Discussion: ”Strike While the Iron Is Hot: Optimal Monetary Policy With a Nonlinear Phillips Curve”

by Peter Karadi, Anton Nakov, Galo Nuño, Ernesto Pastén, Dominik Thaler

Timo Haber[1]

Inflation: Drives and Dynamics, October 25 2024, Cleveland, Ohio

[1]**De Nederlandsche Bank**.

Disclaimer: Views expressed here are my own and do not necessarily reflect official positions of De Nederlandsche Bank or the Eurosystem

Overview of the Paper

This Paper analyzes optimal monetary policy in the context of a nonlinear Phillips curve.

- Model with state-dependent pricers, a central bank, and households that consume and supply labor.
- Golosov-Lucas Framework implies non-linear Phillips Curve whereas Calvo is linear. [not new]
- Inflation hurts because it increases the frequency of menu costs that need to be paid.
- Investigate fully non-linear optimal monetary policy in this setting.

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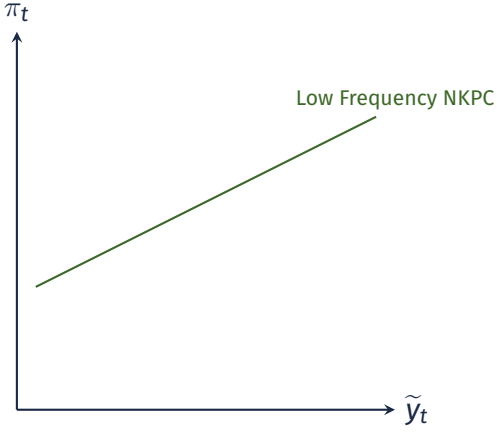

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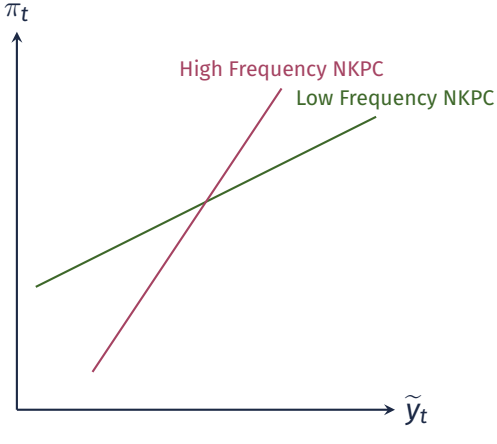

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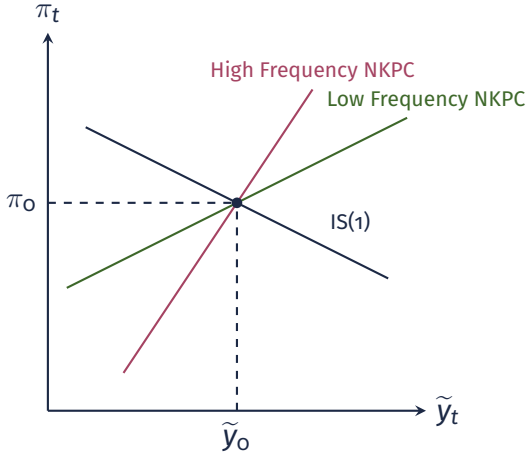

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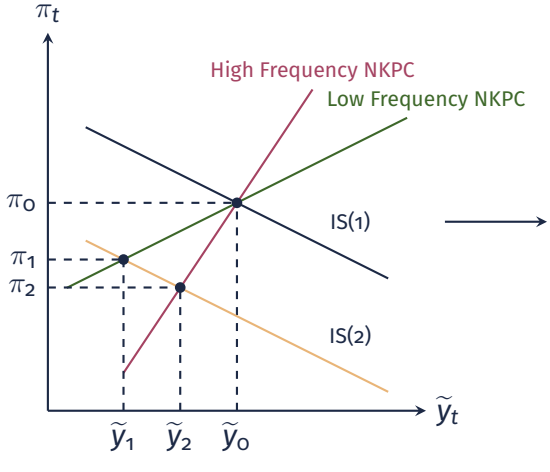

