



# **Monetary Policy Strategies for the Federal Reserve**

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**Monetary Policy Strategy, Tools, and Communication Practices**

**(A Fed Listens Event)**

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# Outline

- Intro: Background for the Fed's Review
- The Fed's mandate, flexible inflation targeting
- Fulfilling the mandate:  
General strategy of “forecast targeting” (better than Taylor-type rule)
- Specific alternative strategies:
- Price-level targeting
- Temporary price-level targeting
- Average-inflation targeting
- Conclusions
- (Appendix: Nominal-income targeting)

# Introduction

- Background for review (Clarida 2019)
- Lower  $r^*$
- Flatter Phillips curve
- Take dual mandate and 2% for PCE deflator as given
- Three questions:
  1. “Can the Federal Reserve best meet its statutory objectives with its existing monetary policy strategy, or should it consider strategies that aim to reverse past misses of the inflation objective?”
  2. “Are the existing monetary policy tools adequate to achieve and maintain maximum employment and price stability, or should the toolkit be expanded?”
  3. “How can the FOMC’s communication of its policy framework and implementation be improved?”

## The Fed's mandate

- Maximum employment and price stability
- Simplify: Assume exogenous labor-force participation rate: Then focus on unemployment and the (minimum) long-run sustainable unemployment rate,  $u_t^*$
- FOMC “Balanced approach”: Equal weight on stabilizing inflation around 2% and unemployment around (*estimated*)  $u_t^*$
- Flexible annual-inflation targeting, standard loss function:

$$L_t = (\pi_t - \pi^*)^2 + (u_t - u_t^*)^2$$

$\pi_t \equiv p_t - p_{t-4}$  annual (4-quarter) inflation rate

$p_t$  log price level (PCE deflator)

## Fulfilling the mandate: Forecast targeting 1

- Take into account that inflation and unemployment responds with lag and that expectations of the future policy-rate path matters
- Focus on forecasts of inflation and unemployment and on the policy-rate path
- Select the policy rate and, importantly, the whole policy-rate path, so that the corresponding forecasts of inflation and unemployment “look good”
- “Look good”: Best fulfill the mandate, that is, best stabilize inflation forecast around 2% and unemployment forecast around (estimated)  $u_t^*$
- Publish and justify policy-rate path and forecasts of inflation and unemployment in order to make them credible.  
If needed, demonstrate that alternative policy-rate paths lead to worse mandate fulfillment.

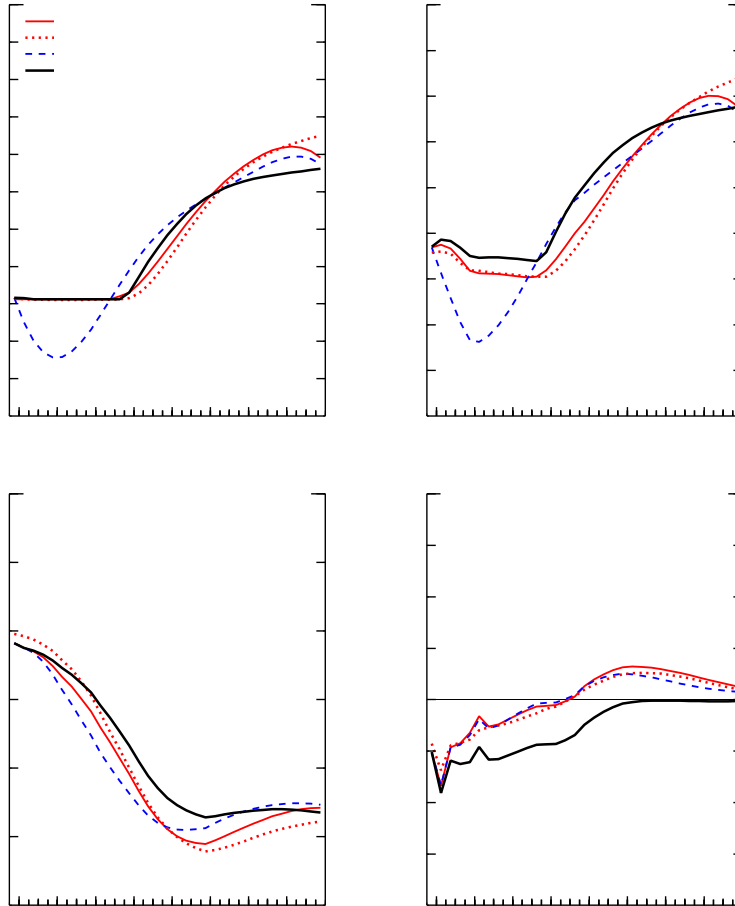
## Fulfilling the mandate: Forecast targeting 2

- Fulfills mandate better than Taylor-type rule
- Takes into account all relevant information
- Relevant information is info that affects the forecasts
- New information is “filtered through the forecasts”
- Allows for judgmental adjustments (combination of model simulations and judgmental adjustments)
- Allows for new situations, updating, learning, model uncertainty (Bayesian optimal policy)
- Can be modified to handle Woodford’s “commitment in a timeless perspective” or discretion (Svensson & Woodford 2005, Svensson 2011)

## **Fulfilling the mandate: Forecast targeting 3**

- Allows the Fed to be held accountable and to be reviewed both in real time and after the outcome of inflation and unemployment
- The Fed is already practicing forecast targeting to a considerable extent
- Would be practicing to a more or less complete extent, if the SEP would report projections that are joint decisions by the FOMC!

