Wealth and Income Inequality in America
1949 - 2016

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University of Bonn

Fed Listens
Distributional Consequences of the
Cycle and Monetary Policy

April 9, 2019
Motivation

- Wealth and income concentration are at historical highs
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- Causes and consequences of high and rising inequality are one of the defining topics of our times
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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

- Combine historical and modern Survey of Consumer Finances (SCF) data covering 1949 to 2016 (SCF+)
- Study inequality trends among bottom 90%
- Explore joint trends of income and wealth inequality
- Highlight importance of asset price dynamics and portfolio composition for wealth inequality trends
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- 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

- “Modern” Survey of Consumer Finances (SCF) starts in 1983

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<thead>
<tr>
<th>Column Number</th>
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000. No income from wages and salaries
Y00. Wage and salary income exceeds $99,999 (record in y book)
X00. Wage and salary income not ascertained
O00. 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 secondary

1. $1 - 99
2. $100 - 499
3. $500 - 999
4. $1,000 - 1,999
5. $2,000 - 2,999
6. $3,000 - 4,999
7. $5,000 - 9,999
8. $10,000 and over

0. No income from this source
W. 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

Construction of SCF+ data

- “Modern” Survey of Consumer Finances (SCF) starts in 1983
- Historical SCF data 1949-1977 so far not systematically coded

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- “Modern” Survey of Consumer Finances (SCF) starts in 1983
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- Major harmonization exercise: extract detailed data on income, assets, and debt

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Variables:
Construction of SCF+ data

- “Modern” Survey of Consumer Finances (SCF) starts in 1983
- Historical SCF data 1949-1977 so far not systematically coded
- Major harmonization exercise: extract detailed data on income, assets, and debt
- Impute missing variables, re-weight for representativeness, and non-response at the top
Changes in income and wealth inequality

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<thead>
<tr>
<th></th>
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<tr>
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<td>21.6</td>
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<td>16.2</td>
<td>15.4</td>
<td>14.5</td>
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<tr>
<td>0- 25%</td>
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- Income concentration increased strongly between 1971 and 2007.
Changes in income and wealth inequality

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- Income concentration increased strongly between 1971 and 2007 with large losses at the bottom.
Joint evolution of income and wealth distribution

- Sort households along the wealth distribution
Joint evolution of income and wealth distribution

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![Graph showing income growth with five income levels: 0% - 50%, 50% - 90%, and Top 10% from 1950 to 2015.]

Income growth

- Strongly diverging income levels between 1971 and 2007
Joint evolution of income and wealth distribution

- Sort households along the wealth distribution

- Strongly diverging income levels between 1971 and 2007
- Wealth levels comove before 2007 and diverge after 2007
Joint evolution of income and wealth distribution

- Sort households along the wealth distribution

- Strongly diverging income levels between 1971 and 2007
- 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
Wealth dynamics

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$q_t^i$: capital gains

$$q_t^i = \sum_{j=1}^{J} \left( \frac{p_{j,t+1}}{p_{j,t}} - 1 \right) \frac{A_{j,t}^i}{W_t^i} = \sum_{j=1}^{J} \left( \frac{p_{j,t+1}}{p_{j,t}} - 1 \right) \alpha_{j,t}^i$$

Capital gains combination of **portfolio allocation** $\alpha_{j,t}^i$ and **asset price changes** $\frac{p_{j,t+1}}{p_{j,t}}$ across asset classes $j$.
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$q^i_t$: capital gains
$Y^i_{L,t}$: labor income
$C^i_t$: consumption
Wealth dynamics

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$$W_{i,t+1}^i = W_{i,t}^i (1 + r_t^i + q_t^i) + Y_{L,t}^i - C_t^i$$

- Savings of group $i$

$$S_t^i = r_t^i W_t^i + Y_{L,t}^i - C_t^i = Y_t^i - C_t^i$$
Wealth dynamics

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

\[ W_{t+1}^i = W_t^i (1 + r_t^i + q_t^i) + Y_{L,t}^i - C_t^i \]

- Savings of group $i$

\[ S_t^i = r_t^i W_t^i + Y_{L,t}^i - C_t^i = Y_t^i - C_t^i \]

- Saving rate $s_t^i = \frac{S_t^i}{Y_t^i}$

\[ W_{t+1}^i = W_t^i (1 + q_t^i) + s_t^i Y_t^i \]
Wealth dynamics

- Dynamics of wealth of group $i$ between $t$ and $t+1$
  
  $$W_{t+1}^i = W_t^i (1 + r_t^i + q_t^i) + Y_{L,t}^i - C_t^i$$

- Wealth growth rate

  $$\frac{W_{t+1}^i}{W_t^i} = 1 + q_t^i + s_t^i \frac{Y_t^i}{W_t^i} = 1 + q_t^i + \sigma_t^i$$

