Wealth and Income Inequality in America 1949 - 2016

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Fed Listens

Distributional Consequences of the Cycle and Monetary Policy

April 9, 2019

Motivation

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- Existing evidence about the "top" of the income ***or*** wealth distribution
- Missing evidence about ***joint*** evolution of the income and wealth distribution
- Joint dynamics key to understand drivers of wealth inequality

Contribution

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- Highlight importance of asset price dynamics and portfolio composition for wealth inequality trends

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  1. From 1971 to 2007 much stronger rise in income inequality
  2. After 2007 unprecedented rise in wealth inequality
- Portfolio differences and asset price changes account for diverging trends
- Wealth dynamics constitute a race between the stock and the housing market

Construction of SCF+ data

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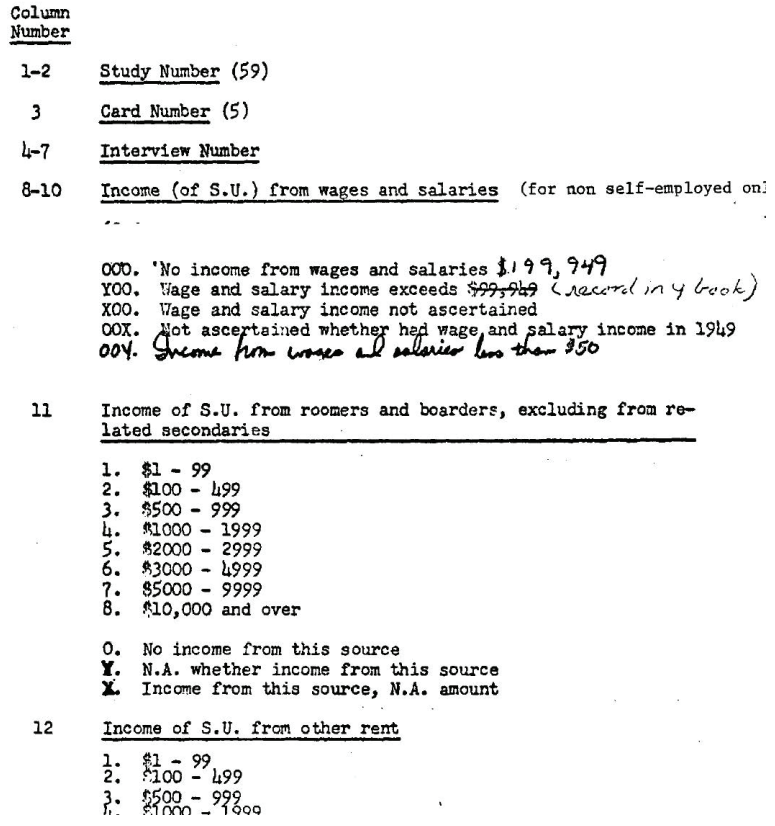

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3 Card Number (5)

4-7 Interview Number

8-10 Income (of S.U.) from wages and salaries (for non self-employed onl

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004. Income from wages & salaries less than $50

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

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3. $500 - 999
4. $1000 - 1999
5. $2000 - 2999
6. $3000 - 4999
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8. $10,000 and over

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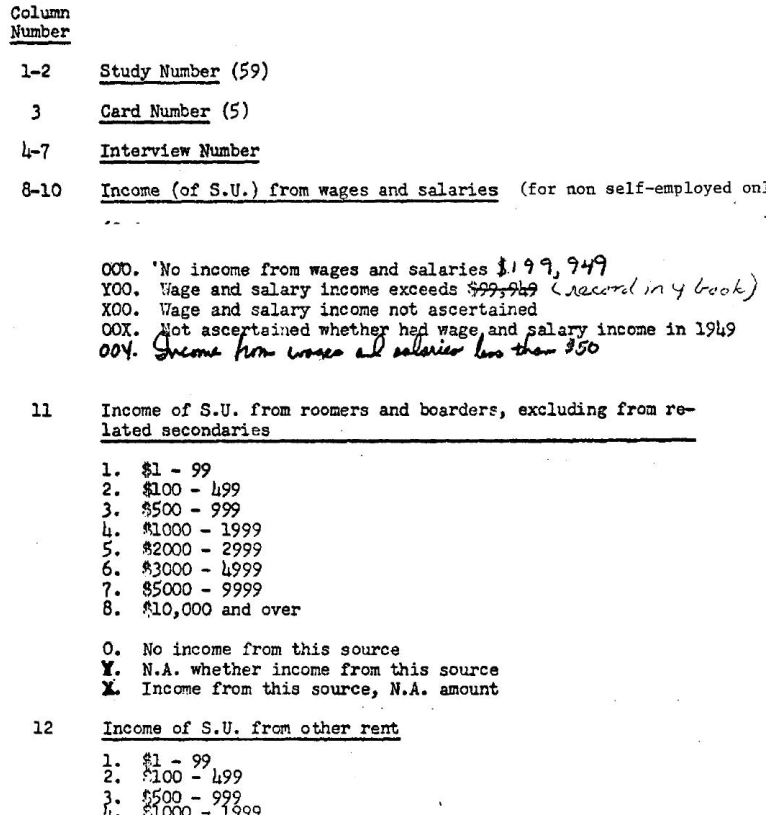

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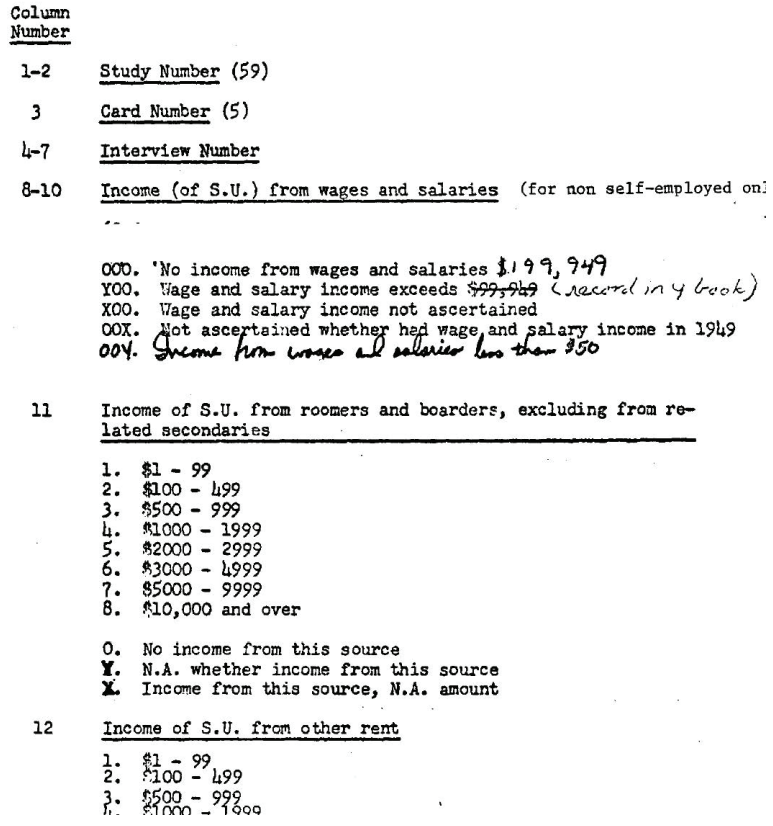
- Major harmonization exercise: extract detailed data on income, assets, and debt



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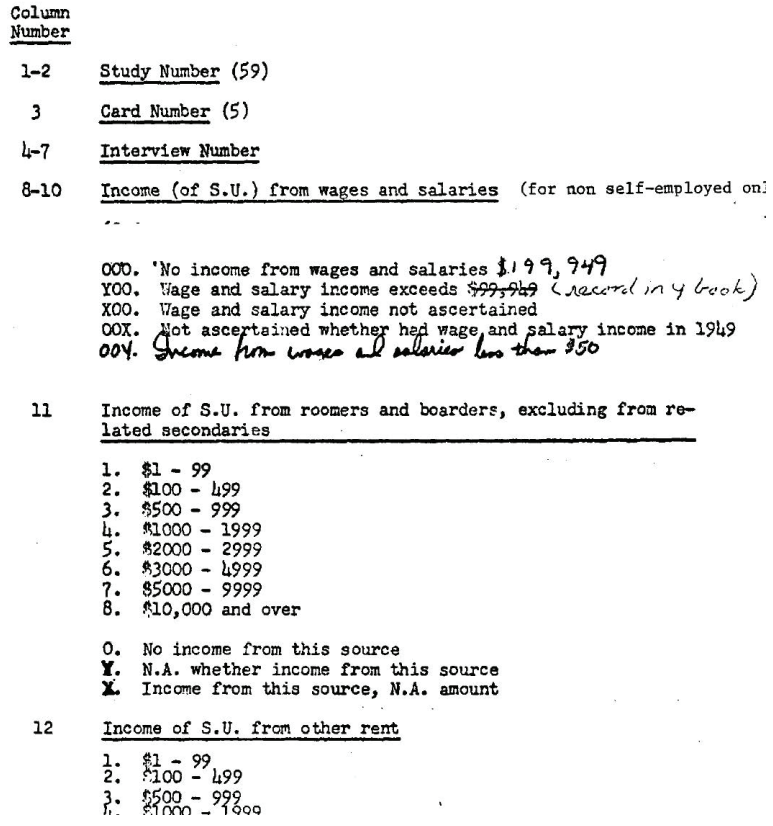
- Impute missing variables, re-weight for representativeness, and non-response at the top



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Changes in income and wealth inequality

	Income					Wealth				
	1950	1971	1989	2007	2016	1950	1971	1989	2007	2016
bottom 50%	21.6	21.6	16.2	15.4	14.5	3.0	3.0	2.9	2.5	1.2
0- 25%	6.1	6.2	5.0	4.5	4.5	-0.1	-0.2	-0.1	-0.1	-0.4
25-50%	15.5	15.4	11.3	11.0	10.1	3.1	3.2	3.0	2.6	1.6
50-90%	43.9	47.7	43.8	40.3	37.9	24.7	26.3	29.5	26.0	21.5
50-75%	23.5	24.9	22.5	20.3	18.4	9.8	10.5	11.7	10.2	7.2
75-90%	20.4	22.8	21.4	20.0	19.5	14.8	15.8	17.8	15.8	14.3
top 10%	34.5	**30.7**	39.9	**44.3**	47.6	72.3	70.7	67.6	71.5	77.4

- Income concentration increased strongly between 1971 and 2007

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- Wealth inequality hardly changed between 1971 and 2007
- Wealth inequality increases strongly after 2007

Joint evolution of income and wealth distribution

- Sort households along the wealth distribution

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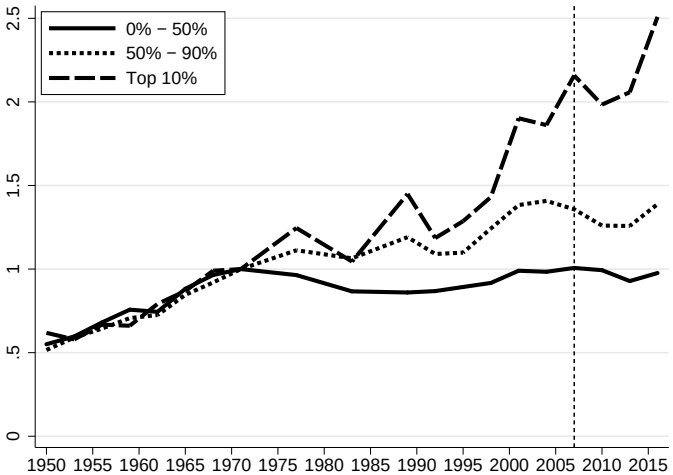

Income growth

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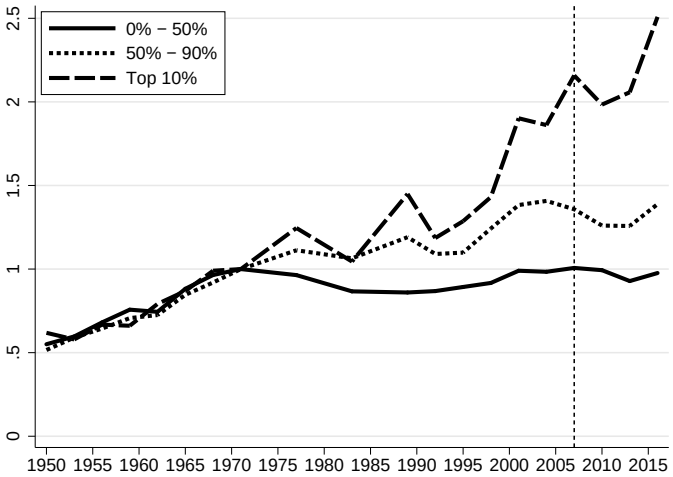

