Household Debt and Inequality in the United States, 1950-2019

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Banca d'Italia

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Motivation

- U.S. household debt grew 4-fold relative to income since the end of WWII
- Ongoing debate about potential drivers of debt boom goes to the heart of theories on savings behavior
    1. Standard theory postulates positive relationship between permanent income and debt
    2. Debt boom explanations link stagnant incomes and rising inequality to indebtedness implying a negative relationship
    3. Debt increase reaction to asset markets and capital gains and independent of individual income growth
- What role does household debt accumulation play for consumption and savings decisions?

Contribution

- Use novel long-run household data on income, assets, and debt to address driving forces of the debt boom
- Comprehensive history of U.S. household debt and its distribution since 1950 (SCF+)
- Contrast income and debt trends by income, age, and education
- Quantify the role of capital gains and home equity extraction for debt boom
- Document secular shift of life cycle of debt and inter-generational differences in debt growth and equity extraction

Results

- Lockstep growth of income and debt until 1970s and broad-based decoupling since then
- Despite stagnant incomes, American middle class (50%-90%) main contributor to the debt increase since 1950
- After 1980, home equity extraction driver of debt accumulation but middle class was never wealthier than at peak of debt boom
- Babyboom generation (1945-1954) with most home equity extraction over time
- Debt accumulation and capital gains have become an integral part of household savings decisions in the 21^{st} century

SCF+ Data

- SCF+ data combine historical **Survey of Consumer Finances** (1949-1977) with modern SCF data (1983-2019)
- Household-level data on joint distribution of income, debt, and wealth
- Detailed household balance sheet information on different asset and debt classes
- Micro data consistent with macro trends

Project # 42 -4- Card III

Col. No.

23-27 Income from wages and salaries: (Add amounts entered after questions 33, 34, 35) (in farm schedule, item 44a)

Code the amount in dollars

00000. No income from wages and salaries
Y0000. Income from wages and salaries exceeds $99,999
X0000. Income from wages and salaries not ascertained (code here if Schedule II contains only a total at the bottom of the page)

28 - Income from wages and salaries, in class intervals:

1. $1-$499
2. $500-$999
3. $1,000-$1,999
4. $2,000-$2,999
5. $3,000-$3,999
6. $4,000-$4,999
7. $5,000-$7,499
8. $7,500-$9,999
9. $10,000 and over

0. No income from wages and salaries

X. Income from wages and salaries not ascertained

29 Did you (R and SU) receive any money from interest, dividends, rents, trust fund, or royalties? (Question 37) (Farm Schedule 44b)

1. Yes, recieved income from this source; less than $100
2. Yes, received income from this source; $100-499
3. Yes, received income from this source; $500-1,999
4. Yes, received income from this source; $2,000-4999
5. " " " " " " ; $5000 or over
6 " " " " " " ; Amount not ascertained
0. No, did not receive income from this source

X. Not ascertained whether received income from this source

30-34 Income from interest, dividends, royalties, rents, trust funds, business, professional practice: (Add amounts entered after questions 37, 39, 40, 41, 43 minus 42; Farm Schedule 44b)

Code the amount in dollars

00000. No income from these sources
Y0000. Income from these sources larger than $99,999*
X0000. Income from these sources not ascertained
XY000. Negative income *

SCF+ Variables

1. **Income:** wages and salaries, professional practice and self employment, rental income, interest, dividends, business and farm income, transfer payments
2. **Assets**
3. **Debt**
4. **Wealth**

SCF+ Variables

1. **Income**
2. **Assets:** liquid assets (CDs, checking, saving, call/money market accounts), housing and other real estate, bonds, stocks, mutual funds, corporate and non-corporate equity, retirement accounts
3. **Debt**
4. **Wealth**

SCF+ Variables

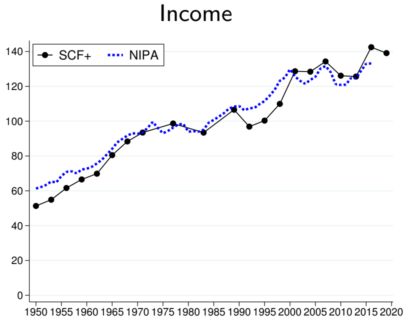
1. **Income**
2. **Assets**
3. **Debt:** housing debt, car loans, education loans, and loans for consumer durables, credit card debt, and other non-housing debt
4. **Wealth**

