INFLATION EXPECTATIONS

SYMPOSIUM ON “INFLATION: RISKS, IMPLICATIONS AND POLICIES”
NY Fed AMEC SYMPOSIUM

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I Inflation expectations

1 **Determinants:**
   - What determines and anchors LT inflation expectations?
   - How to measure the risk that inflation expectations become unanchored?

2 **Monetary Policy Response:**
   - Which MP strategy and communication tools help (or hinder) adequate anchoring?
Approaches to Expectation Formation

1. **Traditional**: Bayesian updating, perfect cognition, perfect information processing
   - Frictions: access to information, model uncertainty
   - Remedy: improve access to information (hence, info experiments), reduce model uncertainty

2. **Behavioral** ([social psych]): Flaw in the software (biases), e.g., over-inference (overweighting recent information), natural expectations (not enough lags), overconfidence etc.
   - Frictions: info processing flaw, imperfect cognition
   - Remedy: Education (interest rate compounding, Bayes’ Rule)

3. **Biological** ([neuro, cognition]): Humans’ views of the world and beliefs are altered by their personal experiences, by events that resonate ⇒ dynamically changing process (brain plasticity, trauma, scars), independent of information and processing abilities
   - Frictions: information processing function of prior exposure
   - Remedy: design of experiences
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What explains the overweighting of food and gas prices?

1. **Traditional**: Different beliefs due to differences in information

2. **Behavioral**: Biases / limited cognition

3. **Experience effects**: Humans change their views of future inflation, as well as savings/spending decisions, after personally being affected
   - Even if fully informed about inflation data
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Step 1: Inflation expectations reflect the lived reality of households (Experience Effects)

Disagreement about future inflation (MSC)

Four-quarter MAs of one-year $E[\pi]$ shown as deviations from the cross-sectional mean.
Fitted and actual relative to full-sample c.s. mean (4-quarter MA)
Findings: Inflation Experiences $\implies$ Inflation Beliefs
Malmendier and Nagel (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.
   - Similar to adaptive learning: people learn following simple “rules of thumb” (e.g., Bray 1982; Marcet and Sargent 1989)
   - Different from adaptive learning: people learn (more) from data realized during their lifetimes. (adaptive learning: all historical data)

2. Implicit weighting of past experiences very similar to weighting pattern in other applications, e.g., stock market!
   - Roughly linearly declining weights.

3. Significant impact on individual financial decisions, namely, long-term nominal-rate borrowing and lending (tenure, ARM/FRM, refi, bonds).
Survey of NZ managers: “How do you typically form your inflation expectations?”

Top 4 answers:

- Media
- Meetings and discussions (with co-workers and families)
- Shopping experience
- Prices of competitors and suppliers
Inflation Experiences of Firms
Kumar, Afrouzi, Coibion and Gorodnichenko (2015)

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Survey of NZ managers: “How do you typically form your inflation expectations?”

Top 4 answers:

- Media
- Meetings and discussions (with co-workers and families) ← Information Resonance
- Shopping experience
- Prices of competitors and suppliers
- 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.
**Staff forecast:** Greenbook forecast.
**Experience-based forecast:** AR(1) model forecast estimated based on weighted life-time inflation data for each FOMC member.
Why?

- Every time we have a new experience, our brain forms a connection between two neurons (synapse).
  - Synapses tell our body how to react to the world around us. The govern the way we experience life.
- The brain can reorganize pathways, create new connections, and even create new neurons (neuroplasticity) in response to learning, experience, and memory foundation.
How and how often we make an experience matters.

Repeated stimulation of hippocampal neurons can induce a prolonged increase in synaptic strength (long-term potentiation (LTP)), Cf. Frey and Morris (Nature 1997, Trends in Neuroscience 1998))


Prior or subsequent “learned knowledge” has very limited power to undo the effects.

Synaptic Tagging

- How and how often we make an experience matters.
  - Repeated stimulation of hippocampal neurons can induce a prolonged increase in synaptic strength (long-term potentiation (LTP)), Cf. Frey and Morris (Nature 1997, Trends in Neuroscience 1998))
  - Prior or subsequent “learned knowledge” has very limited power to undo the effects.

  - Trauma with a big T: German Hyperinflation, Great Depression, Pandemics
  - trauma with a small t: Daily Exposure, daily worry about food, prices, unemployment
  - Other repeated (non-traumatic) exposure, including positive experiences
Women have (more) positively biased inflation expectations, even within households.

Unconditional difference driven by differences in grocery shopping.
Implications for Monetary Policy

1 FREQUENCY: explains roles of food/gas prices, personal shopping $$\implies$$ MP: limitations of focus on core inflation

2 DURATION: inflationary experience extra-powerful if it remains high for a long time; the effect will last for a long time $$\implies$$ MP: to be accounted for in policy choices

3 EMOTIONS: “panic” $$=\$$ strong anchoring in memory $$\implies$$ MP: acknowledge consumer reality, reassure, utilize “information resonance”

4 COMMUNICATION:
   - “Expectations show whether central bank is doing its job” but not in the sense of “being credible,” but in the sense of “fighting the inflation reality”
   - MP tools such as forward guidance less powerful than our standard macro models would imply.