

Core and Underlying Inflation

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1 The Definitions

2 The Estimation

3 The BoC

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The Definitions

Core Inflation:

- **Bryan & Cecchetti (1994):** “Core inflation is the part of measured inflation that has no transitory component. It reflects the long-run trend in the general price level.”
- **Mishkin (2007):** “Core measures of inflation exclude items subject to temporary supply disturbances, such as food and energy.”
- **Quah & Vahey (1995):** “Core inflation is that component of measured inflation that has no medium- to long-run impact on real output.”
- **Clark (2001):** “Core inflation is a statistical measure intended to remove the influence of transitory disturbances.”

The Definitions

Underlying Inflation (π^*):

- **Blinder (1997, Economic Policy):** “Underlying inflation is the component of the observed inflation rate that is expected to persist over time, once the temporary influences and noise in the data are removed.”
- **Rich & Steindel (2007):** “Underlying inflation represents the sustained movement in the general price level that monetary policy can reasonably be expected to influence, abstracting from short-run volatility.”
- **Cogley (2002):** “Underlying inflation refers to the slow-moving component of inflation, associated with long-term expectations and monetary trends, rather than temporary supply shocks.”
- **Rudd (2020):** “Underlying inflation is the rate of inflation that would be expected to eventually prevail in the absence of economic slack, supply shocks, idiosyncratic relative price changes, or other disturbances.”

The Definitions

Core Inflation	Underlying Inflation (π^*)
The prevailing definition of core inflation points to <u>an INDICATOR that removes idiosyncratic and transitory shocks from observed inflation.</u>	The prevailing definition of underlying inflation points to <u>a CONCEPT that has to do with the equilibrium rate of the economy.</u>

The Definitions

Core Inflation	Underlying Inflation (π^*)
The prevailing definition of core inflation points to <u>an INDICATOR that removes idiosyncratic and transitory shocks from observed inflation.</u>	The prevailing definition of underlying inflation points to <u>a CONCEPT that has to do with the equilibrium rate of the economy.</u>

→ Strictly speaking, the widely used index ex food and energy is a measure of core inflation, but it is NOT a measure of underlying inflation. The same goes for other widely used indicators, such as exclusion indexes or trimmed means.



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The Estimation

Core Inflation	Underlying Inflation (π^*)
<ul style="list-style-type: none">• Exclusion indexes<ul style="list-style-type: none">• Index ex. energy• Index ex. food and energy• Median measures, etc..• Trimmed-means• Model-based measures<ul style="list-style-type: none">• Common component (DFMs) • Trend measures (MCT) 	It's complicated..

The Estimation – Underlying Inflation (π^*)

FEDS Notes

September 18, 2020

Underlying Inflation: Its Measurement and Significance

Jeremy B. Rudd¹

Trend-based measures

2.6%

Inflation Expectations

2.3%

General equilibrium ($\pi^* - U^*$)

2.7%



Underlying inflation (π_t^*)

2½%

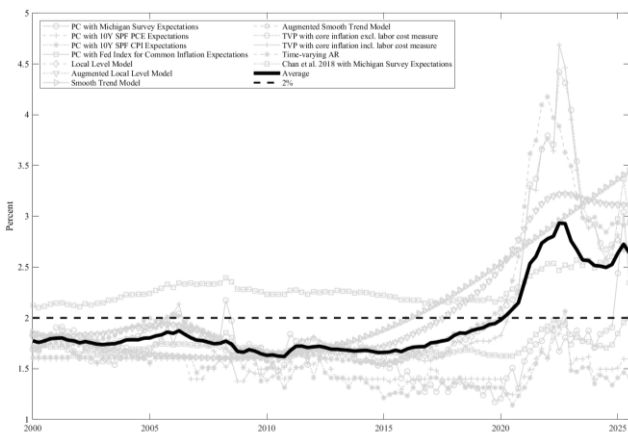
The Estimation – Underlying Inflation (π^*)

Trend-based measures

2.6%

- TVP-VAR
- DFM / State-space
- Phillips curve-type
- Etc..

For a list, see Rudd (2020) and Amisano et al. (2025)



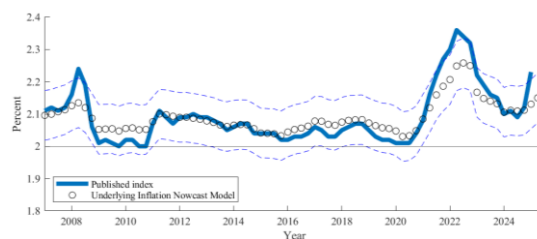
The Estimation – Underlying Inflation (π^*)

Inflation Expectations

2.3%

Not an easy task, because there are N measures of expectations.

