Modigliani Meets Minsky: The Great American Debt Boom, 1949-2016

Alina Bartscher[†] Moritz Kuhn[‡]
Moritz Schularick[¶] Ulrike Steins[✠]

[†] University of Bonn
[‡] University of Bonn, CEPR
[¶] University of Bonn and New York University
[✠] University of Bonn

How and why did U.S. household debt rise from 15% of income in 1946 to more than 100% in 2007?

Survey of Consumer Finances 1949 - 2016

- Historical SCF files so far not systematically coded
- Major harmonization exercise: extract detailed data on income, assets, and debt
- Result: comprehensive annual dataset 1949-2016
- Particularly good picture of the "bottom 90%"

Codebook of 1950

Column Number	
1-2	Study Number (59)
3	Card Number (5)
4-7	Interview Number
8-10	Income (of S.U.) from wages and salaries (for non self-employed onl

000. 'No income from wages and salaries $199,949
Y00. Wage and salary income exceeds ~~$99,949~~ (record in y book)
X00. Wage and salary income not ascertained
00X. Not ascertained whether had wage and salary income in 1949
00Y. Income from wages and salaries less than $50

11 Income of S.U. from roomers and boarders, excluding from related secondaries

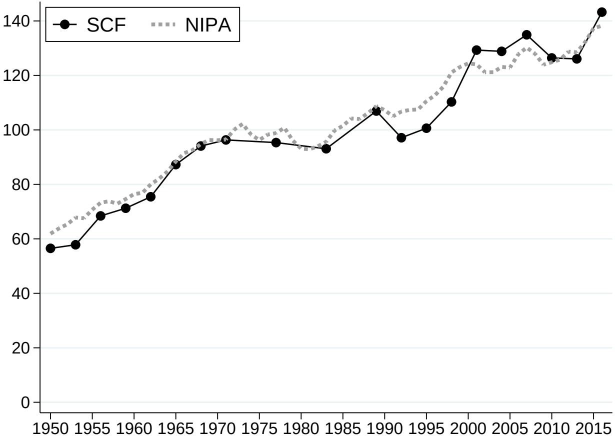
1. $1 - 99
2. $100 - 499
3. $500 - 999
4. $1000 - 1999
5. $2000 - 2999
6. $3000 - 4999
7. $5000 - 9999
8. $10,000 and over

0. No income from this source
Y. N.A. whether income from this source
X. Income from this source, N.A. amount

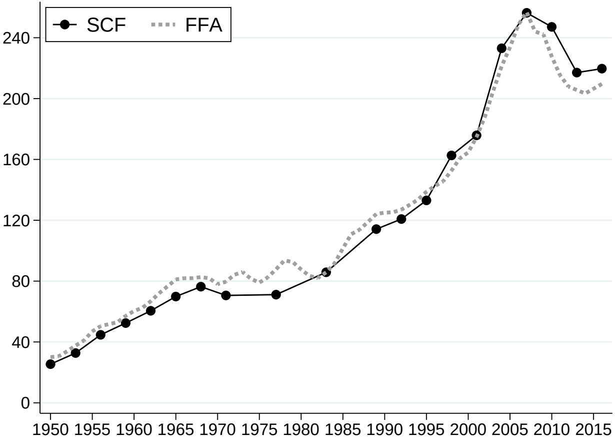
12 Income of S.U. from other rent

1. $1 - 99
2. $100 - 499
3. $500 - 999
4. $1000 - 1999

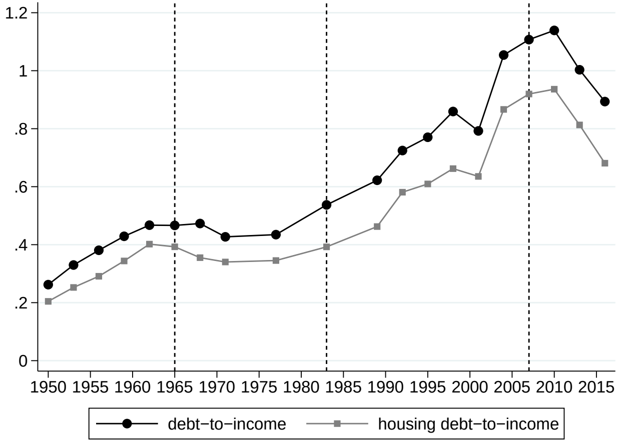
Aggregate trends: income



Aggregate trends: debt



It’s all about housing debt



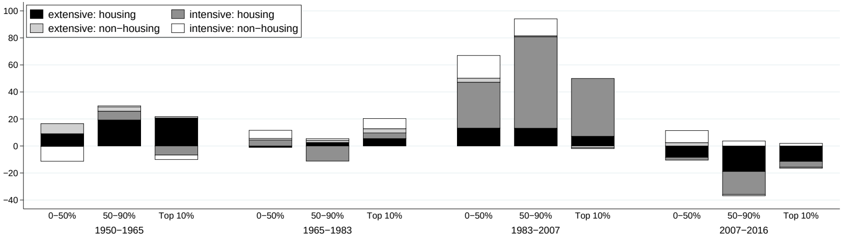
Mortgages account for 2/3 of total debt increase

