc debt who make mistake				
	Liquid assets needed, mean (median)	Aggr. liquid assets holdings	Aggr. mortgage and heloc debt	Liquid asset holdings, mean (median)	Other accessible fin. asset holdings, mean (median)	Less accessible fin. assets holdings, mean (median)	Aggregate loss from making mistake	Aggr. debt repayment needed to avoid loss
	\$K	\$B	\$B	\$K	\$K	\$K	\$B	\$B
	Survey of Consumer Finances, 2004							
Households' estimate of savings needed for emergencies	21 (5)	1,299	6,607	43 (15)	80 (0)	131 (43)	21.5 (25.7)	577
max(3 mo of hh income,\$10K)	23 (15)	1,299	6,607	93 (45)	150 (6)	171 (56)	16.3 (20.7)	443
max(6 mo of hh income,\$20K)	47 (31)	1,299	6,607	147 (71)	198 (16)	188 (69)	10.2 (14.8)	280
Survey of Consumer Finances, 2001								
Households' estimate of savings needed for emergencies	29 (6)	1,467	4,406	59 (15)	110 (3)	143 (50)	20.6 (24.0)	517
max(3 mo of hh income,\$10K)	24 (16)	1,467	4,406	121 (48)	169 (20)	198 (70)	16.2 (19.5)	408
max(6 mo of hh income,\$20K)	49 (31)	1,467	4,406	192 (81)	213 (35)	210 (74)	10.5 (14.2)	264
Survey of Consumer Finances, 1998								
Households' estimate of savings needed for emergencies	22 (5)	891	3,443	41 (11)	86 (2)	109 (38)	15.1 (17.4)	309
max(3 mo of hh income,\$10K)	20 (13)	891	3,443	86 (34)	161 (15)	161 (64)	11.3 (13.7)	239
max(6 mo of hh income,\$20K)	39 (27)	891	3,443	147 (60)	226 (30)	185 (72)	6.9 (9.4)	145

Liquid assets=Checking accounts + savings accounts + money market accounts (incl. money market MFs) + call accounts at Other accessible financial wealth=CDs + non-money market mutual funds + stocks + bonds, all held outside retirement accounts. Less accessible financial wealth=All holdings in retirement plans + savings bonds + cash value of life insurance + annuities and trusts + other financial assets (e.g. loans from the household to someone else).

Table 2. Distribution of potential interest savings across households

(all statistics are calculated using SCF survey weights)

Assumption about liquid assets needed	Fraction of home owners making the mistake	Fraction of homeowners with mortgage/ heloc debt making the mistake	Potential dollar interest savings (\$)					
			1st pctile	10th pctile	Median	90th pctile	99th pctile	Mean
Survey of Consumer Finances, 2004								
Households' estimate of savings needed for emergencies	33.82%	48.69%	4	33	258	2,001	8,553	821
max(3 mo of hh income,\$10K)	13.80%	19.87%	10	77	779	3,960	12,219	1,521
max(6 mo of hh income,\$20K)	6.91%	9.94%	25	265	980	4,586	12,301	1,901
Survey of Consumer Finances, 2001								
Households' estimate of savings needed for emergencies	30.11%	45.54%	5	25	297	2,418	7,853	948
max(3 mo of hh income,\$10K)	13.91%	21.04%	8	102	740	4,080	12,054	1,615
max(6 mo of hh income,\$20K)	7.28%	11.02%	13	111	981	4,783	17,211	1,998
Survey of Consumer Finances, 1998								
Households' estimate of savings needed for emergencies	27.14%	41.69%	4	19	264	1,830	7,935	817
max(3 mo of hh income,\$10K)	11.73%	18.02%	13	64	582	3,364	10,664	1,422
max(6 mo of hh income,\$20K)	5.59%	8.59%	13	68	870	4,486	12,328	1,803

Table 3. Types of debt held by households making the mistake

(all statistics are calculated using SCF survey weights)

	SCF 2004	SCF 2001	SCF 1998
	\$B	\$B	\$B
Total debt	1,991	1,320	920
Housing debt (mortgages and home equity lines of credit, on principal residence)	1,574	1,098	704
Debt for other residential property (not including principal residence)	255	112	107
Credit card debt	22	11	10
Installment loans (including auto loans, consumer loans, and education loans)	102	73	62
Other debts (lines of credit, loans against pensions or life insurance, margin loans)	37	25	36

Note: This table assumes liquid assets needed are max(3 months of hh income,\$10K).

Preliminary findings on the cross-section of expected returns on fixed-rate mortgage-backed securities

- Like Treasuries, except for pre-payment risk (important) and default risk (important in sub-prime market).
- Pre-payments are driven by: Refinancings, home sales (including foreclosures), and curtailment (hh's paying off ahead of schedule).
- In turn driven by:
 - Macro variables: Interest rates, house prices, job turnover
 - Mortgage specific variables: Years since issue, mortgage size, initial loan-to-value ratio etc.
 - Borrower specific variables: Credit score of borrower, education, income, refinancing costs etc.

So....

- What drives the cross-section of expected returns for MBSs? Just Treasury returns, or something more?
- Is the compensation for taking on risk as in the Treasury market?
- Are new pricing factors needed?

