Personal Experiences and Financial Decision-Making – Understanding Inflation Expectations

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Skandia Award Presentation

Example: Effect of the COVID-19 Pandemic

1. **Immediate Impact** of being "at home" on behavior/consumption: less or different interaction at work; online shopping, using yoga/HIIT apps, telemedicine; more trading (Robinhood; meme stocks such as GameStop, AMC Entertainment Holdings)

STOCKS

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3. **Long-Run Impact** of pandemic _beyond_ changes (in jobs, health measures etc.) that "are here to stay."
   - How does the experience alter beliefs and behavior in the long-run?

Post-COVID Behavior

- **A bit of magical thinking**: Suppose everybody had returned to their pre-pandemic educational path or career path; earnings and earnings prospects are as if the pandemic did not happen; impact on accumulated wealth is minimal.

- Basically, we are back to the world of pre-COVID-19.

- **Question:** Under these assumptions, would we be back to economic decisions and financial risk-taking from pre-COVID-19?
  - That's what an exclusive focus on SR + MR impact implies.
  - That's not what I see in the behavior of my students, of the staff I am working with at the university, of the politicians I advise.
  - That's not what economists are saying, but arguments build on "economic conditions have changed;" we will not be back to pre-COVID-19 conditions.
  - What about "we have changed" and will behave differently even if the world returned back to its pre-COVID version?

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Experience Effects

Traditional Models of Economic Decision-Making

- Effect of "personally experienced pandemic or crisis" no different from information about outcomes *ceteris paribus*.

- Effect of "living through a depression" on financial investment no different than effect of reading about it; of "having experienced unemployment" on consumption no different than knowing your risk of future unemployment; of living through a pandemic no different from knowing about likelihood and implications (controlling for wealth, income, age, etc.).

Models and Empirical Evidence of Experience Effects

- Personal experience has lasting impact on beliefs and behavior (scarring effects).

- "Re-wiring" (neuroplasticity, synaptic tagging)

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A Famous Example: Depression Babies $\Longrightarrow$ Stock-Market and Risk Aversion

"I don't know about you, but my parents were depression babies, and as a result, avoided the stock market and all things risky like the plague."

Illustration:
stock-market participation rates at age 36-45
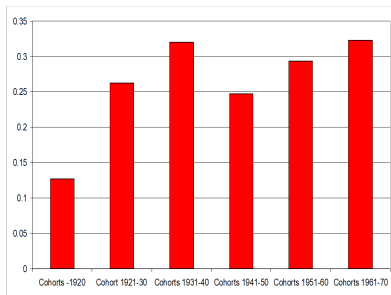
- Participation of generation that experienced the 1930s Great Depression as teenagers/adults (13%) significantly lower than that of all other cohorts (26-32%).
- 1931-1940 cohort experienced the post-war boom years during their young adult life, has a participation rate at age 36-45 that is more than twice as high.
- In 1941-50 cohort, the rate dips again, consistent with the fact that this cohort reached age 36-45 just after the depression years of the 1970s.

Depression Babies

(Malmendier and Nagel, *QJE*, 2011)

Approach: Probit model $\Pr(y_{i,t} = 1 | x_{i,t}, A_{i,t}(\lambda)) = \Phi(\alpha + \beta A(\lambda) + \gamma' x_{i,t})$ in SCF data, with $A_{i,t}(\lambda)$ = weighted sum of past experiences (weights governed by λ) using ML to simultaneously estimate λ and coefficient β.

1. Relate $A_{i,t}(\lambda)$ = "lifetime stock-market experiences" to $y_{i,t}$ = stock investment.
2. Relate $A_{i,t}(\lambda)$ = "lifetime bond-market experiences" to $y_{i,t}$ = bond investment.