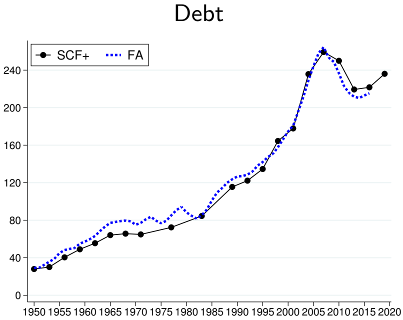
SCF+ Variables

1. **Income**
2. **Assets**
3. **Debt**
4. **Wealth:** consolidated household balance sheet

Macro trends from micro data

- Aggregated micro data match macro growth trends
- Micro data informative about underlying distributional dynamics

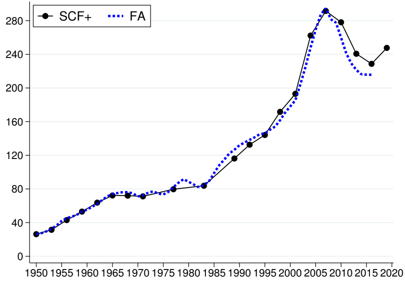




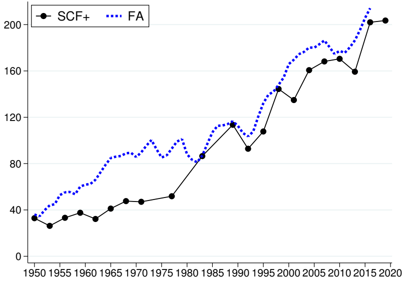
Macro trends from micro data

- Aggregated micro data match macro growth trends
- Micro data informative about underlying distributional dynamics

Housing debt



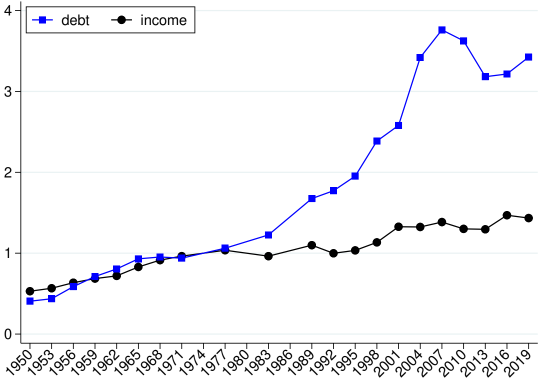
Non-housing debt



PSID data

- Supplement SCF+ cross sectional data with panel data from Panel Study of Income Dynamics (PSID)
- PSID provides data starting in 1968 (SRC sample)
- Wealth data start in 1984 but housing values and housing debt covered from the start
- Panel data allow tracking debt increase at the household level
- PSID and SCF+ align closely for aggregate debt trends

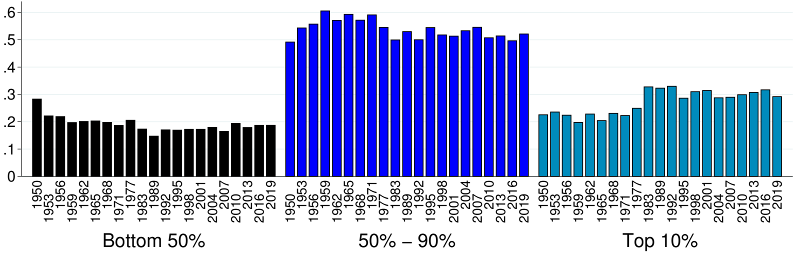
U.S. household debt and income growth



- Income and debt grow in lockstep until 1970s
- Divergence of debt and income growth after 1970s

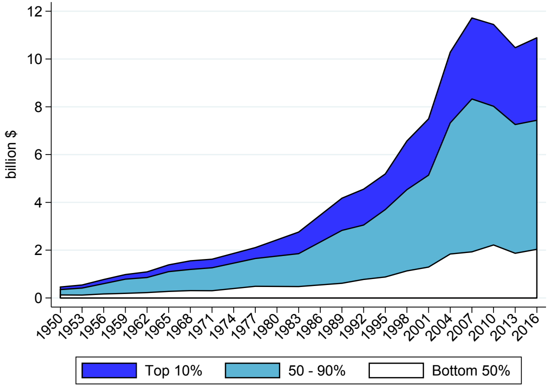
Distribution of debt

- Middle-class households owe 50% of total debt
- Top 10% with slightly increasing debt share over over time
- Bottom 50% with decreasing share and less than 20% of total debt after 1980