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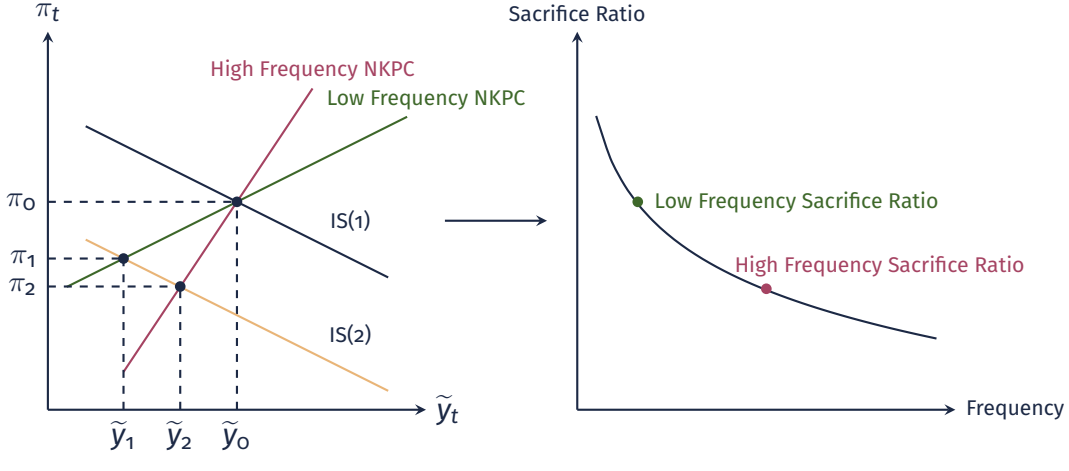

Main Results

Main Message

Strike while the iron is hot: aggressive inflation stabilization in case of large shocks.

More normative results:

1. Steady State Inflation rate is positive due to asymmetry in profit function.
2. Optimal response to TFP shocks retains divine coincidence.
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The paper in a nutshell

- Great and highly relevant paper. ▸ Post-Covid Inflation ▸ Isabel Schnabel: Quote
- Intuitive story with clear message. ▸ Main Graph
- Impressive use of state of the art techniques that pushes the frontier. [see also Dávila and Schaab (2022), Le Grand et al (2022), Nuño and Thomas (2022) and others]

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- Comment **#1**: How relevant is the non-linearity?
- Comment **#2**: An aggregate estimate of the non-linear PC
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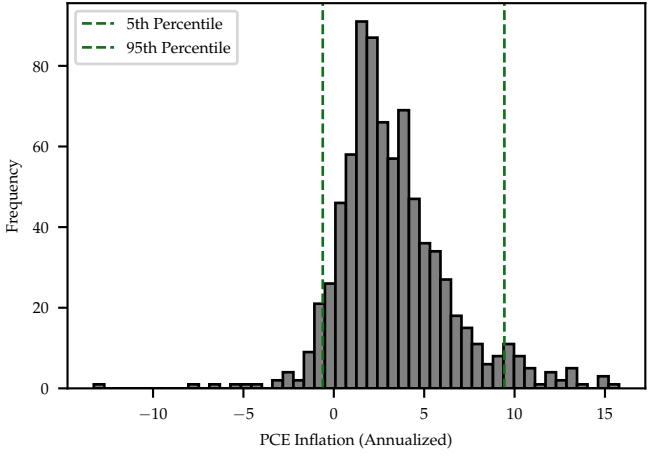
Histogram of US inflation rates (1959-2024)



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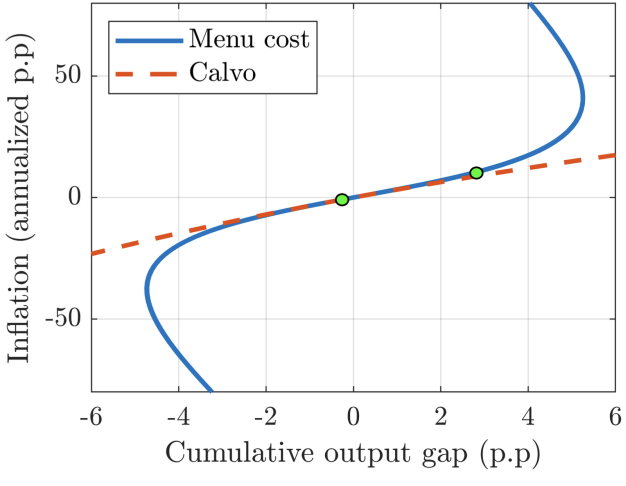