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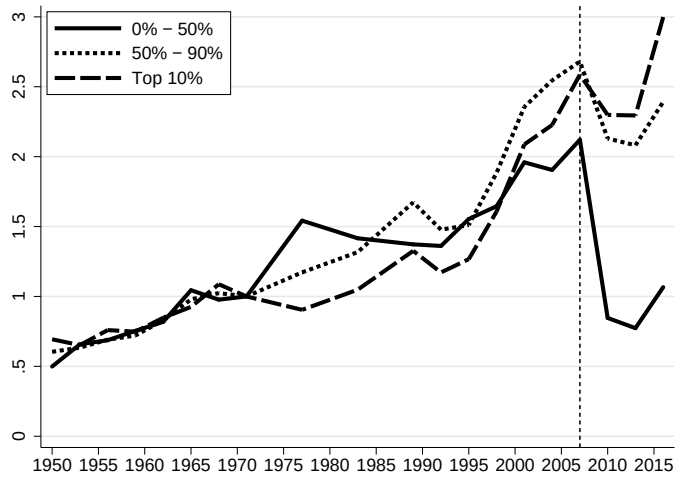

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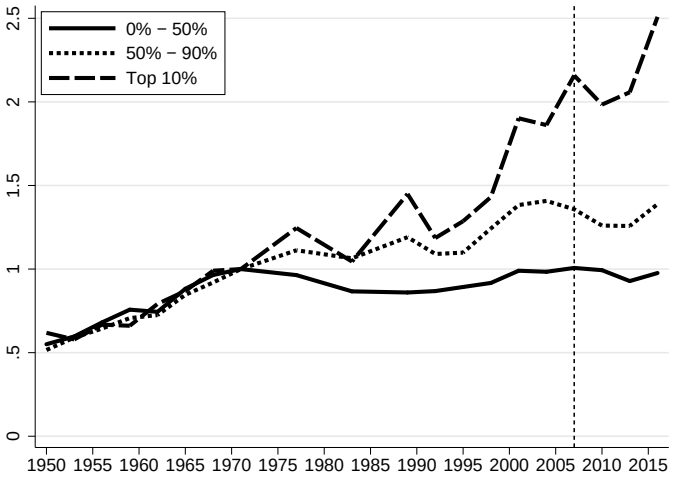

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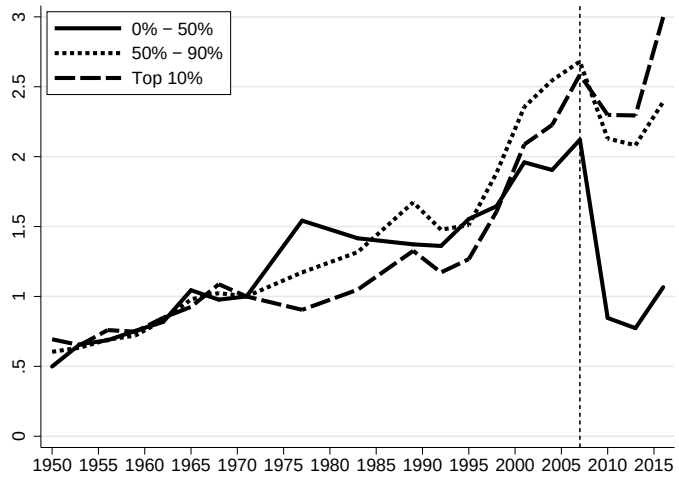

Wealth growth

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- Wealth levels comove before 2007 and diverge after 2007
- Strong wealth growth leads to rising wealth-to-income ratios

details

Wealth dynamics

- Dynamics of wealth of group i between t and $t+1$

$$W^i_{t+1} = W^i_t(1 + r^i_t + q^i_t) + Y^i_{L,t} - C^i_t$$

W^i_t: wealth

r^i_t: capital income

q^i_t: capital gains

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$$q^i_t = \sum_{j=1}^{J} \left(\frac{p_{j,t+1}}{p_{j,t}} - 1 \right) \frac{A^i_{j,t}}{W^i_t} = \sum_{j=1}^{J} \left(\frac{p_{j,t+1}}{p_{j,t}} - 1 \right) \alpha^i_{j,t}$$

Capital gains combination of **portfolio allocation** $\alpha^i_{j,t}$ and **asset price changes** $\frac{p_{j,t+1}}{p_{j,t}}$ across asset classes j

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- Potentially large effects on wealth growth in the short run

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- High wealth-to-income ratio (low Y/W) mutes effects from income inequality

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- Growth rate of wealth share $\omega^i_t = \frac{W^i_t}{W_t}$

$$\frac{\omega^i_{t+1}}{\omega^i_t} = \frac{1 + q^i_t + \sigma^i_t}{1 + q_t + \sigma_t}$$

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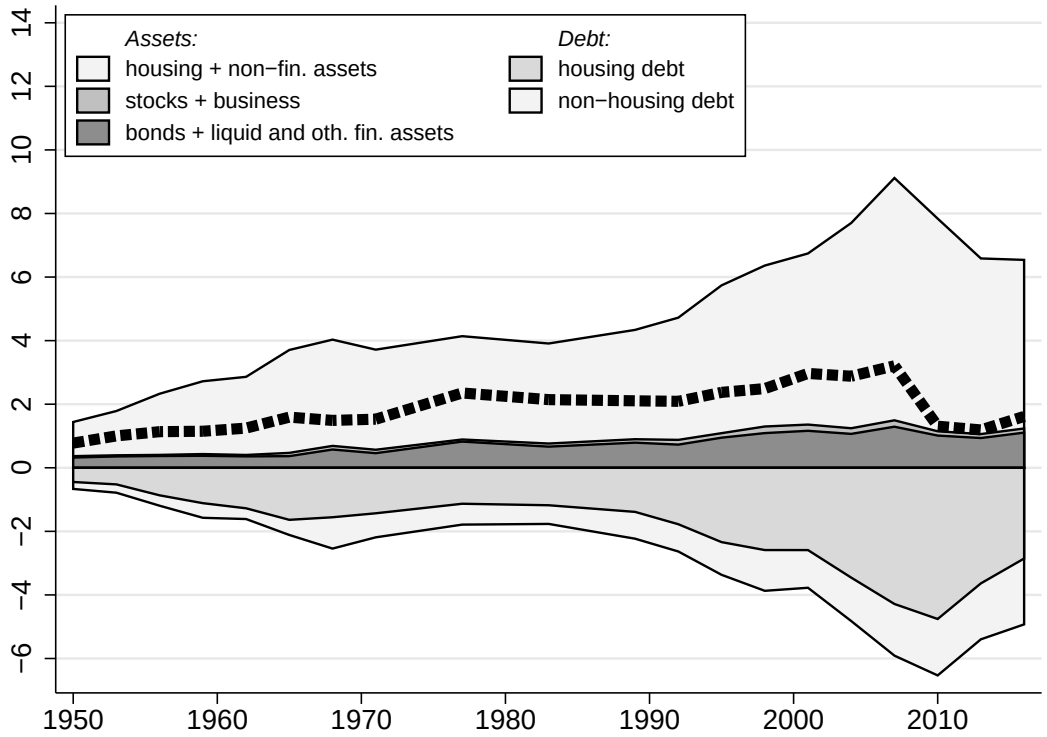
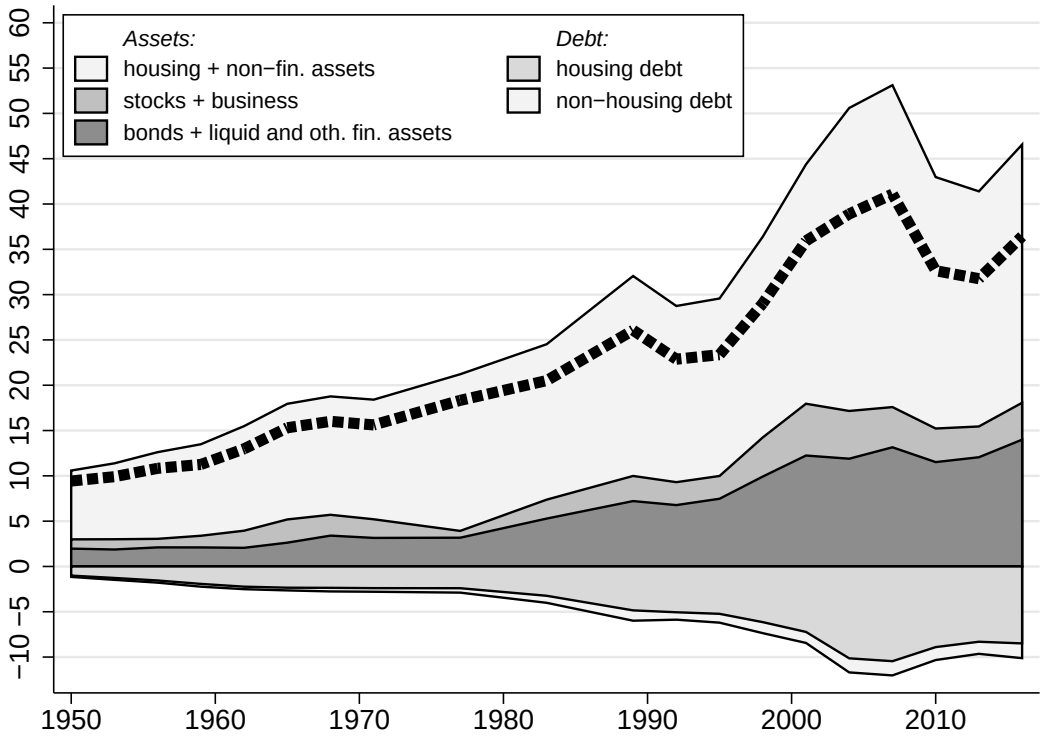
- Portfolio differences determine q^i_t and shape wealth inequality dynamics

Portfolio heterogeneity: Bottom 50%



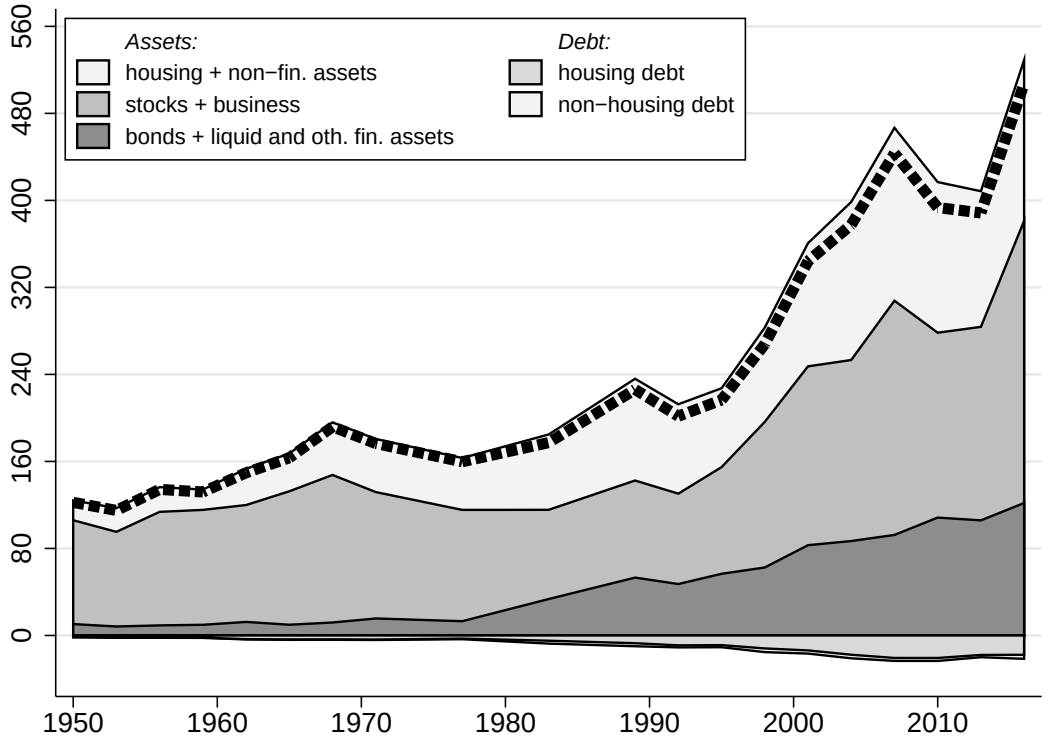
- Little wealth but large gross positions
- Housing most important asset with high leverage