Distribution of debt

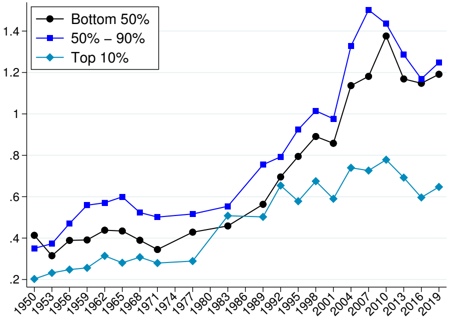
- Middle class main contributor to the debt boom since 1950



Debt increase along the income distribution

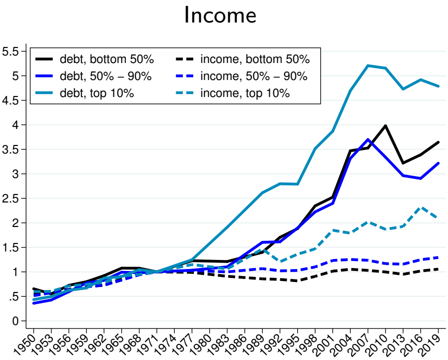
- Secular rise in debt-to-income ratios across the entire income distribution

Debt-to-income ratio



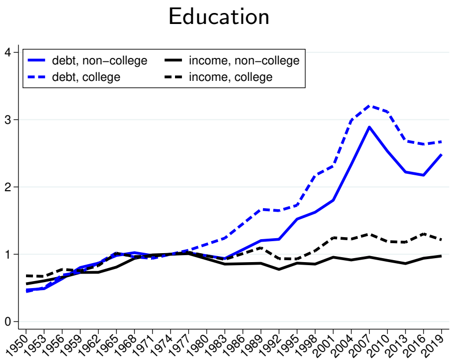
Debt increase along the income distribution

- Since 1970s diverging trends of debt and income by income



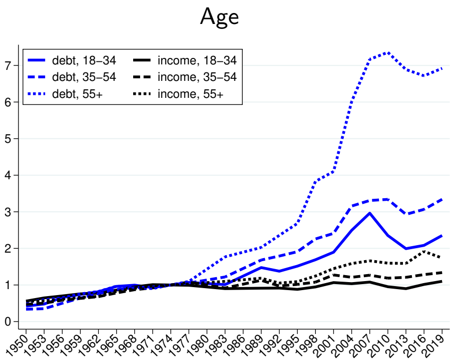
Debt increase along the income distribution

- Since 1970s diverging trends of debt and income by income, education



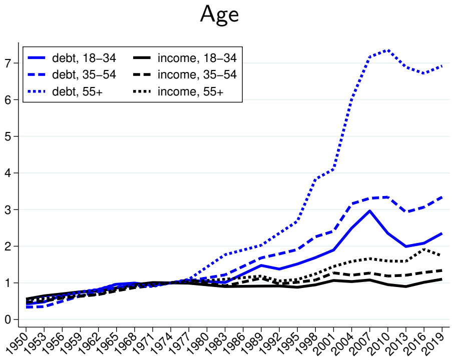
Debt increase along the income distribution

- Since 1970s diverging trends of debt and income by income, education, or age



Debt increase along the income distribution

- Since 1970s diverging trends of debt and income by income, education, or age

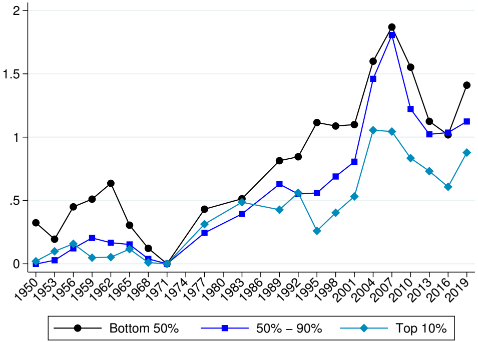


- General decoupling of debt from income growth over last 40 years

Capital gains and debt dynamics

- SCF+ offer comprehensive data on household balance sheets
- Large capital gains for bottom 90% in the housing market

Change of housing-to-income ratio



PSID analysis

- Home equity extraction allows realizing capital gains without selling the house
- Rely on PSID to quantify role of home equity extraction
- Identify four household groups in PSID data

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- Rely on PSID to quantify role of home equity extraction
- Identify four household groups in PSID data
    1. **Extractors** (Bhutta and Keys (2016)) are households who
        (a) did not purchase a new home
        (b) increased nominal mortgage balance by more than 5%