Fed staff solution: the so-called «Fed CIE» (Common Inflation Expectations) – DFM.



The Estimation – Underlying Inflation (π^*)

General equilibrium (π^* - U^*)

2.7%

(Semi)structural model,
see Amisano (2025)

$$GDP_t = y_t^* + c_t + e_{GDPt}$$

$$GDI_t = y_t^* + c_t + e_{GDI_t}$$

$$y_t^* = y_{t-1}^* + \tau_t + \varepsilon_{y^*t}$$

$$\tau_t = \tau_{t-1} + \varepsilon_{\tau t}$$

$$c_t = \phi_1 c_{t-1} + \phi_2 c_{t-2} + \varepsilon_{ct}$$

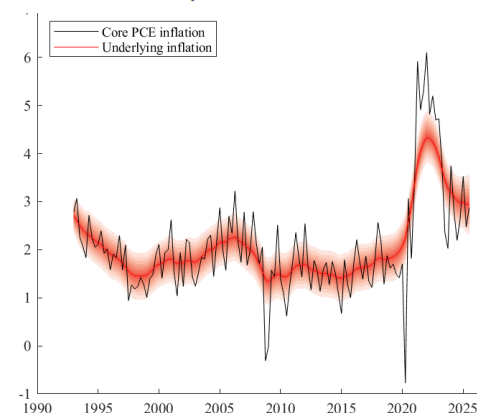
$$u_t = u_t^* + \alpha_0 c_t + \alpha_1 c_{t-1} + e_{ut} \quad (A.4)$$

$$u_t = u_t^* + \varepsilon_{u^*t}$$

$$\pi_t = \pi_t^{LUI} + \beta_0 c_t + \beta_1 c_{t-1} + vZ_t + e_{\pi t}$$

$$\pi_t^{LUI} = \gamma E \pi_t^{SPF} + (1 - \gamma) \pi_t^*$$

$$\pi_t^* = \pi_{t-1}^* + \varepsilon_{\pi_t^*}$$



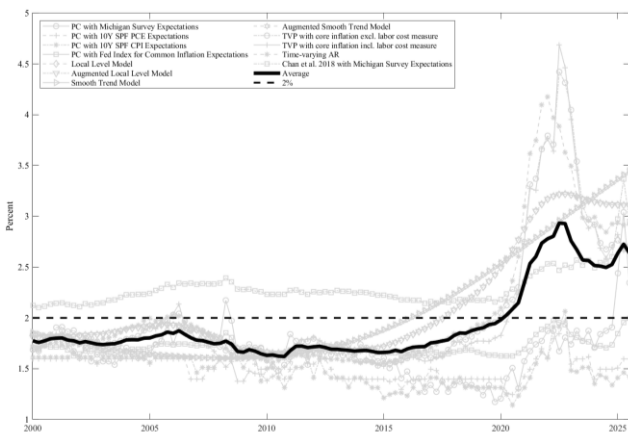
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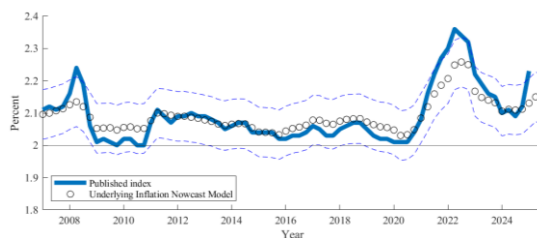


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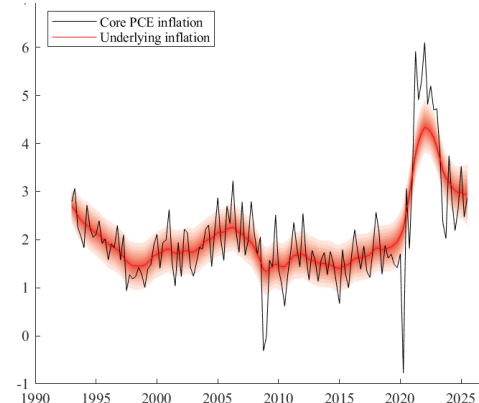
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$$\pi_t^{LUI} = \gamma E \pi_t^{SPF} + (1 - \gamma) \pi_t^*$$

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The Estimation – Underlying Inflation (π^*)