- Asset price component $q_t^i$ multiplies stock of wealth

- Potentially large effects on wealth growth in the short run

- Growth rate of wealth share
Wealth dynamics

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

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  \]

- Savings component $\sigma_t^i$ transmits income inequality to wealth inequality
Wealth dynamics

- Dynamics of wealth of group $i$ between $t$ and $t + 1$
  \[ W_{t+1}^i = W_t^i (1 + r_t^i + q_t^i) + Y_{L,t}^i - C_t^i \]

- Wealth growth rate
  \[ \frac{W_{t+1}^i}{W_t^i} = 1 + q_t^i + s_t^i \frac{Y_t^i}{W_t^i} = 1 + q_t^i + \sigma_t^i \]
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- Savings component $\sigma_t^i$ transmits income inequality to wealth inequality

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

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- Wealth growth rate

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- Growth rate of wealth share $\omega_t^i = \frac{W_t^i}{W_t}$

\[ \frac{\omega_{t+1}^i}{\omega_t^i} = \frac{1 + q_t^i + \sigma_t^i}{1 + q_t + \sigma_t} \]
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- Growth rate of wealth share $\omega_t^i = \frac{W_t^i}{W_t}$
  \[ \frac{\omega_{t+1}^i}{\omega_t^i} = \frac{1 + q_t^i + \sigma_t^i}{1 + q_t + \sigma_t} \]

- Portfolio differences determine $q_t^i$ and shape wealth inequality dynamics
- Little wealth but large gross positions
- Housing most important asset with high leverage
- 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
Household exposure to house price changes

- Elasticity of wealth with respect to house prices: \(\frac{\text{Housing}}{\text{Wealth}} \times 100\)
Household exposure to house price changes

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

- Middle class exposure to house prices at least 3 times larger than of top 10%
Household exposure to house price changes

- Elasticity of wealth with respect to house prices $\frac{\text{Housing}}{\text{Wealth}} \times 100$
- Middle class exposure to house prices at least 3 times larger than of top 10%
- 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}^{\text{top10}}) = \beta_0 + \beta_h \Delta \log(p_{t+1}^h) + \beta_s \Delta \log(p_{t+1}^s) + \varepsilon_t
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- Economically significant “race” coefficients $\beta_h$ and $\beta_s$

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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
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Wealth inequality and asset prices

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- Wealth concentration increased almost 5 times more with constant house prices
- Wealth concentration declined at constant stock prices
Wealth inequality and asset 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
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- Wealth dynamics constitute a race between the stock and housing market
Wealth and Income Inequality in America
1949 - 2016

Fed Listens: Distributional Consequences of the Cycle and Monetary Policy

April 9, 2019
Additional results

- Comparison to estimates from tax data
- Distribution of assets across wealth groups
- Sensitivity and top 1%
- Racial divide
- Wealthy hand-to-mouth households
- Micro data matching macro data
- Income concentration at the top matches results from tax data
Wealth inequality

- Wealth concentration at the top matches results from capitalizing income tax data
Distribution of assets across wealth groups

- Bottom 90% always hold more than 50% of housing
- Top 10% always hold more than 90% of stocks
Excluding top income and wealth households

- Divergence of income and wealth inequality robust to excluding top of distribution
Top 1% income in SCF+

- Same share and income level in SCF+ data above 99th percentile from tax data
Top 1% income in SCF+

- Same share and wealth level in SCF+ data above 99th percentile from tax data
Top 1% income and wealth shares

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

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

- Kaplan et al document large fraction of wealthy hand-to-mouth households
- SCF+ data points to slightly larger share historically
Micro data and macro trends: Income

- Micro data matches macroeconomic income trends from NIPA
Micro data and macro trends: Wealth

- Micro data matches macroeconomic wealth trends from Flow of Funds
Re-weighting: Representativeness

- Consider demographic characteristics of household heads
Re-weighting: Representativeness

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- Match Census population shares for age, education, and race
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- Age group 25 - 34
Re-weighting: Representativeness

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- Age group 65 - 99
Re-weighting: Representativeness

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- College graduates
Re-weighting: Representativeness

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- 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
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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-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
Wealth-to-income ratios by wealth group

- Strong wealth growth leads to rising wealth-to-income ratios
Asset price elasticity of top 10% wealth share

![Graph showing asset price elasticity over time for top 10% wealth share.](image)
Decomposing house price exposure

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

- Little diversification of middle class

Leverage \( \left( \frac{\text{Debt}}{\text{Wealth}} \times 100 \right) \)
Decomposing house price exposure

- Little diversification of middle class
- Additional amplification from leverage
Decomposing house price exposure

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