PSID analysis

- Home equity extraction allows realizing capital gains without selling the house
- Rely on PSID to quantify role of home equity extraction
- Identify four household groups in PSID data
    1. **Extractors**
    2. **Upgraders** are households who
        (a) were homeowners before
        (b) bought a new house
        (c) either explicitly state upgrading as a reason to move **or** moved to a home with more rooms

PSID analysis

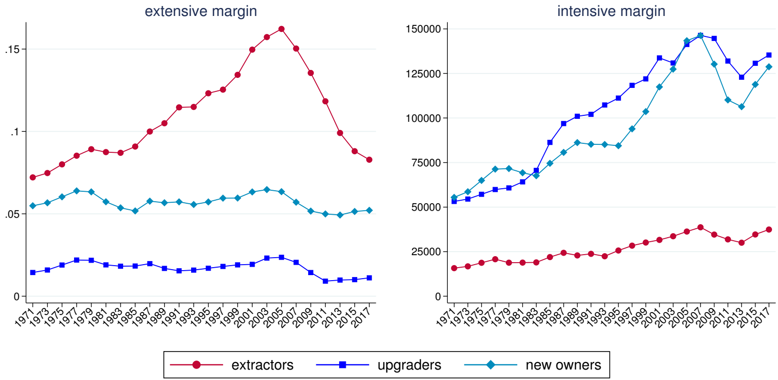
- Home equity extraction allows realizing capital gains without selling the house
- Rely on PSID to quantify role of home equity extraction
- Identify four household groups in PSID data
  1. **Extractors**
  2. **Upgraders**
  3. **Downgraders** are households equivalent to upgraders (downgrading as reason **or** fewer rooms)

PSID analysis

- Home equity extraction allows realizing capital gains without selling the house
- Rely on PSID to quantify role of home equity extraction
- Identify four household groups in PSID data
  1. **Extractors**
  2. **Upgraders**
  3. **Downgraders**
  4. **New owners** are households who
     (a) bought a house
     (b) were no homeowners in the previous two surveys

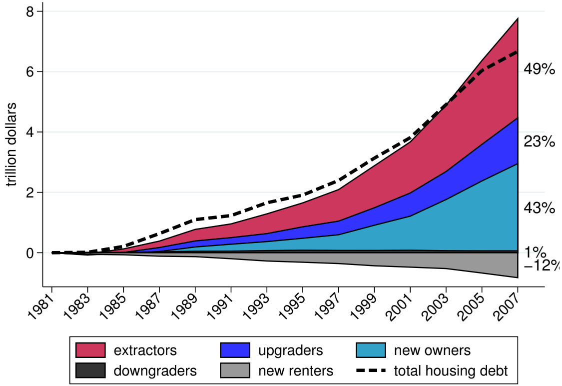
Household types over time

- Extractors largest group with large extraction amounts
- Share of new owners and upgraders constant but with increased borrowing over time



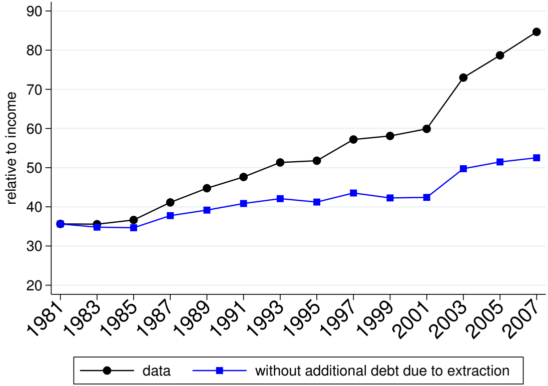
Contributions to the debt increase

- Decomposition captures 90% of the debt increase since 1980
- Equity extraction alone accounts ≈ 50% of debt increase
- Upgraders account for another 23% of the debt increase



Home equity extraction and the macroeconomy

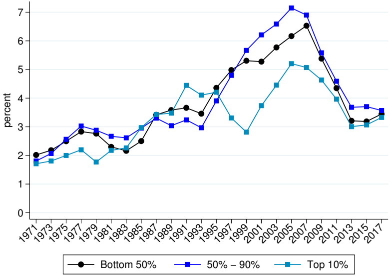
- Without home equity extraction 2007 debt-to-income ratios 30pp lower than observed