- Green dots signifiy the 5th and 95th percentile of inflation in the US.
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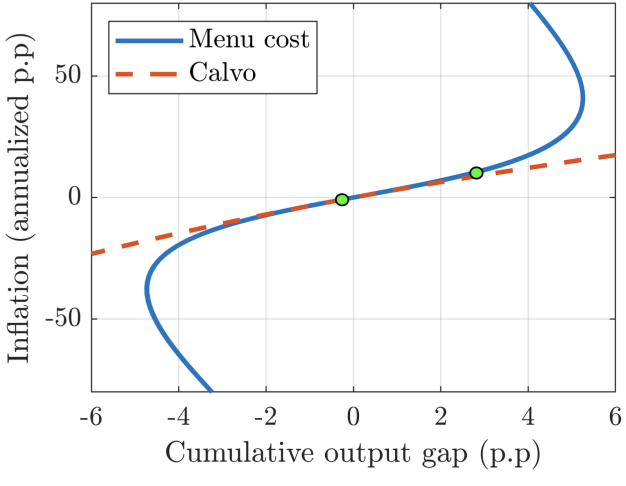

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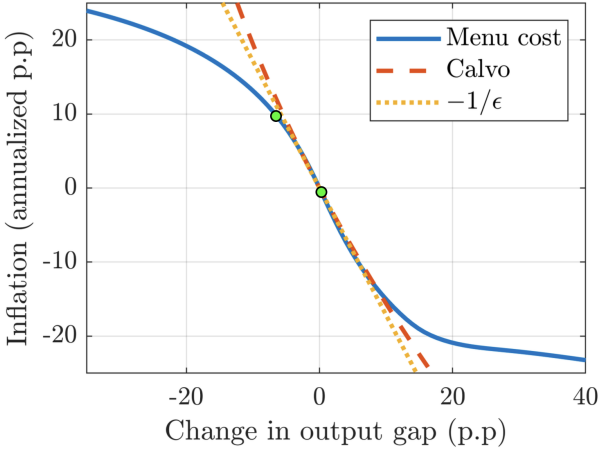

The same is true for the optimal targeting rule

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My suggestion:

- Can we obtain some estimate for the welfare loss following Calvo instead of the non-linear optimal rule given historical inflation?
- Crude way: Assume 5% of the time large cost push (ie. above 10%). Otherwise they are below. Compute weighted welfare loss.
- More sophisticated: Calculate welfare gap as function of inflation and integrate using historical inflation distribution?

More broadly:

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- Key to results is the shape and magnitude of the response of inflation and output to shocks [as they are related to the shape of the PC]
- Validate these objects by comparing them to empirical evidence [Ascari and Haber (2021)]
- We estimate size-dependent impulse responses to inflation and output following monetary policy shocks in the US between 1969 and 2007.

$$y_{t+h} = \alpha_h + \tau_h t + \beta_h e_t + \zeta_h (e_t \cdot |e_t|) + \sum_{k=1}^{K} \gamma_{h,k} w_{t,k} + v_{t+h}, \tag{1}$$

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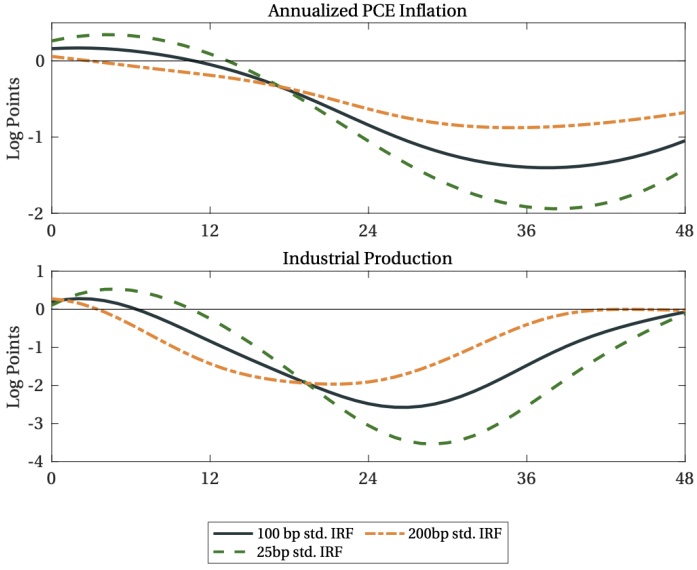
Qualitatively the "same" non-linear responses as in the optimal case ▸ Model IRFs



