A Safe Harbor: Wealth-Income Ratios in Switzerland over the 20th Century and the Role of Housing Prices

Enea Baselgia

Isabel Z. Martínez

a University of St. Gallen

b ETH Zurich, KOF Swiss Economic Institute

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June 23, 2021
Motivation

- How important is wealth relative to income in an economy?

- How and why their relationship changes over time?
  - income growth (slowdown)
  - savings
  - capital gains

- Why studying Switzerland?
  - small open, but major industrialized economy
  - not directly involved in military conflicts
  - low and stable taxes
  - no anticapital policies after WW
This Paper

- New estimate of the ratio of private wealth to national income for Switzerland, 1900–2018.

- For the post-1990 period:
  - Breakdown of the Swiss national wealth into its components.
  - Decomposition of wealth accumulation into a saving and capital gains part.

- The role of price dynamics in housing wealth in international comparison.
Outline

1 Introduction

2 Related Literature

3 Data

4 Results
   - Switzerland’s Private Wealth-Income Ratio, 1900–2018
   - Swiss National Wealth and its Components, 1990–2018
   - What Explains the Rising Wealth-Income Ratio?

5 Conclusion
Related Literature

- Long-run evolution of wealth inequality:
  - US: Kopczuk and Saez (2004), Saez and Zucman (2016)

- Growing literature on aggregate wealth in relation to income:
  - **U-shape pattern**: Piketty and Zucman (2014), Waldenström (2017), Brülhart et al. (2018)
  - **J-shape pattern**: Artola Blanco et al. (2020)

- The role of increasing house prices for wealth (inequality):
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5 Conclusion
Data

Private Wealth:
- Our approach to estimate a consistent long-run private wealth series for the period 1900-1980:
  - Backward extrapolation with historical wealth data:
    - aggregate tax data (Dell et al., 2007)
    - total pension fund assets (Leimgruber, 2008)

Additional wealth data for the post-1990 period:
- Public wealth at market value (Federal Finance Administration)
- Net foreign wealth (SNB)
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Public & Private Wealth, 1990–2018

Private wealth (left scale)  Public wealth (right scale)

- National WIR; CH, DE, FR, IT, SE, US
- Domestic & Net Foreign Wealth
- Public WIR; CH, DE, FR, IT, SE, US
- Public Wealth Decomposition

Wealth-Income Ratios and the Role of Housing Prices
Outline

1 Introduction

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Decomposition of Wealth Accumulation

- Additive decomposition:

\[ W_{nt+1} = W_{nt} + S_t + KG_t \]

- Multiplicative decomposition:

\[ \beta_{nt+1} = \frac{(1 + g^w_{st})(1 + q_t)}{1 + g_t} \beta_{nt} \]
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<tbody>
<tr>
<td>Wealth-income ratio</td>
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<tr>
<td>Change</td>
<td>$\Delta \beta_{n,t}$</td>
<td>+238 pp.</td>
<td>+40 pp.</td>
<td>-3 pp.</td>
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<td>Capital accumulation</td>
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<td>Net saving rate</td>
<td>$s$</td>
<td>15.7%</td>
<td>14.6%</td>
<td>16.4%</td>
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<tr>
<td>Real wealth growth rate</td>
<td>$g^w$</td>
<td>3.4%</td>
<td>2.4%</td>
<td>2.9%</td>
</tr>
<tr>
<td>... savings-induced ($g^w_s = s / \beta_n$)</td>
<td>$g^w_s$</td>
<td>2.7%</td>
<td>2.8%</td>
<td>2.8%</td>
</tr>
<tr>
<td>... capital gains induced</td>
<td>$q$</td>
<td>0.7%</td>
<td>-0.4%</td>
<td>0.1%</td>
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<tr>
<td>Income growth</td>
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<tr>
<td>Real income growth rate</td>
<td>$g$</td>
<td>1.7%</td>
<td>1.2%</td>
<td>3.0%</td>
</tr>
</tbody>
</table>

- Structure Savings; CH
- Structure Savings; International
- Growth & Savings; International
- Wealth Accumulation; International
- Decomposition in $W_{pt}$ & $W_{gt}$
## The Accumulation of Private Wealth in Switzerland