Results

- IDR effect of moving from a bad to a good lifetime experience (10th to 90th percentile) on probability of being in lowest risk-tolerance category (baseline 36.3%): -10.1 pp
- Stock-market participation (Stock holdings $>$ \$0): IDR $+14$ pp
- Bond-market participation (Bond holdings $>$ \$0): IDR $+15$ pp
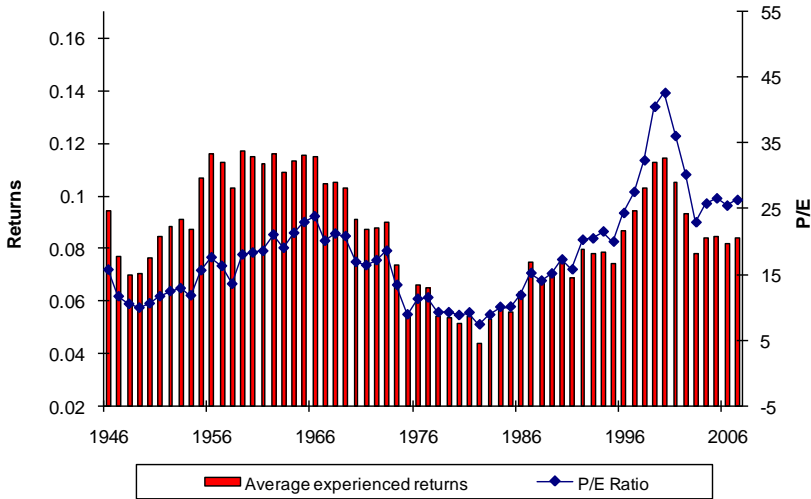- No cross-fertilization!

Weighting Function

$$A_{i,t}(\lambda) = \sum_{k=1}^{\text{age}_{i,t}-1} w_{i,t}(k,\lambda) R_{t-k} \text{ and } w_{i,t}(k,\lambda) = \frac{(\text{age}_{i,t}-k)^{\lambda}}{\sum_{k=1}^{\text{age}_{i,t}-1}(\text{age}_{i,t}-k)^{\lambda}}$$

Illustration for 50-year old individual
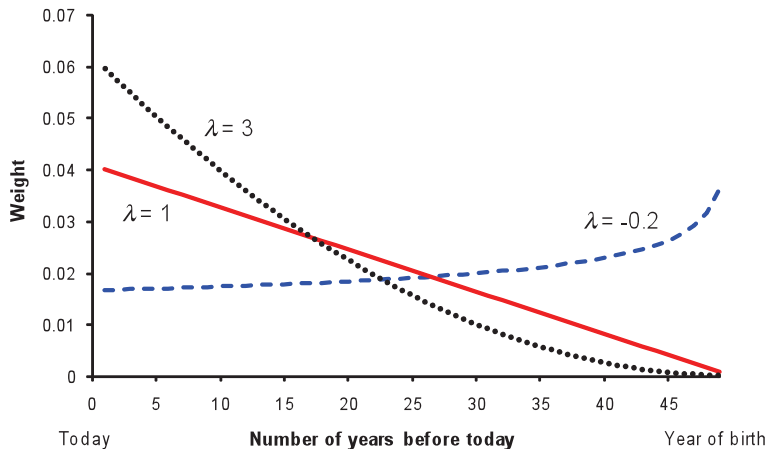
Aggregate Perspective: Market Valuation

Applications of Experience Effects

Evidence of personal experiences affecting beliefs and choices from

- Depression Babies (QJE 2011, JFE 2020)

- Inflation fears (QJE 2016, JPE 2021, JME 2021, PNAS 2022)

- Consumption spending and unemployment experiences (AEJ Macro *forthcoming*)

- Homeownership, tenure decisions (buy versus rent) (JF *forthcoming*, NBER WP)

- Living under communist regimes (AEA P&P 2019, NBER WP)

- International capital flows (home bias, retrenchment, fickleness) (JIE 2020)

Today: Inflation Experiences $\Longrightarrow$ Inflation Beliefs

Malmendier and Nagel (2016); Malmendier, Nagel, and Yan (2020)

German motivation ...
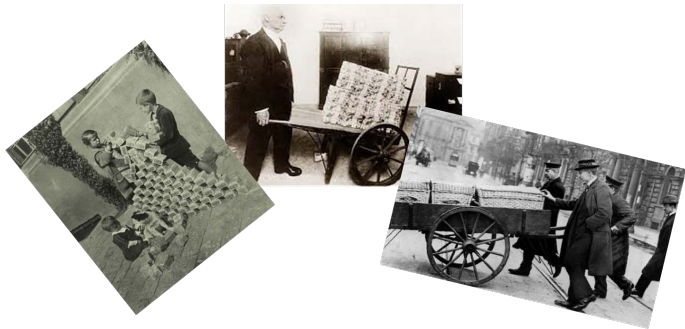

... and US motivation

Paul Volcker (1979): "An entire generation of young adults has grown up since the mid-1960s knowing only inflation, indeed an inflation that has seemed to accelerate inexorably. In the circumstances, it is hardly surprising that many citizens have begun to wonder whether it is realistic to anticipate a return to general price stability."

