

Understanding Japanese Household Portfolios

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- **Low stock market participation in Japan:** only about **20%** of households hold any stocks versus roughly 50% in the U.S., 68% in Sweden and 34% in Finland.
- **Low conditional stock share:** Japanese households invest only **around 20%** of their financial wealth in stocks, far less than the 52% in the U.S., 28% in France, 35% in the Netherlands and 46% in Italy.
- In this paper we use an estimated household portfolio choice model to investigate why this is the case

- **Life-cycle portfolio choice model** with uninsurable idiosyncratic risk and a choice of investing in risky high-return stocks and safe low-return bonds.
 - Historical **asset returns** and **probability of large loss**
 - **Stock market entry cost** as in the literature
- **Data:** Survey of Household Finances 1981 - 2019
- **Simulated Method of Moments estimation:** key parameters estimated to match the model's implications for the wealth-to-income ratio of Stockholders and Non-stockholders, the stock share (for Stockholders) over the life-cycle and the aggregate rate of stock market participation

Summary of main findings

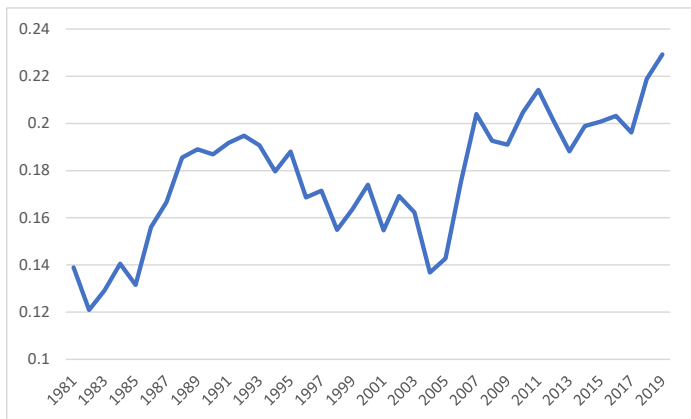
- **Estimated model matches the data well**
- **Low and volatile expected returns:** Since the early 1990s, Japanese equity returns have been low and highly variable, reducing the attractiveness of stocks.
- **History of financial crises and large stock market declines:**
 - Catastrophic losses (close to 100%) following the end of WW2
 - Multiple large $\geq 50\%$ crashes in recent years (e.g. 1990–91, 2001–02 and 2008–09)
- **High costs of accessing the stock market** We estimate a relatively high cost of stock market entry possibly reflecting comparatively low levels of financial literacy.

Survey of Household Finance (SHF)

- **Scope:** Annual survey (repeated cross-sections) covering roughly 8,000 Japanese households from 1981–2019.
- **Data collected:** Detailed balance sheets (financial assets and liabilities) and demographic characteristics such as the age of the household head.
- **Participation rate:** About 13–14% in the early 1980s; rose to nearly 20% during the late-1980s boom; declined to 12–14% by the mid-2000s; and climbed above 22% in the most recent surveys.
- **Conditional stock share:** The average share of stocks held by participants was around 20% in 1981, peaked near 30% during the boom, and has fluctuated around 20% since.

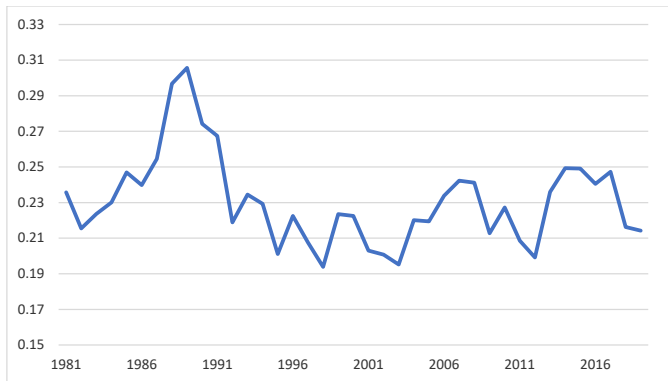
Stock market participation

- 13–14% in the early 1980s; rose to nearly 20% during the late-1980s boom; back to 14% by the mid-2000s; climbed above 20% in the most recent surveys.



