

Monetary Policy Rules and the Inflation Surge

Volker Wieland
IMFS, Goethe University Frankfurt

WKÖ Public Lecture, University of Vienna
October 2, 2024

Monetary policy rules and the inflation surge

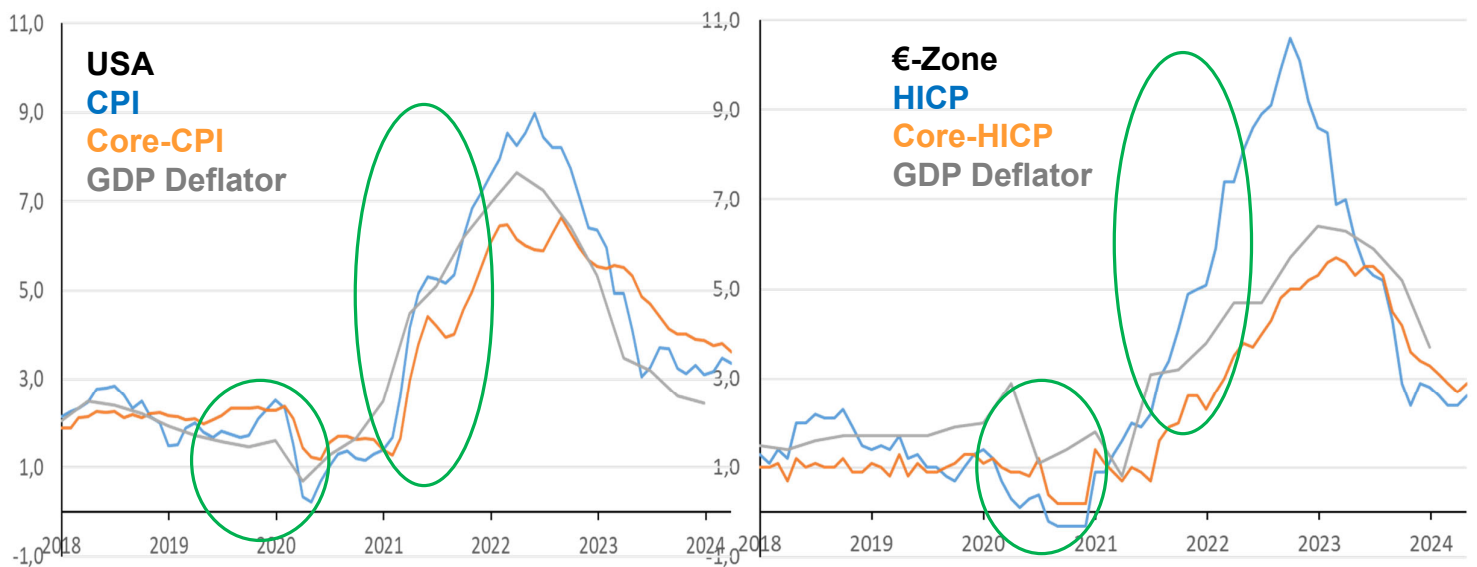
1. The inflation surge
2. Policy rules from the U.S. Fed's Report
3. Need to account for supply side effects of COVID
4. Rules called for early response to the inflation surge
5. The case of the ECB

Tatar and Wieland (2024a), [Taylor rules and the inflation surge: The case of the Fed](#), CEPR DP 18910, March.

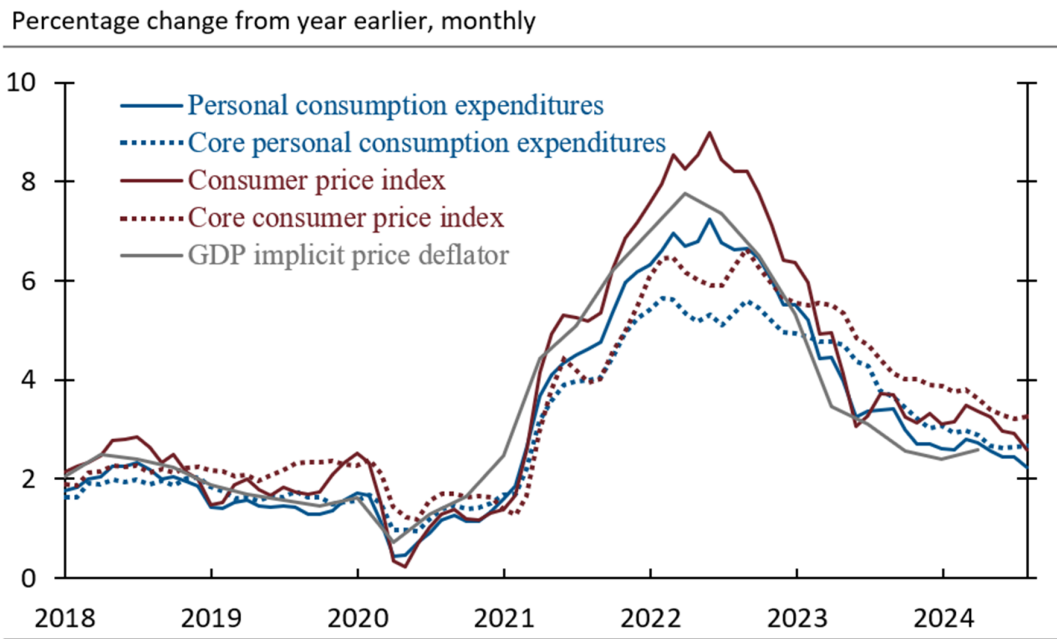
Tatar and Wieland (2024b), [Policy rules and the inflation surge: The case of the ECB](#), CEPR DP 19521, September.