<table>
<thead>
<tr>
<th>Private wealth-income ratios (%)</th>
<th>Decomposition of the private wealth growth rate (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>( \beta_{p,t} )</td>
<td>( \beta_{p,t+n} )</td>
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<tr>
<td>----------------------------------</td>
<td>---------------------------------------------------</td>
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<tr>
<td><strong>Panel A: 2000–2018</strong></td>
<td></td>
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<tr>
<td>Total Private Wealth</td>
<td></td>
</tr>
<tr>
<td>526%</td>
<td>687%</td>
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<tr>
<td>Housing Wealth</td>
<td></td>
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<td>248%</td>
<td>380%</td>
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<td>Non-Housing Wealth</td>
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<td>278%</td>
<td>307%</td>
</tr>
</tbody>
</table>
Wealth-Income Ratios and Real Estate Prices

Switzerland

Germany

Sweden

Italy

France

United States

AU, CA, ES, GB, JP, NO
## Multi-Country Panel Analysis

<table>
<thead>
<tr>
<th></th>
<th>(1) House prices</th>
<th>(2) Share prices</th>
<th>(3) both</th>
<th>(4) +world share price index</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1970–2018</strong></td>
<td></td>
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</tr>
<tr>
<td>House prices</td>
<td>0.22*** (0.03)</td>
<td></td>
<td>0.24***</td>
<td>0.24*** (0.03)</td>
</tr>
<tr>
<td>Share prices</td>
<td>0.03** (0.02)</td>
<td>0.03* (0.02)</td>
<td>0.03*</td>
<td>1.00 (0.77)</td>
</tr>
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<td>MSCI world</td>
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<tr>
<td>Adj. R^2</td>
<td>0.153</td>
<td>0.075</td>
<td>0.176</td>
<td>0.176</td>
</tr>
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<td>Obs.</td>
<td>485</td>
<td>471</td>
<td>471</td>
<td>471</td>
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<tr>
<td><strong>1990–2018</strong></td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>House prices</td>
<td>0.31*** (0.05)</td>
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<td>0.31***</td>
<td>0.31*** (0.05)</td>
</tr>
<tr>
<td>Share prices</td>
<td>-0.01 (0.03)</td>
<td>-0.01 (0.02)</td>
<td>-0.01</td>
<td>-0.31 (0.23)</td>
</tr>
<tr>
<td>MSCI world</td>
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<tr>
<td>Adj. R^2</td>
<td>0.217</td>
<td>0.098</td>
<td>0.215</td>
<td>0.215</td>
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<tr>
<td>Obs.</td>
<td>306</td>
<td>306</td>
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</table>

*Note:* Panel regressions including 12 countries of changes in wealth-income ratios on changes in real house prices (Column 1), changes in real share prices (Column 2) and both (Column 3). Column (4) includes the global MSCI world share price index as a control. All specifications in Panel B include year and country fixed effects. Standard errors shown in parentheses. *p < .1, **p < .05, ***p < .01
Conclusion

- The long-run evolution of the wealth-income ratio in Switzerland is best described by a J-shaped pattern.

- The significant rise in the Swiss wealth income ratio after the Great Recession (+200pp.) is mainly driven by large capital gains in housing wealth and was amplified by a slowdown in income growth.

- We show that real housing prices are systematically correlated ($\epsilon = 0.31$) with wealth-income ratios, while stock prices are not.
Thank you.

Comments and questions welcome:
enea.baselgia@unisg.ch
martinez@kof.ethz.ch
Appendix
Data II

Net National Income ($Y_t$):
- 1995–2018: Swiss National Accounts; FSO
- 1929–1994: historical (national) income series; HSSO database
- 1900–1928: historical GDP estimates; Stohr (2016)

Additional Macroeconomic Data:
- population data; FSO
- price data (CPI); FSO and HSSO database
- savings data; Swiss National Accounts (FSO)
- international data on wealth-income ratios; WID.world
- house price index data and stock market index data; OECD
Different Private Wealth Estimates for Switzerland, 1975–2018

Wealth-Income Ratios and the Role of Housing Prices


ρ = 0.91

% change


Private wealth at market value (annual change in %)

Taxable wealth inc. pension wealth (annual change in %)

ρ = 0.91

CH, DE, FR, GB

Wealth-Income Ratios and the Role of Housing Prices
Switzerland’s Private Wealth-Income Ratio, 1900–2018

Wealth-Income Ratios and the Role of Housing Prices 24
Private Wealth-Income Ratios in International Comparison

Wealth-Income Ratios and the Role of Housing Prices
National Wealth, 1990–2018

Wealth-Income Ratios and the Role of Housing Prices
Net Foreign Wealth

Value of wealth (in % of national income)