Portfolio heterogeneity: 50% - 90%



- Housing most important asset class
- Housing held with large leverage

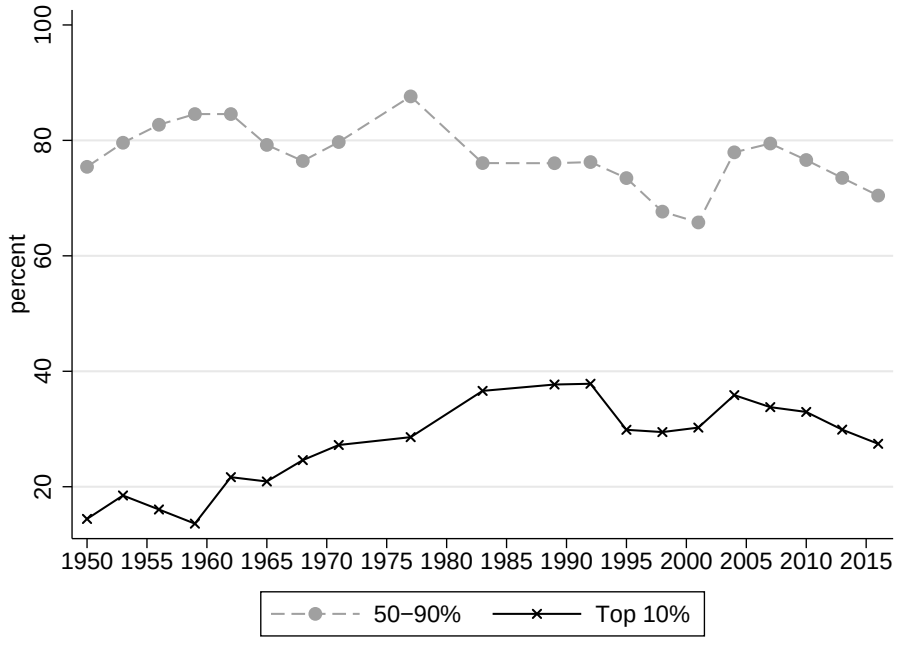
Portfolio heterogeneity: Top 10%



- Small housing position and little leverage
- Large equity share in portfolio

Asset distribution

Household exposure to house price changes



- Elasticity of wealth with respect to house prices $\frac{\text{Housing}}{\text{Wealth}} \times 100$

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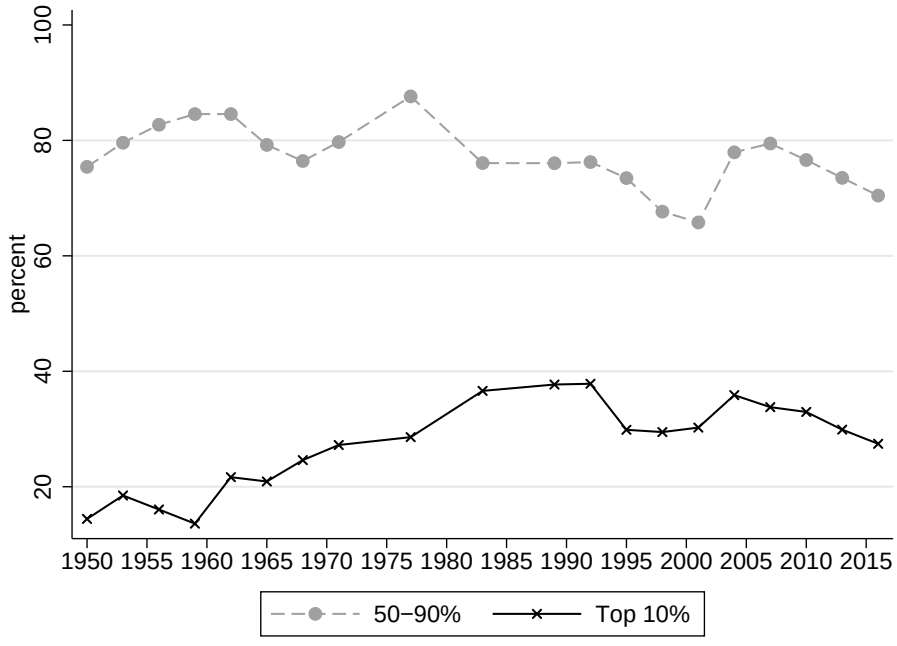

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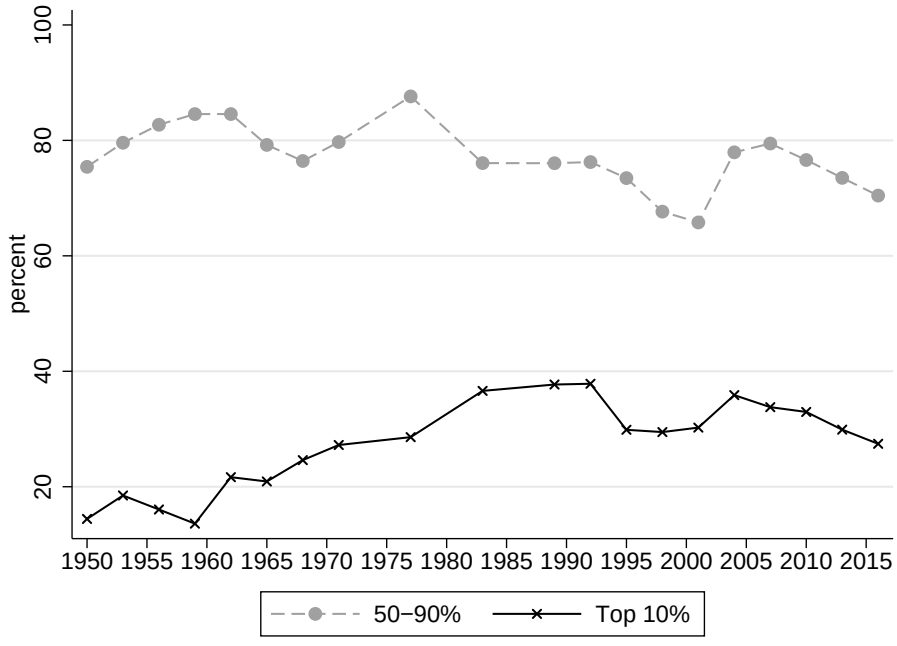

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- Increasing house prices good for middle class, increasing stock prices favor top 10%

Race between housing and stock market

- Regression of growth rate of top 10% wealth share on house and stock market price growth

$$\Delta \log(\omega_{t+1}^{top10}) = \beta_0 + \beta_h \Delta \log(p_{t+1}^{h}) + \beta_s \Delta \log(p_{t+1}^{s}) + \varepsilon_t$$

Race between housing and stock market

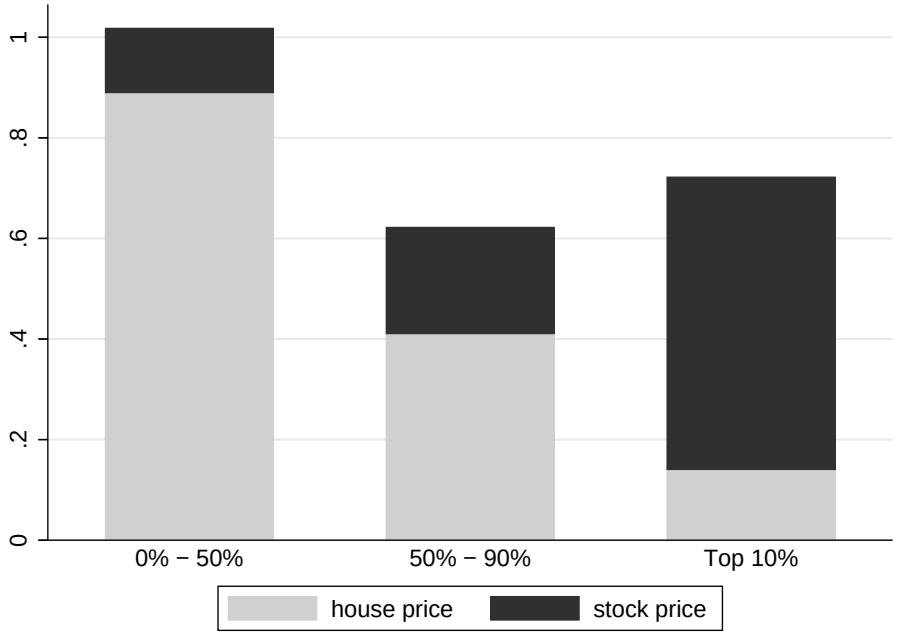
- Regression of growth rate of top 10% wealth share on house and stock market price growth

$$\Delta \log(\omega_{t+1}^{top10}) = \beta_0 + \beta_h \Delta \log(p_{t+1}^h) + \beta_s \Delta \log(p_{t+1}^s) + \varepsilon_t$$

- Economically significant "race" coefficients β_h and β_s

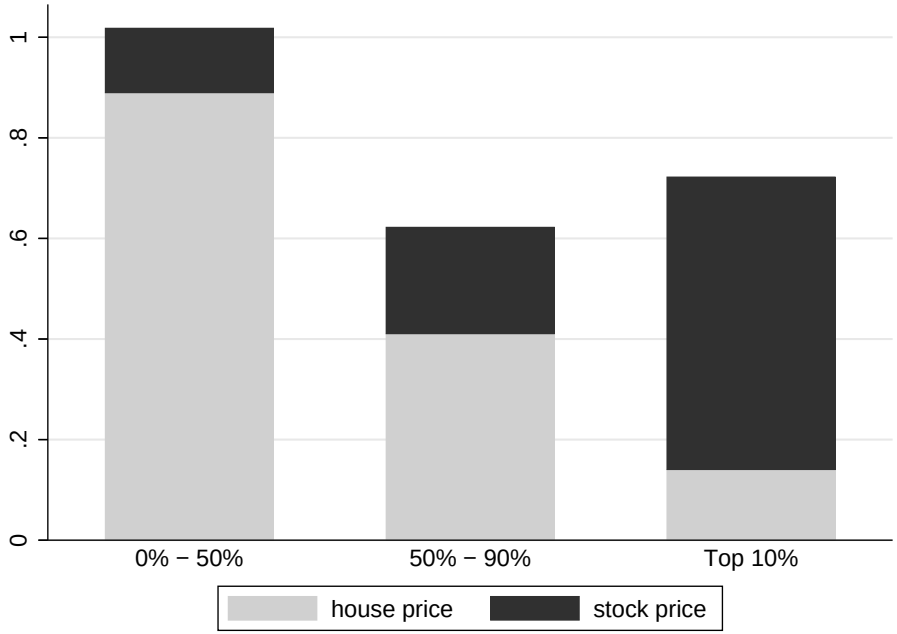
β_h	-0.104	-0.116	-0.138*	-0.157**
β_s	0.043*	0.044*	0.052**	0.043*
θ^{top10}	no	yes	no	yes
$\frac{Y}{W}$	no	no	yes	yes
N	19	19	19	19
R^2	0.162	0.246	0.352	0.468

Wealth gains from asset prices



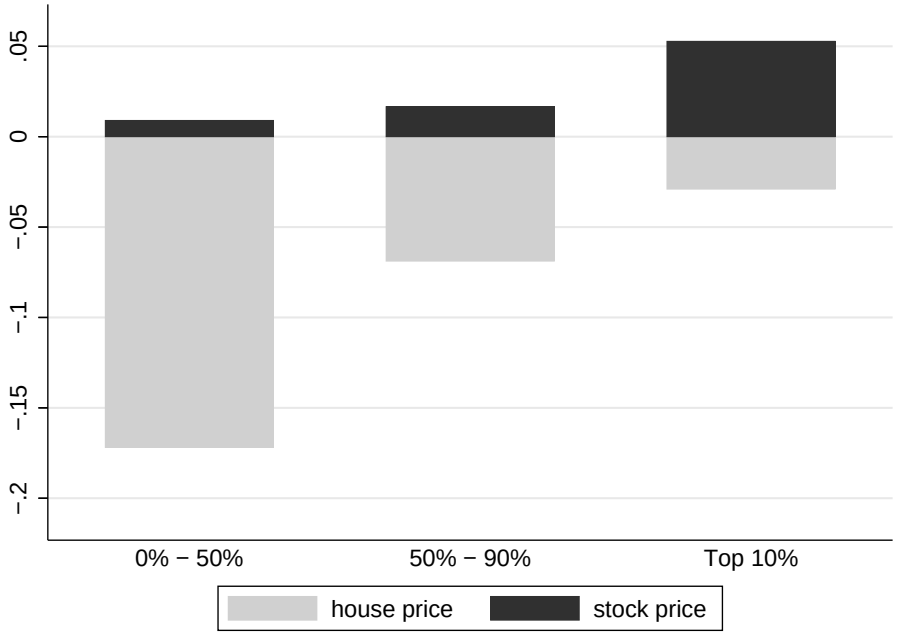
- Between 1971 and 2007 wealth growth due to asset prices between 56% and 95%

