In It Together? Inequality and the Joint Distribution of Income and Wealth

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Top 1% Wealth Shares in International Comparison

![Chart showing top 1% wealth shares over time for Switzerland, France, and USA.](chart)

- **Switzerland**: Red line
- **France**: Brown line
- **USA**: Blue line

The data shows a decline in wealth share among the top 1% over time, with fluctuations. The chart covers the years from 1900 to 2020.
Top 0.01% Wealth Shares in International Comparison

![Graph showing the trend of top 0.01% wealth shares in Switzerland, France, and the USA from 1900 to 2020.](image-url)
Top 0.01% Wealth Shares in International Comparison

- Switzerland
- Switzerland, incl. pension wealth
- France
- USA
Research Questions

- What is the importance of different wealth components?
- What is the joint distribution of income and wealth?
- What is the ratio of wealth (debt) to income?
- How large is wealth mobility?
- Who gets inheritances and inter-vivos-gifts?
Motivation

- Distribution of wealth understudied compared to income
- Wealth highly concentrated

- Wealth at the focus of tax policy:
  - US: wealth tax proposals (Warren, Sanders)
  - US: lower estate tax exemptions (Sanders)
  - CH: 99% initiative
  - CH: national inheritance tax initiative (2015)
  - OECD (2018): The Role and Design of Net Wealth Taxes

- Sensitivity of wealth to taxation

- Wealth and pension policy:
  - How rich are the elderly?
  - Who saves voluntarily for retirement?
Literature

Wealth Inequality

Joint Distribution
- Jäntti et al. (2015), Jäntti et al. (2008), Sierminska et al. (2007), Gallusser and Krapf (2019)

Wealth-Income Ratio

Heterogeneous Returns
- Fagereng et al. (2016), Cao and Luo (2017)
Outline

1. Introduction

2. Data

3. Descriptive Results
   - Composition of Wealth and Income
   - Heterogeneous Rates of Return to Wealth
   - Joint Distribution of Income and Wealth
   - Wealth-Income Ratios
   - Wealth Mobility

4. Responses to Taxation: The Inheritance Tax Threat

5. Conclusion and Outlook
Data: Cantonal Income and Wealth Tax Data

Institutional background:

- Federal country with strong tax autonomy at cantonal level
- Federal income tax
- Cantonal income and wealth tax
  (and some inheritance taxes for non-family heirs)
- Cantons administer cantonal + federal tax collection

For this project:

- Individual tax register data from currently 5 German-speaking Swiss cantons:
  AG, OW, BE, SG, ZH (LU, BS, JU to be added)
- Varying years over the period 2001-2016
Data: Regional Coverage
Data: Time Periods Covered

- BS
- JU
- LU
- ZH
- OW
- AG
- SG
- BE

Solid lines: panel data
Dashed lines: cross-section data
Data: Variables I

Total income sum from different sources:

- employment
- self-employment
- financial assets
- real estate (incl. imputed rent)
- public pension (pillar 1)
- occupational pension (pillar 2) + private pensions (pillar 3)
- UI benefits, DI benefits
- family and child allowances
- alimony and transfers from other households

Deductions

- retirement savings plans
- political party donations / memberships
- charity donations
Data: Variables II

Sum of different wealth components:
- financial assets
- business assets
- movable assets (cars, art, ...)
- real estate
- debt
- in Bern (BE): inheritances and inter vivos gifts

Demographics:
- Gender, age, single/married, # of children
- Income attributable to main taxpayer or spouse
- Wealth held in common
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4 Responses to Taxation: The Inheritance Tax Threat

5 Conclusion and Outlook
Wealth Composition

The graph shows the share in total gross wealth against the percentile in the cantonal gross wealth distribution. The x-axis represents the percentile, ranging from 0 to 100, and the y-axis represents the share in total gross wealth, ranging from -1 to 1. The graph includes the following categories:

- Business assets
- Other movable assets
- Real estate
- Financial assets
- Debt

Each category is represented by a different color, allowing for easy visualization of how each type of asset changes in share over the percentile range.
Wealth Composition: Retirees vs. Non-Retirees

Graphs by retiree (by legal retirement age) (p1)
Income Composition: Retirees vs. Non-Retirees

Graphs by retiree (by legal retirement age) (p1)
Rates of Return to Financial Wealth by Wealth Ventile

AG, 2011
Rates of Return to Financial Wealth by Income Ventile

![Graph showing rates of return by income ventile. The graph plots the rate of return on financial wealth against ventiles of the cantonal gross income distribution. The graph includes two lines: one for the mean and one for the median. The x-axis represents the ventiles of the income distribution, ranging from 0 to 100. The y-axis represents the rate of return, ranging from 0% to 5%. The graph indicates that the rate of return increases as the income ventile increases, with the mean rate of return generally being higher than the median rate. AG, 2011.]
Rates of Return to Total Wealth by Wealth Ventile

AG, 2011
Gender Differences in Return to Financial Wealth

![Graph showing average return on financial wealth across different ventiles of the cantonal net wealth distribution for males, females, and married individuals.](image)
Gender Differences in Return to Total Wealth