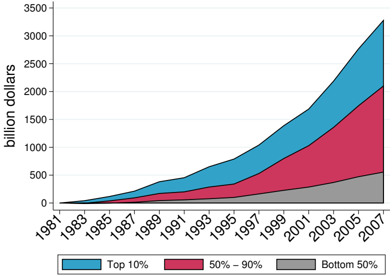
Equity extraction by the middle class

- Until 1980s, home equity extraction between 2% and 3% of annual income
- Increase to almost 7% for the middle class by 2007
- Middle class accounts for lion's share of extracted home equity

Extraction relative to income



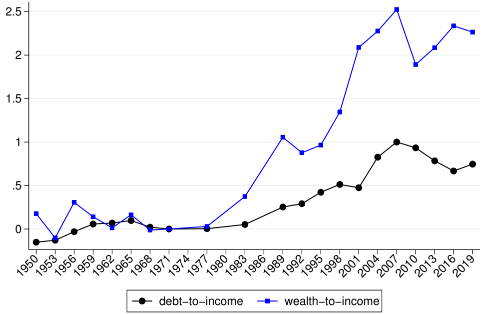
Contribution to extraction boom



Wealth richer middle class despite higher debt

- Despite large equity extraction and rising debt levels, middle class was never wealthier than at peak of the debt boom

Change in wealth- and debt-to-income ratios

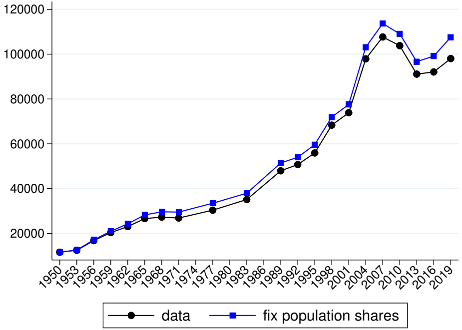


Aging and the debt boom

- Indebtedness tightly related to the life cycle of households
- Young households buy houses using debt and repay over time
- Aging society shifts distribution to lower debt levels
- Equity extraction increased debt during later part of life
- New owner on average 34-years old, extractors on average 47-years old

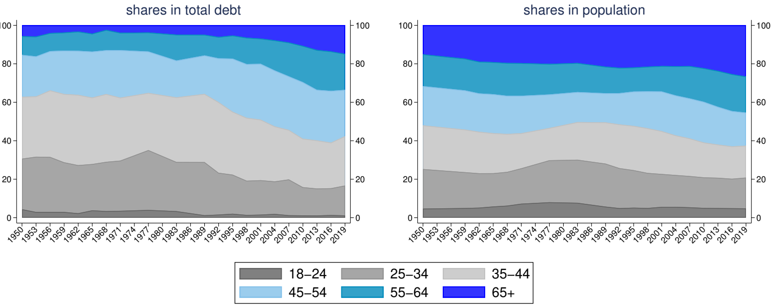
Aging population and the debt boom

- Fixing population shares of age groups to 1950 level has little effect on aggregate debt boom
- Small composition effects imply changes in life cycle of debt



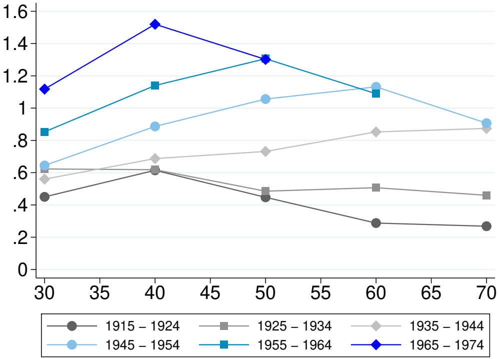
Graying of U.S. household debt

- Share of retirees' debt increased more than their population share since 1980s
- Debt share of households younger than 45 years declined from 60% to 40% within 30 years with little change in population share



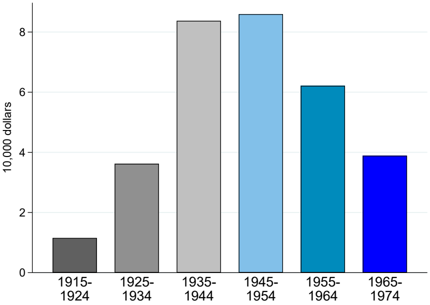
The changing life cycle of U.S. debt

- Oldest cohort shows declining debt-to-income profile
- Profiles start “turning” around 1980 with start of equity extraction boom
- Young households enter more indebted after 1980



