The College Wealth Divide
Evidence from the Historical Survey of Consumer Finances
1949 - 2016

Alina Bartscher    Moritz Kuhn    Moritz Schularick

Is College Still Worth It?
Symposium at the St. Louis Federal Reserve Bank
May 24, 2018
Motivation

- Wealth and income inequality are at historical highs
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- Rising *college wage premium* driver of rising income inequality
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- Rising *college wage premium* driver of rising income inequality
- Education turned into a key stratifying dimension in U.S. society
- Data limitations impede studying long-run wealth differences across education groups
Contribution

- Study income and wealth differences using *Historical Survey of Consumer Finances (HSCF)*
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- HSCF data covers entire distribution of income and wealth together with demographics (education, martial status, ...)

- Explore determinants of wealth differences between households
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Survey of Consumer Finances (SCF) most widely used data for distribution of income and wealth.
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- “Modern” SCF data exist since 1983
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- Link and harmonize historical and modern SCFs
- Newly compiled HSCF data provide representative household data on income, wealth, and demographics for period from 1949 to 2016
Results

- Newly compiled HSCF micro data match macro trends from NIPA and FFA
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- Share of college-educated households relatively constant across wealth groups
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- Diverging income trends in line with previous research
- Strongly increasing wealth divide between college and non-college households
- Share of college-educated households relatively constant across wealth groups
- Rising stock prices appear as driver of college wealth divide
Historical SCF data

- Historical SCF files so far not systematically coded
Historical SCF data

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

<table>
<thead>
<tr>
<th>Column Number</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-2</td>
<td>Study Number (59)</td>
</tr>
<tr>
<td>3</td>
<td>Card Number (5)</td>
</tr>
<tr>
<td>4-7</td>
<td>Interview Number</td>
</tr>
<tr>
<td>8-10</td>
<td>Income (of S.U.) from wages and salaries (for non self-employed or self-employed)</td>
</tr>
</tbody>
</table>

000. No income from wages and salaries
199, 949
Y00. Wage and salary income exceeds 999,949 (account in your book)
X00. Wage and salary income not ascertained
O00. Not ascertained whether had wage and salary income in 1949
004. Income from wage and salary less than $50

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<tr>
<td>11</td>
<td>Income of S.U. from roomers and boarders, excluding from related necessaries</td>
</tr>
<tr>
<td>1</td>
<td>$1 - $9</td>
</tr>
<tr>
<td>2</td>
<td>$100 - $199</td>
</tr>
<tr>
<td>3</td>
<td>$500 - 999</td>
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<td>4</td>
<td>$1,000 - 1999</td>
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<tr>
<td>5</td>
<td>$2,000 - 2999</td>
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<td>6</td>
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<tr>
<td>7</td>
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</tr>
<tr>
<td>8</td>
<td>$10,000 and over</td>
</tr>
<tr>
<td>9</td>
<td>No income from this source</td>
</tr>
<tr>
<td>T</td>
<td>N.A. whether income from this source</td>
</tr>
<tr>
<td>X</td>
<td>Income from this source, N.A. amount</td>
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- No income from wages and salaries $1,999.99+
- Wage and salary income exceeds $999.99 (record in 999.99)
- Wage and salary income not ascertained
- Not ascertained whether had wage and salary income in 1949
- Income from wage and salary less than $50

Income ranges:
1. $1 - 99
2. $100 - 199
3. $500 - 999
4. $2,000 - 2,999
5. $3,000 - 3,999
6. $4,000 - 4,999
7. $5,000 - 9,999
8. $10,000 and over

0. No income from this source
1. N.A. whether income from this source
2. Income from this source, N.A. amount

Income ranges:
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- Re-weight for representativeness
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- Re-weight for representativeness
- Re-weight for non-response at the top
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, mutual funds, 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
Micro data and macro trends: Income

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

- Micro data match macroeconomic wealth trends from Flow of Funds
Income inequality

- Income concentration at the top matches results from tax data
Wealth concentration at the top matches results from capitalizing income tax data
College and non-college households

- Group households in education groups according to education of household head
College and non-college households

- Group households in education groups according to education of household head

- Household head is male in a married couple
College and non-college households

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- Household head is male in a married couple
- Distinguish households in college and non-college
College and non-college households