Idea Inflation Experiences $\implies$ Inflation Beliefs

Malmendier and Nagel (QJE 2016), using MSC data since 1953

1. When forming inflation expectations, individuals put a higher weight on realizations experienced over their life-times than on other available historical data.

   ▶ <u>Similar to adaptive learning</u>: people learn following simple "rules of thumb" (e.g., Bray 1982; Marcet and Sargent 1989)
   ▶ <u>Different from adaptive learning</u>: people learn (more) from data realized during their lifetimes. (adaptive learning: all historical data)

2. Implicit weighting of past experiences

   ▶ Roughly linearly declining weights.
   ▶ Very similar to weighting pattern in stock market (and other data) data!

3. Significant impact on individual financial decisions, namely, long-term nominal-rate borrowing and lending.

Disagreement about future inflation (MSC)
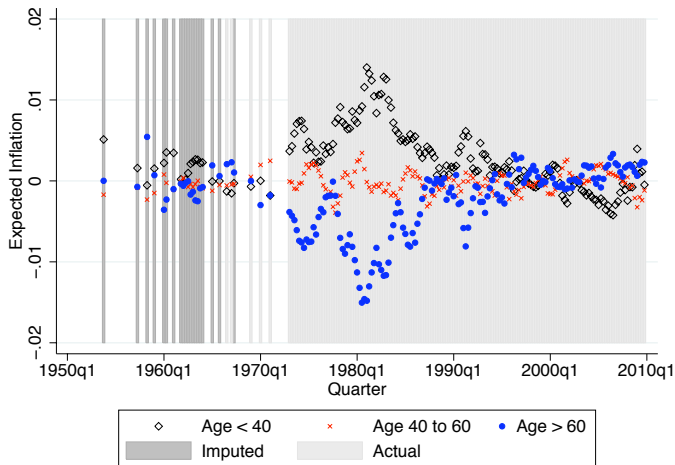
Four-quarter moving averages of one-year inflation expectations shown as deviations from the cross-sectional mean.
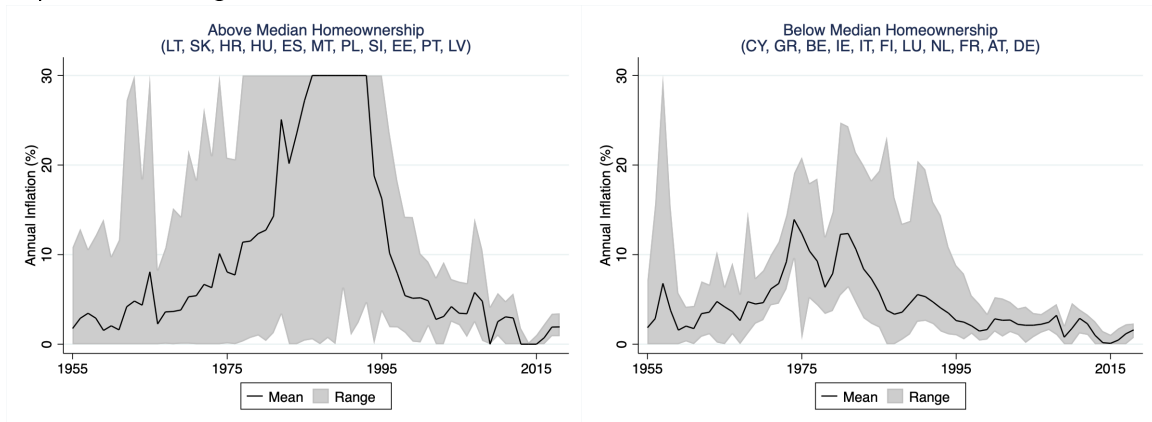
Fitted expectations
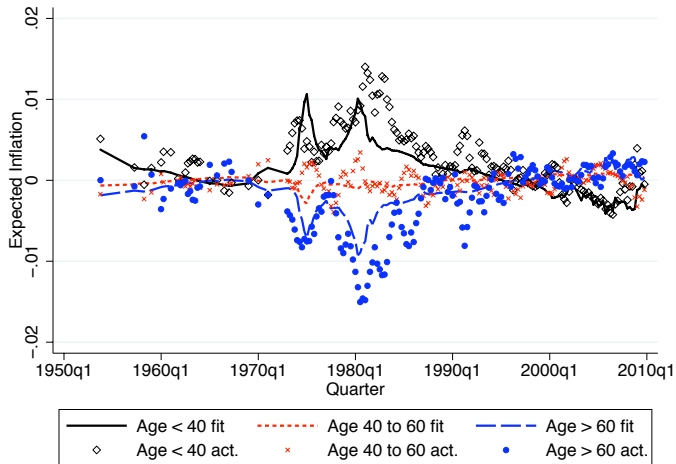
Fitted and actual relative to full-sample c.s. mean (4-quarter MA)