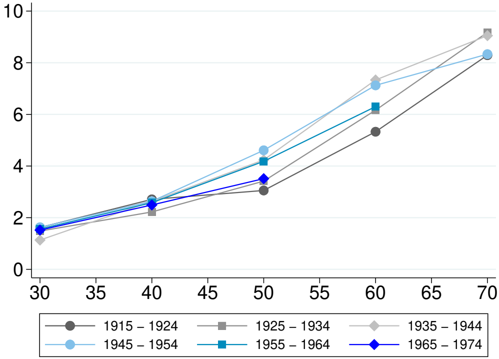
Equity extraction across generations

- Differential exposure to capital gains and potential to extract equity across cohorts
- Babyboomer cohort (1945-1954) extracted on average most home equity over time
- About twice as much as their parents (1925-1934) or their children (1965-1974)



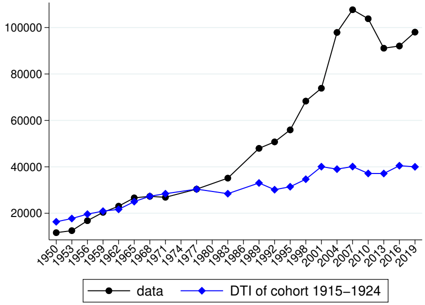
Equity extraction across generations

- Babyboomer cohort (1945-1954) actively extracted equity and accumulated debt
- Despite rising debt levels one of the richest cohort among six generations of U.S. households



Debt like grandma and grandpa

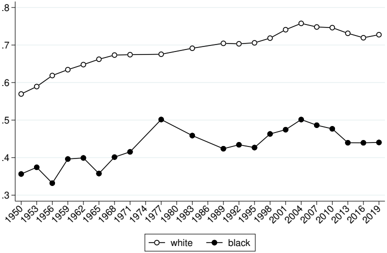
- Oldest cohort (1915-1924) enters post-1980 debt boom at age 60
- Construct counterfactual of aggregate debt boom using debt-to-income profiles of oldest cohort
- Counterfactual debt today only at 40% of observed debt level



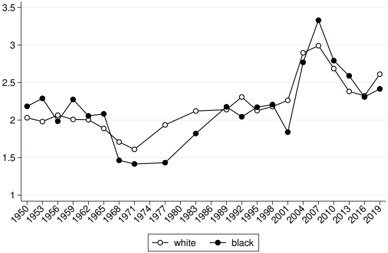
The debt boom and race

- Large and persistent differences in wealth between black and white households
- Different homeownership rates connect black and white households differently to the debt boom

Homeownership rate



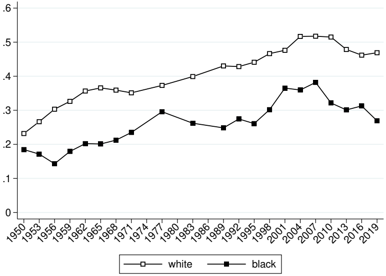
Housing-to-income ratio of homeowners



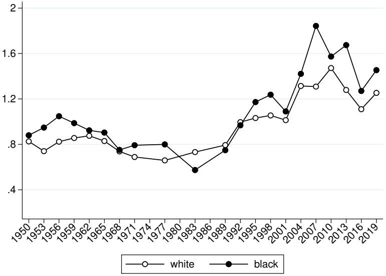
The debt boom and race

- Homeownership differences also show up in participation in mortgage markets
- No differences in borrowing conditional on participation between black and white households

Mortgage borrowing rate



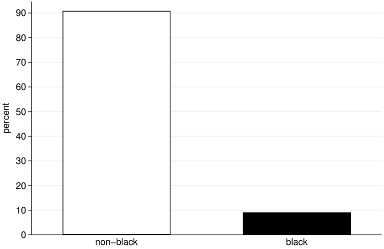
Housing debt-to-income ratio of mortgagors



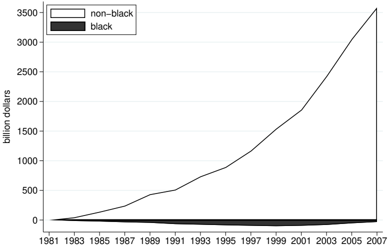
Contribution of black households to debt boom

- Lower participation and a persistent income gap make black households account for little of aggregate debt
- Contribution to the macroeconomic debt boom from black households very small