Stock share for participants

- The average share of stocks held by participants was around 20% in 1981, peaked near 30% during the 1980s boom and has fluctuated around 20% since.



Structural life-cycle portfolio choice model

- Households live for 81 periods (years), face idiosyncratic labour income risk and decide each year how much to consume and how to allocate savings between **bonds** and **stocks**.
- **Stocks**
 - High expected returns but subject to volatility and a small probability of a disastrous 50% loss, capturing low trust.
 - Costly to access and hold: fixed entry cost; after entry there is an additional per period fixed cost.
- **Bonds**
 - Low expected returns but safe
 - Provide liquidity benefits.

Household Problem

$$V_{it}^j(X_{it}) = \max_{C_{it}, S_{it}, B_{it}} \left\{ (1 - \beta^j) C_{it}^{1-1/\psi} \right. \quad (1)$$

$$\left. + \beta^j \left(E_t[\xi_t V_{it+1}^j(X_{it+1})^{1-\rho} + (1 - \xi_t) \varphi^j X_{it+1}^{1-\rho}] \right)^{\frac{1-1/\psi}{1-\rho}} \right\}^{\frac{1}{1-1/\psi}} \quad (2)$$

subject to the budget constraint

$$X_{it} = C_{it} + S_{it} + B_{it} + 1_t(\cdot)FY_{it}^p \quad (3)$$

and the wealth evolution constraint

$$X_{it+1} = Y_{it+1} + R_{t+1}^s S_{it} + R_{t+1}^b B_{it} - 1_t(S_{it} > 0)fY_{it}^p - \Omega_{it}Y_{it}^p \quad (4)$$

Household Problem (cont'd)

- Bonds give liquidity convenience benefits in the form of lower shopping costs

$$\Omega_{it}Y_{it}^p = \varepsilon \left(\frac{C_{it}}{B_{it}} \right) Y_{it}^p, \quad \varepsilon \geq 0 \quad (5)$$

- Standard income process with a permanent and transitory (iid) component

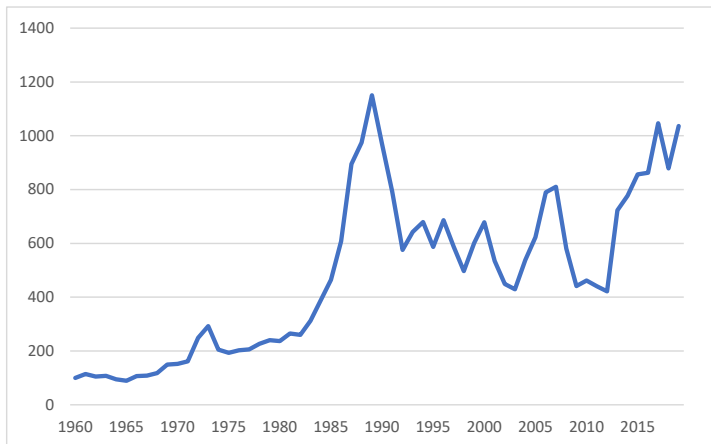
$$Y_{it} = Y_{it}^p U_{it} \quad (6)$$

$$Y_{it}^p = \exp(f(t, Z_{it})) Y_{it-1}^p N_{it} \quad (7)$$

Calibration and estimation

- Some parameters calibrated from direct evidence or from previous studies.
- Asset returns based on historical data from the Macrohistory Database
 - Real stock and bond mean and standard deviation of returns: 1960-2019
 - Probability of large ($\geq 50\%$) stock market decline: 1885-2019
- Method of Simulated Moments estimation:
 - Age, time and cohort effect identification using the Deaton-Paxson method: compute moments based on age-related profiles
 - The life-cycle profile of the ratio of financial wealth to income and portfolio choices across age groups.