1. The inflation surge

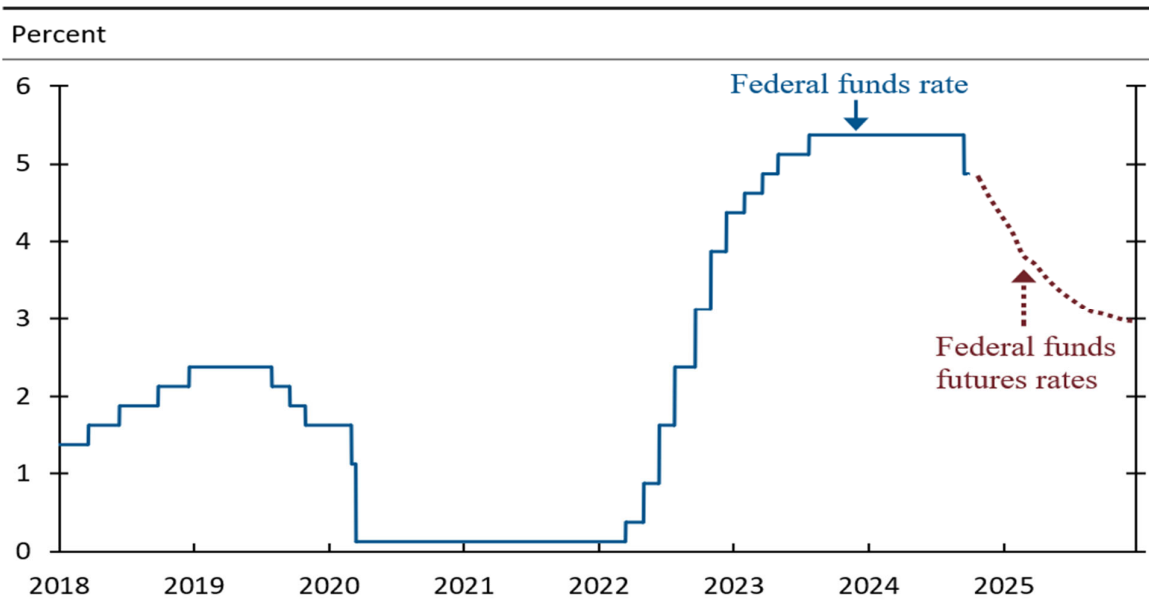
The inflation surge: United States vs Eurozone



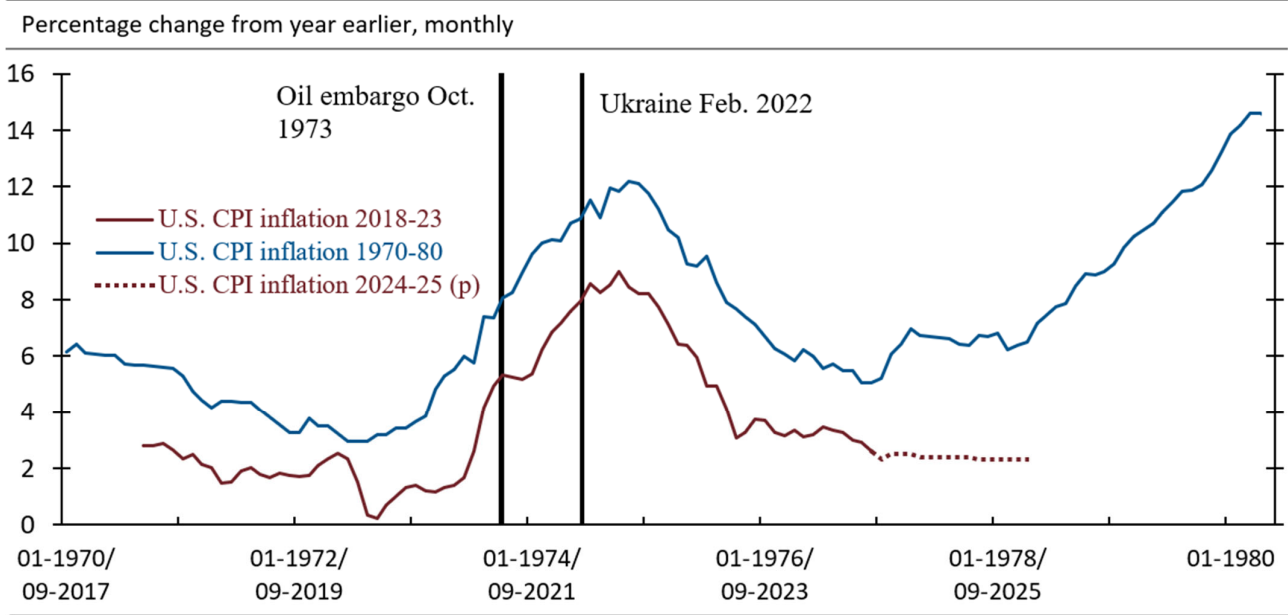
Comparing to the Fed's preferred (core) PCE measures of inflation