Wealth gains from asset prices



- Between 1971 and 2007 wealth growth due to asset prices between 56% and 95%
- Rising wealth-to-income ratios muted rising income inequality

Wealth gains from asset prices



- Between 1971 and 2007 wealth growth due to asset prices between 56% and 95%
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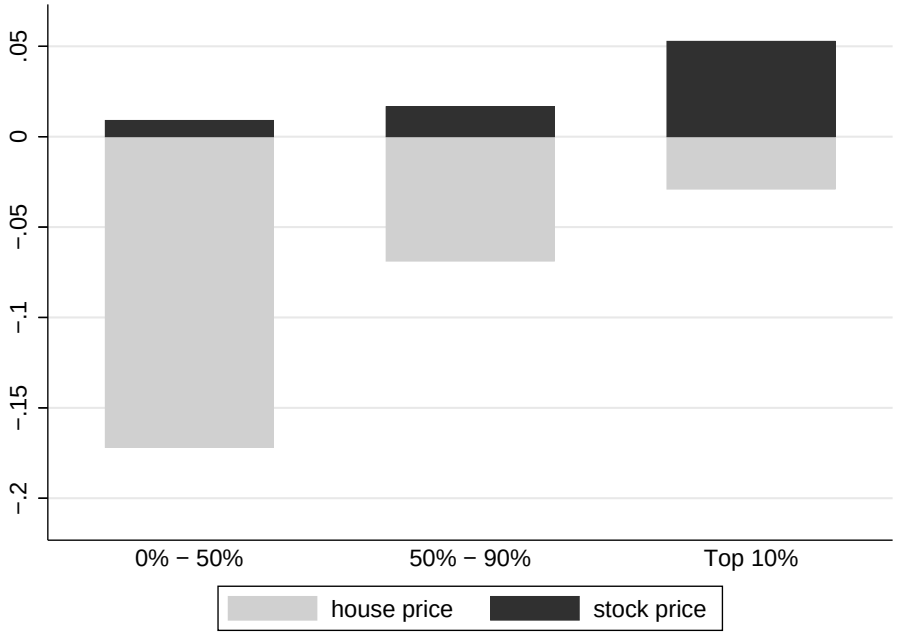
- Financial crisis induced large losses among bottom 90%

Wealth gains from asset prices



- Between 1971 and 2007 wealth growth due to asset prices between 56% and 95%
- Rising wealth-to-income ratios muted rising income inequality
- Financial crisis induced large losses among bottom 90%
- Wealth inequality strongly increased after 2007

Wealth inequality and asset prices

		1989	2007	2016
bottom 50 %	observed change	-0.1	-0.6	-1.9
	constant house prices	-0.3	-1.5	-2.6
	constant stock prices	-0.1	-0.2	-1.7
50% - 90%	observed change	3.2	-0.3	-4.8
	constant house prices	2.8	-2.4	-6.5
	constant stock prices	3.7	3.0	-1.3
Top 10%	observed change	-3.1	**0.8**	6.7
	constant house prices	-2.4	**3.9**	9.1
	constant stock prices	-3.7	-2.8	3.0

- Wealth concentration increased almost 5 times more with constant house prices

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- Wealth concentration increased almost 5 times more with constant house prices
- Wealth concentration declined at constant stock prices
- House price growth slowed down wealth concentration by 26%

Conclusions

- Long-run micro data to study trends in the financial situation of American households

Additional slides

Conclusions

- Long-run micro data to study trends in the financial situation of American households
- Differential time paths of rising income and wealth inequality

Additional slides

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- Long-run micro data to study trends in the financial situation of American households
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- Systematic portfolio differences and asset price dynamics account for differential trends

Additional slides

Conclusions

- Long-run micro data to study trends in the financial situation of American households
- Differential time paths of rising income and wealth inequality
- Systematic portfolio differences and asset price dynamics account for differential trends
- Wealth dynamics constitute a race between the stock and housing market

Additional slides

Additonal slides

Wealth and Income Inequality in America 1949 - 2016

Fed Listens: Distributional Consequences of the Cycle and Monetary Policy

April 9, 2019

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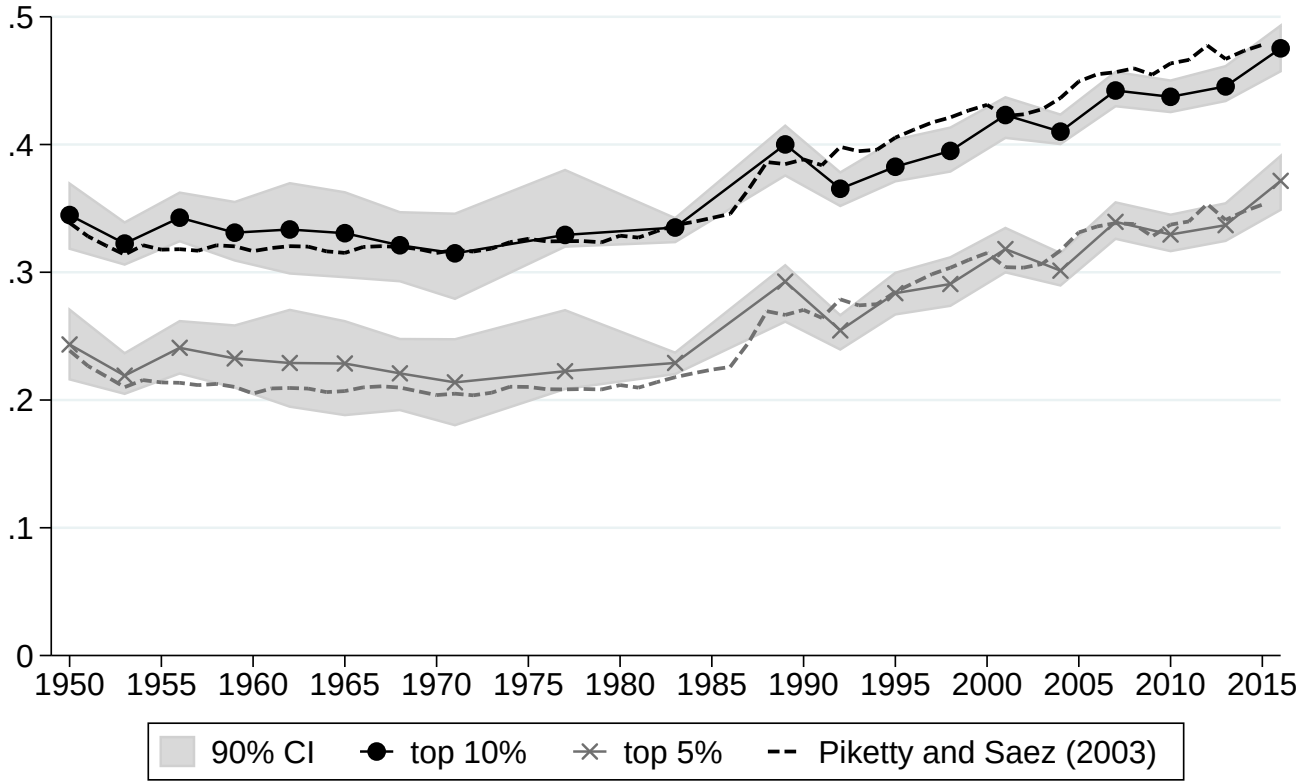
Additional results

- Comparison to estimates from tax data go there
- Distribution of assets across wealth groups go there
- Sensitivity and top 1% go there
- Racial divide go there
- Wealthy hand-to-mouth households go there
- Micro data matching macro data go there

Income inequality



- Income concentration at the top matches results from tax data

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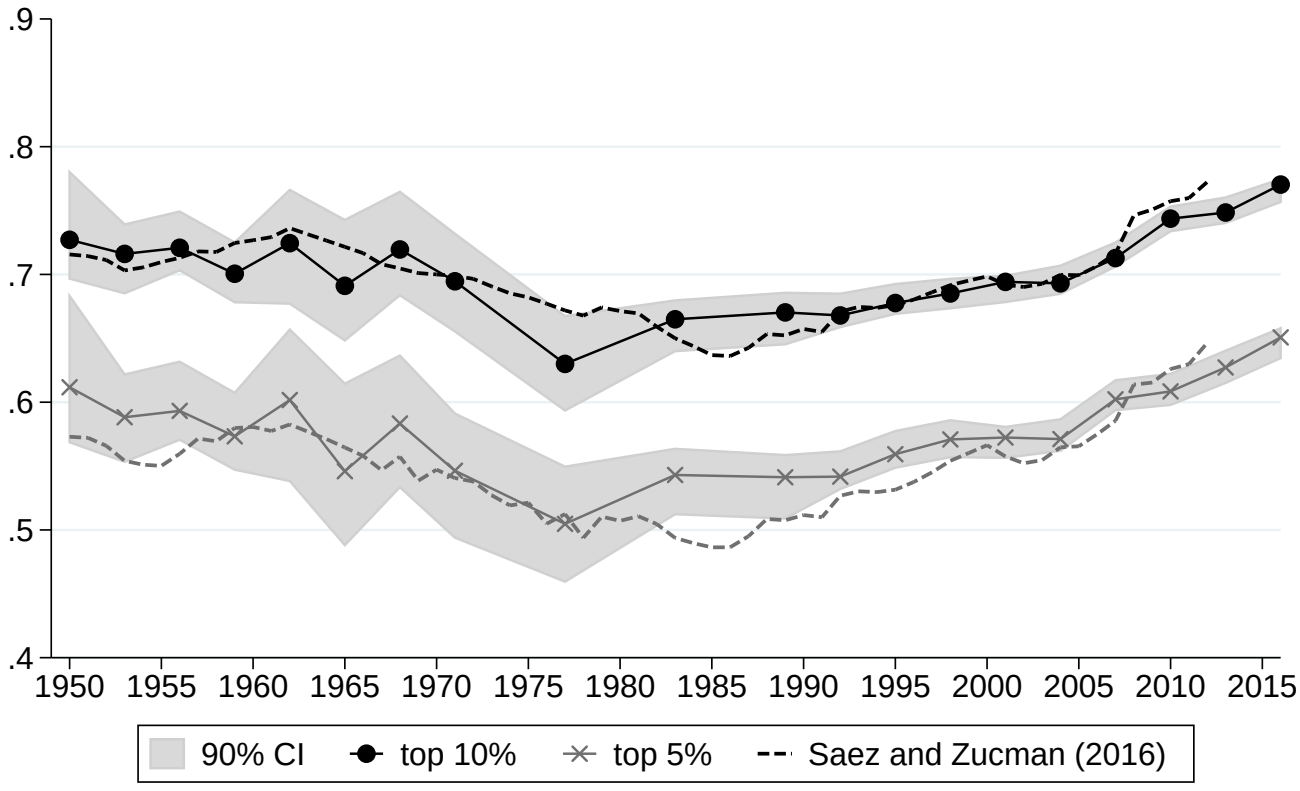
Wealth inequality



- Wealth concentration at the top matches results from capitalizing income tax data