Domestic wealth
Net foreign wealth

Public & Private Wealth

Wealth-Income Ratios and the Role of Housing Prices
Net Foreign Wealth

Wealth-Income Ratios and the Role of Housing Prices

- Switzerland
- Germany
- France
- Italy
- Sweden
- United States
Public Wealth-Income Ratios in International Comparison

Wealth-Income Ratios and the Role of Housing Prices
Public Wealth as Share of National Wealth, 1990–2018

Wealth-Income Ratios and the Role of Housing Prices
Decomposition of Total Net Public Wealth in Switzerland, 1990–2018

Wealth-Income Ratios and the Role of Housing Prices
Public Wealth by Government-levels, 1990–2018

(a) Confederation

(b) Cantons

(c) Municipalities

(d) Social Security Funds

Wealth-Income Ratios and the Role of Housing Prices
Public Wealth-Income Ratios in Switzerland by Government-level, 1990–2018

Wealth-Income Ratios and the Role of Housing Prices
Housing Wealth-Income Ratios in International Comparison

Private Wealth Decomposition

Wealth-Income Ratios and the Role of Housing Prices
Private Debt-Income Ratios in Switzerland, 1990–2018

Wealth-Income Ratios and the Role of Housing Prices
Wealth-Income Ratios and Real Estate Price Indices

United Kingdom

Australia

Canada

Spain

Japan

Norway

Real estate price index (2010=100)

United Kingdom

Australia

Canada

Spain

Japan

Norway

Real estate price index (2010=100)

ρ = 0.79

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### Structure of National Savings in Switzerland

<table>
<thead>
<tr>
<th>Period</th>
<th>Net private saving (household &amp; corporate) (%)</th>
<th>Net household saving (%)</th>
<th>Net corporate saving (retained earnings) (%)</th>
<th>Net public saving (%)</th>
<th>Net national saving (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1995–2018</td>
<td>14.1</td>
<td>12.3</td>
<td>1.8</td>
<td>1.6</td>
<td>15.7</td>
</tr>
<tr>
<td>1995–2002</td>
<td>14.0</td>
<td>10.8</td>
<td>3.3</td>
<td>0.5</td>
<td>14.6</td>
</tr>
<tr>
<td>2002–2010</td>
<td>14.7</td>
<td>11.4</td>
<td>3.3</td>
<td>1.7</td>
<td>16.4</td>
</tr>
<tr>
<td>2010–2018</td>
<td>13.7</td>
<td>14.0</td>
<td>-0.3</td>
<td>2.2</td>
<td>15.9</td>
</tr>
</tbody>
</table>
# International Structure of National Savings

<table>
<thead>
<tr>
<th>Country</th>
<th>Net private saving (household &amp; corporate) (%)</th>
<th>Net household saving (%)</th>
<th>Net corporate (retained earnings) (%)</th>
<th>Net public saving (%)</th>
<th>Net national saving (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Switzerland (1995–2015)</td>
<td>14.6</td>
<td>11.9</td>
<td>2.6</td>
<td>1.4</td>
<td>16.0</td>
</tr>
<tr>
<td>Germany (1995–2013)</td>
<td>11.2</td>
<td>6.3</td>
<td>4.8</td>
<td>-3.0</td>
<td>8.2</td>
</tr>
<tr>
<td>France (1995–2010)</td>
<td>11.1</td>
<td>8.5</td>
<td>2.6</td>
<td>-3.1</td>
<td>8.0</td>
</tr>
<tr>
<td>Italy (1995–2014)</td>
<td>8.4</td>
<td>6.4</td>
<td>2.0</td>
<td>-3.8</td>
<td>4.7</td>
</tr>
<tr>
<td>Sweden (1995–2015)</td>
<td>16.1</td>
<td>7.4</td>
<td>8.7</td>
<td>2.6</td>
<td>18.7</td>
</tr>
<tr>
<td>United States (1995–2013)</td>
<td>7.9</td>
<td>4.3</td>
<td>3.6</td>
<td>-4.8</td>
<td>3.1</td>
</tr>
</tbody>
</table>

## Wealth Accumulation

- **Wealth-Income Ratios and the Role of Housing Prices**
## International Growth and Saving Rates