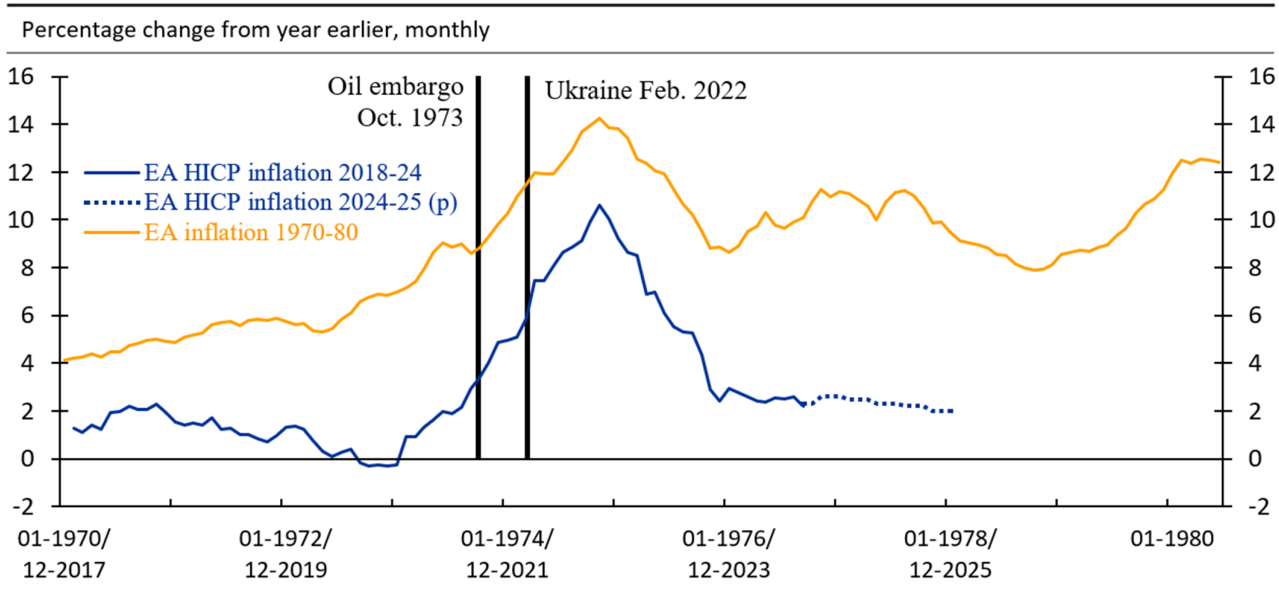
The policy tightening in the United States



The challenge: 2021-24 vs 1970s



The case of the euro



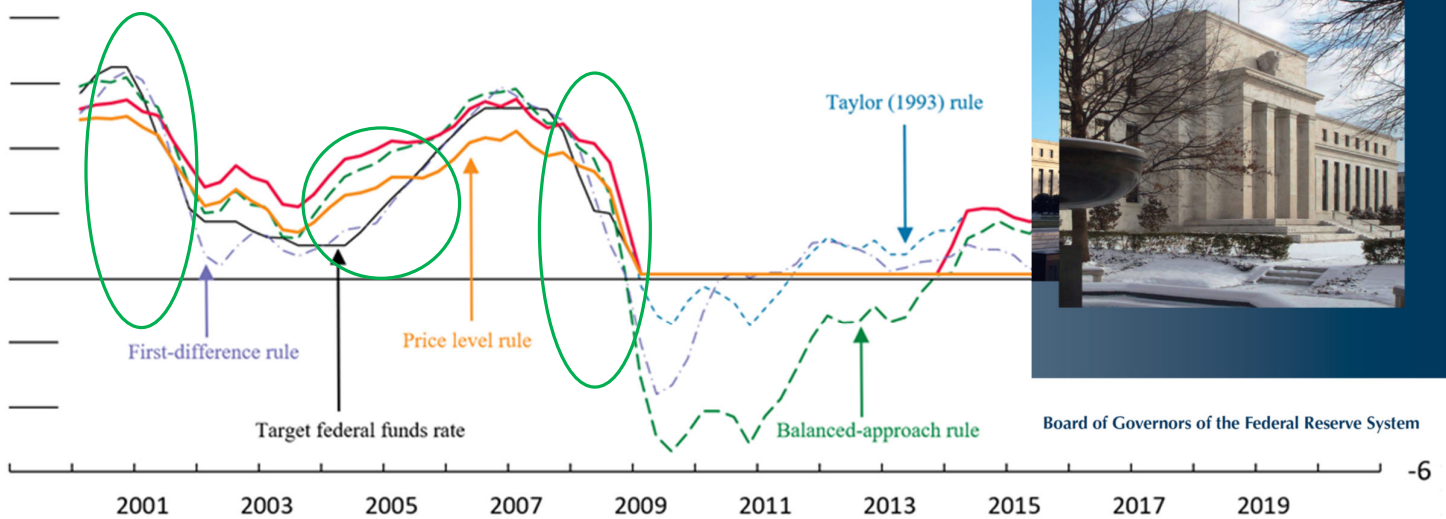
2. Policy rules from the Fed's Report

Funds rate prescriptions from policy rules The Federal Reserve's Monetary Policy Report, February 7, 2020

MONETARY POLICY REPORT

February 7, 2020

Quarterly



The Taylor rule at 30!

*Carnegie-Rochester Conference Series on Public Policy 39 (1993) 195-214
North-Holland*

Discretion versus policy rules in practice

John B. Taylor*
Stanford University, Stanford, CA 94305

*Research was supported by a grant from the National Science Foundation at the National Bureau of Economic Research and by the Stanford Center for Economic Policy Research. I am grateful to Craig Furfine, Ben McCallum, Volker Wieland, and John Williams for helpful comments and assistance.

11

Taylor (1993) „Discretion versus policy rules in practice“ – An exercise in estimation?

- The Taylor rule is often understood as an exercise in estimation
- It is seen as a reaction function estimated to fit the data on interest rates, output and inflation for the early Greenspan period in the United States.