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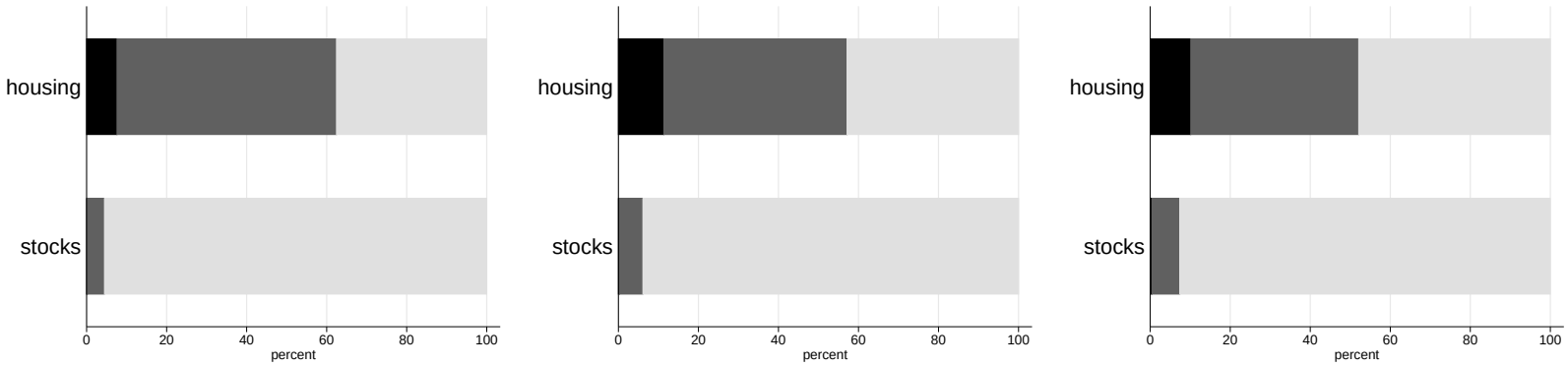
Distribution of assets across wealth groups



1950 1971 2007

- Bottom 90% always hold more than 50% of housing
- Top 10% always hold more than 90% of stocks

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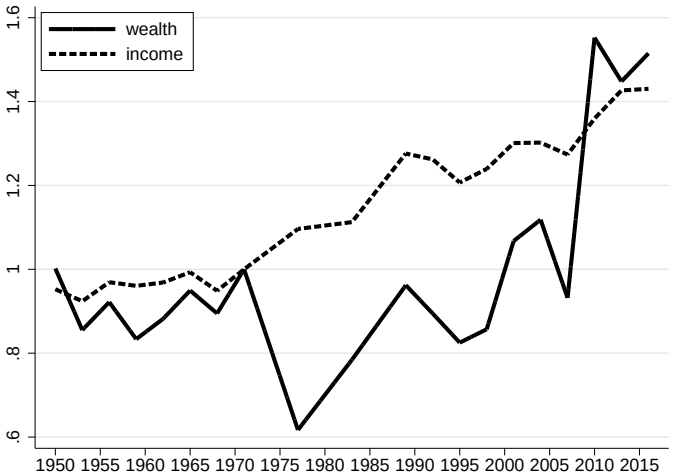
Excluding top income and wealth households



90-50 ratios

95-50 ratios

- Divergence of income and wealth inequality robust to excluding top of distribution

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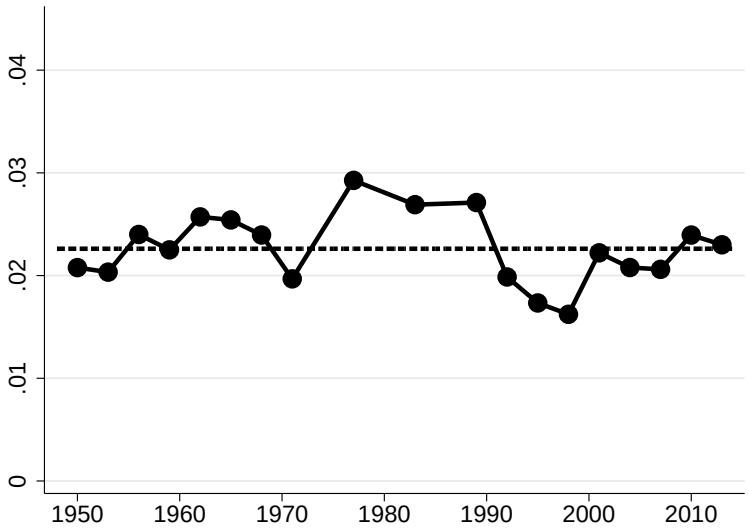
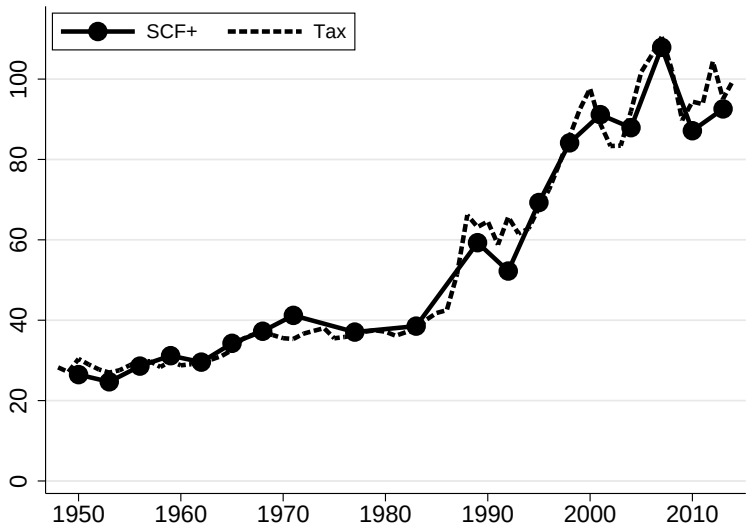
Top 1% income in SCF+



share above 99th pct

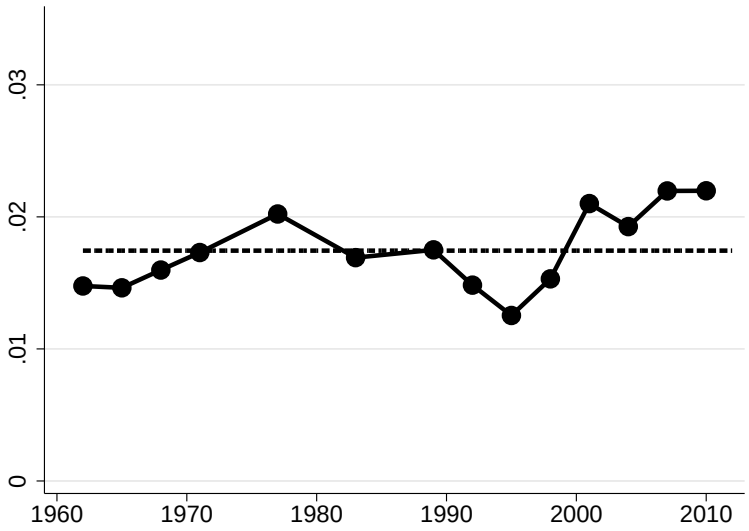


level above 99th pct

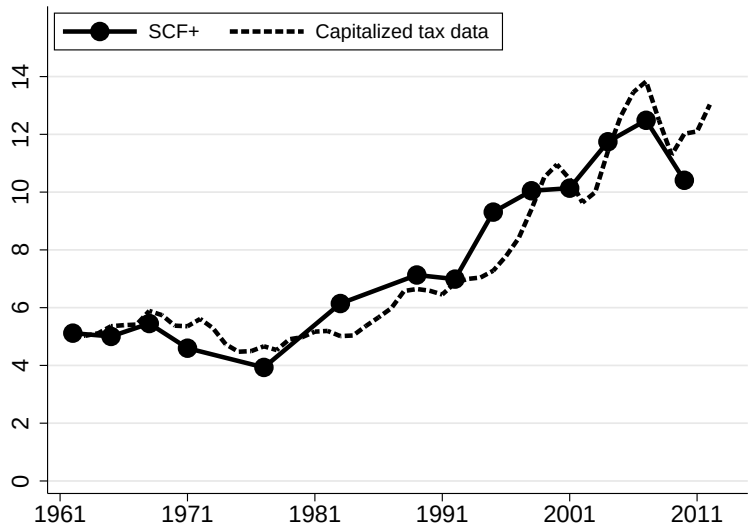
- Same share and income level in SCF+ data above 99th percentile from tax data

back

Top 1% income in SCF+



share above 99th pct



level above 99th pct

- Same share and wealth level in SCF+ data above 99th percentile from tax data

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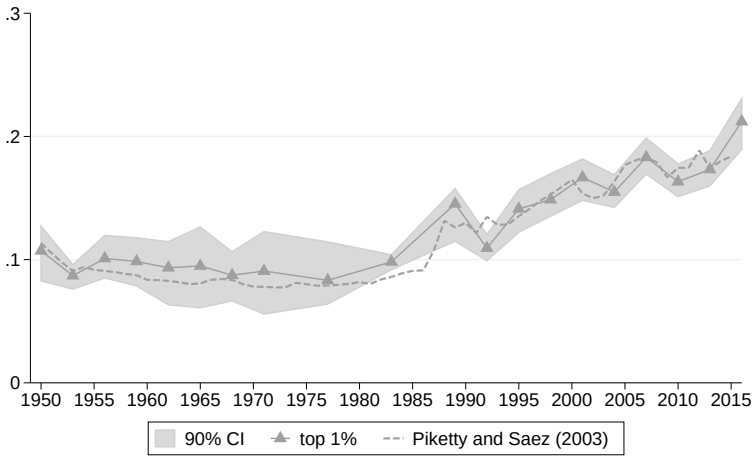
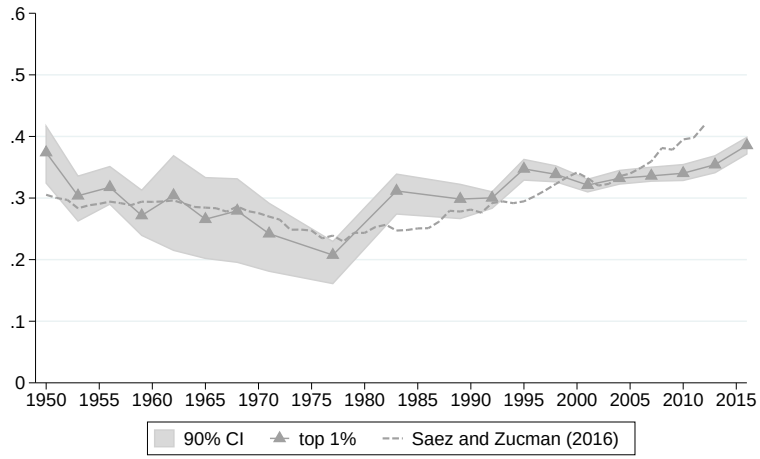
Top 1% income and wealth shares



Income

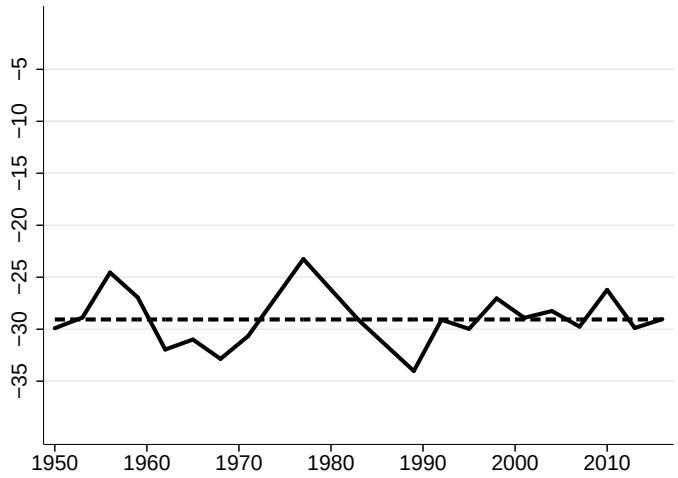


Wealth

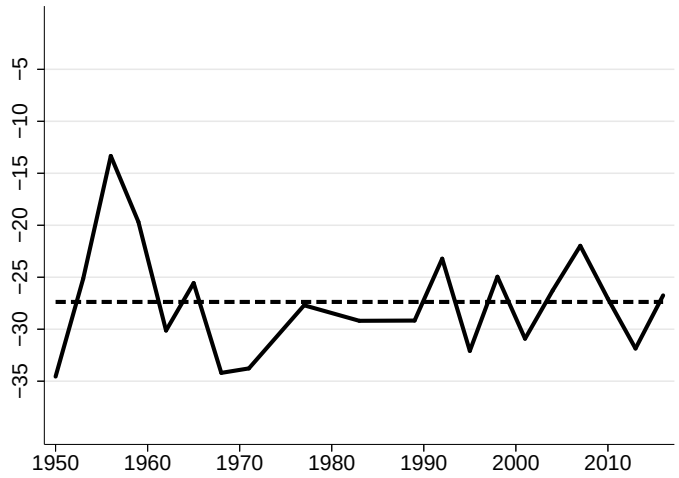
- SCF+ matches levels and trends of top 1% shares historically

back

Racial wealth divide



Rank gap median



Rank gap 90th percentile

- Large and persistent racial rank gaps for wealth
- Typical black households has less wealth than 80% of white households

