

# On Robustness of Average Inflation Targeting

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Discussion: Lilia Maliar

July 12, 2021

# Mitä he tekevät tässä artikkelissa?

What do they do in the paper?

## **Timely and well-executed paper:**

- extensively analyzes the stability properties of average inflation targeting (AIT) as an alternative monetary policy (MP) framework;
- compares the AIT with other MP frameworks, namely, standard inflation targeting and price level targeting;
- studies whether the AIT can help escape liquidity trap.

# Revisiting MP framework

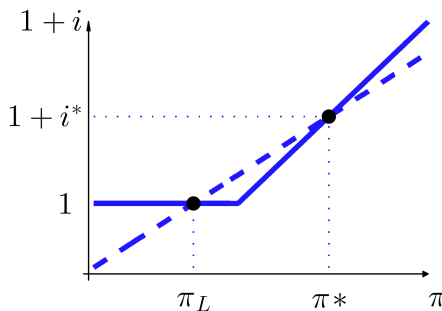
- Inflation targeting (IT) – standard central-banking framework.
- Since the Great Recession 2007-2009, periods of nominal interest rates at ZLB.
- Unconventional MP tools (quantitative easing, forward guidance, asset purchases).
- Discussion of alternative MP frameworks:
  - change in inflation target  $\pi^*$ ;
  - AIT;
  - price level targeting (PLT);
  - nominal GDP targeting, etc.
- A natural question to ask how/when/whether the AIT should be implemented and how it compares to other alternatives.

## AIT – a new MP framework in the U.S.

- On August 27th, 2020, Chairman Powell announced a switch to AIT at Jackson Hole annual conference.  
“If inflation runs below 2% following economic downturns but never moves above 2% even when the economy is strong, then over time inflation will average less than 2%. Households and businesses will come to expect this result, which means that inflation expectations would tend to move below our inflation goal and bring realized inflation down. . . . Therefore, following periods when inflation has been running below 2%, appropriate monetary policy will likely aim to achieve inflation moderately above 2% for some time.”
- *Stabilizing effects of AIT*: if  $\pi < \pi^*$ , the central bank cuts the interest rate, agents consume more  $\Rightarrow \pi$  goes up.
- *IT*: if  $\pi < \pi^* \Rightarrow$  interest rate decreases.
- *AIT*: if  $\pi < \pi^* \Rightarrow$  interest rate decreases only if average  $\pi$  is lower than target.

# "Perils of Taylor Rule", Benhabib, Schmidt-Grohe and Uribe (2001)

- A closed, flexible-price economy with constant endowments
- *Taylor rule with IT*:  $1 + i_t = \max\{1, 1 + i^* + \alpha_\pi (\pi_t - \pi^*)\}$
- *Euler equation*:  
 $1 = \beta (1 + i_t) E_t \{1/\pi_{t+1}\}$
- Assume:  $1 + i^* = \pi^*/\beta$
- *Two inflation ss*: (1) the intended ss ( $\pi^*$ ); (2) liquidity trap ( $\pi_L$ )
- *Dynamics*: non-explosive eqm path for inflation ends in the liquidity trap



*Literature*: assume some form of learning  $\Rightarrow \pi_L$  is not learnable but  $\pi^*$  is  $\Rightarrow$  Eqm is unique.

## Analysis in the paper

- *Novel features:*

*AIT + Learning + Imperfect information about policy*

- *Imperfect information about policy:*
  - *Opacity:* agents do not know anything about the interest rate rule.
  - No opacity but agents do not know the policy coefficients and forecast the MP rule using the *correct functional form*.
- *Steady-state learning:*  $\hat{\pi}_t^e = \hat{\pi}_{t-1}^e + \omega (\hat{\pi}_{t-1} - \hat{\pi}_{t-1}^e)$ ,  $\omega =$  speed of updating expectations.
- Study local convergence for different lengths of the data window  $L - 1$ .

## Some results in the paper

1. A Fisherian model with flexible prices:
  - for  $L \geq 4$ , the intended ss is locally unstable.
2. A log-linearized NK model with Rotemberg pricing:
  - for  $L \geq 4$ , the intended ss is locally unstable with price flexibility;
  - for  $\forall L$ , the intended ss is locally stable with price stickiness.
3. A NK model with exponentially declining weights (or an exponential moving AIT):
  - for  $\forall L$ , the intended ss is locally stable with both price stickiness and price flexibility.
4. Calibrated non-linear model with opacity:
  - instability of the intended ss for  $\omega > \omega_0$ . With AIT,  $\omega_0$  is smaller than with IT  $\Rightarrow$  AIT is less stable.
5. Calibrated model with a correct functional form for the AIT rule:
  - more stable than with opacity  $\Rightarrow$  Important for the central bank to communicate well its policy.
6. Model with a binding ZLB: – near the liquidity trap ss, the economy may not converge to the intended ss.  $\Rightarrow$  No sense to introduce AIT.