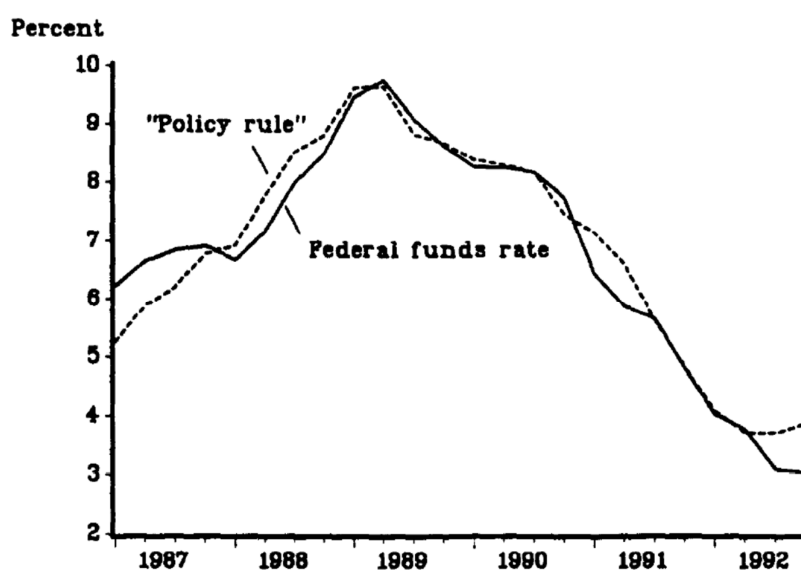


Figure 1. Federal funds rate and example policy rule.

12

Taylor (1993) „Discretion versus policy rules in practice“ – An exercise in estimation?

$$r = p + .5y + .5(p - 2) + 2 \quad (1)$$

where

- r is the federal funds rate,
- p is the rate of inflation over the previous four quarters
- y is the percent deviation of real GDP from a target.

13

No, the other way around. First testing what rules work well in macro models. Then comparing to policy practice

This paper examines how recent econometric policy evaluation research on monetary policy rules can be applied in a practical policymaking environment. According to this research, good policy rules typically call for changes in the federal funds rate in response to changes in the price level or changes in real income. An objective of the paper is to preserve the concept of such a policy rule in a policy environment where it is practically impossible to follow mechanically any particular algebraic formula that describes the policy rule. The discussion centers around a hypothetical but representative policy rule much like that advocated in recent research. This rule closely approximates Federal Reserve policy during the

Models used then: Bryant, Hooper, Mann (1993), Taylor (1993, book)

More recent models: www.macromodelbase.com (Taylor & Wieland 2012, Wieland et al (2016, Macro Handbook).

14

The Fed's Taylor 1993 rule: Different gap, coefficient doubled

$$R_t^{T93} = r_t^{LR} + \pi_t + 0.5(\pi_t - \pi^{LR}) + (u_t^{LR} - u_t)$$

- Unemployment gap ($u^{LR} - u$) used in place of output gap.
- Response coefficient is doubled: Taylor (1993) uses 0.5, Fed uses 1.0.
- Fed refers to **Okun's law** suggesting 2% deviation of GDP from potential coincides with opposite change in unemployment of 1 pp.
- (Okun 1962, Ball, Leigh, Loungani JMCB 2017).

The other inputs used by the Fed

- Inflation: Fed uses the core PCE deflator
- r^{LR} : Blue Chip Econ.Ind. (BCEI) median for long-run neutral real interest rate
 - (3-month T-bill rate projected 6-10 years, deflated with corresp. annual GDP deflator)
- π^{LR} : 2%
- u^{LR} BCEI median unempl. rate projected 6-10 years

The Fed's rules menu: Pre-Covid

Taylor (1993) rule	$R_t^{T93} = r_t^{LR} + \pi_t + 0.5(\pi_t - \pi^{LR}) + (u_t^{LR} - u_t)$
Balanced-approach rule	$R_t^{BA} = r_t^{LR} + \pi_t + 0.5(\pi_t - \pi^{LR}) + 2(u_t^{LR} - u_t)$
Adjusted Taylor (1993) rule	$R_t^{T93adj} = \text{maximum} \{R_t^{T93} - Z_t, 0\}$
Price-level rule	$R_t^{PL} = \text{maximum} \{r_t^{LR} + \pi_t + (u_t^{LR} - u_t) + 0.5(PLgap_t), 0\}$
First-difference rule	$R_t^{FD} = R_{t-1} + 0.5(\pi_t - \pi^{LR}) + (u_t^{LR} - u_t) - (u_{t-4}^{LR} - u_{t-4})$

NOTE: R_t^{T93} , R_t^{BA} , R_t^{T93adj} , R_t^{PL} , and R_t^{FD} represent the values of the nominal federal funds rate prescribed by the Taylor (1993), balanced-approach, adjusted Taylor (1993), price-level, and first-difference rules, respectively.

3. Policy prescriptions during COVID need to account for the supply side

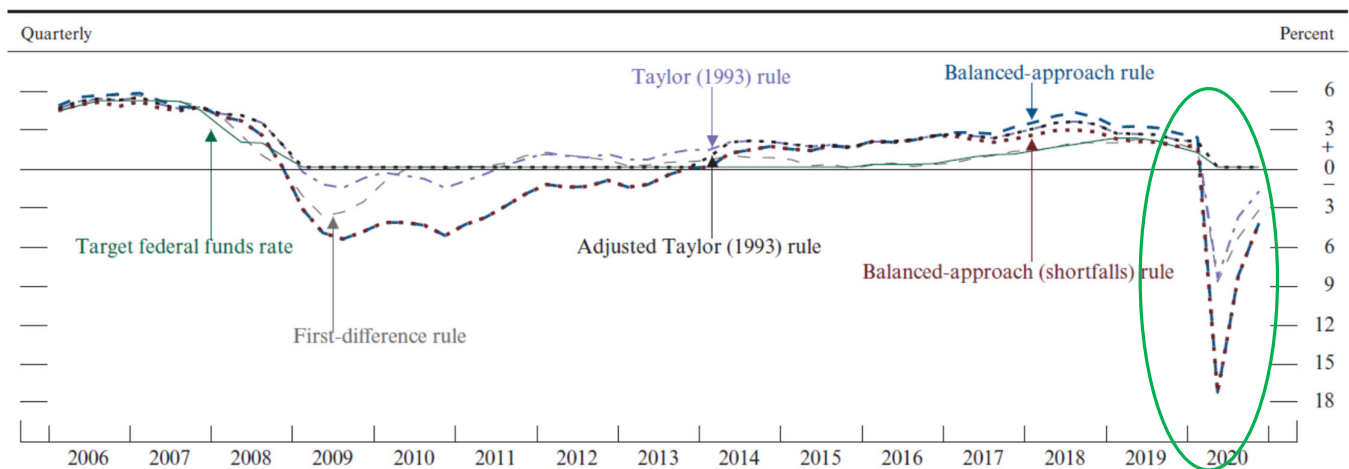
After the strategy review: The Fed's rules since February 2021