- Group households in education groups according to education of household head
- Household head is male in a married couple
- Distinguish households in college and non-college
- Consider only college graduates ("some college" not included)
Comparison to Census Data

- Share of college-headed households from HSCF matches Census data
Income divide

- No real income growth for non-college households since 1971
Income divide

- No real income growth for non-college households since 1971
- 50% increase of income divide between college and non-college households
Wealth divide

- Meager wealth growth of non-college households since 1971
Wealth divide

- Meager wealth growth of non-college households since 1971
- Tripling of wealth for college households
Wealth and income growth

- Small increase of wealth-to-income ratio for non-college households
Wealth and income growth

- Small increase of wealth-to-income ratio for non-college households
- Much stronger wealth than income growth for college households
College households in the wealth distribution

- Share of college households increased from 15% to 34%
College households in the wealth distribution

- Share of college households increased from 15% to 34%
- Share among bottom 50% of wealth distribution increased from 9% to 21%
College households in the wealth distribution

- Share of college households increased from 15% to 34%
- Share among 50%-90% of wealth distribution increased from 15% to 40%
College households in the wealth distribution

- Share of college households increased from 15% to 34%
- Share among top 10% of wealth distribution increased from 38% to 76%
College households in the wealth distribution

- College households across wealth groups

![Graph showing the distribution of college and non-college households along the wealth distribution.](image-url)
College households in the wealth distribution

- College households across wealth groups

- Distribution of college and non-college households along the wealth distribution roughly stable
College households in the wealth distribution

- Non-college households across wealth groups

- Distribution of college and non-college households along the wealth distribution roughly stable
Wealth and income divide

- Ratios of wealth and income between college and non-college roughly constant until 1970
Wealth and income divide

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- College income divide +50% since 1970
Wealth and income divide

- Ratios of wealth and income between college and non-college roughly constant until 1970
- College income divide +50% since 1970
- College wealth divide +100% since 1970
Accounting for divergent wealth growth

- Income growth leads to wealth growth

- Simplest case: constant wealth-to-income ratio over time

\[
\frac{W_{t+1}}{Y_{t+1}} = \frac{W_t}{Y_t} : \quad Y_{t+1} = 2 \times Y_t \quad \Rightarrow \quad W_{t+1} = 2 \times W_t
\]

- College income grew relative to non-college income

\[
\frac{Y_C^{1970}}{Y_N^{1970}} \approx 2 \quad \rightarrow \quad \frac{Y_C^{2010}}{Y_N^{2010}} \approx 3 \quad \Rightarrow \quad \frac{W_C^{2010}}{W_N^{2010}} \approx 3
\]

- Simplest case: College wealth growths 50% more than non-college wealth

- Half of wealth growth for college households unexplained
Wealth growth accounting

- Regress income growth on wealth growth

\[
\frac{W_t^i}{W_{1971}^j} = \alpha \frac{Y_t^i}{Y_{1971}^j} + \beta \times \text{age}_t^i + \gamma_t \left( \text{year} \times \text{college}_t^i \right) + \varepsilon_{i,t}
\]

with \( j \) for college and non-college
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\]

with \(j\) for college and non-college

- Increasing residual “college effect” \(\gamma_t\) over time
Wealth growth accounting

- Control for income growth by conditioning on position in income distribution (50% - 90%)
Wealth growth accounting

- Control for income growth by conditioning on position in income distribution (50% - 90%)
- Restrict sample to age 40 to 60 to control for age
Wealth growth accounting

- Control for income growth by conditioning on position in income distribution (50% - 90%)
- Restrict sample to age 40 to 60 to control for age
- Same residual “college effect” starting to shown up around 1980s
Long-run wealth divide

- Averaging data to decades shows rising college wealth divide since 1980s

![Graph showing income and wealth over decades](chart.png)
Long-run wealth divide

- Averaging data to decades shows rising college wealth divide since 1980s
- Increasing wealth divide not driven by income or age
Asset price effects and wealth growth

- Asset prices changes alternative force for wealth growth
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- Capital gains from asset prices unrelated to income dynamics
Asset price effects and wealth growth

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- Portfolio heterogeneity and different asset price exposure lead to differences in capital gains

Large part of wealth divergence during stock market boom of 1990s
Asset price effects and wealth growth