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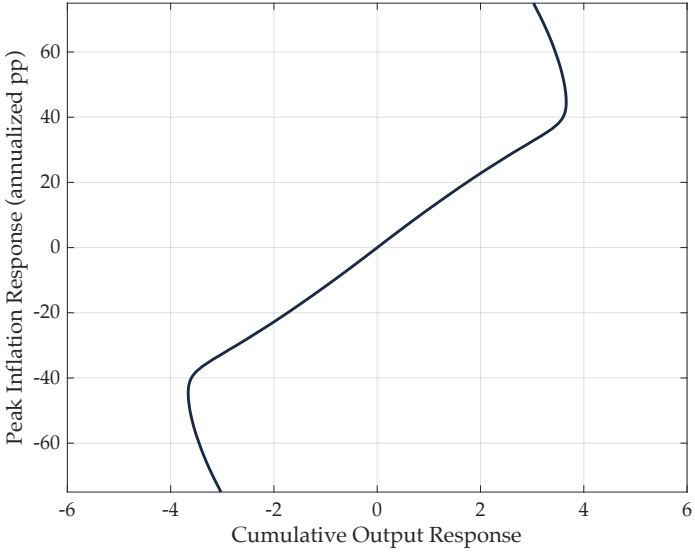
- **Qualitative**: Remarkably similar in shape
- **Quantitative**: Much steeper, with even higher values where non-linearity kicks in



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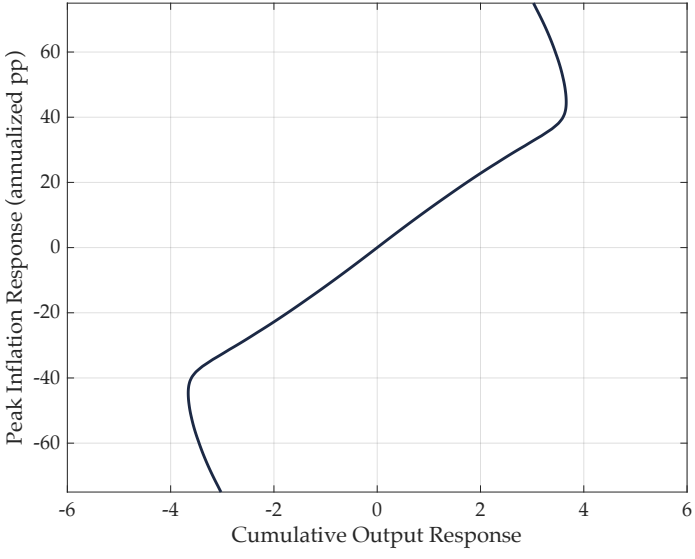

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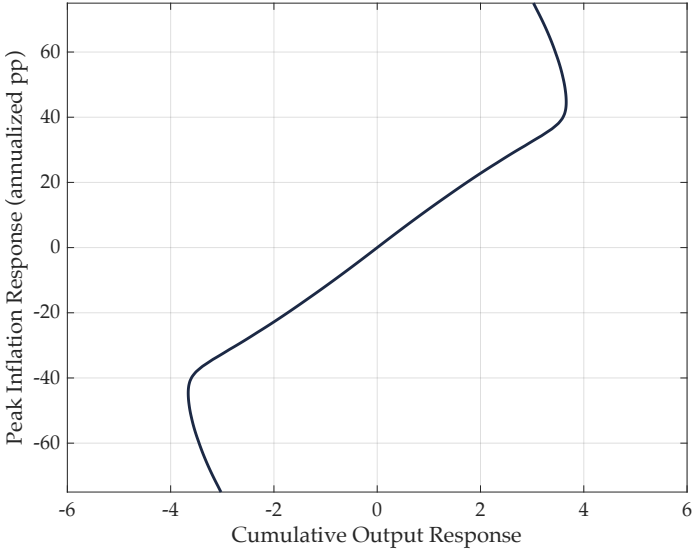

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- Currently the model is calibrated to match frequency and size of price changes in the US
- Can we go a step further and use direct empirical evidence on the non-linear Phillips curve? [Gagnon, 2009; Karadi and Reiff, 2019; Alvarez and Neumeyer, 2020; Alexandrov, 2020); Ascari and Haber (2021), Cavallo (2024)]
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Comment #3: Uncertainty and Imperfect Information

- The cost-push shock and policy response are modeled assuming perfect foresight.
  $\rightarrow$ Policy maker knows the evolution of the sacrifice ratio at every point

- In reality: Sacrifice ratio is uncertain object & CB has imperfect information
- For example, Beaudry et al (2024) argue that post-2020 data was consistent with flat PC
- Raises potential for policy mistakes based on evolution of PC [Orphanides and Williams , 2007]