![Graph showing the median return on total wealth across different ventiles of the cantonl net wealth distribution for males, females, and married individuals.]
Joint Distribution: Bottom 10%
Joint Distribution: Middle 20%
Joint Distribution: Top 10%

Distribution of 10th gross income decile... over net wealth deciles

AG
Joint Distribution: Top 10% Wealthiest

Distribution of 10th net wealth decile... over gross income deciles

AG

... over gross income deciles

2001 2011

1 1
2 2
3 5
4 6
5 6
6 8
7 8
8 10
9 12 12
10 28 31

0% 5% 10% 15% 20% 25% 30% 35% 40%
Joint Distribution: Top 10%

2001

Distribution of 10th gross income decile... over net wealth deciles

2011

Distribution of 10th gross income decile... over net wealth deciles

AG

AG
Joint Distribution: Top 10% Wealthiest

2001

2011
Wealth-Income Ratio - Mean

![Graph showing the wealth-income ratio for different years (2001, 2005, 2010). The x-axis represents ventiles of total income distribution, and the y-axis represents total net wealth to income ratio.]
Wealth-Income Ratio - Median

![Graph showing wealth-income ratio across ventiles of total income distribution for years 2001, 2005, and 2010.](image-url)

AG
Wealth-Income Ratio - Median OW

![Graph showing Wealth-Income Ratio for various years.](image_url)
Wealth-Income Ratio - Median by Age Group

![Graph showing wealth-income ratio by age group across different income distribution ventiles.]

- Median wealth-income ratio for each age group is plotted across various income distribution ventiles.
- Each line represents a different age group: 18-29, 30-39, 40-54, 55-64, 65-74, 75+. 
- The x-axis represents the ventiles of total income distribution, and the y-axis represents the total net wealth to income ratio.
Real Estate-Income Ratio - Median

The graph illustrates the real estate to income ratio across different ventiles of the total income distribution for 2001, 2005, and 2010. The data shows a trend where the real estate to income ratio increases as we move from lower ventiles to higher ventiles, indicating a growing disparity between real estate values and income levels over the years.
Debt-Income Ratio - Mean

The graph above illustrates the change in total debt to income ratio across various ventiles of the total income distribution from 2001 to 2010. The data shows an increasing trend over time, indicating a rising debt-income ratio. The legend indicates the years 2001, 2005, and 2010, each represented by a different line color.

AG
Debt-Income Ratio - Median

![Graph showing total debt to income ratio across ventiles of total income distribution for different years.]
Wealth Mobility
Wealth Mobility

![Graph showing wealth mobility]
Income Mobility
Responses to Taxation: The Inheritance Tax Threat

- In June 2011, the Social Democratic Party (SP) formally decided to launch a popular initiative to introduce a national inheritance tax on family heirs and spouses.
- Only 4 cantons still had inheritance tax (AI, SO, NE, VD).
- Proposed exemption level: 2 mio CHF.
- Proposed tax rate: 20%.
- Affected inheritances each year (estimate): 2%.
- Would affect inheritances and inter-vivos gifts from January 1 2011 onward if accepted.
- March 2013: Required signatures deposed.
- June 2015: Proposal rejected by 71% in popular vote.
Huge Increase in Average Inter-Vivos Gifts

\[ \Delta \text{gifts received} = 3.7 \quad \Delta \text{gifts made} = 4.2 \quad \Delta \text{inheritances} = 0.3 \]
DiD: Average Amount Transmitted

**average amount (CHF)**

<table>
<thead>
<tr>
<th>Source</th>
<th>SS</th>
<th>df</th>
<th>MS</th>
<th>Number of obs</th>
<th>F(3, 18)</th>
<th>Prob &gt; F</th>
<th>R-squared</th>
<th>Adj R-squared</th>
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</thead>
<tbody>
<tr>
<td>Model</td>
<td>35231095.4</td>
<td>3</td>
<td>11743698.5</td>
<td>22</td>
<td>74.60</td>
<td>0.0000</td>
<td>0.9256</td>
<td>0.9131</td>
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<td>Residual</td>
<td>2833745.12</td>
<td>18</td>
<td>157430.285</td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>38064840.5</td>
<td>21</td>
<td>1812611.45</td>
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<td></td>
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</tr>
</tbody>
</table>

| avg_         | Coef.       | Std. Err. | t    | P>|t| | [95% Conf. Interval] |
|--------------|-------------|-----------|------|------|----------------------|
| time         | 588.2502    | 416.141   | 1.41 | 0.175| -286.0295            | 1462.53 |
| treat        | -660.23     | 177.4431  | -3.72| 0.002| -1033.024            | -287.4358 |
| did          | 5597.995    | 588.5122  | 9.51 | 0.000| 4361.577             | 6834.414 |
| _cons        | 2307.866    | 125.4712  | 18.39| 0.000| 2044.261             | 2571.471 |

change: 2.838335515793462
implied elasticity: 14.19167757896731
Huge Increase in Wealth Transmitted as Gifts