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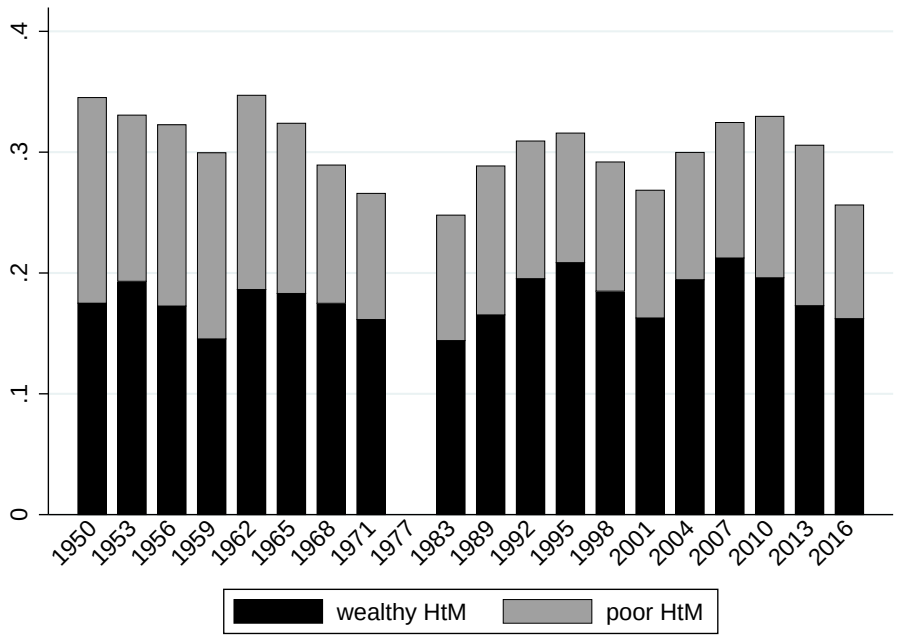
Hand-to-mouth households

- Kaplan et al document large fraction of wealthy hand-to-mouth households
- SCF+ data points to slightly larger share historically



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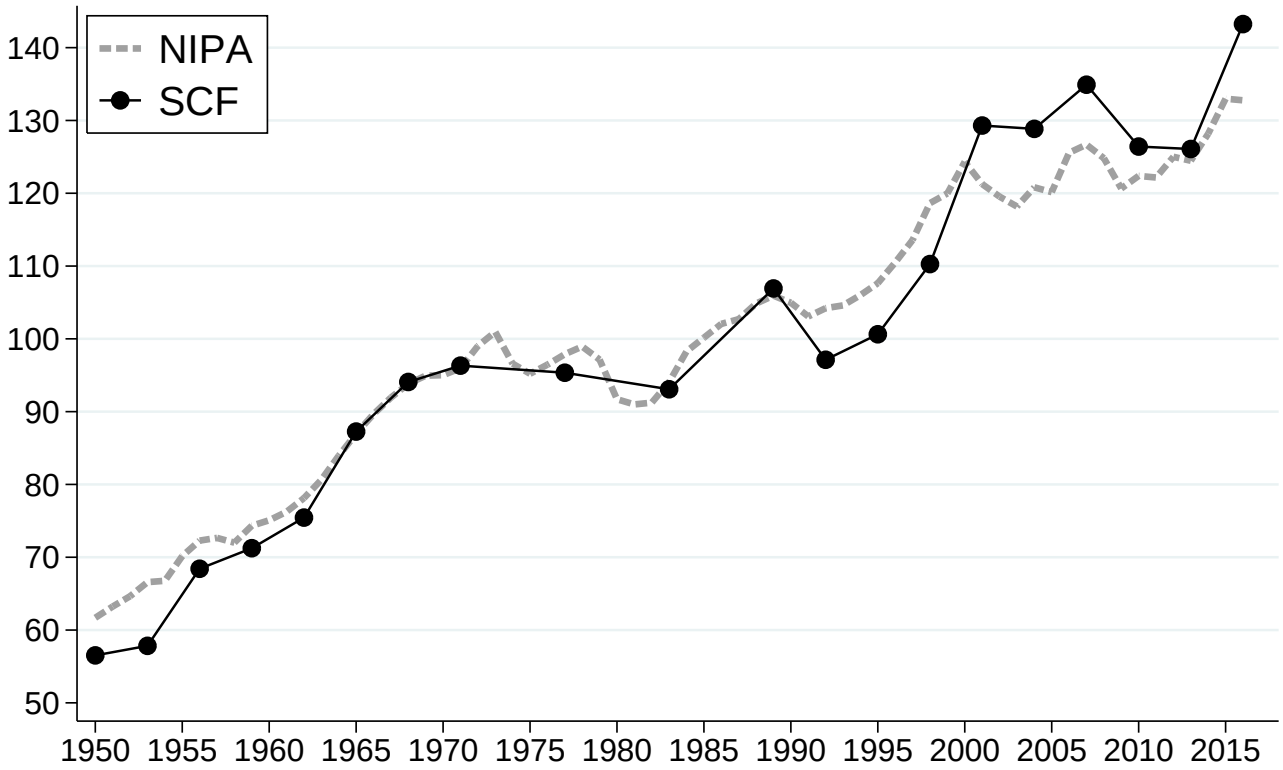
Micro data and macro trends: Income



- Micro data matches macroeconomic income trends from NIPA

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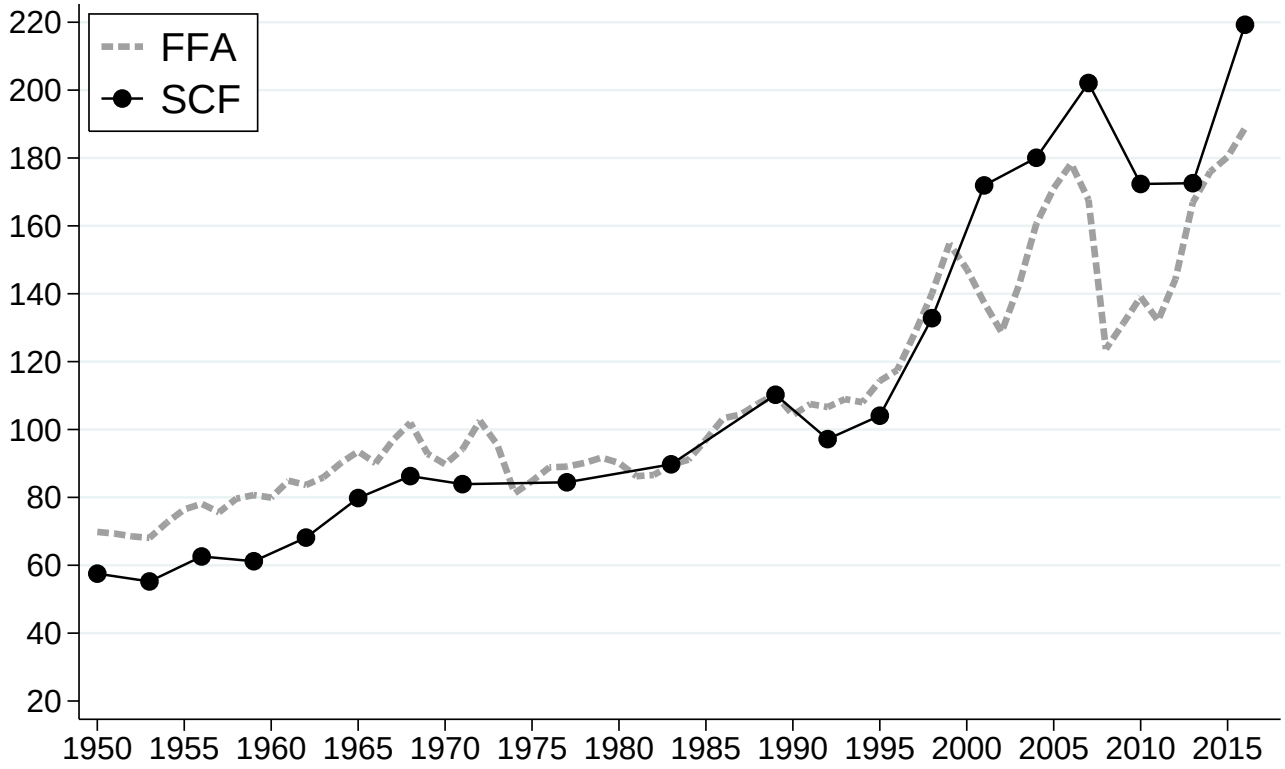
Micro data and macro trends: Wealth



- Micro data matches macroeconomic wealth trends from Flow of Funds

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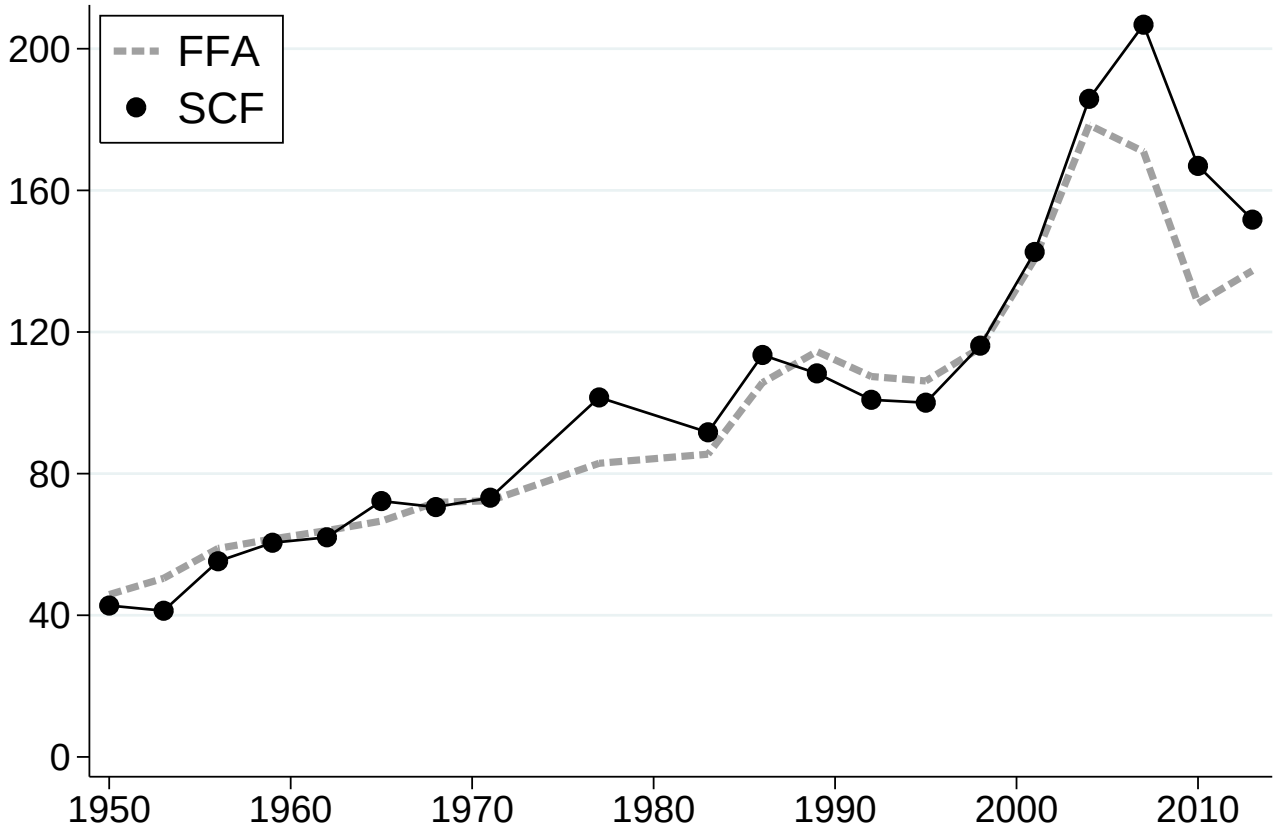
Houses