Contribution to debt growth, 1950-2019



Contribution to extraction, 1981-2007



Conclusions

- Household debt accumulation has become integral part of household savings decisions in the 21^{st} century
- U.S. middle class owe 50% of all household debt
- Half of the debt increase after 1980 from home equity extraction
- Babyboomers (1945-1954) extracted lion's share of home equity
- Driver of the debt boom are middle-class households borrowing against rising asset values

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Banca d'Italia

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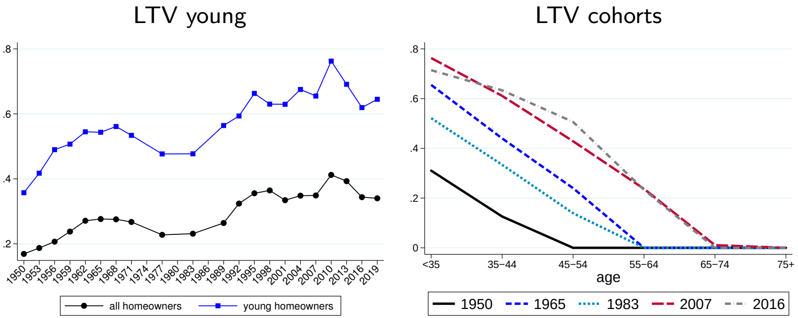
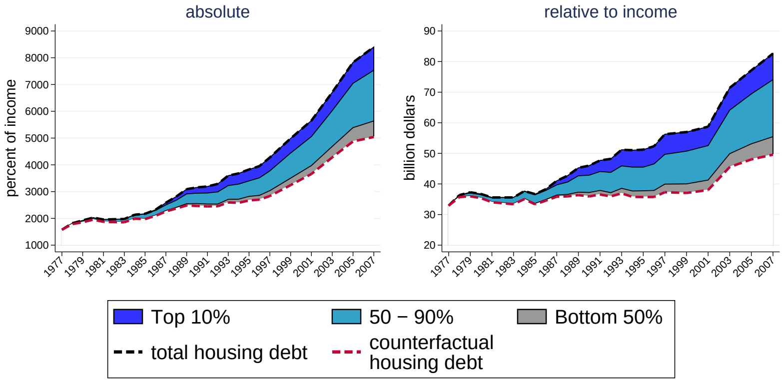
Higher debt for young households



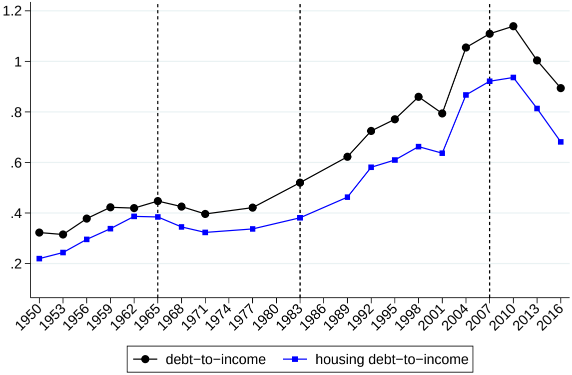
The left panel shows average housing debt relative to average housing for all homeowners and homeowners with a head below age 35. The right panel shows average LTV by age in 1950, 1965, 1983, 2007 and 2016.

Macroeconomic effects of equity extraction



Four phases of the debt boom

- Split debt boom into four phases



Four phases of the debt boom

- Decompose drivers of debt-to-income changes during each phase

$$d_{i,t} - d_{i,t-1} = \underbrace{\left(s_{i,t}^{H^+} - s_{i,t-1}^{H^+}\right) d_{i,t-1}^{H^+}}_{\Delta \text{ extensive housing}} + \underbrace{s_{i,t}^{H^+} \left(d_{i,t}^{H^+} - d_{i,t-1}^{H^+}\right)}_{\Delta \text{ intensive housing}}$$

$$+ \underbrace{\left(s_{i,t}^{N^+} - s_{i,t-1}^{N^+}\right) d_{i,t-1}^{N^+}}_{\Delta \text{ extensive non-housing}} + \underbrace{s_{i,t}^{N^+} \left(d_{i,t}^{N^+} - d_{i,t-1}^{N^+}\right)}_{\Delta \text{ intensive non-housing}}$$

