The Saving Glut of the Rich

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Motivation

Rising debt ...  ... and falling rates

Debt to GDP ratio

Real interest rate (%)


Two Research Studies

1. **The Saving Glut of the Rich** *(facts)*
   - Measuring the rise in savings by the rich in a national accounting framework
   - Savings have been transformed into gov and hh borrowing, as opposed to investment

2. **Indebted Demand** *(model)*
   - Model incorporating differential MPCs out of lifetime income *(non-homotheticity)*
   - Inequality, financial liberalization lead to rising debt and lower interest rates
   - Implications for monetary and fiscal policy, risk of debt traps
Saving Glut of the Rich: Findings

• Measuring the savings of the rich, and what it finances:
  • using income flows (the NIPA)
  • using measures of debt and wealth (the Financial Accounts)
  • using state-level first-difference specification that approximates ideal experiment

• Findings
  • Savings by the top 1% have risen 2.5 to 4 pp of national income comparing 1960s and 1970s to post-2000; same order of magnitude as global saving glut
  • Savings associated with borrowing by non-rich and gov; not rise in investment
  • State-level analysis: Rise in top income shares explains all of the rise in household debt held as a financial asset by household sector
Related Empirical Literature


• **Wealth inequality:** Saez and Zucman (2016); Wolf (2017); Bricker, et al (2018); Batty, et al (2019); Kuhn et al (2020); Smith, et al (2020)

• **Long-term rise in household debt:** Bartscher et al (2020)

• **Linking inequality and borrowing:** Rajan (2011); Cynamon and Fazzari (2015); Bertrand and Morse (2016); Kumhof, et al (2015)

• **Consumption:** Slesnick (2001), Krueger and Perri (2006), Blundell et al. (2008), Heathcote et al. (2010), Aguiar and Bils (2015), Attanasio and Pistaferri (2016), Meyer and Sullivan (2017), Guvenen et al. (2017), Fisher et al. (2016), Guvenen et al. (2019), and De Nardi et al. (2018)).
Measuring the Saving Glut of the Rich
Savings in the NIPA

• Start with GDP

\[ Y = C + G + I + (X - M) \]  \hspace{1cm} (1)

• National income: \( Z = Y - \delta + W - \epsilon \); \( \delta \): consumption of fixed capital, \( W \): net income from abroad, \( \epsilon \): statistical discrepancy; \( F = (X - M + W) \)

\[ Z - C = G + I^n + F - \epsilon \]  \hspace{1cm} (2)

• Using the government budget constraint \( S^g = T - R - G \):

\[ \Theta = Z - T + R - C = I^n + F - S^g - \epsilon \]  \hspace{1cm} (3)

• \( \Theta \) is the key concept of aggregate private savings (includes personal and business savings)
Accounting for the Distribution

• Split savings by income or wealth distribution:

\[ \Theta_{top1} + \Theta_{next9} + \Theta_{bot90} = I^n + F - S^g - \epsilon \]

• Central challenge is measurement of \( \Theta_{it} \): savings by group \( i \) in year \( t \)

• Two approaches:
  
  • Income less consumption approach:

\[ \Theta_{it} = Z_{it} - T_{it} + R_{it} - C_{it} \]

  • Wealth-based approach

\[ \Theta_{it} = \sum_{j \in J} \left( \Delta W_{it}^j - \pi_t^i W_{i,t-1}^j \right) \]
Measurement: Income less consumption approach

- $Z_{it} - T_{it} + R_{it}$:

  - Piketty et al 2018; Congressional Budget Office

- $C_{it}$:

  - Two inputs: (1) consumption share in a baseline year and (2) assumption on long-run evolution of consumption to income ratio

  - Baseline uses PSID, SCF (Fisher et al 2017)

  - Consumption to income ratio assumption over time follows Straub (2019):

$$\frac{C_{it}}{\bar{y}_t} = K \ast \left( \frac{y_{it}}{\bar{y}_t} \right)^\beta$$
Consumption Share of the Top 1% of Income Distribution

- $\beta = 1$, under-report
- $\beta = 0.7$, under-report
- $\beta = 0.5$, under-report

Consumption share over time from 1960 to 2020.
Measurement: Wealth-based approach

- $W_{it}$:
  - Saez Zucman 2016; Piketty et al 2018; Distributional Financial Accounts
  - Careful consideration of criticisms in Bricker et al 2018; Smith et al 2020

- $\pi_{jt}$:
  - As in Saez Zucman 2016 (and others), with a few changes
  - Ensure that total savings adds up to national accounts
  - Take into account debt write-downs
How Large Is the Saving Glut of Rich?
Saving Glut of the Rich Relative to 1982
(Income less consumption approach)