Table: Decomposition of the increase in aggregate debt-to-income ratios between 1950 and 2013

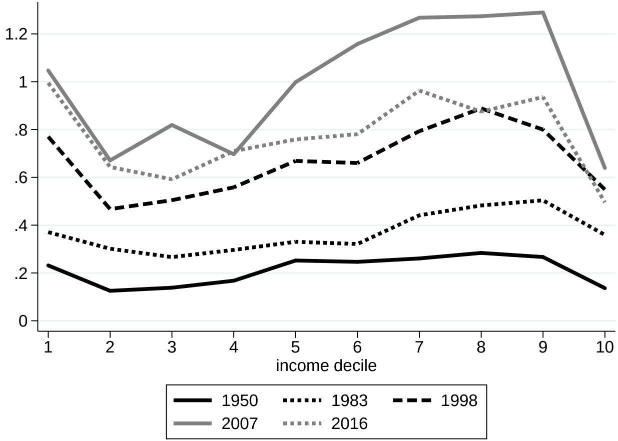
Extensive margin	housing debt	**21.7**
	non-housing debt	9.6
Intensive margin	housing debt	**33.3**
	non-housing debt	17.8
	total increase	82.4

Percentage point change in aggregate debt-to-income between 1950 and 2016.

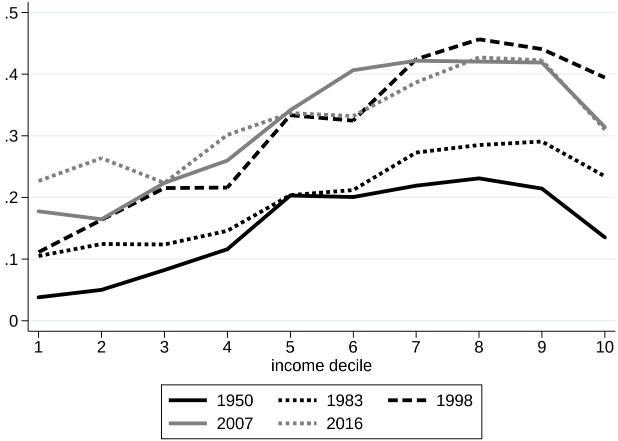
The four phases



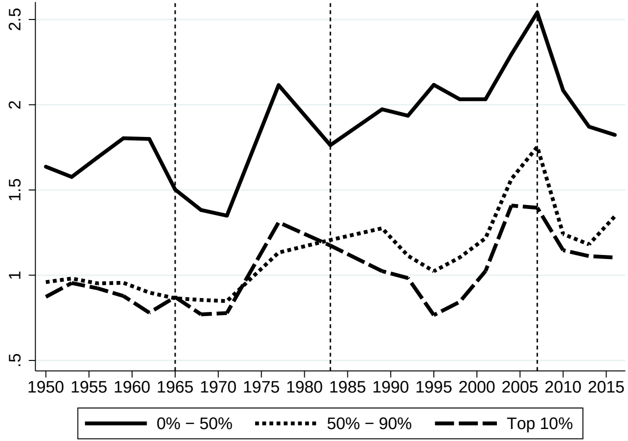
Housing debt to income ratios



Loan to value ratios



Home equity to income

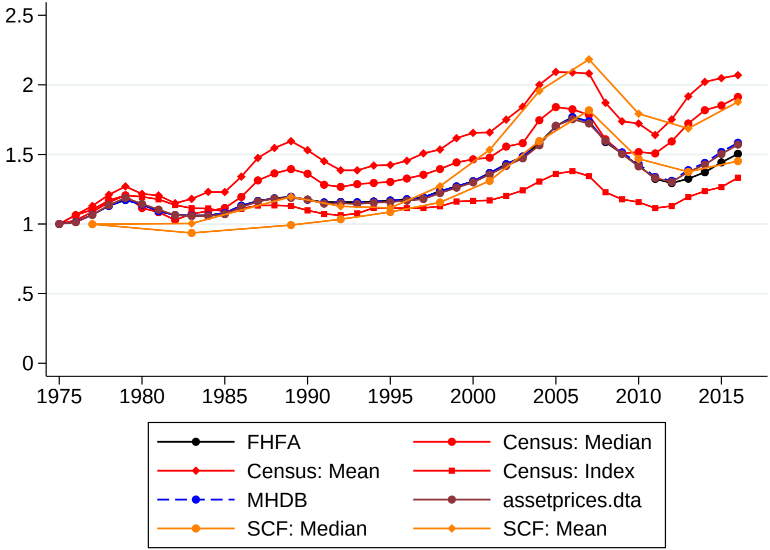


Summary

- Sharply higher debt-to-income ratios, increasingly concentrated among households in 50 to 80th percentile of the income distribution
- Substantial increases in aggregate loan-to-value ratios, with somewhat faster increases for households in the middle and lower part of the income distribution
- Stable home equity positions over time and across the distribution