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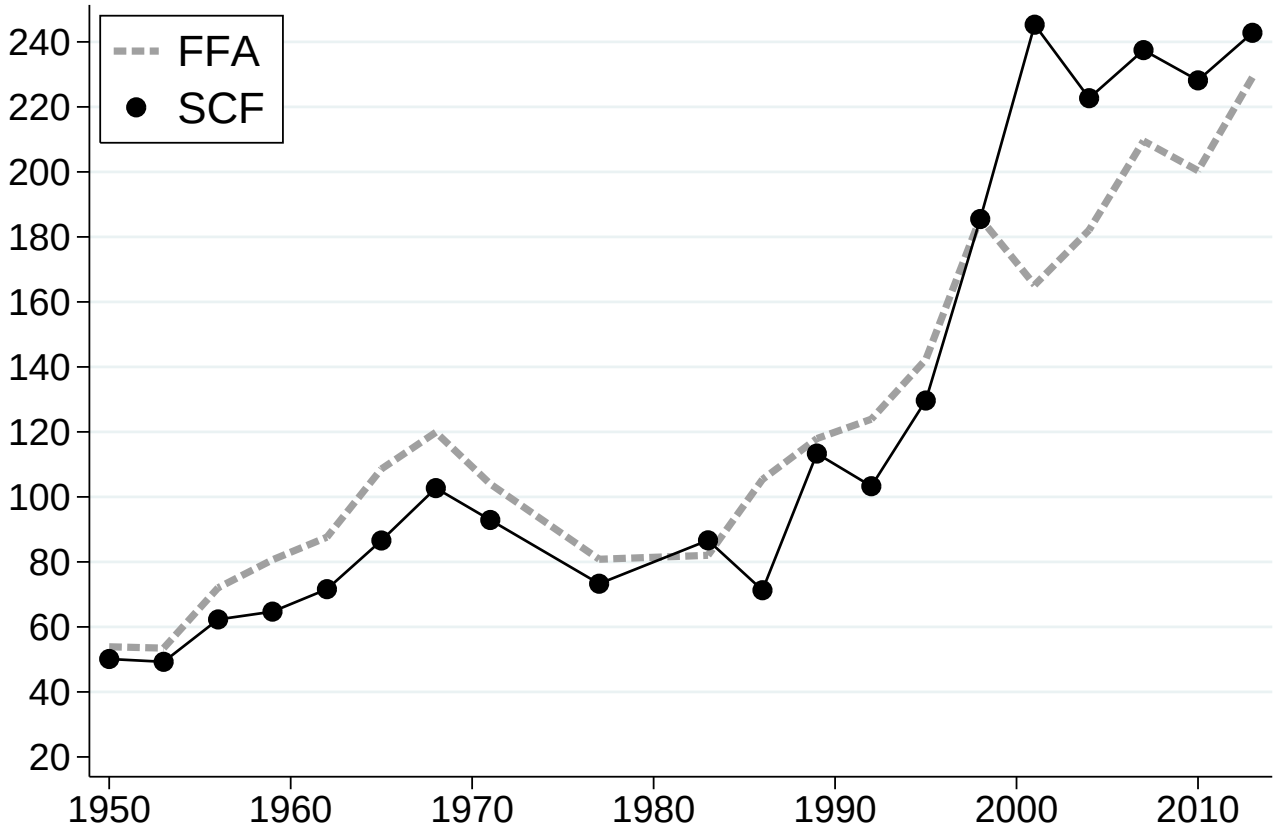
Financial assets



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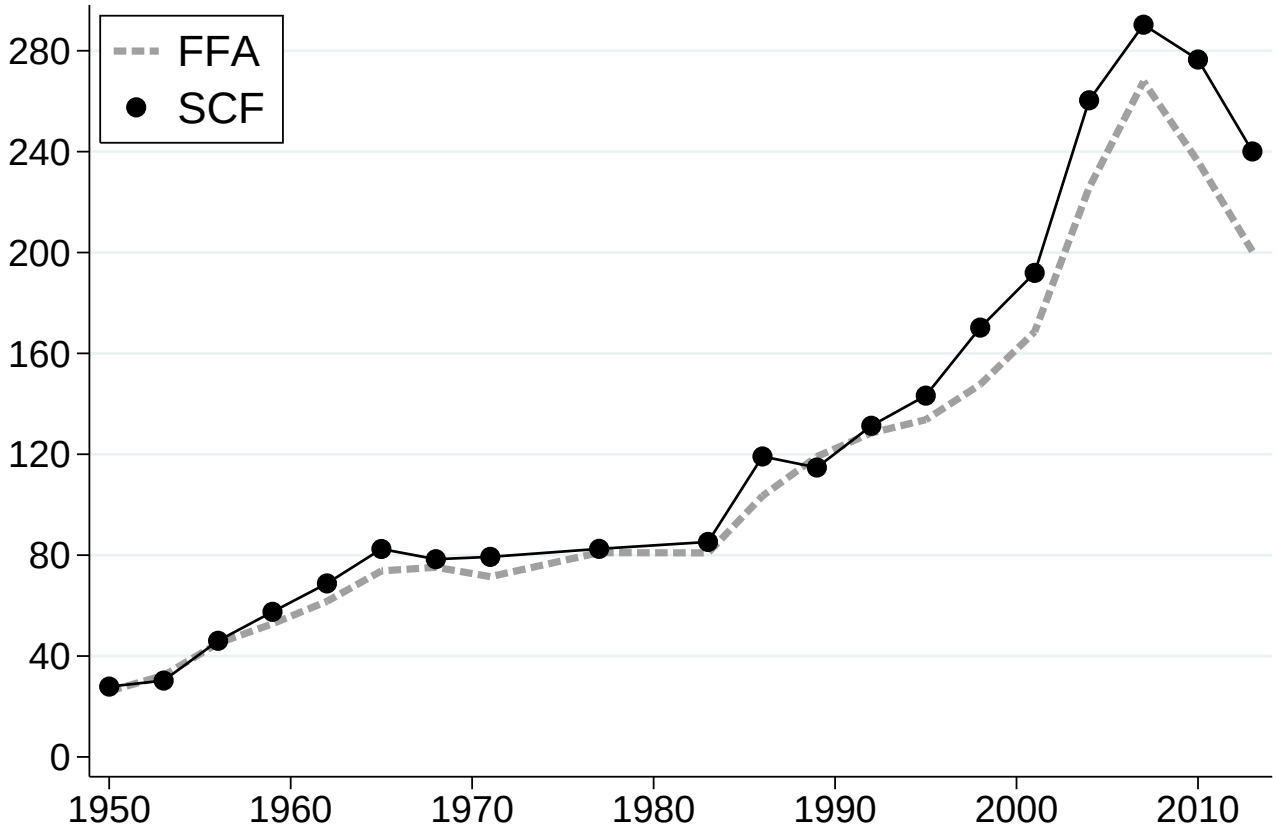
Housing debt



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Re-weighting: Representativeness

- Consider demographic characteristics of household heads

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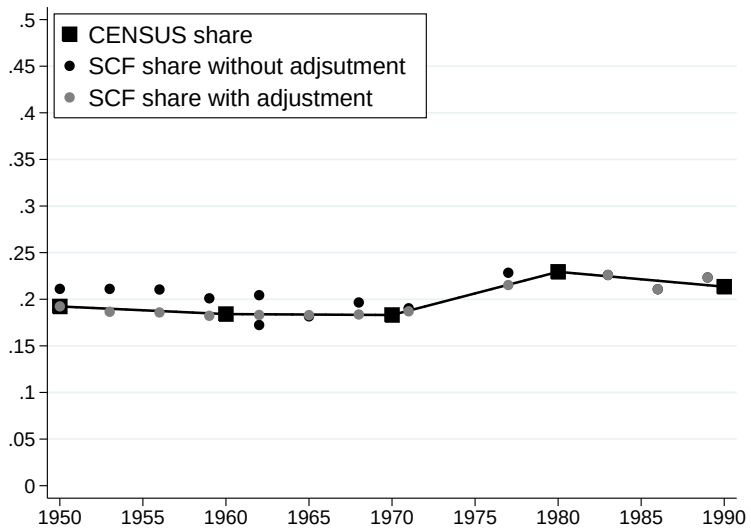
- Match Census population shares for age, education, and race

Re-weighting: Representativeness

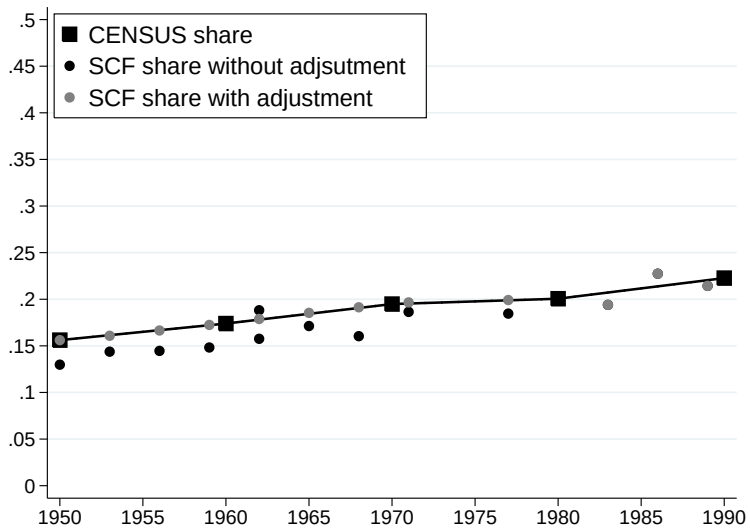
- Consider demographic characteristics of household heads
- Match Census population shares for age, education, and race
- Adjust survey weights using 24 demographic cells



- Age group 25 - 34

Re-weighting: Representativeness

- Consider demographic characteristics of household heads
- Match Census population shares for age, education, and race
- Adjust survey weights using 24 demographic cells



- Age group 65 - 99

Re-weighting: Representativeness

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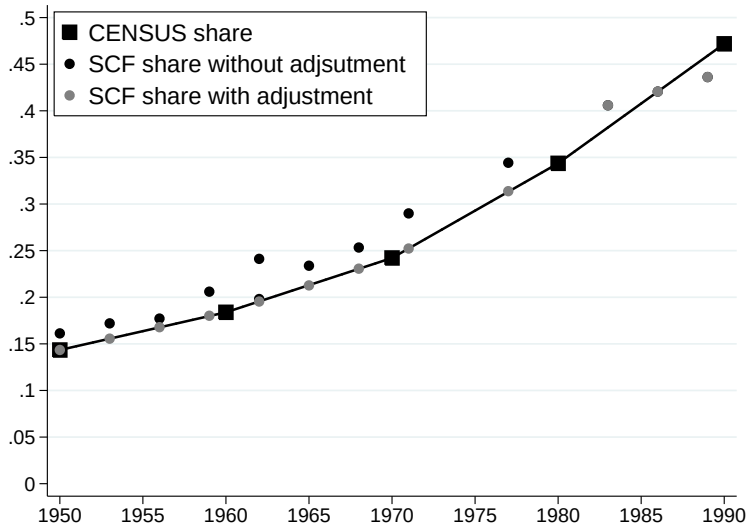
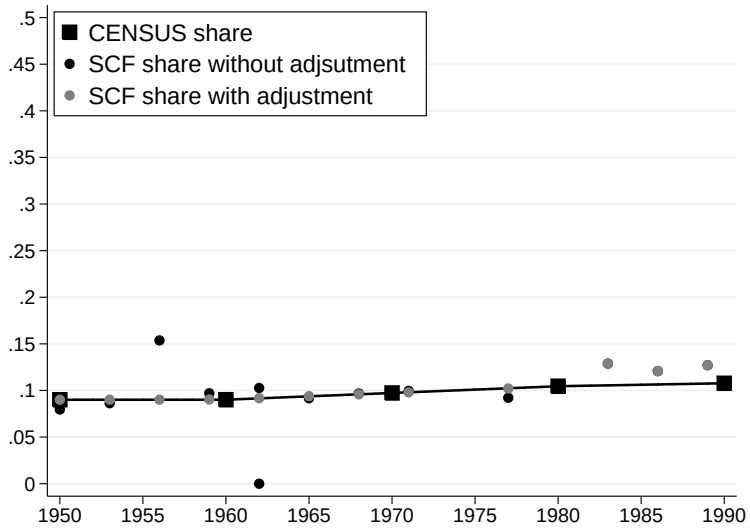
- Match Census population shares for age, education, and race
- Adjust survey weights using 24 demographic cells



- College graduates

Re-weighting: Representativeness

- Consider demographic characteristics of household heads
- Match Census population shares for age, education, and race
- Adjust survey weights using 24 demographic cells



- Black household heads

Re-weighting: Non-response

- Non-response of wealthy household problem in survey data

Re-weighting: Non-response

- Non-response of wealthy household problem in survey data
- "Modern" SCF applies two-frame sampling scheme

Re-weighting: Non-response

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- "List sample" contains sample of wealthy households