Scaled by national income

β = 1, under-report
β = 0.7, under-report
β = 0.5, under-report
## Saving Glut of the Rich over Time

<table>
<thead>
<tr>
<th>Time Period</th>
<th>Baseline</th>
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<tbody>
<tr>
<td>63-82</td>
<td>0.057</td>
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<tr>
<td>83-97</td>
<td>0.073</td>
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<tr>
<td>98-07</td>
<td>0.086</td>
</tr>
<tr>
<td>08-15</td>
<td>0.099</td>
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</tbody>
</table>
## Saving Glut of the Rich over Time: Robustness

<table>
<thead>
<tr>
<th>Decade</th>
<th>PSZ</th>
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<th>CBO</th>
<th></th>
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<tr>
<td></td>
<td>$\beta = 1$</td>
<td>$\beta = 0.7$</td>
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<td>$\beta = 1$</td>
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<td>98-07</td>
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<tr>
<td>08-15</td>
<td>0.041</td>
<td>0.046</td>
<td>0.049</td>
<td>0.031</td>
<td>0.035</td>
<td>0.039</td>
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</table>
Saving Glut of the Rich
(Wealth-based approach)
Where Does the Saving Glut Settle?
Where Does the Saving Glut Settle?

• Re-arranging the NIPA equation and scaling by $Z_t$ yields:

$$\theta_{top1,t} = \frac{I^n_t + F_t}{Z_t} - \theta_{next9,t} - \theta_{bot90,t} - \frac{S^g_t}{Z_t}$$

• Saving glut could be invested, could be sent overseas …

• or could finance more borrowing by the bottom 99% and the government
Net Domestic Investment and the Foreign Account

Investment

Current account

Scaled by national income

1960 1980 2000 2020

Net domestic investment

Saving of top 1%

Investment

Current account position

Saving of top 1%
Saving Glut of the Rich and the Global Saving Glut

Scaled by national income

1960 1980 2000 2020

Foreign flows into U.S.

Saving of top 1%

-0.02 0 0.02 0.04 0.06

Scaled by national income
## Traditional Channels of Absorption

<table>
<thead>
<tr>
<th>Time Period</th>
<th>Saving glut</th>
<th>Investment</th>
<th>Current Account</th>
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<tbody>
<tr>
<td>63-82</td>
<td>0.057</td>
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<tr>
<td>83-97</td>
<td>0.073</td>
<td>0.088</td>
<td>-0.020</td>
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<tr>
<td>98-07</td>
<td>0.086</td>
<td>0.091</td>
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<tr>
<td>08-15</td>
<td>0.099</td>
<td>0.045</td>
<td>-0.033</td>
</tr>
</tbody>
</table>
Saving Glut of the Rich and Saving of the non-Rich

Scaled by national income

1960 1980 2000 2020
top 1%
next 9%
bottom 90%

Scaled by national income

1960 1980 2000 2020

Top 1%: ▲
Next 9%: ▲
Bottom 90%: ▲
Using the Wealth-based Approach

Scaled by national income (relative to 77–82)


top 1%
next 9%
bottom 90%
# Absorption by the Bottom 90%

<table>
<thead>
<tr>
<th>Time Period</th>
<th>Top 1%</th>
<th>Next 9%</th>
<th>Bottom 90%</th>
<th>Gov Saving</th>
</tr>
</thead>
<tbody>
<tr>
<td>63-82</td>
<td>0.057</td>
<td>0.043</td>
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<tr>
<td>83-97</td>
<td>0.073</td>
<td>0.043</td>
<td>-0.011</td>
<td>-0.051</td>
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<tr>
<td>98-07</td>
<td>0.086</td>
<td>0.042</td>
<td>-0.055</td>
<td>-0.026</td>
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<tr>
<td>08-15</td>
<td>0.099</td>
<td>0.044</td>
<td>-0.038</td>
<td>-0.089</td>
</tr>
</tbody>
</table>
Integrating to Obtain Accumulated Absorption

• Start with:

\[ \theta_{top1,t} + \theta_{bot99,t} - \left( \frac{I^n}{Z} \right)_t = \left( \frac{F}{Z} \right)_t + \left( \frac{S^g}{Z} \right)_t + \epsilon_t = 0 \]

• For each of the 6 variables, construct

\[ \hat{V}_t = V_t - V_{pre} \]

• Obtain:

\[ \overline{V} = \sum_{t=1983}^{2015} \hat{V}_t \]