Taylor (1993) rule	$R_t^{T93} = r_t^{LR} + \pi_t + 0.5(\pi_t - \pi_t^{LR}) + (u_t^{LR} - u_t)$
Balanced-approach rule	$R_t^{BA} = r_t^{LR} + \pi_t + 0.5(\pi_t - \pi_t^{LR}) + 2(u_t^{LR} - u_t)$
Balanced-approach (shortfalls) rule	$R_t^{SBA} = r_t^{LR} + \pi_t + 0.5(\pi_t - \pi_t^{LR}) + 2\min\{(u_t^{LR} - u_t), 0\}$
Adjusted Taylor (1993) rule	$R_t^{T93adj} = \max\{R_t^{T93} - Z_t, ELB\}$
First-difference rule	$R_t^{FD} = R_{t-1} + 0.5(\pi_t - \pi_t^{LR}) + (u_t^{LR} - u_t) - (u_{t-4}^{LR} - u_{t-4})$

- Dropped price level rule. Added short-falls rule, lower funds rate when $u > u^{LR}$, do not respond when $u < u^{LR}$

Policy rules chart after Fed strategy review (Feb 2021)

B. Historical federal funds rate prescriptions from simple policy rules



NOTE: The rules use historical values of the federal funds rate, core personal consumption expenditure inflation, and the unemployment rate. Quarterly projections of longer-run values for the federal funds rate and the unemployment rate are derived through interpolations of the biannual projections from Blue Chip Economic Indicators. The longer-run value for inflation is taken as 2 percent.

SOURCE: Federal Reserve Bank of Philadelphia; Wolters Kluwer, Blue Chip Economic Indicators; Federal Reserve Board staff estimates.

Fed's interpretation of rules in COVID-19 period

- Funds rate prescriptions reflect the sharp recession due to the pandemic in 2020: Prescriptions from Taylor-93 rule dropped 10 pp from BA-rule 20 pp
- The Fed's Monetary Policy Report (February 2021) concluded:
“These deeply negative prescribed policy rates show the extent to which policymakers' ability to support the economy through cuts in the policy rate was constrained by the effective lower bound during the pandemic-driven recession—a constraint that helped motivate the FOMC's other policy actions at the time, including forward guidance and asset purchases.”

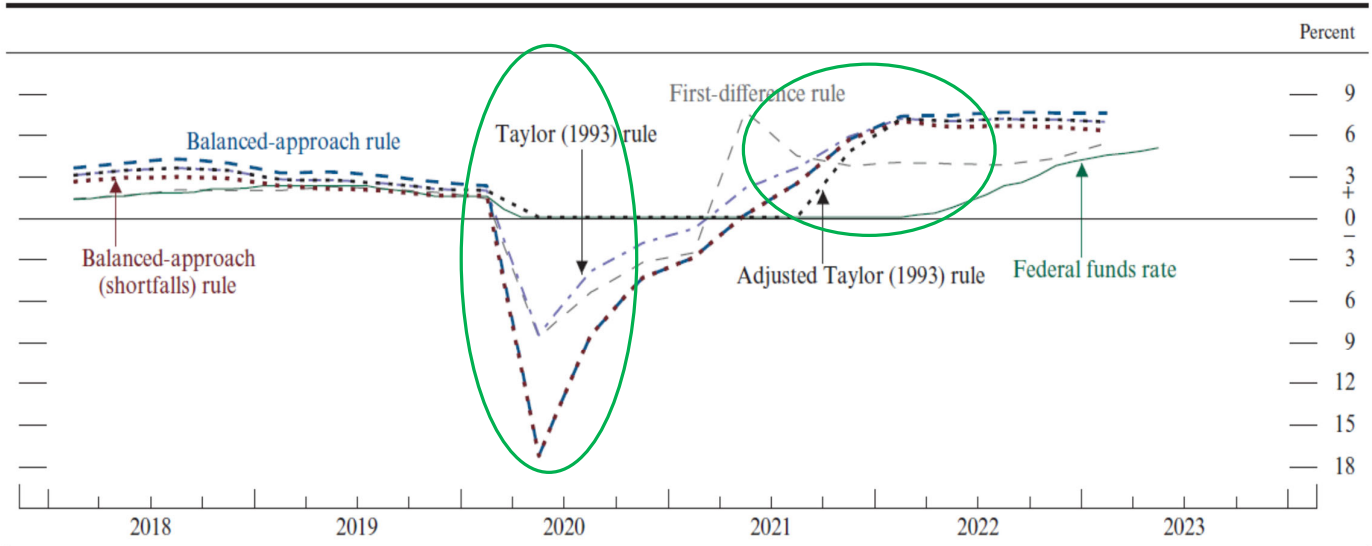
The Fed's forward guidance

September 2020 statement:

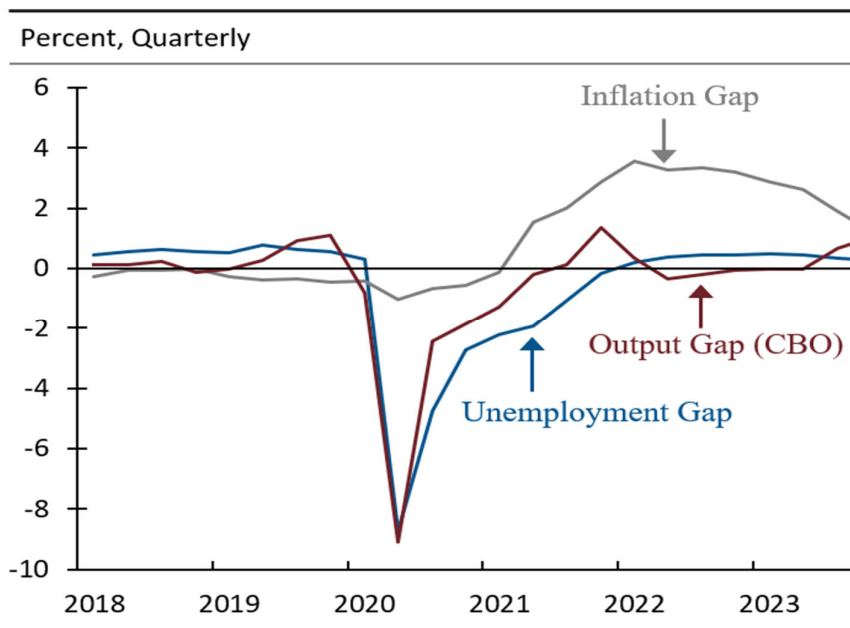
- *The Committee decided to keep the target range for the federal funds rate at 0 to 1/4 percent and **expects** it will be appropriate **to maintain this target range until labor market conditions have reached levels consistent with the Committee's assessments of maximum employment and inflation has risen to 2 percent and is on track to moderately exceed 2 percent for some time.***

Policy rules chart of the Fed, June 2023

B. Historical federal funds rate prescriptions from simple policy rules



1st Issue: Unemployment gap = output gap (vs long-run potential). No cause for doubled response coefficient.



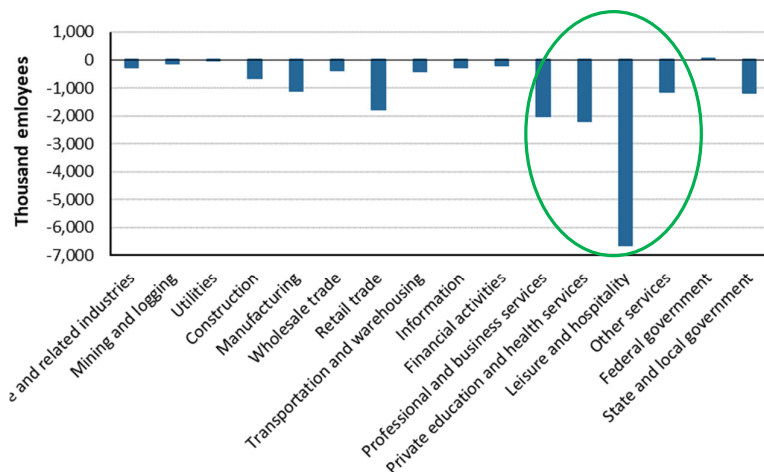
What happened to Okun's „law“? Extending Ball et al 2017.

$$U_t - U_t^* = \beta(L)(Y_t - Y_t^*) + \epsilon_t$$

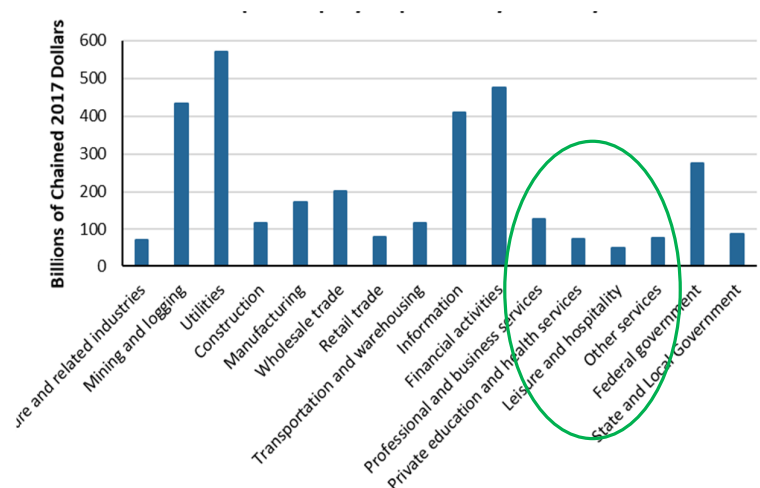
	(1) 1948Q1- 2019Q4	(2) 1948Q1- 2023Q4	(3) 1948Q1- 2023Q4
Total reaction to Ygap	-0.479*** (0.015)	-0.578*** (0.034)	-0.476*** (0.015)
Total reaction to Ygap during Covid-19			-1.044*** (0.171)
Observations	288	304	304
Adjusted R ²	0.941	0.832	0.955
Durbin-Watson	1.682	1.988	1.728

What led to the deviation from Okun's law in COVID? Unusually high unemployment in low-productivity sectors.