Re-weighting: Non-response

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- 1983 data identifies list sample

Re-weighting: Non-response

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- "Modern" SCF applies two-frame sampling scheme
- "List sample" contains sample of wealthy households
- 1983 data identifies list sample
- Calibrate re-weighting using 1983 distribution of list sample

Re-weighting: Non-response

- Non-response of wealthy household problem in survey data
- "Modern" SCF applies two-frame sampling scheme
- "List sample" contains sample of wealthy households
- 1983 data identifies list sample
- Calibrate re-weighting using 1983 distribution of list sample
- Re-weight existent underrepresented household information in "historical" SCF data

Variables

1. ***Income :*** wages and salaries, professional practice and self employment, rental income, interest, dividends, business and farm income, transfer payments

Variables

1. ***Income***

2. ***Assets:*** liquid assets (CDs, checking, saving, call/money market accounts), housing and other real estate, bonds, stocks, corporate and non-corporate equity, retirement accounts

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

Variables

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

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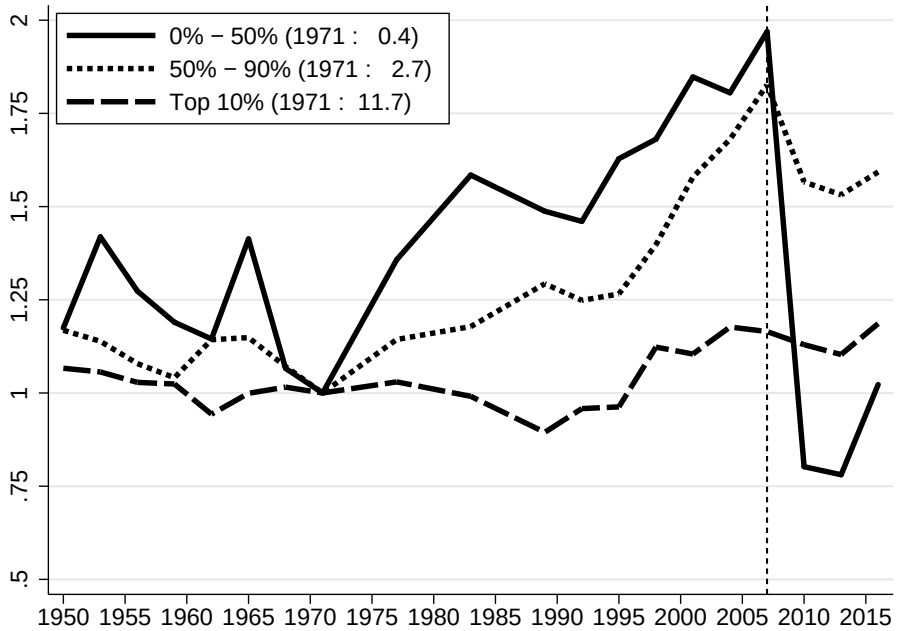
Wealth-to-income ratios by wealth group



- Strong wealth growth leads to rising wealth-to-income ratios

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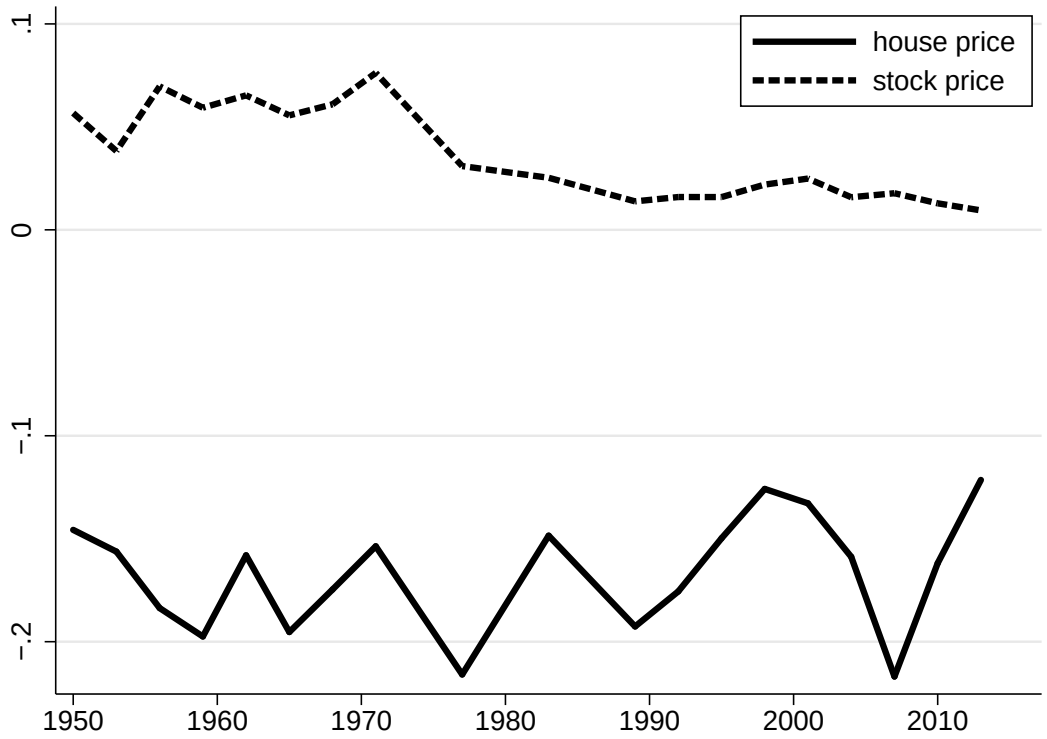
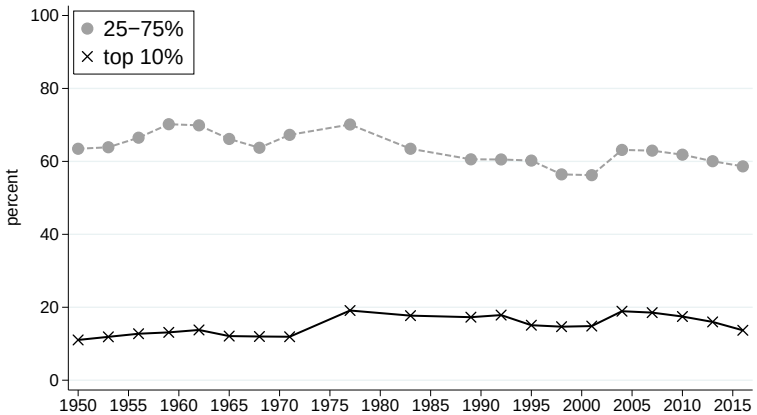
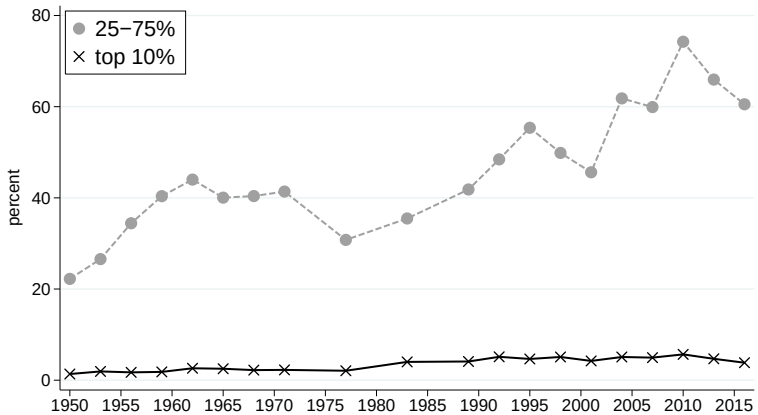
Asset price elasticity of top 10% wealth share



Decomposing house price exposure



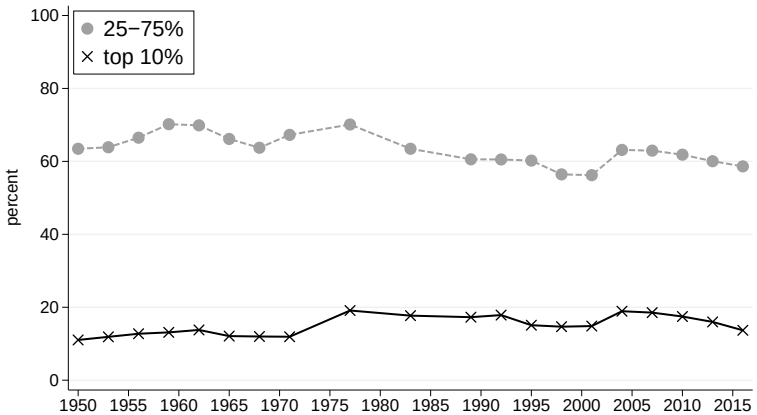
Diversification $\left(\frac{\text{Housing}}{\text{Assets}} \times 100\right)$



Leverage $\left(\frac{\text{Debt}}{\text{Wealth}} \times 100\right)$

- Little diversification of middle class

Decomposing house price exposure



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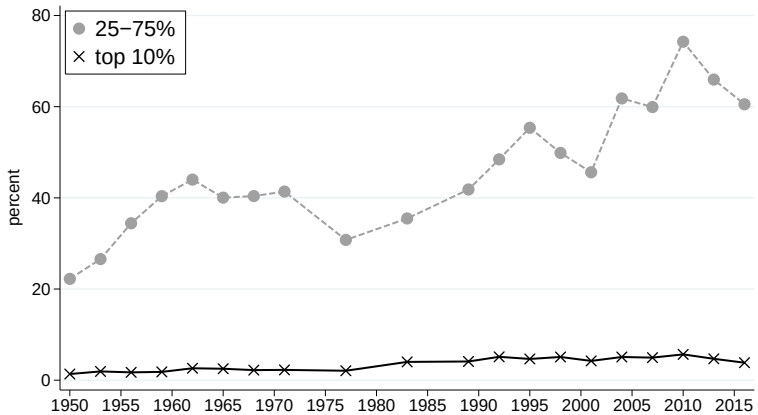
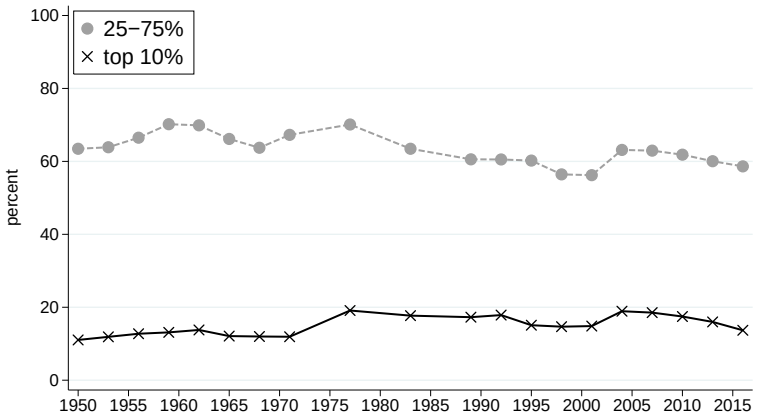


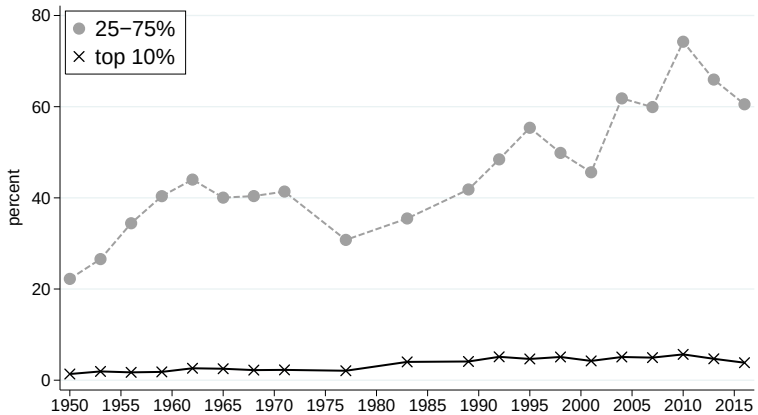
Leverage $\left(\frac{\text{Debt}}{\text{Wealth}} \times 100\right)$

- Little diversification of middle class
- Additional amplification from leverage

Decomposing house price exposure



Diversification $\left(\frac{\text{Housing}}{\text{Assets}} \times 100\right)$



Leverage $\left(\frac{\text{Debt}}{\text{Wealth}} \times 100\right)$

- Little diversification of middle class
- Additional amplification from leverage
- Little diversification and leverage no phenomenon of house price boom