# Tealbook January 2012: “Constrained vs. Unconstrained Optimal Control Policy”





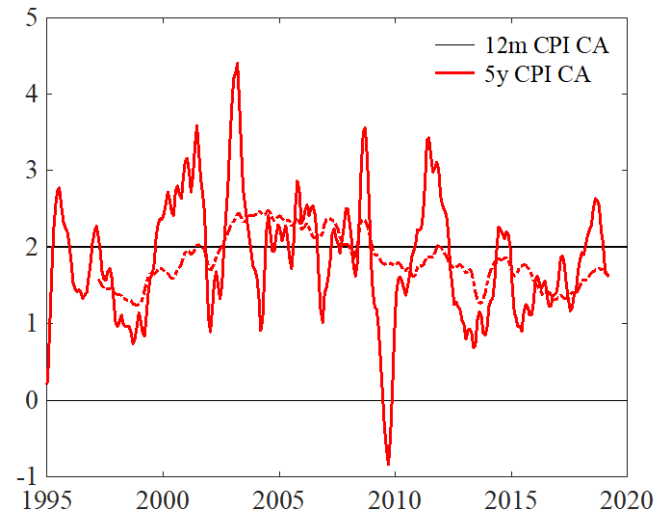
## Specific monetary policy strategies

- Flexible annual-inflation targeting
- Flexible price-level(-path) targeting
- Temporary price-level(-path) targeting
- Flexible average-inflation targeting

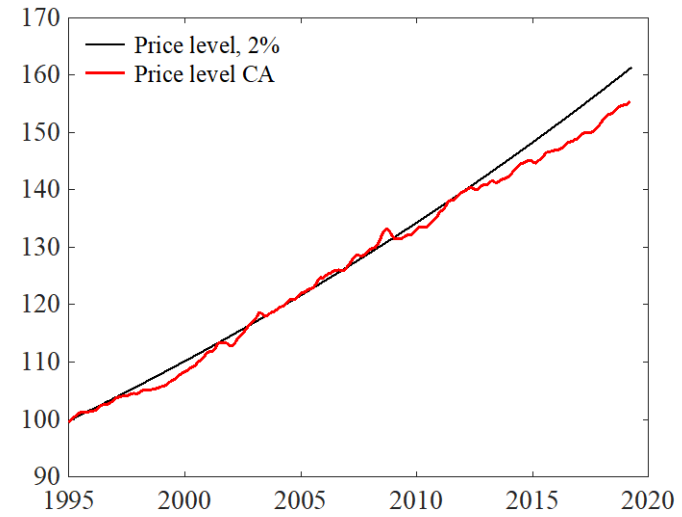
# Flexible price-level targeting 1

- Loss function  $L_t = (p_t - p_t^*)^2 + \lambda_u (u_t - u_t^*)^2$
- Price-level-target path  $p_t^* = p_{t-1}^* + \pi^*$  (increasing at 2%)
- Annual-inflation targeting, “bygones are bygones”
  - Price level: Unit root, random walk with drift, variance increasing with horizon
- Price-level targeting, past inflation misses undone, price level returns to target path
  - Price level stationary around target path, variance constant
- This is in theory. What is the practice?