## Comment 1: Will there be stability if we modify steady-state learning?

- Under the steady-state-learning assumption,

$$\hat{\pi}_t^e = \hat{\pi}_{t-1}^e + \omega (\hat{\pi}_{t-1} - \hat{\pi}_{t-1}^e),$$

$$\hat{\pi}_t^e = \left(\frac{p_{t+1}}{p_t}\right)^e, \hat{\pi}_{t-1}^e = \left(\frac{p_t}{p_{t-1}}\right)^e \text{ and } \hat{\pi}_{t-1} = \frac{p_{t-1}}{p_{t-2}} = \text{inflation at } t-1,$$

- *Small clarification question:* Why does past inflation  $\hat{\pi}_{t-1}$  enter there?
- Furthermore, what is the evidence for this type of learning?
  - How robust are the results if we modify the learning type?
  - How critical is this assumption?



## Comment 2: How is stability affected by transition from IT to AIT?

- The paper only studies AIT as an alternative MP regime.
- How will transitional dynamics look like if we switch from the standard IT to AIT?
- Will the stability be preserved during the transition from IT to AIT?

## Comment 3: How is learning affected by anticipation effects?

- What are the anticipation effects when the switch to the new MP regime is announced?
- The Fed's Chair Jeromy Powell announced that Fed will switch from IT to AIT on August 27th 2020.
- However, as was stated by Richard Clarida, during his presentation at the Hoover Economic Policy Working Group on January 13, 2021, one month prior to that, there was evidence that Fed would introduce that framework, and as a result, there were substantial anticipatory price moves in the U.S. economy.

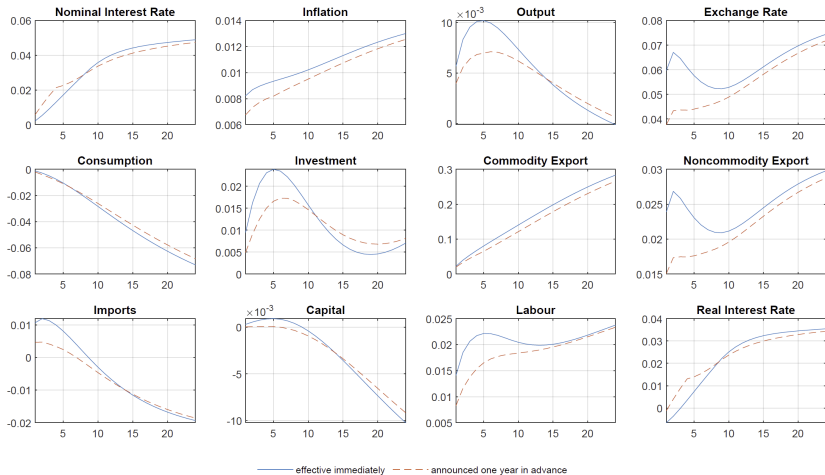
## Comments 2&3: Lepetyuk, Maliar, Maliar and Taylor (LMMT, 2021)

- Develop a solution framework for studying non-recurrent policy changes in DSGE models with rational expectations:
  - models are non-stationary  $\Rightarrow$  find time-dependent decision rules.
- Consider a scaled-down version of the ToTEM model of the Bank of Canada with 50 state variables.
- MP rule with AIT

$$R_t = \rho_r R_{t-1} + (1 - \rho_r) \left[ \bar{R} + \rho_\pi \left( \frac{1}{L} \sum_{j=0}^{L-1} \pi_{t-j} - \bar{\pi}_t \right) + \rho_Y (\log Y_t - \log \bar{Y}_t) \right] + \eta_t^r.$$

- Amano et al. (2020): optimal  $L - 1$  ranges from 2 to 8; we assume  $L - 1 = 8$ .

# LMMT (2021): Transitional dynamics and anticipation effects of AIT



## LMMT (2021): Transitional dynamics and anticipation effects of AIT (cont.)

- A change to AIT has very modest anticipation effects on the economy in the absence of any shocks.
- In fact, when the policy becomes effective immediately, there are larger responses in such variables as output, labor, imports, and noncommodity exports.
- That is, reacting to average inflation rather than inflation smooths out dynamics to a new steady state.
- Therefore, we would not expect the economy to experience any drastic changes in the course of transition to AIT.
- In contrast, for PLT, the immediate effects are larger;
  - PLT was argued in the literature to be welfare improving.
  - a central bank that waits to implement PLT loses time, and the economy does not get earlier benefits from higher output.

## Comment 4: Further extensions

- Coibion, Gorodnichenko, Knotik, Schentle (2021), "Average Inflation Targeting and Household Expectations":
  - even if people are explained AIT, they do not understand it.
- How to extend the notion of opacity so that the model under learning accounts for Coibion et al. (2021) observation?
- Some alternatives:
  - agents expect IT;
  - incorrect knowledge of  $L$ ;
  - learning about  $L$  or  $\mu$  – the past inflation weight in the AIT rule.
- In the paper, when agents know the functional form of the AIT rule, they learn values of the coefficients  $\psi_p$  and  $\psi_y$ .
- As for me, learning about  $L$  (or  $\mu$ ) is the most important experiment, given how the Fed announced its policy.

Thank you!