What Do Large Datasets Reveal about Household Financial Decisions?

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HOUSEHOLD FINANCE

- Households are increasingly responsible for their finances.
- Do households use financial markets efficiently?
- How heterogeneous are their investment strategies?
- How do household financial decisions correlate with household characteristics?
- What are the implications for the asset management industry?
OUTLINE

1. The Measurement Challenge

2. Financial Wealth

3. Total Wealth
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1. THE MEASUREMENT CHALLENGE

Traditional data sets

- **Surveys** (US Survey of Consumer Finances)
  Not detailed enough, low response rate, answers often implausible.

- **Account providers** (brokerage house, 401(k))
  Detailed but multiple accounts, non-representative sample.

- **Tax records**
  Capital income or information on assets at death (estate tax return).
# THE SWEDISH DATASET

Administrative data on the wealth, demographics and income of every Swedish resident.

**Demographics**  
Age, gender, marital status, education, birthplace, residence.

**Assets at security level**  
- Bank account balances and debt
- Holdings at year-end of financial assets (stocks, mutual funds, bonds, derivatives, etc.) identified by the ISIN code.
- Real estate properties
- Private business holdings
- Pension assets (defined contribution and defined benefits)

**Income flows**  
- Labor income, welfare payments, capital income by asset, private pension savings
OUTLINE

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3. Total Wealth
62% of Swedish households hold risky assets over the period.

<table>
<thead>
<tr>
<th>Financial Portfolio</th>
<th>$35,500 on average</th>
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<tr>
<td>Cash</td>
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<td>Risky Portfolio</td>
<td>$19,500 on average</td>
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<tr>
<td>Stocks</td>
<td>$9,200</td>
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<tr>
<td>Mutual funds</td>
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Financial Portfolio

- Cash
  - $16,000 on average
  - Bank accounts
  - Money market funds

Risky Portfolio

- Stocks
  - $9,200
- Mutual funds
  - $10,300

- $19,500 on average

Risky share = value of risky portfolio / value of financial portfolio
How diversified is household financial wealth?

METHODOLOGY

• Compute the mean and variance of household portfolios under an asset-pricing model such as the CAPM (or a Fama-French 3 factor model)

• Compare household portfolios with diversified indexes

• Benchmarks
  - MSCI All Country World Index
    • hedged for currency risk
    • unhedged
  - Swedish Stock Index
What Do Large Datasets Reveal about Household Financial Decisions?

Return mean (% per year) vs. Return standard deviation (% per year)

- Household Stock Portfolios
- Hedged World Index
- Unhedged World Index
- Swedish Index in SEK
- Swedish T-Bill
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Return mean (% per year) vs Return standard deviation (% per year)

- Household Complete Portfolios
- Hedged World Index
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A majority of households have a higher Sharpe ratio than the Swedish index.
### MUTUAL FUNDS MOST WIDELY HELD

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<th>Fund Name</th>
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<th>Domestic Stocks (%)</th>
<th>Domestic Bonds (%)</th>
<th>International Stocks (%)</th>
<th>International Bonds (%)</th>
<th>Cash (%)</th>
<th>Futures (%)</th>
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<td>60.0</td>
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<td>38.6</td>
<td>0.0</td>
<td>1.4</td>
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<td>60.0</td>
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<td>38.9</td>
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<td>1.1</td>
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<td>39.5</td>
<td>0.0</td>
<td>9.6</td>
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</table>

**Substantial share of international assets**
TAKE-AWAY ON DIVERSIFICATION

- Household financial wealth is well diversified.

- Good diversification is achieved via mutual funds and cash holdings.

- Less sophisticated households (low education and wealth) have more concentrated risky portfolios, but tilt the portfolio allocation toward cash. Their portfolios are close to the efficient frontier.
What drives risk-taking in household portfolios?

L.E. Calvet and P. Sodini (2014),
Twin picks: Disentangling the determinants of risk-taking in household portfolios,
*Journal of Finance.*
POTENTIAL DRIVERS OF RISK-TAKING

Insights from financial theory

- **Financial wealth**
  - Constant relative risk aversion (CRRA): Risky share does not depend on wealth.
  - Decreasing relative risk aversion (DRRA): Risky share increases with wealth.

- **Other determinants**
  - Human capital, borrowing constraints, real estate holdings
  - Family composition

Measurement challenge
Households have heterogeneous risk attitudes, backgrounds, etc.
- Higher wealth $\rightarrow$ Higher risky share
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Heterogeneous CRRA agents

DRRA
IDENTIFICATION STRATEGY: TWINS

Controls for ability, upbringing, expected inheritance, or genes. 25% to 45% of individual variation in risk taking due to genes (Cesarini et al. QJE 08, JF 09)

True and tried method in labor economics
Taubman (AER 76), Bronars and Grogger (AER 94), Ashenfelter and Krueger (AER 94), Ashenfelter and Rouse (QJE 98), Behrman and Rosenzweig (AER 00)

Does the richer twin have a larger risky share?
SWEDISH TWIN REGISTRY

Largest twin survey in the world
- Response rate: 60%–70%
- Over 8,000 twin pairs of known zygosity (fraternal vs identical)
- Frequency of communication between twins

We merge it with the Swedish Wealth Registry.
TWIN REGRESSION

\[
\ln(w_{i,j,t}) = \alpha_{i,t} + \eta f_{i,j,t} + \gamma' x_{i,j,t} + \epsilon_{i,j,t}
\]

year-twin pair fixed effect

\(f_{i,j,t}\) log of financial wealth of twin \(j\) in pair \(i\) in year \(t\)

\(x_{i,j,t}\) characteristics of twin \(j\) in pair \(i\) in year \(t\)
TAKE-AWAY ON DRIVERS OF RISK-TAKING

- The risky share increases with:
  - financial wealth (consistent with DRRA),
  - residential real estate,
  - expected human capital.