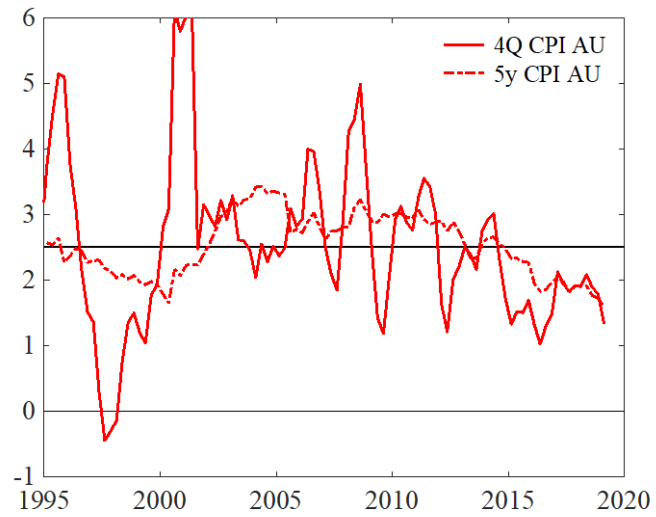
### Inflation: Canada



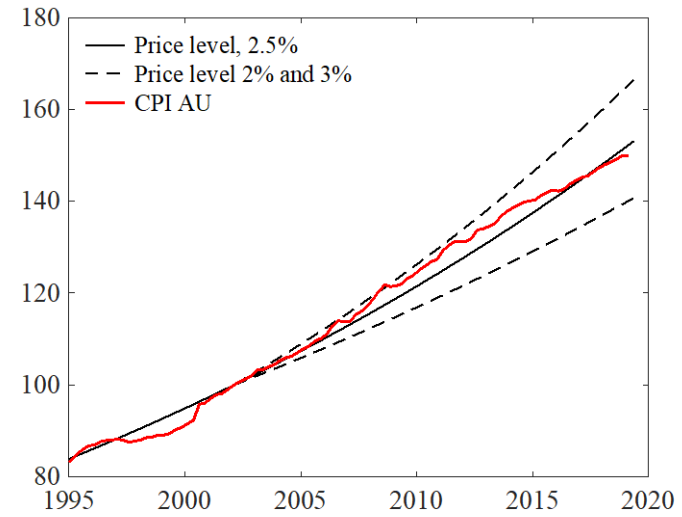
### Price level: Canada



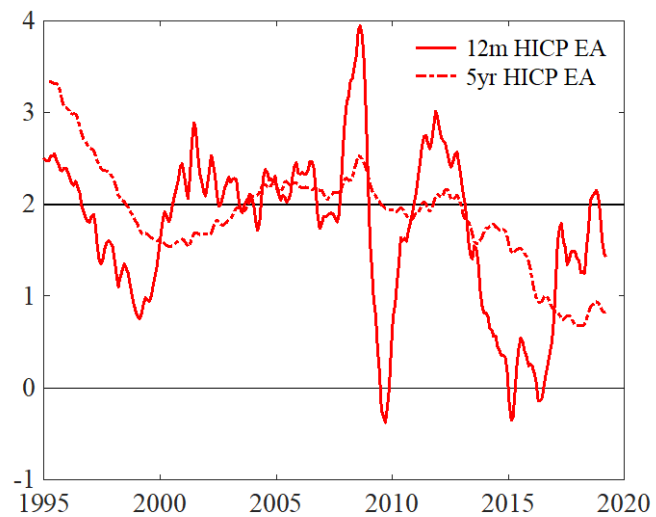
### Inflation: Australia



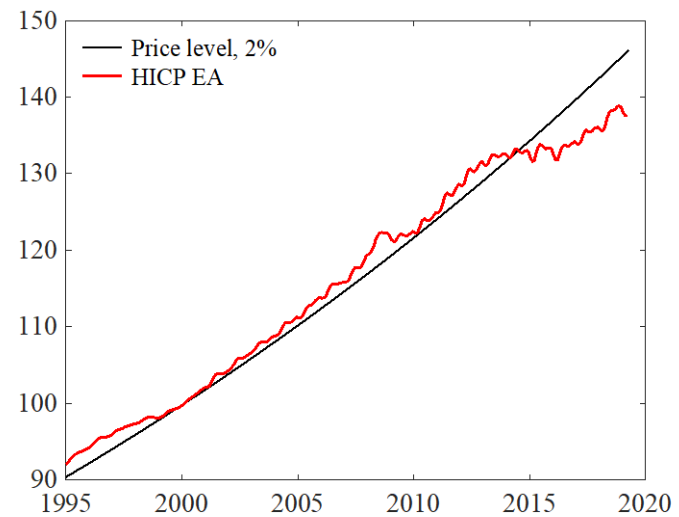
### Price level: Australia



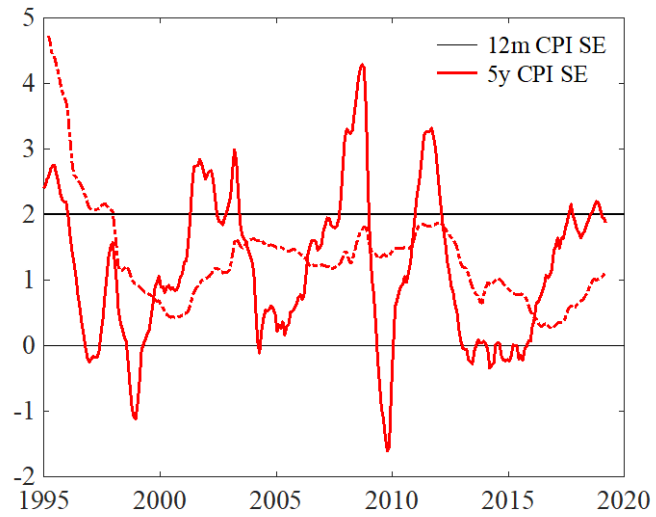
### Inflation: Euro area



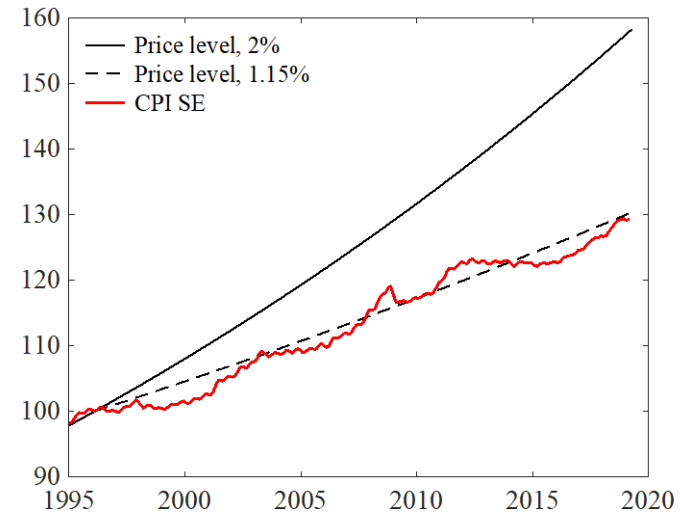
### Price level: Euro area



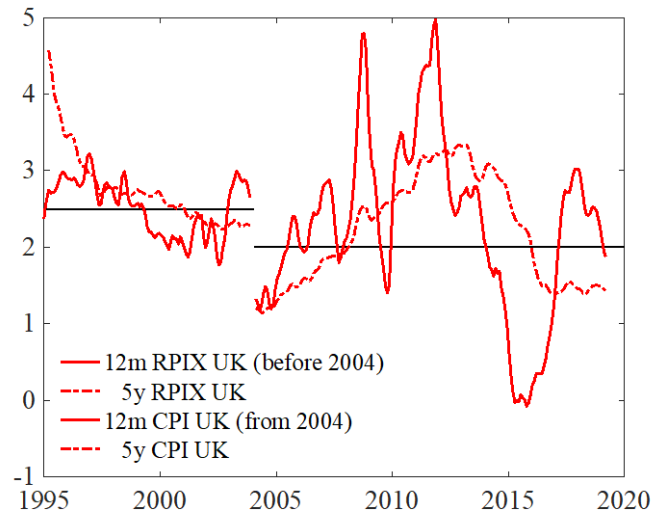
### Inflation: Sweden



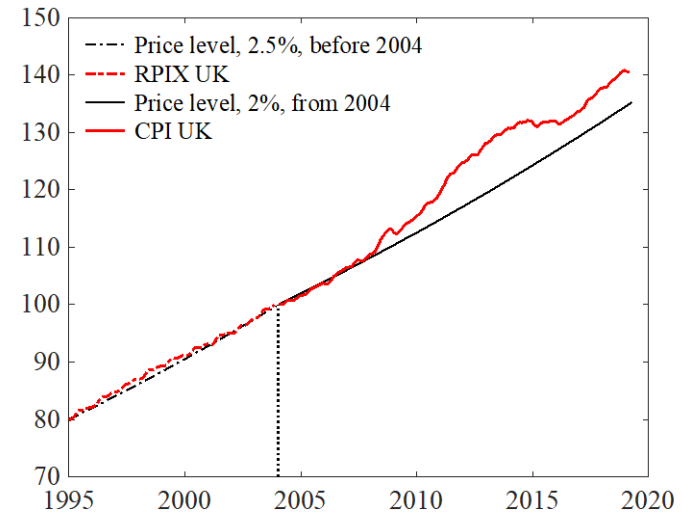
### Price level: Sweden



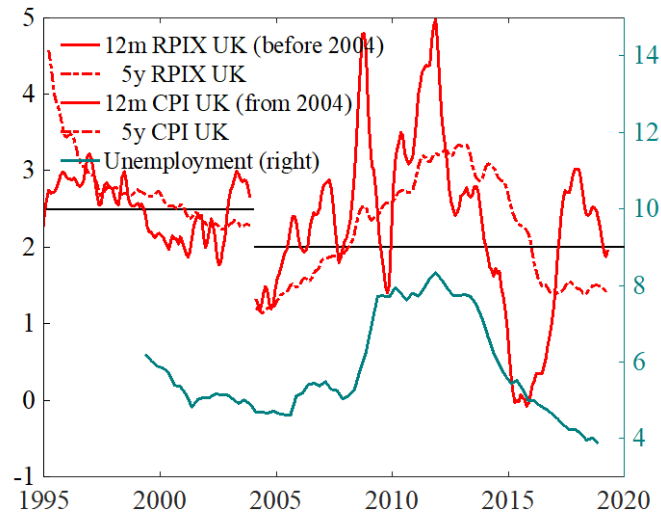
### Inflation: UK



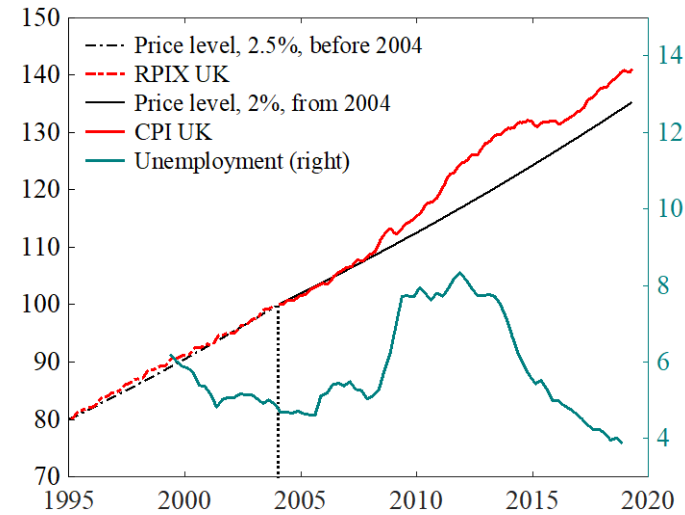
### Price level: UK



### Inflation: UK

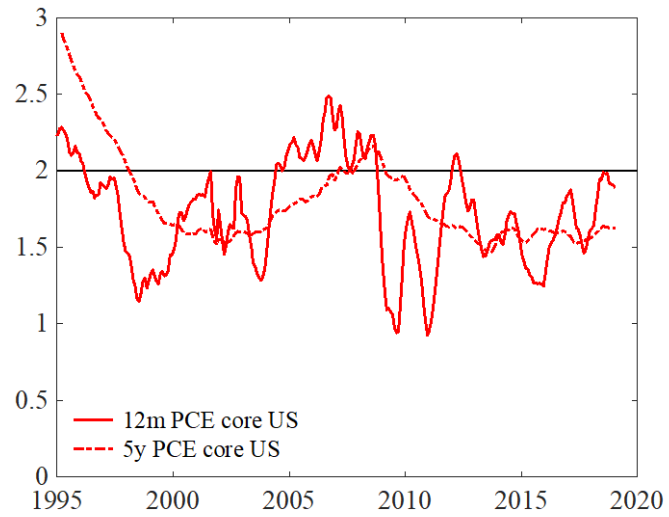


### Price level: UK

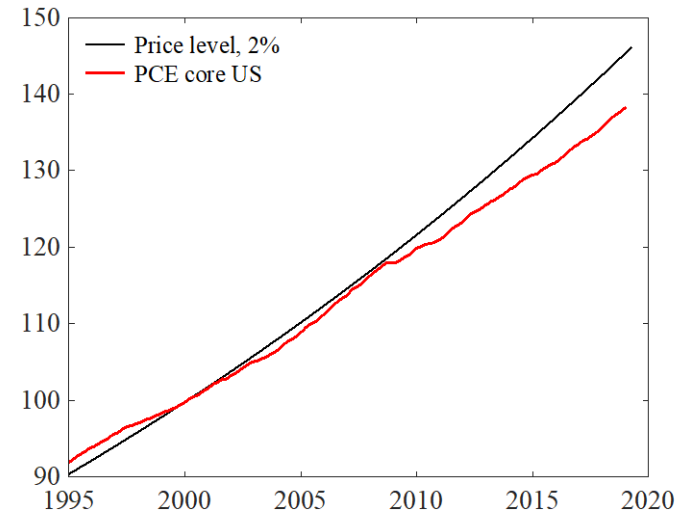




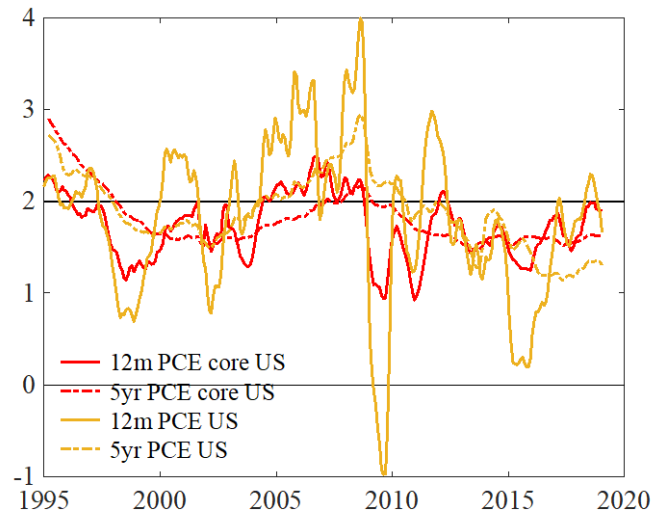
### Inflation: US PCE core



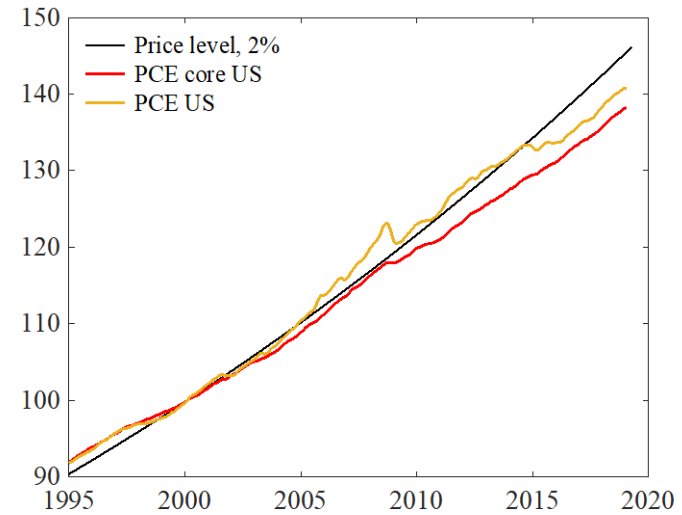
### Price level: US PCE core



Inflation: US PCE core, PCE



Price level: US PCE core, PCE



## Flexible price-level targeting 2

- The practice is different: Except for Sweden, it looks like price-level targeting until financial crisis 2008-2009 (into 2014 for Canada and euro area)
- Canada special: For 1993M1–2013M3, Ruge-Murcia 2014 *rejects* unit root, *cannot reject* price level stationary around target path