Inflation Experiences and Longlasting Effects on Behavior
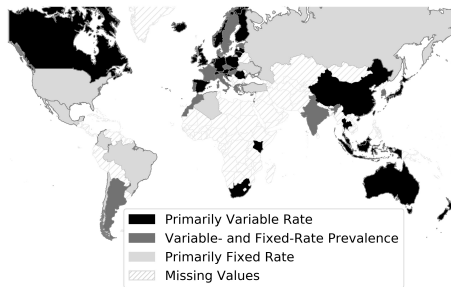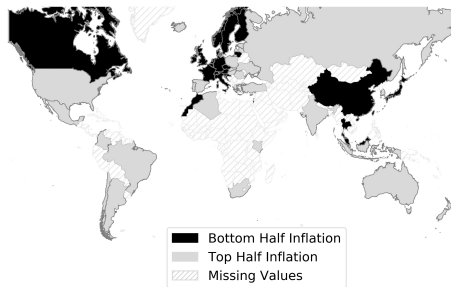
Experiences of high inflation influence tenure choices

Note: Even among immigrants to the US (ACS data + home country inflation)
(Malmendier and Wellsjo, JF *forthcoming*)

Inflation Experiences and Longlasting Effects on Behavior

Experiences of high inflation mortgage choices

Note: Costly if ARM provides access to homeownership among low-income population (e.g., Baby Boomer generation in the US overpaid $22bn for FRMs in late 1980s and 1990s) (Botsch and Malmendier, WP 2022)

# Inflation Experiences of Experts

- Henry (Heinrich) Wallich: Fed governor 1974-1986
  - ▶ Born in Germany in 1914 into a family of bankers.
  - ▶ Lived through Germany's hyperinflation in 1923.
  - ▶ Emigrated to the US in the 1930s.
- Wallich dissented 27 times (!) during his tenure on the Fed Board, the highest number of dissents in Federal Reserve history, **decades later**.

# Beyond Wallich: FOMC Members' Inflation Experiences and Forecasts
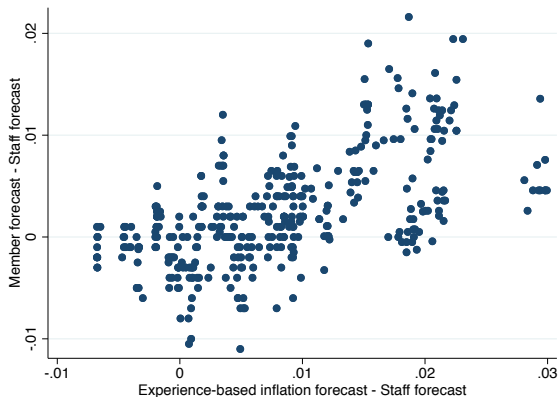
Member forecast: from semi-annual Monetary Policy Report to Congress, 1992 - 2004.

Staff forecast: Greenbook forecast.

Experience-based forecast: AR(1) model forecast estimated based on weighted life-time inflation data for each FOMC member.

Inflation experiences and FOMC voting behavior

Effect on dissent probabilities of +0.1pp rise in experience-based inflation forecast
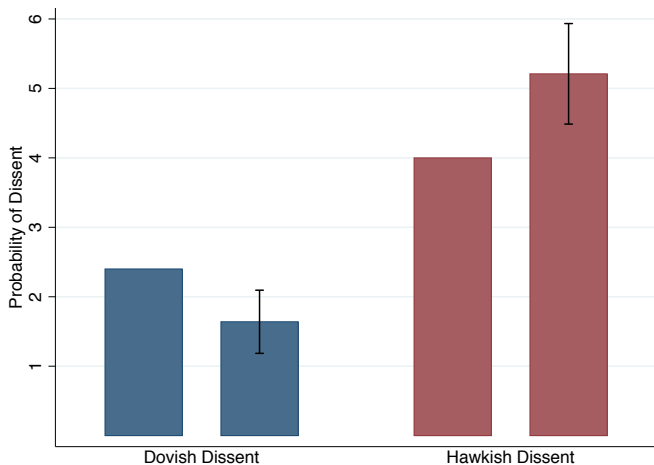
Experience Effects – Key Features