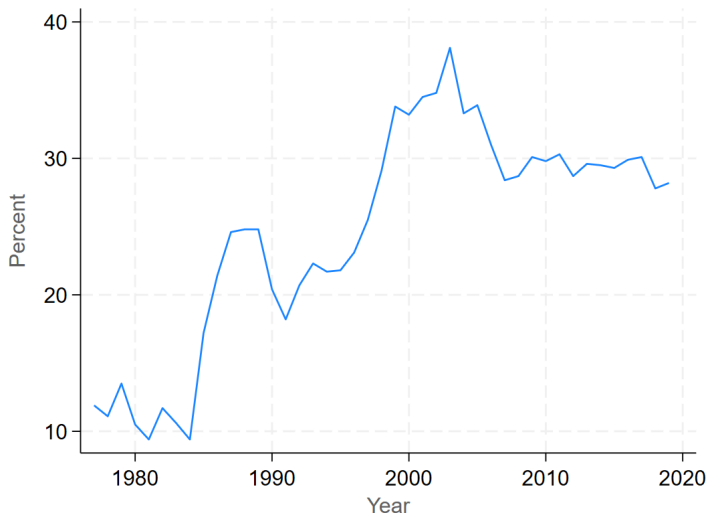
Real Topix evolution 1960-2019



Asset returns

- Bond returns based on 1-year time deposit: 0% real return.
- Equity real returns (minus 2% for taxes and fees): 4.1% with 20% standard deviation
- 3.7% probability of large loss in the stock market

Growing preference for safe/guaranteed products

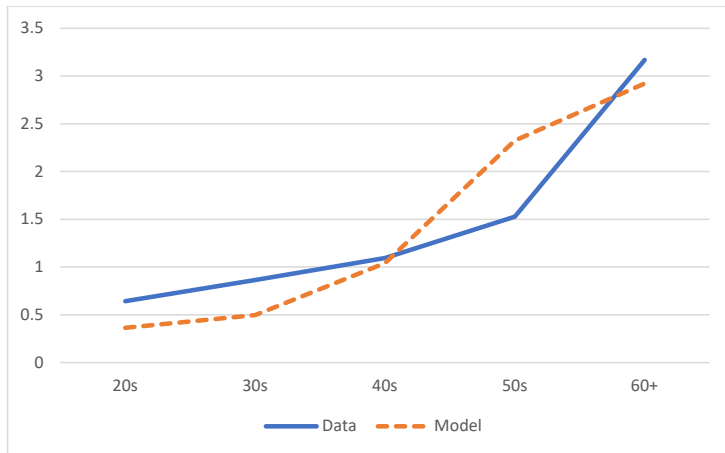


Estimated Structural Parameters

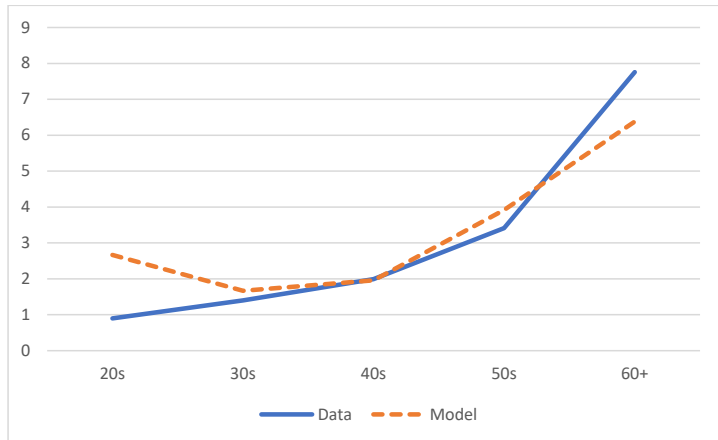
Parameter	Point estimate	St. Err.	Parameter Description
β^H	0.9280	0.0008	Discount factor (patient)
β^L	0.9078	0.0007	Discount factor (impatient)
ρ	7.0	0.312	Coefficient of relative risk aversion
ε	0.012	0.001	Shopping cost parameter
F	0.0483	0.0001	Fixed cost of stock market entry

Table: β^H (β^L) is the annual discount factor of the more (less) wealthy households, ρ is the coefficient of relative risk aversion, ε is the shopping cost parameter, and F is the fixed cost incurred to participate in the stock market. The standard errors (S.E.) are computed using numerical derivatives of the moment conditions weighted by the inverse of the standard deviation of each moment.

