On Robustness of Average Inflation Targeting

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Abstract

This paper considers average inflation targeting (AIT) policy in a New Keynesian model with adaptive learning agents. Our analysis raises concerns regarding AIT when agents have imperfect knowledge and the averaging window length is not public knowledge. AIT can create severe stability risks near the inflation target steady state which would be avoided under inflation targeting (IT) or price level targeting (PLT). Communicating the averaging window length or adopting an asymmetric average inflation target that judges below-target average inflation more negatively avoids these pitfalls.

Introduction

In August of 2020, the Federal Reserve announced a new policy framework of average inflation targeting.

The general public (including economists) has imperfect knowledge about the new framework.

- What does "average inflation" mean?
- What determines the averaging window (1-year, 2-year, etc.)?
- Will the Fed respond *symmetrically* to deviations of "average inflation" from the 2% target?

Earlier research literature assumed that the public understands the basic structure of AIT and the economy.

Question: How does AIT perform if there is imperfect knowledge and agents are adaptively learning?

Criterion for Policy: Anchored Expectations

Our analysis combines learning, AIT and a standard macro model. The ingredients:

1. Simple New Keynesian model (infinite-horizon learning).
2. AIT: policymaker *symmetrically* targets a *L*-period moving average of inflation:

$$i_t = \psi_p \sum_{k=0}^{L-1} \pi_{t-k} + \psi_y y_t,$$

where i is the nominal interest rate, π is inflation, y is the output gap. This implies that aggregate variables depend on the L-1-lags of inflation in rational expectation equilibrium (REE):

REE: $$Z_t = (\pi_t, y_t, i_t)' = \sum_{k=1}^{L-1} A_k * \pi_{t-k} + C * shocks.$$

3. Agents recursively estimate a PLM that might not properly account for the lag structured implied by AIT:

Forecasting model: $$Z_t = (\pi_t, y_t, i_t)' = a + \sum_{k=1}^{M-1} b_k * \pi_{t-k} + c * shocks.$$

Learning agents recursively estimate coefficients a, b_k, c using least squares.

- **Opacity** = agents underestimate the averaging window (M<L).
- **Transparency** = agents perfectly understand the averaging window (M=L).

Criterion for monetary policy: Any reasonable monetary policy needs to anchor expectations to the inflation target in the long-run.

- **Robust stability**: expectations are anchored in long-run when learning is sensitive to incoming data (i.e. the "gain" parameter in agents' estimation routine is empirically plausible).

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De-anchoring Risks

Our analysis raises severe warning signals about AIT.

1. A symmetric and opaque AIT policy is likely to *permanently* de-anchor expectations.
   - Inflation target is not robustly stable under opaque AIT.
   - Flexible prices greatly exaggerate the issue.

2. AIT is much riskier than inflation targeting (IT) or price-level targeting (PLT).
   - Neither IT nor PLT creates similar stability issues (e.g., see Honkapohja and Mitra, 2020 concerning PLT).
   - Results challenge the notion that AIT is a compromise between IT and PLT (e.g., see Nessén and Vestin, 2005).
   - PLT vs. AIT = infinite vs finite averaging window.

Stability problem caused by **finite** and **opaque** averaging window:

- Following low inflation, central bank aims for "make-up" inflation (π).
- Learning agents mistake transitory make-up inflation for permanent π → rising (de-anchoring) π expectations → higher than expected π.
- Under finite window, bygones are bygones; central bankers forget initial low π data and aim to undershoot π target to compensate for make-up π → falling (de-anchoring) π expectations→ lower than expected π in the future.
- Explosive oscillatory pattern in π is the result (which is avoided with IT or PLT).

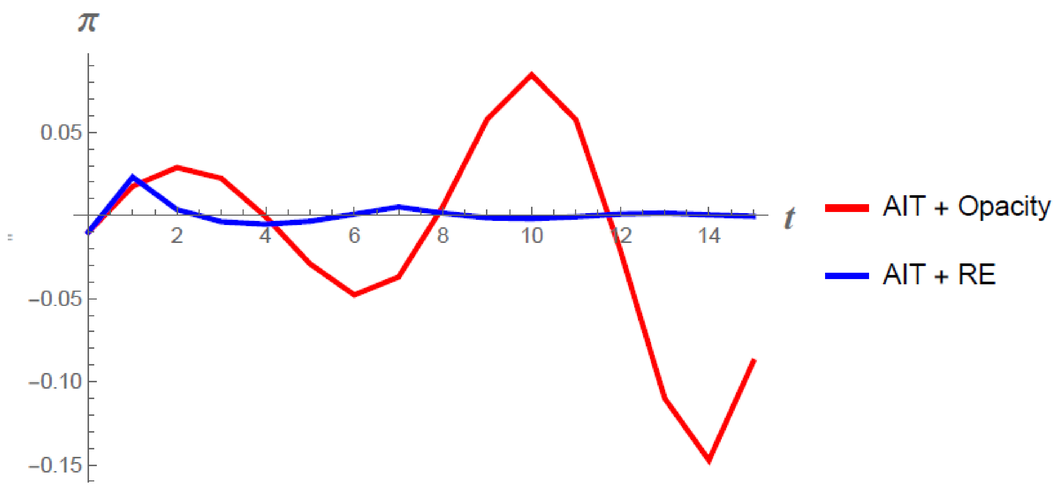

Chart 1. Instability Problem.

How to Anchor Expectations

An asymmetric AIT target avoids de-anchoring risks.

- Shorten the averaging window when average inflation is high (e.g., target current inflation).
- Lengthen the averaging window at the ZLB.
- Policymaker does *not* need to communicate the averaging window to anchor expectations if the average inflation target is asymmetric.

Policymakers might consider adopting an asymmetric AIT strategy if they do not want to make the averaging window transparent.

The Federal Reserve has not announced an averaging window.

Conclusion

- We analyzed performance of a symmetric AIT policy when expectations can de-anchor via learning.
- If agents underestimate the averaging window, then expectations will de-anchor from the inflation target.
- De-anchoring risks are worse under AIT than under price-level targeting or inflation targeting.
- A state-dependent (asymmetric) averaging window anchors expectations without the need to commit to a transparent averaging window.

References

1. Nessén, Marianne and David Vestin, "Average Inflation Targeting," *Journal of Money, Credit and Banking*, 2005, 37, 837–863.
2. Honkapohja, Seppo and Kaushik Mitra, "Price Level Targeting with Evolving Credibility," *Journal of Monetary Economics*, 2020, 116, 88–103.