1. Experiences over one's lifetime so far have long-lasting effects on beliefs and choices.
   - Different cohorts are affected differently.
2. Experiences are domain-specific.
   - No cross-fertilization between different realms of economic decisions.
   - Same pattern across domains (stocks, bonds, inflation, interest rate expectations, unemployment experiences etc.)
3. Robustness (imperviousness) to **learned knowledge**: Experiences affect experts.
4. Extent of exposure matters.
   - Different locations are affected differently.
   - **Implication**: Different genders/races/... are affected differently in the long-run, even after exposure has passed.
   - **Implication**: Interaction with inequality.

Example: Gendered Experiences

D'Acunto, Malmendier, Weber (PNAS, 2021): "Gender Roles Produce Divergent Economic Expectations"

Within-Household
Inflation Expectations

Short-term Inflation Expectations
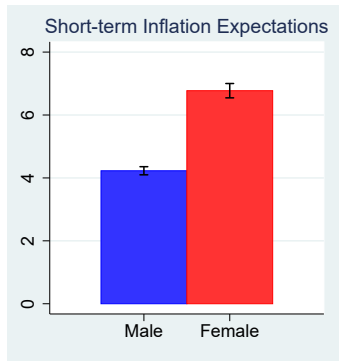
- Women have (more) positively biased inflation expectations, even within households.
- Cf. Lars Jonung (AER, 1981), "Perceived and Expected Inflation Rates in Sweden"

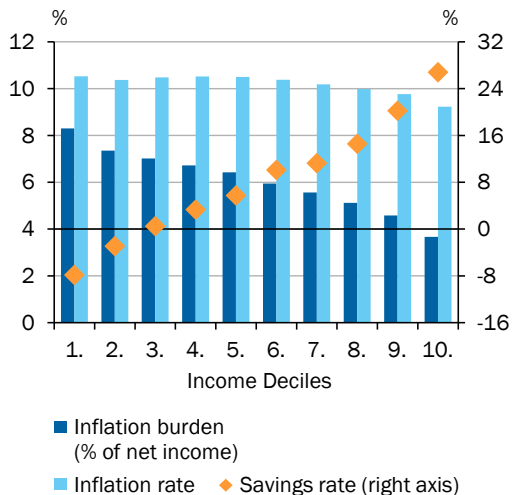# Why Are Women (More) Biased? They Do the Groceries!

Groceries highly volatile, and consumers known to anchor on price increases.

Gender Difference in Inflation Expectations

- Large difference in inflation expectations by gender *within* household
- Unconditional difference driven by differences in grocery shopping

Example: SES-dependent Experiences

Welfare and Policy Implications of Experience Effects in Inflation

1. **Long-lasting implications** of personal experiences, depending on of "duration" and "severity"
   - Even if back to status quo ante (successful disinflation), lingering effect on beliefs and behavior

2. Automaticity (neurological re-wiring): information campaigns/credible policy announcements versus experiences
   - Corresponding policy response, cf. German "Tankrabatt" (gas price discount)

3. Heightened conflict between monetary and fiscal policy (fiscal stimuli)

4. Spill-over to the role of media and communication: strong effect if "experiential" ⟷ limited effect unless "experiential" (cf. reggae songs of Central Bank of Jamaica, Netflix movies)

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- Standard Neoclassical Model
  - ▶ Payoff maximizer
  - ▶ Bayesian beliefs
  - ▶ Perfect cognition

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» **Homo oeconomicus**

Behavioral Models of Economic Decision-Making

- Standard Neoclassical Model
  - ▸ Payoff maximizer
  - ▸ Bayesian beliefs
  - ▸ Perfect cognition

- Behavioral Additions
  - ▸ Social preferences
  - ▸ Overconfidence
  - ▸ Limited attention

The Next Step: *Human* Models of Economic Decision-Making

- Standard Neoclassical Model
  - ▸ Payoff maximizer
  - ▸ Bayesian beliefs
  - ▸ Perfect cognition

- Behavioral Additions
  - ▸ Social preferences
  - ▸ Overconfidence
  - ▸ Limited attention

- How do our lifetime experiences shape our (ir)rational decisions?

» **Homo** (homo experiens)