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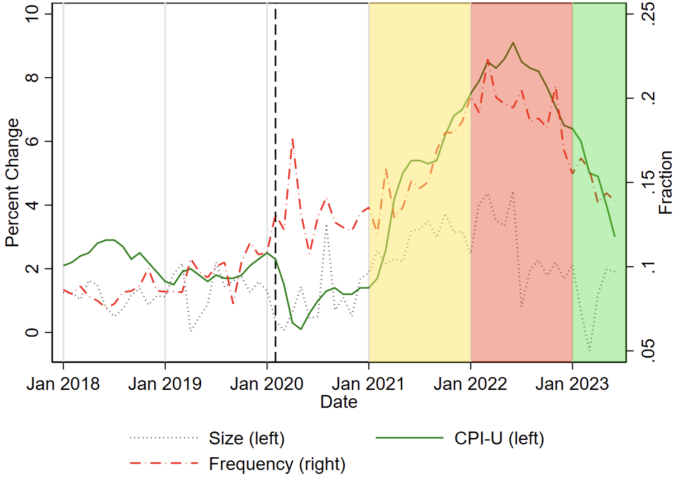
Comment #4: When shall we strike the iron?

- In the model the shock raises inflation **immediately** but in the recently inflation rises and falls more **gradually**
- Green marks the area where we do want to land smoothly
- Red marks the area where we should strike the iron
- But what about the yellow area?

Figure 1: Montag and Villar, 2023



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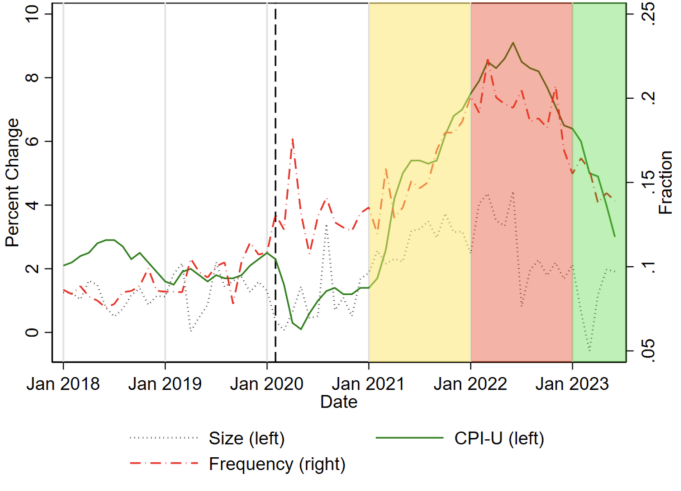

Conclusion

- Great paper!
- Would like to see some more work on the quantitative side of the model
  - How important is it?
  - What's the most likely shape of the NL PC?
- Fantastic foundation for future work:
  1. Normative implications for a world with larger supply shocks
  2. Normative analysis with wage stickiness or multiple sectors
  3. Normative analysis for other types of lumpiness (labor, investment etc.)

Thank you for your attention!

Quote from Isabel Schnabel (22nd July 2024)

We are no longer in a situation where inflation is persistently too low. On the contrary, many fear that we could face inflationary supply-side shocks more frequently in the future. We should look at how we can reliably fulfil our price stability mandate in such an environment.

Interview with Isabel Schnabel, Member of the Executive Board of the ECB, conducted by Christian Siedenbiedel (FAZ) on 22 July 2024

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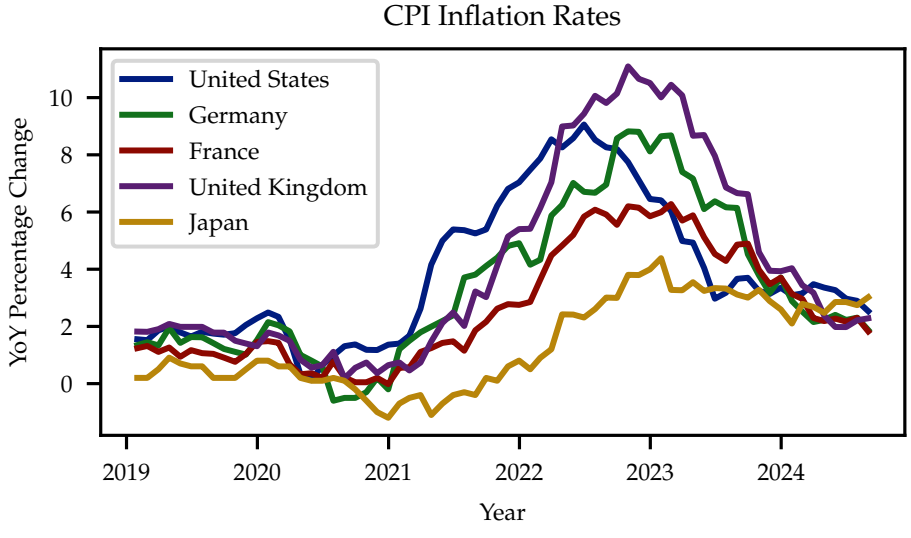
Inflation between 2019 and 2024