- The risky share decreases with:
  - commercial real estate,
  - leverage,
  - income risk, unemployment, entrepreneurship,
  - household size and expenditure commitments.

- Communication is also important: frequently communicating fraternal twins make more similar choices than infrequently communicating identical twins.
Portfolio rebalancing

L.E. Calvet, John Y. Campbell, and P. Sodini (2009),
Fight or flight? Portfolio rebalancing by individual investors,
Quarterly Journal of Economics.
Asset returns induce passive variations in the risky share, which an investor can

- fight,
- ignore,
- amplify.
ACTIVE AND PASSIVE CHANGES

• **Actual risky shares** at $t$ and $t+1$: $w_{h,t}$ and $w_{h,t+1}$

• **Passive share** $w_{h,t+1}^p$: risky share at $t+1$ if household does not trade during year

\[
w_{h,t+1} - w_{h,t} = (w_{h,t+1} - w_{h,t}^p) + (w_{h,t+1}^p - w_{h,t})
\]

Active change $A_{h,t+1}$  Passive change $P_{h,t+1}$

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TAKE-AWAY ON PORTFOLIO REBALANCING

• **Active rebalancing** offsets over 50% the passive variation in the risky share.

• Households offsets passive changes by
  - purchasing stocks and, to a lesser extent, mutual funds when unlucky,
  - fully selling stocks and purchasing less of the funds when lucky.

• **Sophisticated** households rebalance more actively.
Who holds value stocks and growth stocks?
Do households have a hedging motive?

S. Betermier, L.E. Calvet, and P. Sodini (2017),
Who are the value and growth investors?
*Journal of Finance.*
VALUE PREMIUM

Value stocks (high book-to-market ratio) outperform growth stocks (low book-to-market ratio) on average.

A risk-based story?
• Compensation for higher systematic risk of value stocks.

Or a sentiment-based story?
• Irrational exuberance / myopic extrapolation / overconfidence.
Data
- monthly data (1985-2009)
- universe: Nordic stocks (743 from SSE, HEX, CSE, OSE)
- market portfolio: SIX return index.

Unconditional 4-factor pricing model
For each asset (stock and fund), we estimate

$$r_{i,t} = a_i + b_iMKT_t + v_iHML_t + s_iSMB_t + m_iMOM_t + u_{i,t}$$
Value loading of household $h$ in year $t$ is:

$$v_{h,t} = \sum_i w_{h,i,t} v_i$$

- Portfolio share of asset $i$ at date $t$
- Value loading of asset $i$

Changes in portfolio loading are driven by changes in portfolio weights.
- Unconditional asset-pricing model shuts down firm migration over time.
What Do Large Datasets Reveal about Household Financial Decisions?

Age (beginning in 1999 for each cohort)

Value loading of stock portfolio

- young
  - low financial wealth
  - levered RE wealth
  - high human capital

- older
  - high financial wealth
  - unlevered RE wealth
  - low human capital
THE VALUE LADDER

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Allocation and return on total wealth

L. Bach, L.E. Calvet, and P. Sodini (2020),
Rich pickings? Risk, return, and skill in household wealth,
*American Economic Review.*
What Do Large Datasets Reveal about Household Financial Decisions?

GROSS WEALTH

FINANCIAL WEALTH
- Bank account balances, money market funds
- Mutual funds, directly held stocks, bonds, derivatives, capital insurance

PRIVATE EQUITY
- Non-financial corporations, family offices, investment companies

REAL ESTATE WEALTH
- Primary and secondary residences
- Rental & agricultural property
CONCLUSION

- The growing availability of large datasets is allowing us to expand our knowledge of household financial decisions.

- The predictions of financial theory are often confirmed.
  - On average, households tend to make rather reasonable decisions. Sensible financial advice and intuitive knowledge of finance (Milton Friedman’s pool player).
  - There is also considerable heterogeneity.

- The asset management industry plays a key role.
  - Helps retail investors achieve good diversification via mutual funds.
  - Can provide precious help to less competent investors, possibly via online platforms and robo-advisors.
  - Can encourage stockmarket participation by the least knowledgeable investors.
NEXT STEPS

Papers available at:
• https://sites.google.com/view/laurent-e-calvet/home
• SSRN, Research Gate

laurent.calvet@edhec.edu
NEXT STEPS

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Thank you!
ADDITIONAL SLIDES
HOW DO HOUSEHOLDS REBALANCE?

• Types of trades:
  Stocks vs. funds          Sales vs. purchases          Full trades vs. partial trades

• Decomposition of the active change:

\[
w_{h,t+1} - w_{h,t+1}^p = \sum_{j}^{stock} (w_{h,j,t+1} - w_{h,j,t+1}^p) + \sum_{j}^{fund} (w_{h,j,t+1} - w_{h,j,t+1}^p)
\]

• Distinguish between “lucky” and “unlucky” households with better or worse than average portfolio returns
<table>
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<tr>
<th></th>
<th>Active Changes</th>
<th>Lucky Households</th>
<th>Unlucky Households</th>
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