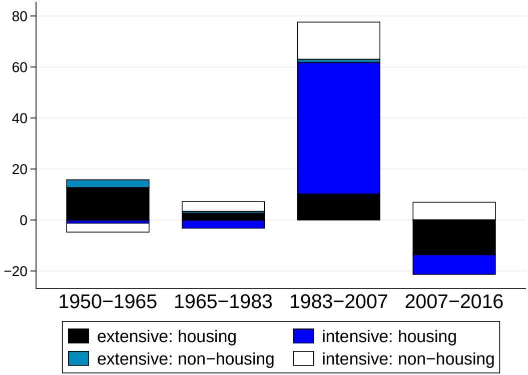
$s_{i,t}$: share of HH with positive debt of group i in period t

$d_{i,t}$: (positive) debt level of group i in period t

H : housing debt $\quad N$: non-housing debt

Four phases of the debt boom

- Decompose drivers of debt-to-income changes during each phase



Four phases of the debt boom

- Decompose drivers of debt-to-income changes during each phase

    1. Housing debt main driver of the debt boom

Four phases of the debt boom

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  2. Extensive margin boom from 1950-1965

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    1. Housing debt main driver of the debt boom

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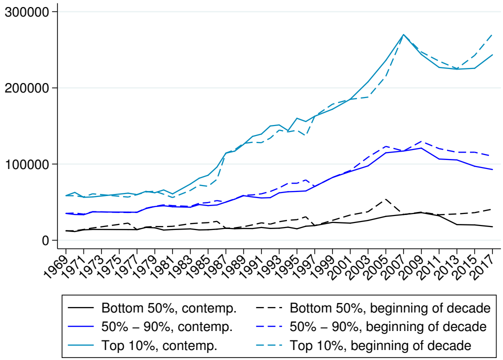
- How did the debt boom vary across the income distribution?

A small detour: group stability

- SCF data based on synthetic cohort approach
- PSID data follows households over time
- Difference in income trends are small



Debt boom of homeowners

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  - Tax changes lead to abolition of consumer debt interest deductibility
  - Debt portfolios reshuffled from consumer debt towards housing debt

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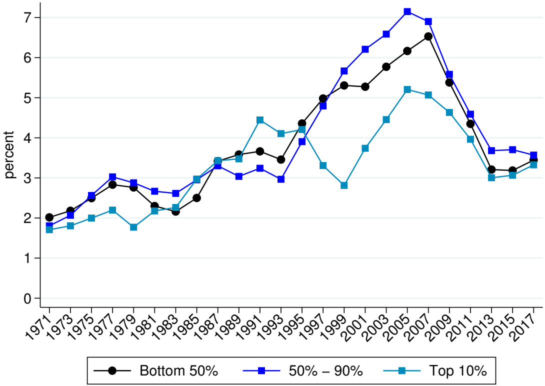
- Extraction boom after 1986
  - Tax changes lead to abolition of consumer debt interest deductibility
  - Debt portfolios reshuffled from consumer debt towards housing debt
- Upgraders account for 35% of the debt increase

Debt boom of homeowners

- Home equity extraction single most important driver of debt boom
- Extraction boom after 1986
  - Tax changes lead to abolition of consumer debt interest deductibility
  - Debt portfolios reshuffled from consumer debt towards housing debt
- Upgraders account for 35% of the debt increase
- Extractors and upgraders: (housing) consumption response accounts for 88% of debt increase

Extraction by income group

- Bottom 90% with largest wealth gains from house price boom
- Wealth gains mirrored in extraction activity
- In 2007 equity extraction at 7% of annual income



Extraction by income group

- Dynamics of a household's debt-to-income ratio d_t

$$d_{t+1} = (1+g)^{-1}((1+r)d_t - s_t)$$

with g income growth and s_t amortization/extraction flows

$$\Delta d_{t+1} \approx ((r-g)d_t - (1-g)s_t)$$

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$$d_{t+1} = (1+g)^{-1}((1+r)d_t - s_t)$$

with g income growth and s_t amortization/extraction flows

$$\Delta d_{t+1} \approx ((r-g)d_t - (1-g)s_t)$$

- Additional equity extraction Δs_t translates linearly in debt-to-income

Extraction by income group

- Dynamics of a household's debt-to-income ratio d_t

$$d_{t+1} = (1+g)^{-1}((1+r)d_t - s_t)$$

with g income growth and s_t amortization/extraction flows

$$\Delta d_{t+1} \approx ((r-g)d_t - (1-g)s_t)$$

- Additional equity extraction Δs_t translates linearly in debt-to-income
- Example: 3% additional equity extraction over 10 years increases debt-to-income by $\approx$ 30pp