- Several papers comment on why BOC looks like doing PT:
  - Small symmetric shocks, or some inherent error-correcting behavior in the policy setting (for example, a high degree of interest-rate smoothing)
  - Not that BOC has covertly and consciously pursued price-level targeting (Murray 2019)

## Flexible price-level targeting 3

- Automatic stabilization with credible PT
- $p_t \downarrow, p_t < p_t^* \Rightarrow \pi^e \uparrow \Rightarrow r_t = i_t - \pi^e \downarrow \Rightarrow u_t \downarrow \Rightarrow \pi_t \uparrow, p_t \uparrow$  (Ph. curve)
- Also direct effect:  $\pi^e \uparrow \Rightarrow \pi_t \uparrow$ , even if Phillips curve is flat
- Works with binding ELB
- Reduces both inflation and employment variability (free lunch)
- Requires credibility: Beliefs that the CB will deliver
- If little credibility, costly to bring price level back after overshooting
- Bank of Canada review of “inflation-control” 2011:  
Not clear conditions satisfied for PT to improve on IT
- BOC did not take the jump: If it had, we would be wiser today
- The private sector probably needs to see PT in operation and its principles obeyed by the CB for credibility
- Credibility needs to be earned by policymakers

## Temporary price-level target when ELB binds 1

- Evans (Sep 2010 FOMC mtg): State-contingent PT; core PCE increasing at 3% from Dec 2007; mock-up of potential FOMC Nov 2010 announcements; policy actions to achieve target; once target achieved switch to 2% IT over medium term
- “In the event other supporting actions are deemed helpful or necessary to meet the target-price-level path within a reasonable timeframe, the Committee will take all necessary actions”
- Close to 2 years before Draghi’s “whatever it takes”
- Proposal was not accepted
- If it had been, we would have been wiser today

## Temporary price-level target when ELB binds 2

- Bernanke (2017): FOMC announces that, in the future, when the policy rate is at or near the ELB, a necessary condition to raise the policy rate is that average inflation since the policy rate first hit the ELB be at least 2%
- Temporary price-level target couched in inflation-targeting language
- Compromise between raising inflation target and price-level targeting
- Works if sufficiently credible
- But would only be applied occasionally and temporarily
- Private sector may not be used to and understand it; considerable explanation and communication may be necessary; may not be sufficient for credibility
- A permanent compromise may be preferable
- Average inflation targeting