<table>
<thead>
<tr>
<th>Country</th>
<th>Real growth rate of national income (%)</th>
<th>Population growth rate (%)</th>
<th>Real growth rate of per capita national income (%)</th>
<th>Net national saving (%)*</th>
<th>$\Delta \beta_{nt}$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Switzerland</td>
<td>1.86</td>
<td>0.82</td>
<td>1.04</td>
<td>16.0</td>
<td>+ 173 pp.</td>
</tr>
<tr>
<td>Germany</td>
<td>1.38</td>
<td>0.05</td>
<td>1.33</td>
<td>8.2</td>
<td>+ 58 pp.</td>
</tr>
<tr>
<td>France</td>
<td>1.49</td>
<td>0.53</td>
<td>0.96</td>
<td>8.0</td>
<td>+ 219 pp.</td>
</tr>
<tr>
<td>Italy</td>
<td>0.31</td>
<td>0.35</td>
<td>-0.04</td>
<td>4.7</td>
<td>+ 131 pp.</td>
</tr>
<tr>
<td>Sweden</td>
<td>3.03</td>
<td>0.55</td>
<td>2.48</td>
<td>18.7</td>
<td>+ 276 pp.</td>
</tr>
<tr>
<td>United States</td>
<td>2.42</td>
<td>0.94</td>
<td>1.48</td>
<td>3.1</td>
<td>+ 63 pp.</td>
</tr>
</tbody>
</table>

### Wealth Accumulation

Wealth-Income Ratios and the Role of Housing Prices
## The Accumulation of Private Wealth in Switzerland

### Decomposition of the private wealth growth rate (%)

<table>
<thead>
<tr>
<th></th>
<th>Private wealth-income ratios (%)</th>
<th>Real growth rate of private wealth</th>
<th>Savings-induced wealth growth rate</th>
<th>Capital gains induced wealth growth rate</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$\beta_{p,t}$</td>
<td>$\beta_{p,t+n}$</td>
<td>$g_w$</td>
<td>$g_{ws} = s / \beta_p$</td>
</tr>
<tr>
<td><strong>Panel A: 2000–2018</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total Private Wealth</td>
<td>526%</td>
<td>687%</td>
<td>2.9%</td>
<td>2.2%</td>
</tr>
<tr>
<td>Housing Wealth</td>
<td>248%</td>
<td>380%</td>
<td>3.8%</td>
<td>2.1%</td>
</tr>
<tr>
<td>Non-Housing Wealth</td>
<td>278%</td>
<td>307%</td>
<td>1.9%</td>
<td>2.2%</td>
</tr>
<tr>
<td><strong>Panel B: 2000–2010</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total Private Wealth</td>
<td>526%</td>
<td>517%</td>
<td>1.6%</td>
<td>2.1%</td>
</tr>
<tr>
<td>Housing Wealth</td>
<td>248%</td>
<td>275%</td>
<td>2.9%</td>
<td>1.8%</td>
</tr>
<tr>
<td>Non-Housing Wealth</td>
<td>278%</td>
<td>242%</td>
<td>0.4%</td>
<td>2.4%</td>
</tr>
<tr>
<td><strong>Panel C: 2010–2018</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total Private Wealth</td>
<td>517%</td>
<td>687%</td>
<td>4.5%</td>
<td>2.3%</td>
</tr>
<tr>
<td>Housing Wealth</td>
<td>275%</td>
<td>380%</td>
<td>5.0%</td>
<td>2.6%</td>
</tr>
<tr>
<td>Non-Housing Wealth</td>
<td>242%</td>
<td>307%</td>
<td>3.9%</td>
<td>1.9%</td>
</tr>
</tbody>
</table>
## Decomposition of the wealth growth rate (%)

<table>
<thead>
<tr>
<th>Country</th>
<th>( \beta_{n,t} )</th>
<th>( \beta_{n,t+n} )</th>
<th>( g_w )</th>
<th>( g_{ws} = \frac{s}{\beta_n} )</th>
<th>( q )</th>
</tr>
</thead>
<tbody>
<tr>
<td>Switzerland</td>
<td>504%</td>
<td>644%</td>
<td>3.2%</td>
<td>2.9%</td>
<td>0.3%</td>
</tr>
<tr>
<td>Germany</td>
<td>342%</td>
<td>388%</td>
<td>2.1%</td>
<td>2.2%</td>
<td>-0.1%</td>
</tr>
<tr>
<td>Italy</td>
<td>379%</td>
<td>544%</td>
<td>2.3%</td>
<td>1.2%</td>
<td>1.1%</td>
</tr>
<tr>
<td>Sweden</td>
<td>233%</td>
<td>475%</td>
<td>6.9%</td>
<td>5.4%</td>
<td>1.5%</td>
</tr>
<tr>
<td>United States</td>
<td>350%</td>
<td>384%</td>
<td>2.9%</td>
<td>0.8%</td>
<td>2.1%</td>
</tr>
</tbody>
</table>