Change in employment by sector: 2020Q2 vs 2019Q4



Real value added per employee by sector: 2019



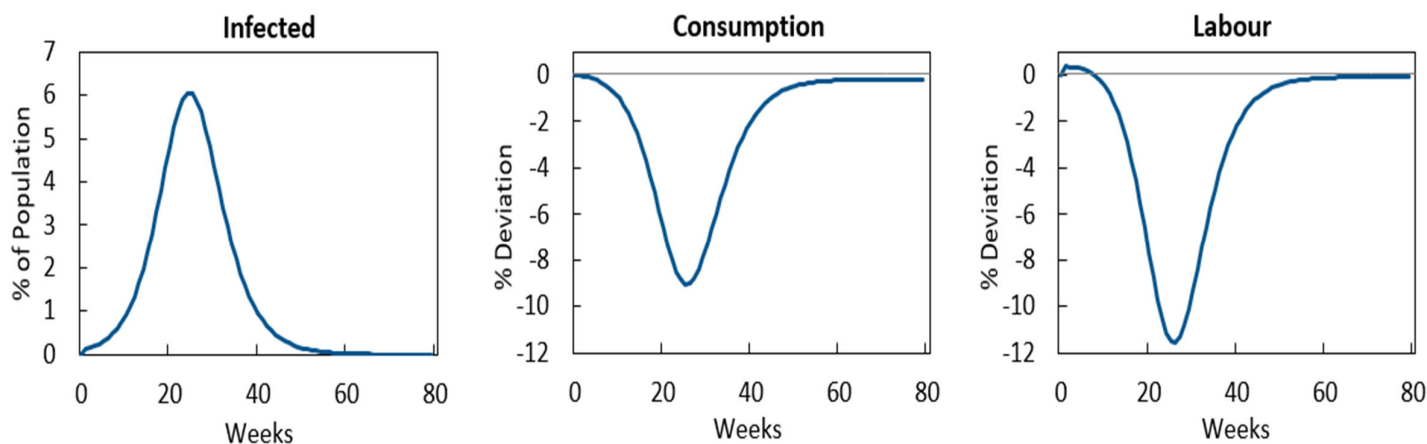
2nd Issue: Need to account for supply-side effects of the pandemic

- Pandemic had a similar impact on aggregate demand and aggregate supply.
- Consumers and workers feared infection with COVID-19 and reduced contact-intensive consumption and work hours.
- Employers shut down contact-intensive production to avoid the spread of the virus at the workplace, dismissed workers, or let them work from home.
- Governments implemented lockdowns to further reduce the risk of infections.
- As a result, demand and supply largely moved in lock-step, first sharply down, then back up.
- The relevant gap indicating disinflationary pressures from the pandemic was much smaller than the deviation from long-run potential.

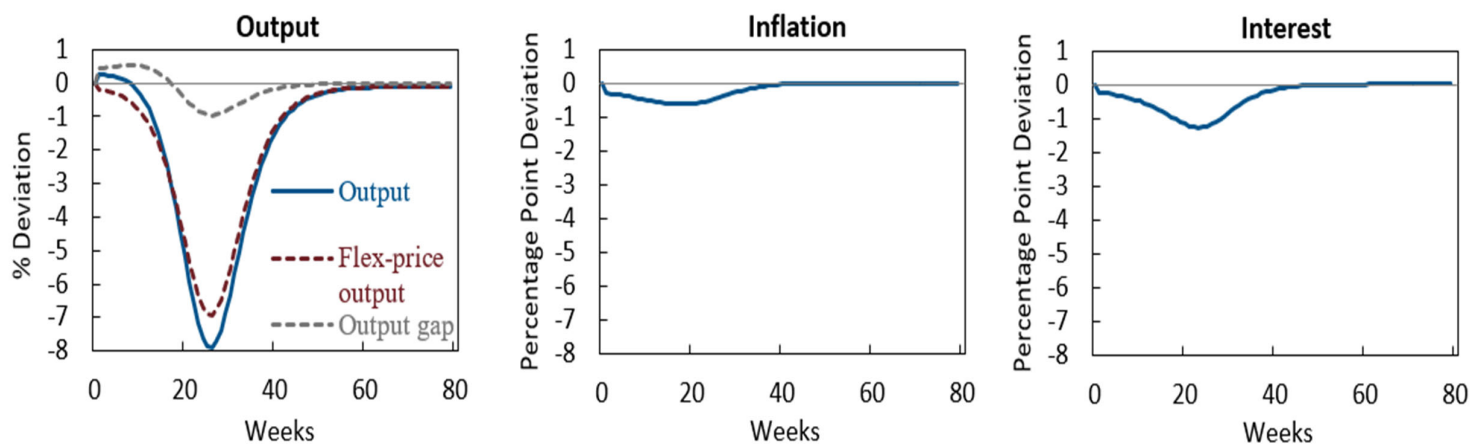
To quantify the effect use macro-epi models

- Consider the new class of macro-epidemic models developed during the coronavirus pandemic; which incorporates the epidemiological dynamics in a structural framework with forward-looking and optimizing households and firms.
- Example: Use the New-Keynesian macro-epi model of Eichenbaum, Rebelo and Trabandt (2022) to simulate the consequences of an epidemic for the output gap, inflation and interest rates under Taylor's rule.
- New database with macro-epi models at www.epi-mmb.com

Simulation of an epidemic in a New-Keynesian macro-epi model



Demand and supply decline and rise. Little Disinflation. Little role for monetary policy.