# Average-inflation targeting 1

- Average inflation (example: 5-yr, 20-qtr)

$$\bar{\pi}_t = (p_t - p_{t-20})/5 = (\pi_t + \pi_{t-4} + \pi_{t-8} + \pi_{t-12} + \pi_{t-16})/5$$

- Proposed for Sweden (avoid downward inflation bias) and ECB (interpretation of “without prejudice to price stability”)
- Nessén & Vestin 2014; Williams 2018, Mertens & Williams 2019
- Loss function

$$L_t = \mu_{\bar{\pi}}(\bar{\pi}_t - \pi^*)^2 + (1 - \mu_{\bar{\pi}})(\pi_t - \pi^*)^2 + \lambda_u(u_t - u_t^*)^2$$

$$0 \leq \mu_{\bar{\pi}} \leq 1$$

- Some weight on both average and annual inflation

## Average-inflation targeting 2

- In mitigating deviations of 5-yr average inflation, FOMC would try to prevent persistent over- or undershoots of annual inflation.
- If average inflation for the past  $2\frac{1}{2}$  years is below target, average inflation for the next  $2\frac{1}{2}$  years would normally be above target
- While always taking into account the outlook for the labor market (flexible AIT)
- Overcoming “fear of overshooting”
- Similar to having a 5-year price-level target path increasing at 2%, starting today
- If ELB starts to bind, possibly shift to indefinite horizon (similar to Bernanke-Evans)



# Advantages of average-inflation targeting

- Over temporary price-level targeting when ELB binds:  
Operating all the time. Private sector would see it in continuous operation, more likely well understood and credible. If the ELB binds, horizon can be extended until average-inflation target is achieved
- Over price-level targeting:  
Smaller step, considerable continuity with annual-inflation targeting. Averaging over several years instead of one (communication advantage).  
Still, half-way step toward price-level targeting
- Quite flexible
- Some weight on annual inflation
- If successful, averaging period can be extended, getting closer to price-level targeting
- If less successful, possible retreat toward annual-inflation targeting
- Needs consideration and left open: Choice of weights, including “balance”; averaging period (5-yr just example); possible escape clauses (UK overshoot)

## Conclusions

- General strategy to fulfill mandate: Forecast targeting
- Among specific strategies: Average-targeting has some advantages over the alternatives
- Some issues remain and need careful consideration



## The contenders

- Flexible annual-inflation targeting

$$L_t = (\pi_t - \pi^*)^2 + (u_t - u_t^*)^2$$
$$\pi_t \equiv p_t - p_{t-4}$$

- Flexible price-level targeting

$$L_t = (p_t - p_t^*)^2 + \lambda_u (u_t - u_t^*)^2$$
$$p_t^* = p_{t-1}^* + \pi^*$$

- Temporary price-level targeting when the ELB binds
- Flexible average-inflation targeting

$$L_t = \mu_{\bar{\pi}} (\bar{\pi}_t - \pi^*)^2 + (1 - \mu_{\bar{\pi}}) (\pi_t - \pi^*)^2 + \lambda_u (u_t - u_t^*)^2$$

$$\bar{\pi}_t = (p_t - p_{t-20})/5$$

$$= (\pi_t + \pi_{t-4} + \pi_{t-8} + \pi_{t-12} + \pi_{t-16})/5$$

$$0 \leq \mu_{\bar{\pi}} \leq 1$$

## Nominal-income (level) targeting not consistent with mandate

- Dual mandate: Both maximum employment *and* price stability
- *Two* separate targets, variable tradeoff
- Nominal-income targeting: *One* target
- One-to-one constant tradeoff between prices and GDP
- Lower GDP and employment is OK if prices are higher
- Neither maximum employment nor stable prices
- No advantage to flexible price-level targeting
- Flexible inflation targeting and price-level targeting has increasing marginal loss of deviations

## Nominal-income (level) targeting

$$L_t = (Y_t - Y_t^*)^2$$

$$Y_t^* = Y_{t-1}^* + G^*$$

$$Y_t \equiv p_t + y_t$$

$$Y_t^* \equiv p_t^* + y_t^*$$

$$\begin{aligned} L_t = (Y_t - Y_t^*)^2 &= [(p_t + y_t) - (p_t^* + y_t^*)]^2 = [(p_t - p_t^*) + (y_t - y_t^*)]^2 \\ &= (p_t - p_t^*)^2 + (y_t - y_t^*)^2 + 2(p_t - p_t^*)(y_t - y_t^*). \end{aligned}$$

## **Ben Bernanke (2015): “The Fed has a rule”**

<https://www.youtube.com/watch?v=KJmA5JDNpKg&t=42>

*The Fed has a rule.* The Fed’s rule is that we will go for a 2% inflation rate; we will go for the natural rate of unemployment; we put equal weight on those two things; we will give you information about our projections, our interest rate.

*That is a rule,* and that is a framework that should clarify exactly what the Fed is doing.