• Then:

\[ \overline{\theta_{top1}} + \overline{\theta_{bot99}} - \left( \frac{I^n}{Z} \right) - \left( \frac{F}{Z} \right) + \left( \frac{S^g}{Z} \right) + \bar{\epsilon} = 0 \]
Absorption of the Accumulated Saving Glut of Rich

$\text{Top 1\% Saving Glut}$

$\text{Next 9\% Saving}$

$\text{F}$

$I$

$\text{Bottom 90\% Saving}$

$\varepsilon$

$\text{Government Saving}$
Linking the Saving of the Rich to the Borrowing of the Non-Rich
The Rich Financing the Non-Rich

- Goal is to measure how much of the wealth of the rich represents a claim on the borrowing of the non-rich

- Matrix representation:

\[
\begin{bmatrix}
A_1 \\
A_2 \\
\vdots \\
A_I
\end{bmatrix} =
\begin{bmatrix}
\omega_{1,1} & \omega_{1,2} & \cdots & \cdots & \omega_{1,C} \\
\omega_{2,1} & \omega_{2,2} & \cdots & \cdots & \omega_{2,C} \\
\vdots & \vdots & \ddots & \ddots & \vdots \\
\omega_{I,1} & \omega_{I,2} & \cdots & \cdots & \omega_{I,C}
\end{bmatrix}
\begin{bmatrix}
F_1 \\
F_2 \\
\vdots \\
F_C
\end{bmatrix}
\]

- The vector \(F_C\) requires us to “unveil” the financial system; the rich hold household debt through banks, non-financial businesses, mutual funds, etc.
Unveiling the Financial System

• Start with household debt (mortgages and consumer credit) in Financial Accounts

• Use linkages in Financial Accounts to unveil the holdings in a series of rounds

• Series of rounds
  1. Start with GSEs, ABS issuers, banks, REITS, finance companies
  2. Unveil GSEs, ABS issuers, REITS, finance companies
  3. Unveil mutual and money market funds
  4. Unveil banks
  5. Unveil corporations

• Proportionality of ownership claims is crucial assumption
<table>
<thead>
<tr>
<th></th>
<th>Depository Institutions</th>
<th>Non-Fin. Corp Businesses</th>
<th>Non-Fin. Non-Corp Businesses</th>
</tr>
</thead>
<tbody>
<tr>
<td>FED</td>
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<td></td>
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<tr>
<td></td>
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<tr>
<td>Mutual/ Money</td>
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<tr>
<td>Market Funds</td>
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<td>Life Ins. Reserves</td>
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<td>Mutual Funds</td>
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</tr>
<tr>
<td>Money Market</td>
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</tr>
<tr>
<td>Bonds</td>
<td>0.05</td>
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<td>Equity</td>
<td>0.08</td>
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</tr>
<tr>
<td>Checkable Deposits</td>
<td>0.01</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Time Deposits</td>
<td>0.25</td>
<td></td>
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</tbody>
</table>
Total HH Debt

- Pass-Through
  - Agency, ABS, REITs, Finance Comps
- FED
- Mutual/Money Market Funds
- Depository Institutions
- Non-Fin. Corp Businesses
- Non-Fin. Non-Corp Businesses

**FINAL**

- HH Debt
  - Held by U.S. Households

- Pensions 0.18
- Life Ins. Reserves 0.04
- Mutual Funds 0.05
- Money Market 0.03
- Bonds 0.05
- Equity 0.08
- Checkable Deposits 0.01
- Time Deposits 0.25
Who Holds Household Debt as a Financial Asset?

Who holds HH debt?

Relative to 1982

U.S. Households
Rest of world
Government
Residual

Scaled by national income

1960 1980 2000 2020

1960 1980 2000 2020

Scaled by national income
The Rich Financing the Non-Rich

• Matrix representation:

\[
\begin{bmatrix}
A_1 \\
A_2 \\
\vdots \\
A_I \\
\end{bmatrix} =
\begin{bmatrix}
\omega_{1,1} & \omega_{1,2} & \ldots & \ldots & \omega_{1,C} \\
\omega_{2,1} & \omega_{2,2} & \ldots & \ldots & \omega_{2,C} \\
\vdots & \vdots & \ddots & \ddots & \vdots \\
\omega_{I,1} & \omega_{I,2} & \ldots & \ldots & \omega_{I,C} \\
\end{bmatrix}
\begin{bmatrix}
F_1 \\
F_2 \\
\vdots \\
F_C \\
\end{bmatrix}
\]

• The weights \( \omega_{i,c} \) come from capitalization technique (SZ 2016, Smith et al 2020) or Distributional Financial Accounts (Batty et al 2019)
Net Household Debt across Wealth Distribution Relative to 1982

Scaled by NI, relative to 1982

1960 1980 2000 2020
Top 1% Next 9% Bottom 90%

1960 1980 2000 2020
Top 1% Next 9% Bottom 90%
State-level analysis
Advantages of State-level Analysis

- Ideal thought experiment: holding all else equal, how does an increase in top income shares affect the accumulation of household debt held as a financial asset of the rich?