New data set on returns from Lehman Brothers, 1992-2005

Table 1. Panel A. Average excess returns on 20 maturity and price-sorted MBS portfolios, annualized, 1992-2005

			Price<98	98<=Price<100	100<=Price<102	102<=Price	Low Price- High Price
MBS Conventional	Maturity	15	3.08	2.58	2.79	1.90	1.18
		30	3.93	3.23	2.87	1.99	1.94
GNMA	Maturity	15	<i>1.93</i>	<i>2.53</i>	<i>2.65</i>	<i>2.00</i>	
		30	4.11	3.83	3.32	2.10	2.01
MBS Ballons	Maturity	Not stated	<i>1.47</i>	<i>2.34</i>	<i>2.05</i>	<i>1.01</i>	
		Column avg.	2.90	2.90	2.74	1.80	

Note: Portfolios for which 10 or more quarters of data have no content are indicated with small italics and dropped in what follows.

Note: GNMA and MBS Conventional are distinct categories (i.e. do not contain any of the same securities).

Table 1. Panel B. Standard deviation of excess returns on 20 maturity and price-sorted MBS portfolios, annualized, 1992-2005

			Price<98	98<=Price<100	100<=Price<102	102<=Price	Low Price- High Price
MBS Conventional	Maturity	15	8.63	7.29	6.81	4.31	4.32
		30	9.86	8.27	8.06	4.40	5.46
GNMA	Maturity	15	7.41	7.49	6.74	4.68	2.73
		30	10.53	8.04	8.46	4.42	6.11
MBS Ballons	Maturity	Not stated	6.64	6.10	5.62	3.78	2.86
		Column avg.	8.61	7.44	7.14	4.32	

Table 1. Panel C. Average duration on 20 maturity and price-sorted MBS portfolios, 1992-2005

			Price<98	98<=Price<100	100<=Price<102	102<=Price
MBS Conventional	Maturity	15	3.87	3.64	3.14	1.97
		30	5.07	4.32	3.75	2.17
GNMA	Maturity	15	3.92	3.66	3.40	2.21
		30	5.44	4.82	4.30	2.38
MBS Ballons	Maturity	Not stated		2.61	2.30	1.34
		Column avg.	4.58	3.81	3.38	2.01

Table 2. Models of the cross-section of expected returns on 6 Treasury portfolios quarterly data, 1992-2005

Factor or characteristic	Lambda			
	(1)	(2)	(3)	(4)
Beta on $r_{10y,t} - r_{1mo,t}$	0.0106 (11.47)	0.0083 (7.05)	0.0083 (5.46)	
Beta on $r_{2y,t} - r_{1mo,t}$		0.0012 (1.74)	0.0013 (0.63)	
Beta on $r_{30y,t} - r_{1mo,t}$			0.0130 (0.0037)	
Average duration over sample				0.0010 (12.73)
Intercept	0.0009 (1.14)	0.0029 (2.81)	0.0028 (1.26)	0.0029 (5.18)
Observations	6	6	6	6
Cross-sectional avg. of $ \alpha $	0.0021	0.0017	0.0012	
Cross-sectional R2	0.971	0.989	0.989	0.976

Note: The Treasury portfolios are from Lehman Brothers and have the following maturities: 1-3 years, 3-5 years, 5-7 years, 7-10 years, 10-20 years, and 20+ years.

Table 3. Models of the cross-section of expected returns on 17 maturity and price-sorted MBS portfolios, quarterly data, 1992-2005

Second stage Factor	Lambda (t-stat)						
	(1)	(3)	(3)	(4)	(5)	(6)	(7)
Beta on (r10y,t-r1mo,t)	0.0167 (10.00)	0.0166 (10.49)	0.0135 (5.09)	0.0096 (8.27)	0.0134 (5.44)	0.0135 (5.70)	
Beta on (r2y,t-r1mo,t)		0.0060 (5.08)	0.0045 (2.88)		0.0042 (2.55)		
Beta on (r30y,t-r1mo,t)			0.0232 (6.31)		0.0232 (5.55)		
Beta on (r30y,low,t-r30y,high,t)				0.0050 (9.82)	0.0052 (8.79)		
Characteristic							
Variance of residual in first stage of 1-factor model						7.342 (1.79)	
Average duration over sample							0.0017 (20.61)
Intercept	0.0006 (1.02)	-0.0008 (-0.69)	0.0009 (0.55)	0.0008 (1.26)	0.0011 (0.71)	0.0010 (1.63)	0.0011 (3.71)
Observations	17	17	17	17	17	17	17
Cross-sectional avg. of alpha	0.0035	0.0020	0.0019	0.0019	0.0016		
Cross-sectional R2	0.870	0.890	0.905	0.901	0.915	0.894	0.966

r30y,low,t is the quarterly return on the portfolio of MBS Conventional with maturity 30 years and price<98.

r30y,high,t is the quarterly return on the portfolio of MBS Conventional with maturity 30 years and price>=102.

Note: Duration data are missing for various quarters and not the same for each portfolio.

The number of quarters with duration data varies from 31 to 54 across the 17 portfolios.

**Table 4. Duration as driver of both interest rate risk and pre-payment risk for
17 maturity and price-sort MBS portfolios, quarterly data, 1992-2005**

Dependent variable:	Beta on (r10y,t-r1mo,t)	Beta on (r30y,low,t-r30y,high,t)
	(1)	(2)
	Coefficient	Coefficient
	(t-stat)	(t-stat)
Average duration over sample	0.064 (2.17)	0.198 (3.43)
Intercept	0.292 (2.80)	-0.447 (-2.18)
Observations	17	17
Cross-sectional R2	0.239	0.439