A framework to think about household debt dynamics

Real house prices



House prices and debt dynamics

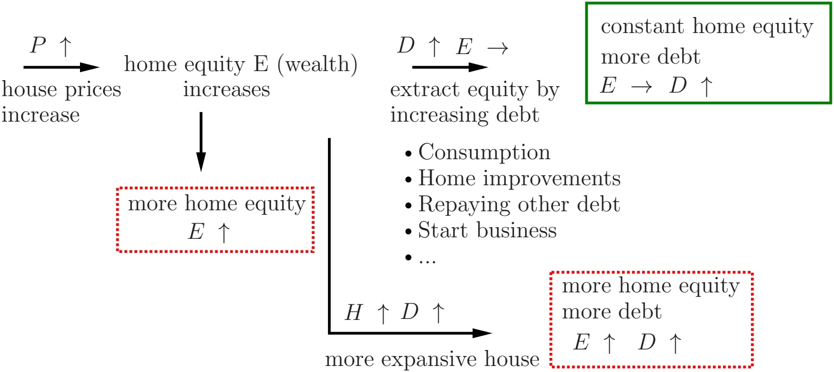
1950	Housing	**100**
	Equity	80
	Debt	20
	Loan to value	0.2
2007	Housing	**150**
	Equity	80
	Debt	70
	Loan to value	0.45

Debt/income rises by 3.5x and LTVs by 2x

“Modigliani”

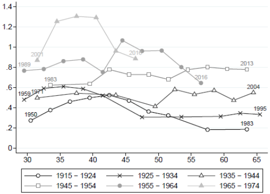
- Faced with an unexpected and permanent increase in wealth, life-cycle households will smooth consumption;
- As housing is indivisible, the adjustment margin is debt (home equity withdrawal, cash-outs)
- Even relatively modest increase in house prices will lead to considerable debt increases and rising LTVs
- The postwar household debt boom is a reaction to higher house prices
- Over time, this makes the economy more fragile and sensitive to asset price fluctuations (Minsky)

The mechanism

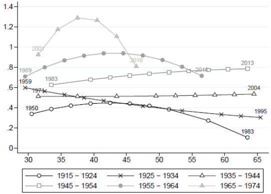


Evidence from birth-cohorts

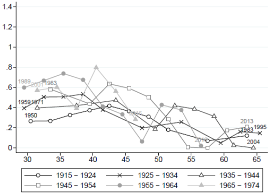
(a) housing debt-to-income



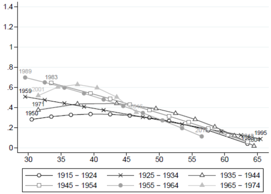
(b) housing debt-to-income (smoothed)



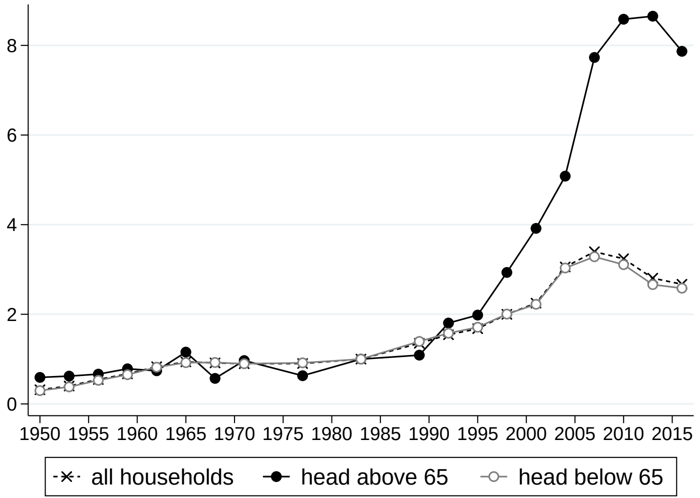
(c) counterfactual housing debt



(d) counterfactual housing debt (smoothed)