- State-level first-difference specification is closer to this ideal thought experiment

- Advantages:
  - Removes other aggregate secular trends (demographics, current account deficits, etc)
  - Helps more directly tie rise in top income shares to accumulation of household debt as financial asset
Change in Top 1% Share of Income Across States

Change in top 1% share, 1982 to 2007
State-level data

- Benchmark: same as Saez-Zucman, with state-level identifiers to create both wealth and income shares across the income distribution

- Key difference: state-level identifiers missing in micro-data for those with AGI above $200K

- Ameliorate this problem using state-level aggregates for all individuals with more than $200K from SOI (new dataset!), but then top income group cannot be too narrow (top 6%)

- Novel data allows us to create:

  \[ A_{i,s,t}^{HHD} = \sum_c \pi_{c,i,s,t} \cdot A_{c,t}^{HHD} \]
State-level specification

- Let

\[ \Delta_{82,07} Y_{is} = \frac{A_{is,2004-07}^{HHD}}{AGI_{s,2004-07}} - \frac{A_{is,1982}^{HHD}}{AGI_{s,1982}} \]

- Key specification:

\[ \Delta_{82,07} Y_{is} = \alpha + \beta_i \ast \Delta_{82,07} \text{Top6Share}_s + \Gamma \ast X_s + \varepsilon_s \]

- Notice:

- \( \Delta_{82,07} Y_s = \sum_i \Delta_{82,07} Y_{is} \), and so sum of \( \beta_i \) gives total effect of \( \Delta_{82,07} \text{Top6Share}_s \)
- Controls \( X_s \) allow us to fix initial household debt ownership (valuation effects), average income growth, initial income levels, etc
Change in Household Debt Holding Against Rise in Top Income Share
Back of Envelope Aggregate Calculation

- Rise in the share of the top 6% is 14.9% in aggregate

- Coefficient implies: 14.9% increase in top income share associated with a 29.1 percentage point increase in the holdings of household debt as a share of income

- Total rise in household debt held as a financial asset by households as a share of national income at the U.S. level between 1982 and 2007 is 30.3 percentage points

- State-level coefficient estimate implies that rise in top 6% income share explains almost all of the rise in household debt held as financial asset by households
Post Recession: The Rise in Government Debt
The Rise of Government after Great Recession

Scaled by national income (relative to 2007)

- Top 10%
- Bottom 90%
- Rest of world
- Government
- Residual

Conclusion
Implications

• Saving glut of the rich may be linked to decline in interest rates and rise in household debt across advanced countries (see model paper)

• Because they ignore distribution, national saving rates can be misleading

• Financial system is channeling funds to households and governments, while investment is weak. Why?
Top income shares and rising household debt across countries
Extra Slides
Instruments through which Household Debt Held by Households

More equity–like

Scaled by NI, relative to 1980


Pensions Equity
Annuities Mutual funds

More fixed income–like

Scaled by NI, relative to 1980


Checking deposits Time deposits
Life Ins Reserves Bonds
Money market funds

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Through What Instruments Does Top 10% Hold Household Debt?

Top 10%, 2007 level

Top 10%, 1992–2007 change
Non-financial business deposits and money market fund holdings

Scaled by national income

1960 1980 2000 2020
Who Holds Household Debt across the Wealth Distribution? Details

Top 1%

Next 9%

Scaled by national income


DFA PSZ
Robustness of household debt holdings of the rich

Scaled by national income (relative to 1982)

1960 1980 2000 2020

Top 10% (baseline)
Top 10% (UST10y)
Top 10% (100 bp spread)
Top 10% (50 bp spread)
Household debt holdings of the rich, DFA

DFA: HHD

DFA & PSZ: HHD
Change in Top 1% Share Against Change in Top 6% Share
Note: Survey Data Misses Many Sources of Income

• The measure of saving used here includes both personal and business saving

• Survey data misses all of business saving, and many sources of personal saving

• Business saving (undistributed corporate profits) averaged 4.2% of national income from 2012 to 2015, completely ignored in survey measures of income

• Survey data misses 21% of personal income (Heathcote, et al 2010) including employer-contributions to pensions and income on pensions that is not yet distributed