The graph shows the net wealth share in percentage from 2002 to 2012. The data points are indicated by circles, with blue circles representing inheritances and red circles representing inter-vivos gifts. The graph indicates a significant increase in wealth transmitted as gifts in 2010.
DiD: Wealth Share Transmitted

<table>
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<tr>
<th>Source</th>
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<th>df</th>
<th>MS</th>
<th>Number of obs =</th>
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<tr>
<td></td>
<td>F(3, 18) =</td>
<td>50.65</td>
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<td></td>
</tr>
<tr>
<td>Model</td>
<td>1.47007944</td>
<td>3</td>
<td>.490026481</td>
<td>Prob &gt; F =</td>
<td>0.0000</td>
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<tr>
<td>Residual</td>
<td>.174142982</td>
<td>18</td>
<td>.00967461</td>
<td>R-squared =</td>
<td>0.8941</td>
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<tr>
<td>Total</td>
<td>1.64422242</td>
<td>21</td>
<td>.078296306</td>
<td>Adj R-squared =</td>
<td>0.8764</td>
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<tr>
<td></td>
<td>Root MSE =</td>
<td>.09836</td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

| share_    | Coef. | Std. Err. | t    | P>|t| | [95% Conf. Interval] |
|-----------|-------|-----------|------|-------|----------------------|
| time      | .0855114 | .1031604 | 0.83 | 0.418 | -.1312206 - .3022434 |
| treat     | -.1438891 | .0439877 | -3.27 | 0.004 | -.236304 - -.0514743 |
| did       | 1.180058 | .1458909 | 8.09 | 0.000 | .8735527 - 1.486563 |
| _cons     | .5222262 | .031104 | 16.79 | 0.000 | .4568791 - .5875734 |

change: 2.607805060979006
implied elasticity: 13.03902530489503
Increase in Number of Gift Recipients

\[ \Delta \text{gifts received} = 0.35 \quad \Delta \text{gifts made} = 0.32 \quad \Delta \text{inheritances} = 0.05 \]
DiD: Number of Recipients

<table>
<thead>
<tr>
<th>Source</th>
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<th>MS</th>
<th>Number of obs = 22</th>
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<tbody>
<tr>
<td>Model</td>
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<td>4509406.73</td>
<td>F(3, 18) = 13.29</td>
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<tr>
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<td>339403.8</td>
<td>Prob &gt; F = 0.0001</td>
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<tr>
<td>Total</td>
<td>19637488.6</td>
<td>21</td>
<td>935118.504</td>
<td>R-squared = 0.6889</td>
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<td></td>
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<td></td>
<td>Adj R-squared = 0.6370</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td>Root MSE = 582.58</td>
</tr>
</tbody>
</table>

| c_       | Coef.    | Std. Err. | t     | P>|t| | [95% Conf. Interval] |
|----------|----------|-----------|-------|------|---------------------|
| time     | 467.6    | 611.019   | 0.77  | 0.454| -816.1032 to 1751.303 |
| treat    | -825.4   | 260.5394  | -3.17 | 0.005| -1372.773 to -278.0271 |
| did      | 3122.4   | 864.1113  | 3.61  | 0.002| 1306.969 to 4937.831  |
| _cons    | 11393.4  | 184.2292  | 61.84 | 0.000| 11006.35 to 11780.45  |

change: .2873242028741008
implied elasticity: 1.436621014370504
Conclusion

- Substantial differences in wealth and income composition by income and age groups
- Heterogeneous rates of return to wealth
- Strong associations between income and wealth
- Wealth-income ratios high for elderly, low for everyone else
- Wealth mobility (s)low
- Strong responses to a possible threat to tax large inheritances
Outlook

Further analysis

- Saving behavior: contributions toward tax-exempt retirement accounts (pillar 2 and 3a)
- Annual saving rate
- Heterogeneity analysis
  - age
  - gender
  - large cities / urban / rural areas

Data:

- Create data sets at individual level instead of tax units
- Analysis for all cantons together, 2010
Thank you.

Comments and questions welcome:
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Appendix
Gini Index

The graph shows the Gini Index from 2000 to 2010 for income and wealth. The Gini Index values range from 0 to 1, with higher values indicating greater inequality. The income data is represented by blue dots, and the wealth data by red dots. The Gini Index values appear to be relatively stable over the years for both income and wealth.
Gini Index OW

![Gini Index Graph]

- **Y-axis**: Gini Index (0.0 - 1.0)
- **Legend**:
  - Blue line: Income
  - Red line: Wealth

The graph shows the Gini Index for income and wealth over the years from 2000 to 2010.
Gini Index SG

The graph shows the Gini Index for income and wealth in Singapore from 2000 to 2010. The Gini Index is a measure of income or wealth inequality, with values ranging from 0 (perfect equality) to 1 (perfect inequality). The graph indicates a slight increase in the Gini Index for wealth from 2000 to 2010, suggesting a growing inequality in wealth distribution over the years.
Gini Index BE


Graph showing the Gini index for income and wealth from 2000 to 2010.
Joint Distribution: Bottom 10%
Joint Distribution: Middle 20%

Distribution of 5th and 6th gross income decile... over net wealth deciles

2001

2011

AG

AG


References II