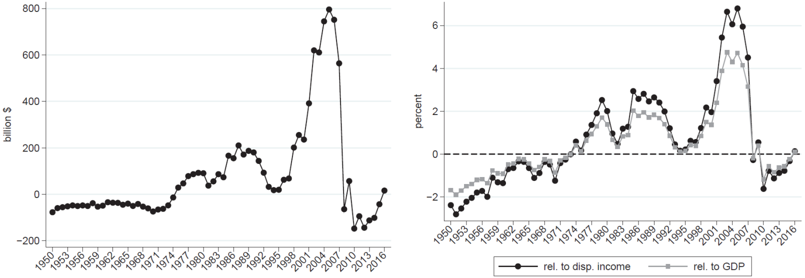
Ageing of debt



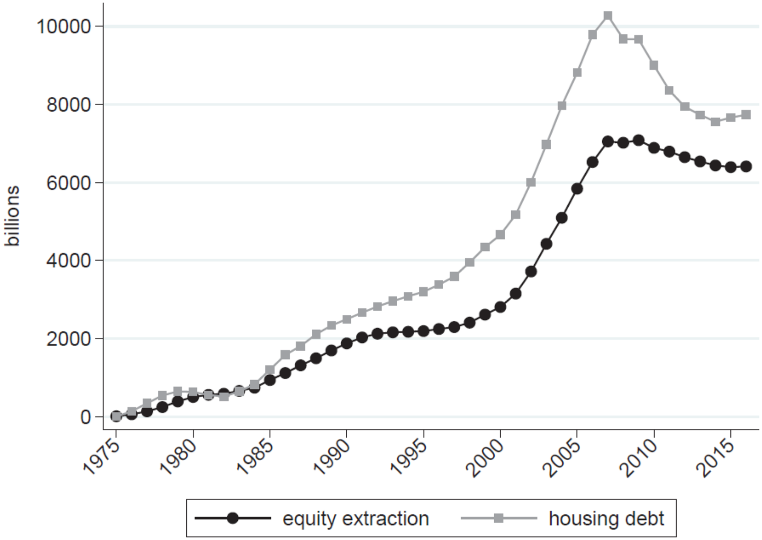
Evidence for HEW

Figure 1: *HEW from FFA, following Klyuev and Mills (2007)*

(a) Levels **(b)** Relative to Income



Evidence for HEW

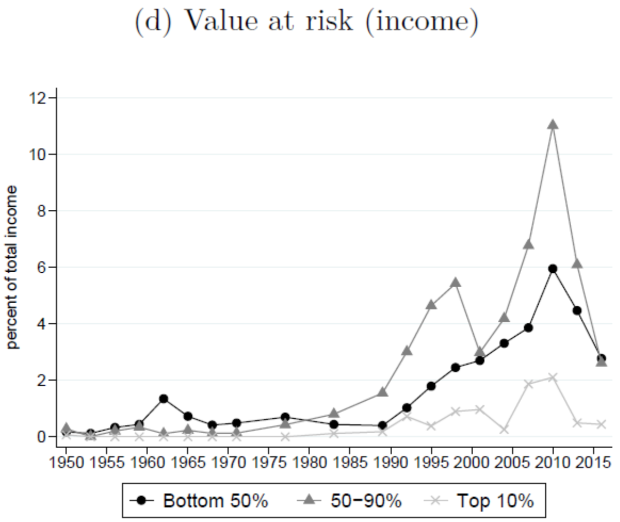


From Modigliani to Minsky

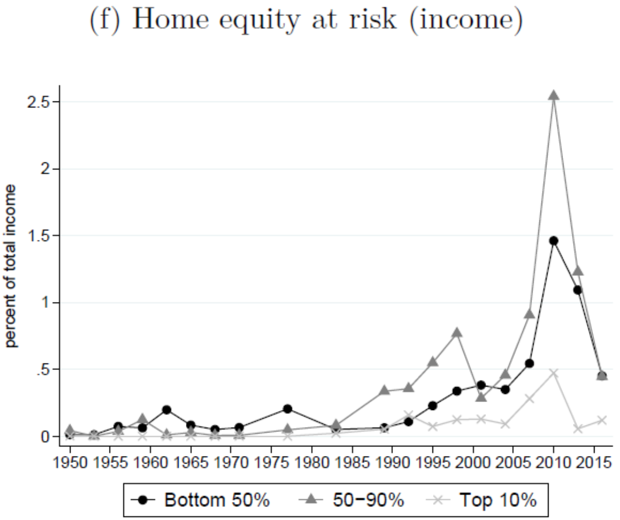
Financial fragility

- Track growing sensitivity of economy to asset price changes
- We stress-test household balance sheets with a 20% exogenous house price decline
- Households are assumed to be “at risk” if they have negative home equity and a debt-service-to-income ratio exceeding 50%
- Key result: owing to higher LTVs and debt, the sensitivity to asset price fluctuations has grown strongly

Notional mortgage value at risk



Home equity at risk



Conclusions

- When real house prices rise, home-owning households become richer
- Without a change in savings behavior, households want to increase consumption
- Owing to indivisibility of housing, they will increase debt
- This mechanism accounts for a large part of the post-WW2 debt increase
- Increasing leverage makes the entire economy endogenously more vulnerable