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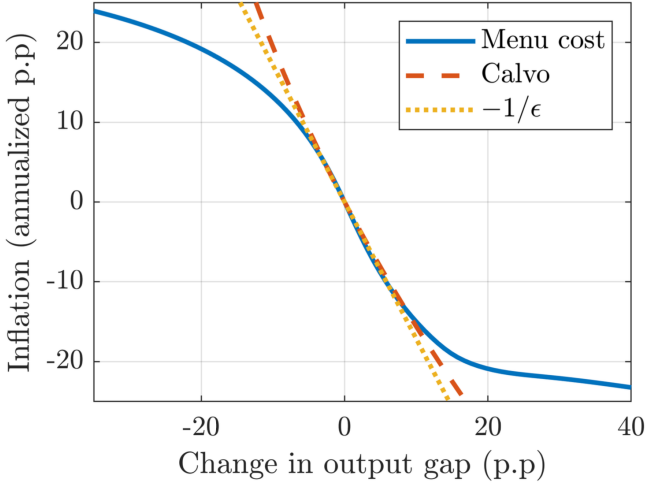
Optimal Targeting Rules



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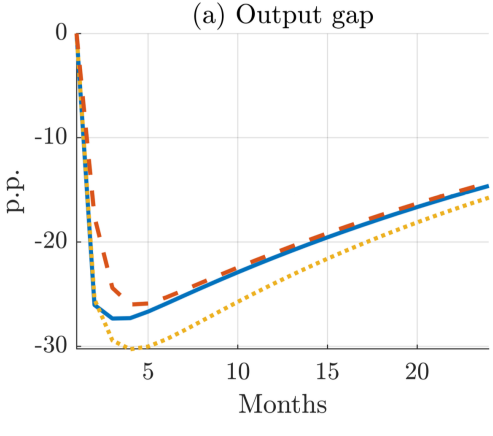

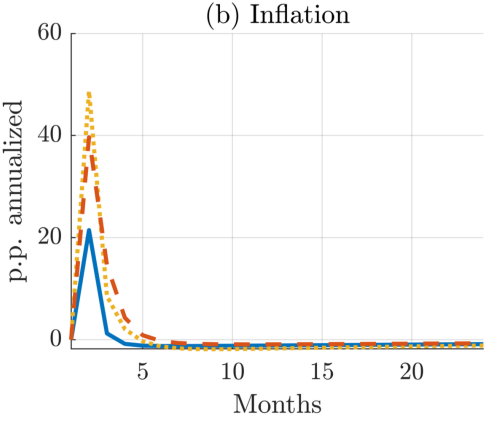

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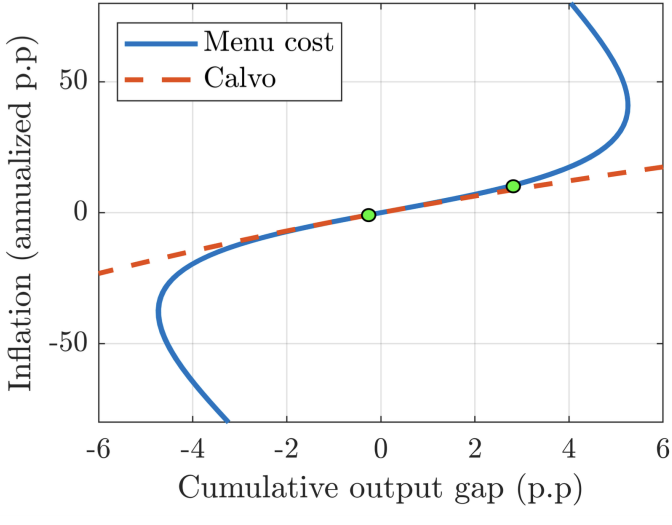

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