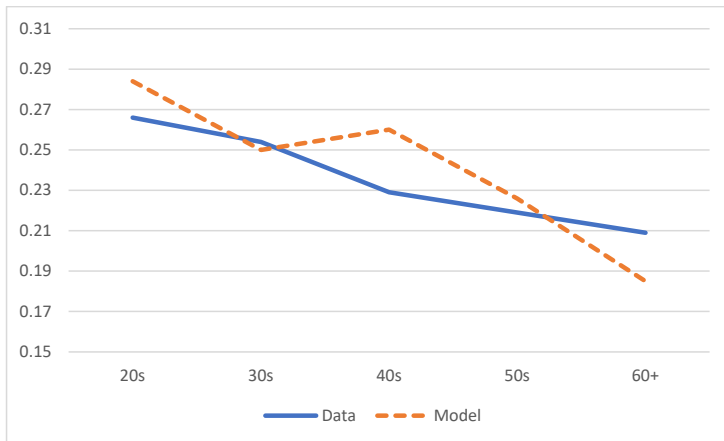
Model vs Data: Wealth-to-income ratio profiles for Non-stockholders



Model vs Data: Wealth-to-income ratio profiles for Stockholders



Model vs Data: Stock share for Stockholders



Robustness: asset returns for the 1960-1990 period

- Asset returns were very high during the boom period in Japan
 - Bond returns based on 1-year time deposit: 0% real return.
 - Equity real returns (minus 2% for taxes and fees): 10.0% with 18% standard deviation
 - 2.9% probability of large loss in the stock market (1885-1990 period)
- Evidence in Cai, Chan and Yamada (1997, RFS): Japanese mutual funds underperformed their benchmarks by 6pp in the 1980s due to over-trading and high commissions
- Model matches the life-cycle profiles of Japanese households and their aggregate stock market participation rate with a $F = 0.0867$

Counterfactual scenarios: assumptions

We consider four policy experiments aimed at increasing stock market participation and equity holdings:

- 1 **Higher equity risk premium (ERP):** Raise the expected real stock return by 0.5 percentage points.
- 2 **Lower volatility:** Reduce annual stock return volatility from 20% to 18%.
- 3 **Lower probability of a financial crisis (P_D):** Reduce the perceived probability of a 50% loss from 3.7% to 2.7%.
- 4 **Lower fixed cost (F):** Cut the stock market entry cost in half, from 4.83% to 2.42%.

Counterfactual scenarios: conditional stock share

Counterfactual implications for the stock share over the life cycle

Age	Baseline	Higher ERP	Lower Vol	Lower P_D	Lower F
20-29	28.4	35.1	35.6	36.4	28.1
30-39	25.0	34.3	32.2	34.3	25.0
40-49	26.0	38.7	35.0	38.8	29.3
50-59	22.8	30.0	27.1	32.4	25.6
60+	18.5	22.6	19.3	25.3	19.0

- Higher ERP, lower volatility and P_D boost the stock share.
- Impact especially large for younger and middle aged households
- Older (60+) households most affected by the lower P_D
- Lower F has no effect on the stock share

Counterfactual scenarios: participation

Stock market participation counterfactuals

Baseline	Higher ERP	Lower Vol.	Lower P_D	Lower F
14.1	36.2	20.6	38.6	42.0

- All counterfactuals increase aggregate participation
- Largest impact of lower P_D and F
- Lower volatility has a comparatively smaller impact

Policy implications and conclusion

- We use a life-cycle portfolio choice model to explain the low Japanese stock share and participation rate.
- Estimate the model by Method of Simulated Moments on SHF data for the 1981-2019 period.
- Key inputs to ensure low stock market participation and low stock share.
 - Low and volatile stock returns (also due to high fees in the past).
 - High probability of large loss in the stock market
 - High fixed cost of stock market entry
- Counterfactual experiments with the model.
 - ERP and P_D boost both participation and the stock share.
 - Lower volatility of returns boosts the stock share
 - Lower F boosts participation

Thank you!