## Fulfilling the mandate

- Consider “normal” times, no balance-sheet policy:  
Policy rate (federal funds rate) is instrument
- Two important considerations:
  1. Policy-rate changes affect inflation and activity with a lag
    - Then policy need to be guided by forecasts of inflation and unemployment
  2. Expectations of *future* policy rate matters, not the current policy rate (Woodford: “Management of expectations”)
    - These policy-rate expectations affect longer interest rates and asset prices, which affect real activity
    - Thus, the entire policy-rate path and its credibility matter



## Forecast targeting: Decision in quarter $t$

- Policy-rate path,  $i^t \equiv (i_{t,t}, i_{t+1,t}, \dots, i_{t+T,t}) \equiv \{i_{t+\tau,t}\}_{\tau=0}^T$   
forecast of inflation,  $\pi^t \equiv \{\pi_{t+\tau,t}\}_{\tau=0}^T$   
forecast of unemployment,  $u^t \equiv \{u_{t+\tau,t}\}_{\tau=0}^T$

- Forecast loss function (mean forecasts, not modal)

$$L_{t+\tau,t} = (\pi_{t+\tau,t} - \pi^*)^2 + (u_{t+\tau,t} - u^*)^2$$

- Select the policy-rate path so that  $i^t$  and  $\pi^t$  nimit  $u^t$

$$\mathcal{L}_t = \sum_{\tau=0}^T L_{t+\tau,t} = \sum_{\tau=0}^T (\pi_{t+\tau,t} - \pi^*)^2 + \sum_{\tau=0}^T (u_{t+\tau,t} - u^*)^2$$

- Mean squared gaps:  $\mathcal{L}_t/T = \text{MSG}_t^\pi + \text{MSG}_t^u$

## Fulfilling the mandate:

### Problems with the Taylor rule (Svensson 2003, 2017)

- Is not optimal, sometimes far from optimal; uses too little information; provides rigid response to inflation and GDP gap; does not allow judgmental adjustments
- Good monetary policy needs to respond to *all* relevant information (much more than current inflation and GDP gap), take into account judgment, and adapt to new information and situations. The TR is too rigid for this.
- Possible response: TR is mere “guidelines” for MP; deviations *are* allowed (Taylor 1993, 2000).
  - But then *incomplete* rule!
  - No rule for when deviations are appropriate!

## Forecast targeting: Implementation

- Successful implementation requires *credibility* of policy-rate path and inflation forecast
- Credibility: Expectations aligned with policy-rate path and forecasts of inflation and unemployment
- Make *actual* financial conditions equal to *intended* financial conditions, in order to affect the economy
- To achieve this, publish and justify policy-rate path and forecasts of inflation and unemployment
- Not publishing the policy-rate path is *to hide the most important information*
- Justification of policy may include demonstrations that alternative policy-rate paths lead to worse mandate fulfillment. MSGs may be used.

## Reaction function?

- Policy rate responds to *all* relevant information  
(that is, to all information that affect the forecasts of inflation and unemployment)
- Relevant information changes over time (new shocks, changing structure, ...)
- Explicit reaction function of *information* complex:  
Too complex to write down
- Reaction to *forecasts* simpler:  
If inflation forecast shifts up (down)  
and/or unemployment forecast shifts down (up),  
shift policy-rate path up (down)
- New information “filtered through forecasts”

## Accountability

- Publication and justification of policy-rate path and inflation and unemployment forecasts allows Fed policy to be reviewed, by external observers and at regular hearings in Congress
- Review possible in real time as well as after outcomes for inflation and unemployment have been observed
- This way the Fed can be held accountable for fulfilling the mandate.

## The forecast-targeting rule: Three steps

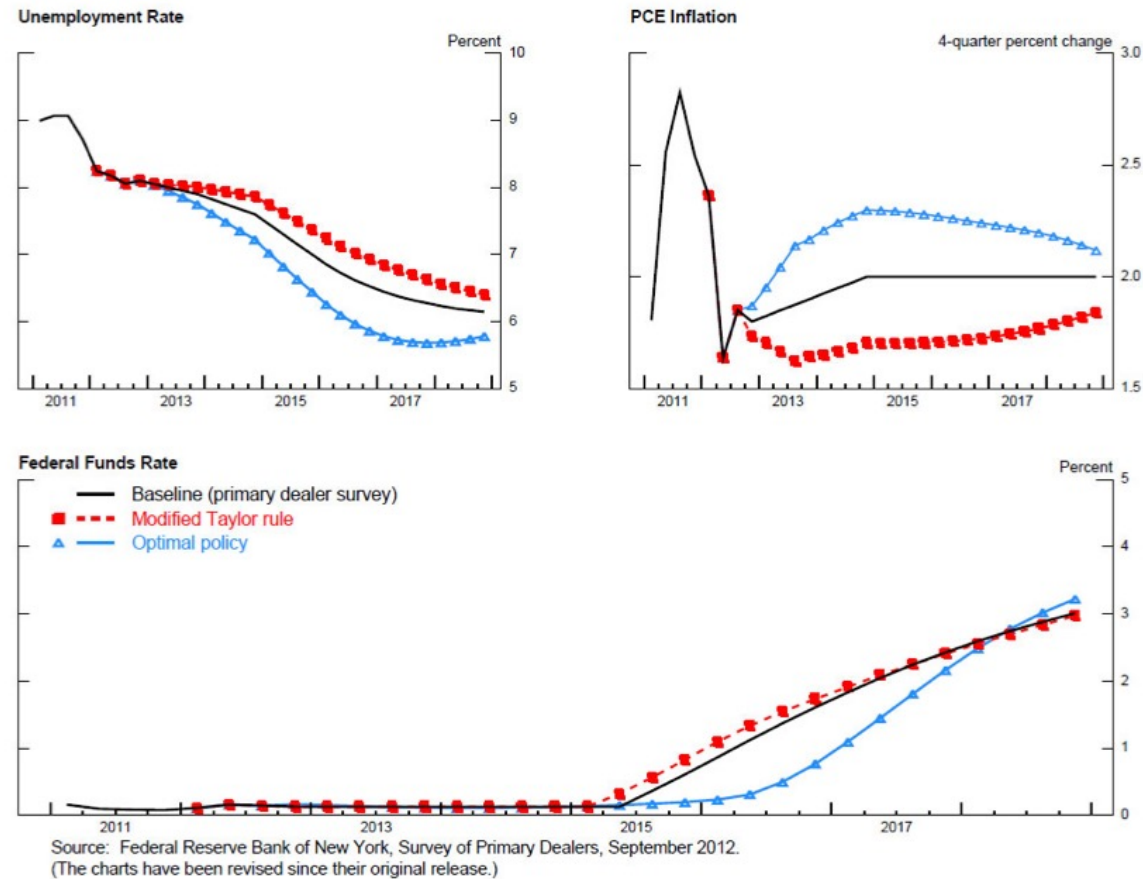
1. For a given policy-rate path (for example, last decision), construct new forecasts of inflation and unemployment, taking new information into account.
2. If the new forecasts “look good,” keep the given policy-rate path; if they do not look good, select a new policy-rate path so they do look good.
3. Publish and justify the policy-rate path and forecasts of inflation and unemployment in order to make them credible. If needed, demonstrate that alternative policy-rate paths lead to worse mandate fulfillment; MSGs may be used.