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- Capital gains from asset prices unrelated to income dynamics
- Portfolio heterogeneity and different asset price exposure lead to differences in capital gains
- Large part of wealth divergence during stock market boom of 1990s
Portfolio composition

- Small differences between college and non-college households for housing
Portfolio composition

- Small differences between college and non-college households for housing
- College households increased equity wealth especially during 1990s
Wealth growth and asset prices

- In 1989 college households own 7.6 times more stock market wealth than non-college households

- Large capital gains for stock owners during stock market boom of the 1990s
Stock market wealth

- Initial difference in level of stock holdings translates into large difference in capital gains
Stock prices and wealth divide

- Stock market growth strongly correlates with estimated “college effect” $\gamma_t$
Stock market and wealth dynamics

- Regress “college effect” on stock price growth $P_t$

\[ \gamma_t = \alpha + \phi \left( \frac{P_t}{P_{1970}} \right) + \hat{\gamma}_t \]
Stock market and wealth dynamics

- Regress “college effect” on stock price growth $P_t$

$$\gamma_t = \alpha + \phi \left( \frac{P_t}{P_{1970}} \right) + \hat{\gamma}_t$$

- Residual “college effect” $\hat{\gamma}_t$ shows no time trend
Asset prices and wealth dynamics

- Wealth growth of college households exceeds income growth
Asset prices and wealth dynamics

- Wealth growth of college households exceeds income growth
- Widening wealth divide between college and non-college households

Estimated "college effect" correlates strongly with stock prices
Wealth growth differences explained by stock price changes
Asset prices important driver of wealth dynamics
Asset prices and wealth dynamics

- Wealth growth of college households exceeds income growth
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Conclusions

- New micro data on the long-run evolution of U.S. households’ financial situation
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- Differential wealth growth of college and non-college households
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- Differential wealth growth of college and non-college households

- Large part of wealth growth of college households not due to income growth

- Evidence points towards large capital gains from stock market for college households
Additional slides

The College Wealth Divide

Evidence from the Historical Survey of Consumer Finances 1949 - 2016

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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
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
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- Age group 65 - 99
Re-weighting: Representativeness

- Consider demographic characteristics of household heads
- Match Census population shares for age, education, and race
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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

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- "Modern" SCF applies two-frame sampling scheme
Re-weighting: Non-response

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- "List sample" contains sample of wealthy households
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- 1983 data identifies list sample
Re-weighting: Non-response

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- "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
Validating re-weighting approach

1. Compare to similarly designed 1962 survey to check for changing non-response pattern
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<tr>
<td>SFCC 1962</td>
<td>top 10% 21 %</td>
<td>top 10% 20 %</td>
</tr>
<tr>
<td></td>
<td>top 5% 35 %</td>
<td>top 5% 28 %</td>
</tr>
<tr>
<td></td>
<td>top 1% 63 %</td>
<td>top 1% 48 %</td>
</tr>
<tr>
<td>SCF 1983</td>
<td>top 10% 17 %</td>
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</tr>
<tr>
<td></td>
<td>top 5% 34 %</td>
<td>top 5% 32 %</td>
</tr>
<tr>
<td></td>
<td>top 1% 88 %</td>
<td>top 1% 72 %</td>
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Validating re-weighting approach

1. Compare to similarly designed 1962 survey to check for changing non-response pattern

2. Drop 1983 list sample and re-weight sample ("proof of concept")

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- Representative household-level data from 1949 to 2016
Historical Survey of Consumer Finances (HSCF)

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  1. Demographics
Historical Survey of Consumer Finances (HSCF)

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  1. Demographics
  2. Income
Historical Survey of Consumer Finances (HSCF)

- Representative household-level data from 1949 to 2016
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  3. Balance sheets
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- Representative household-level data from 1949 to 2016
- Information independent of tax filing status
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- Representative household-level data from 1949 to 2016
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- Balance sheet of "Main Street America" (houses, mortgages, and cars) well covered
Historical Survey of Consumer Finances (HSCF)

- Representative household-level data from 1949 to 2016
- Information independent of tax filing status
- Balance sheet of "Main Street America" (houses, mortgages, and cars) well covered
- Capitalization method imputes large part of assets (in 2010)

1. 91% of wealth for bottom 90%
2. 40% of wealth for top 10%