### Wealth Accumulation

Wealth-Income Ratios and the Role of Housing Prices
### Decomposition of National Wealth Accumulation

<table>
<thead>
<tr>
<th></th>
<th>Wealth-income ratios (%)</th>
<th>Decomposition of the real wealth growth rate (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$\beta_t$</td>
<td>$\beta_{t+n}$</td>
</tr>
<tr>
<td><strong>2000–2018</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>National Wealth</td>
<td>551%</td>
<td>742%</td>
</tr>
<tr>
<td>Public Wealth</td>
<td>25%</td>
<td>55%</td>
</tr>
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<td>Private Wealth</td>
<td>526%</td>
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</tr>
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</table>

Wealth-Income Ratios and the Role of Housing Prices
Annual Changes in $\beta_{pt}$, Real House and Share Prices I

(a) Switzerland

(b) Germany

(c) Sweden

(d) Italy
Annual Changes in $\beta_{pt}$, Real House and Share Prices II

Panel Analysis

Wealth-Income Ratios and the Role of Housing Prices
Annual Changes in $\beta_{pt}$, Real House and Share Prices III

(i) Spain

(j) United Kingdom

(k) Japan

(l) Norway

Panel Analysis

Wealth-Income Ratios and the Role of Housing Prices
The effect of Stock & House Prices on WIR, Switzerland

<table>
<thead>
<tr>
<th></th>
<th>(1) House prices</th>
<th>(2) Share prices</th>
<th>(3) both</th>
<th>(4) +world share price index</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1970–2018</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>House prices</td>
<td>-0.05 (0.10)</td>
<td>-0.05 (0.10)</td>
<td>-0.07 (0.11)</td>
<td></td>
</tr>
<tr>
<td>Share prices</td>
<td>0.04 (0.03)</td>
<td>0.04 (0.03)</td>
<td>0.02 (0.06)</td>
<td></td>
</tr>
<tr>
<td>MSCI world</td>
<td>1.00* (0.56)</td>
<td>0.74 (0.55)</td>
<td>0.84 (0.58)</td>
<td>0.84 (0.58)</td>
</tr>
<tr>
<td>Constant</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Adj. R²</td>
<td>-0.017</td>
<td>0.011</td>
<td>-0.011</td>
<td>-0.029</td>
</tr>
<tr>
<td>Obs.</td>
<td>48</td>
<td>49</td>
<td>48</td>
<td>48</td>
</tr>
</tbody>
</table>

|                |                  |                  |          |                            |
| **1990–2018**  |                  |                  |          |                            |
| House prices   | 0.34* (0.18)     | 0.35* (0.18)     | 0.28 (0.19) |                            |
| Share prices   | 0.05 (0.05)      | 0.05 (0.05)      | -0.04 (0.08) |                            |
| MSCI world     | 1.00 (0.74)      | 0.70 (0.83)      | 0.67 (0.79) | 0.77 (0.78)                |
| Constant       |                  |                  |          |                            |
| Adj. R²        | 0.080            | -0.004           | 0.092    | 0.116                     |
| Obs.           | 29               | 29               | 29       | 29                        |

*Note*: OLS regressions of changes in wealth-income ratios on changes in real house prices (Column 1), changes in real share prices (Column 2) and both (Column 3). Column (4) includes the global MSCI world share price index as a control. Standard errors shown in parentheses. *p < .1, **p < .05, ***p < .01

Wealth-Income Ratios and the Role of Housing Prices
The effect of Stock & House Prices on WIR, 1990–2018

<table>
<thead>
<tr>
<th></th>
<th>Switzerland</th>
<th>France</th>
<th>Italy</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>House prices</strong></td>
<td><img src="image" alt="Graph" /></td>
<td><img src="image" alt="Graph" /></td>
<td><img src="image" alt="Graph" /></td>
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<tr>
<td><strong>Share prices</strong></td>
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<tr>
<th></th>
<th>Spain</th>
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<th>Sweden</th>
</tr>
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<tr>
<th></th>
<th>Norway</th>
<th>Germany</th>
<th>Australia</th>
</tr>
</thead>
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<th>United States</th>
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**Note:** Coefficients along with the 95% confidence intervals from regression of annual changes in the wealth-income ratio on changes of real housing prices and real share prices by country.
References