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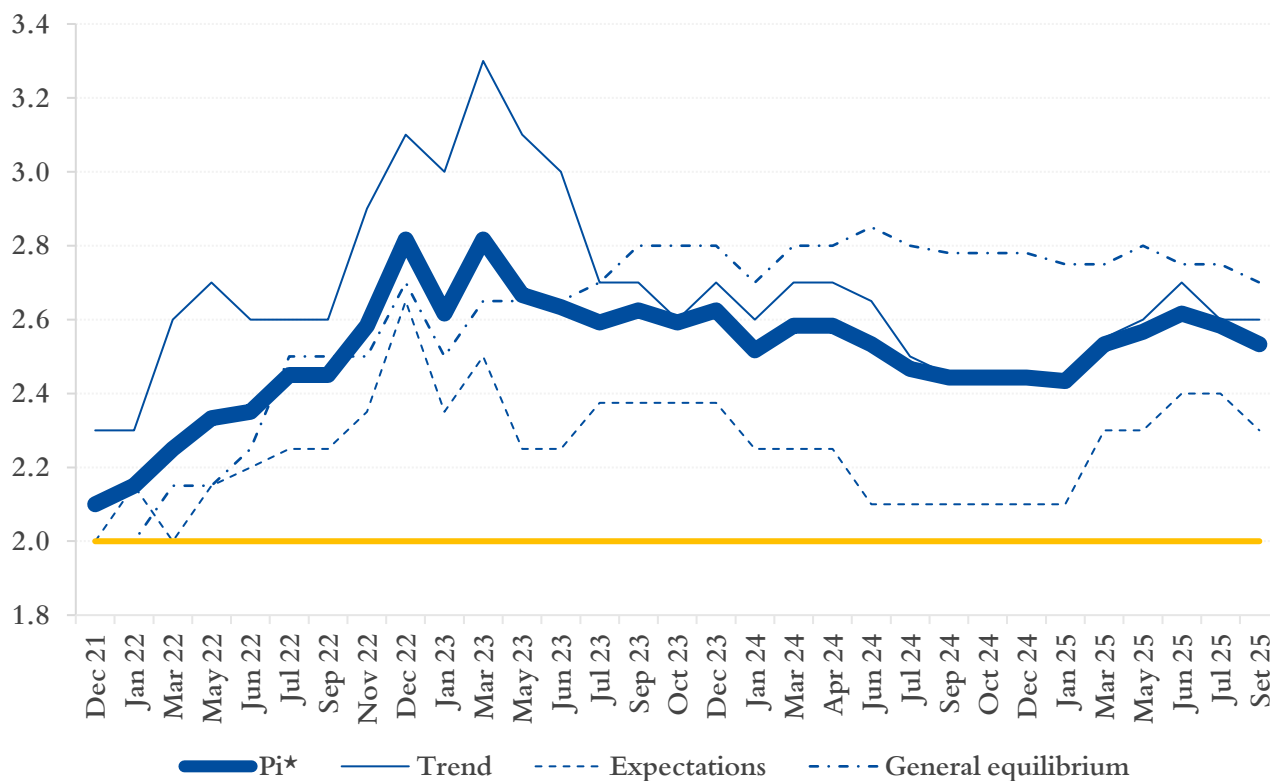


Underlying inflation (π_t^*)

2½%

The Estimation – Underlying Inflation (π^*)

Evolution of π^* . The figure shows the evolution of the estimate of π^* in the US.



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The BoC – Some History

Underlying inflation: Separating the signal from the noise

Remarks

Rhys R. Mendes

Ivey Business School

London, Ontario

October 2, 2025

The BoC is moving in the right direction. Still, it's a hard task!

- Abandoned: CPIXFE and CPIX. In general, moved away from exclusion-based measures.
- Adopted: CPI-trim, CPI-median, CPI-common.
- Issues:
 - CPI-common → subject to large revisions
 - How to treat mortgage interest cost (MIC)?
 - Communication issues: are the “preferred” measures the reaction function of the BoC?

The BoC – Looking Ahead

- Core or Underlying?
 - My comment based on my experience at the Fed: **π^* drives and should drive monetary policy.** However, it is prone to mistakes (see 2021).
- Possibly introducing: Multivariate Core Tred (MCT) à la Stock and Watson, new DFM (PULSE).
 - My comment based on my experience at the Fed: **there is no silver bullet in terms of models.** Maybe a suite of models (including expectations and general equilibrium) can help. The Fed staff changes π^* infrequently and judgmentally: double-edged knife.
- Communication issues
 - **Way more difficult if focus is on π^* , but only with ordinary people. Market participants can follow IF clearly guided.**

THANK YOU!