## Does the Fed already practice forecast targeting?

- Publication of Summary of Economic Projections (SEP):  
Median projections of policy rate, inflation and unemployment
- Some problems:
  - Medians of FOMC participants (not voters); equal weights, but Chair has more weight
  - Medians of projections not consistent. Quantitatively important?
  - Initials of participants would help
  - Not joint FOMC decision. Quantitative difference?
- SEPs already used to some extent for justification of policy (quotes) and for holding the Fed accountable (observers, media)
- Better with joint decision and more explicit justification

# Three policy-rate paths (Yellen 2012)

Three Policy Paths: An Illustrative Exercise





## **An example:**

### **Reviewing the policy decision, Riksbank Feb 2013**

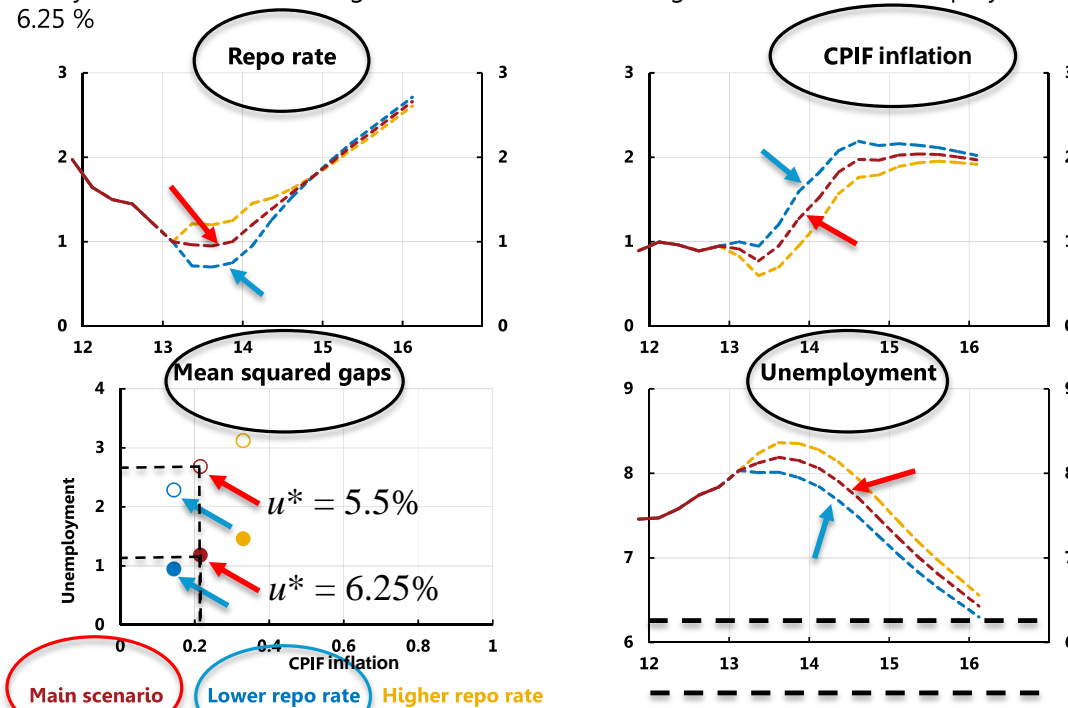
- The forecasts of inflation and unemployment were conditional on a high forecast of foreign interest rates, much above market expectations
- If instead conditional on market expectations of foreign interest rates, the inflation forecast shifts down and the unemployment forecast shifts up
- Then an even lower policy-rate path was warranted, which I dissented in favor of

# An example: Reviewing the policy decision, Riksbank Feb 2013

**Figure 4. Monetary policy alternatives around the main scenario**

Effects according to RAMSES, partly expected monetary policy shocks.

Policy rates abroad according to the main scenario. Long-run sustainable unemployment 6.25 %



Sources: Statistics Sweden and the Riksbank.

Note. Empty circles indicate mean squared gaps calculated with long-run sustainable employment of 5.5%

## Time-consistency problem, forward-looking variables

- Commitment in time-less perspective  
(Svensson & Woodford 2005; Svensson 2010, section 3)
  - Either modify loss function, add cost of deviating from previous announcement
  - Or add restriction on policy rate
- Discretion (Svensson 2010, section 3.8)
  - Expectations depend on state variables
- Quantitatively important?
  - Practical experience
  - Economy sluggish, expectations sluggish