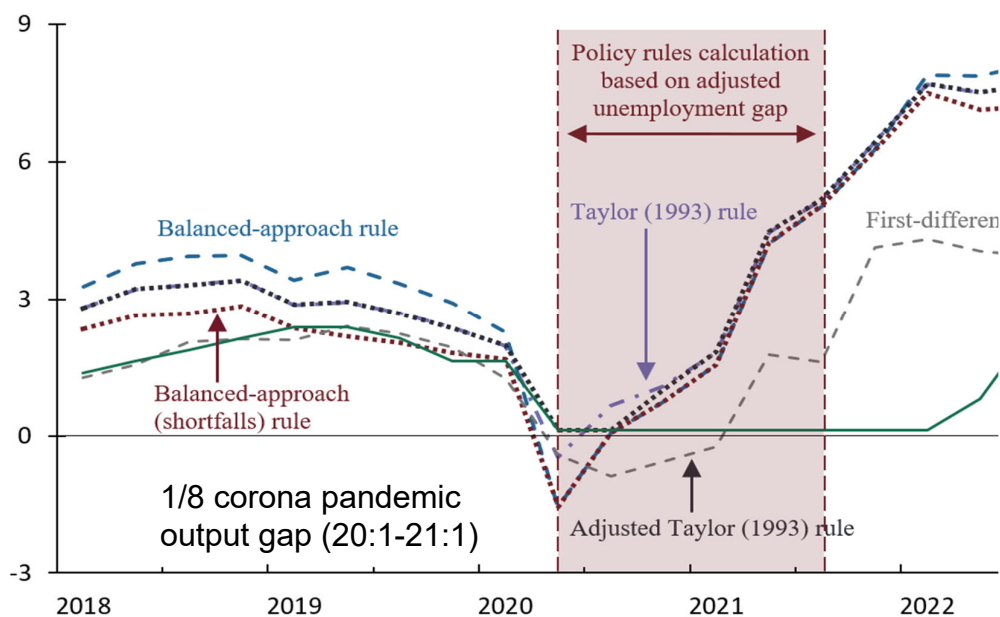


Need to adjust resource gap in the pandemic

- Output and unemployment gap used in the rules in the Fed's Report should be adjusted during the period of the coronavirus pandemic to better reflect the pandemic's impact on aggregate supply.
- We propose to use a model-based measure of potential GDP.
- The first macro-epi models were developed during the pandemic and its impact on demand and supply could be understood already at that time.
- **Simple short-cut: adjust the resource gap used in the rules by a factor of 1/8 during the pandemic.**

4. Rules called for timely response to the inflation surge

Fed fell behind the curve in 2021. Strong signal from rules for policy tightening.



Tatar-Wieland 2024

33

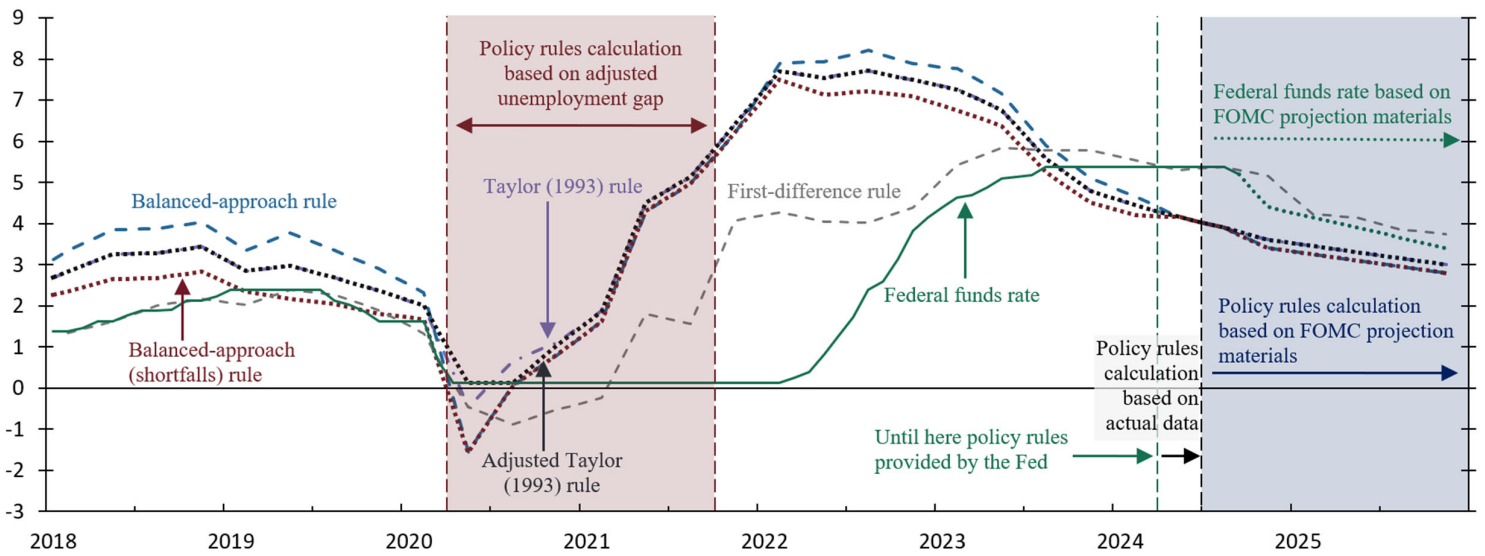
In 2021 Fed was criticized but insisted that inflation would decline by itself without a need for tighter policy

- Rise of inflation triggered criticism that central banks fell behind the curve. „Team transitory“ versus „Team persistent“ in 2021.
- See contributions at Hoover monetary policy conferences: 2021, 2022 „How Monetary Policy Got Behind The Curve And How To Get Back: A Policy Conference“ , 2023. „How To Get Back On Track: A Policy Conference“
- For example, Papell and Prodan-Boul (2020, 2022), Clarida (2022), Reis (2022), Bullard (2022), Lacker (2022), Wieland (2022).
- What about now? When to cut rates?

Tatar-Wieland 2024

34

Projecting rules with FOMC projections. Rules declined below Fed policy in spring 2024. ($r^{LR} = 0.9\%$, often called r^*)



Projecting rules forward: 4 out of 5 rules lower rates faster than Fed policy in 2024

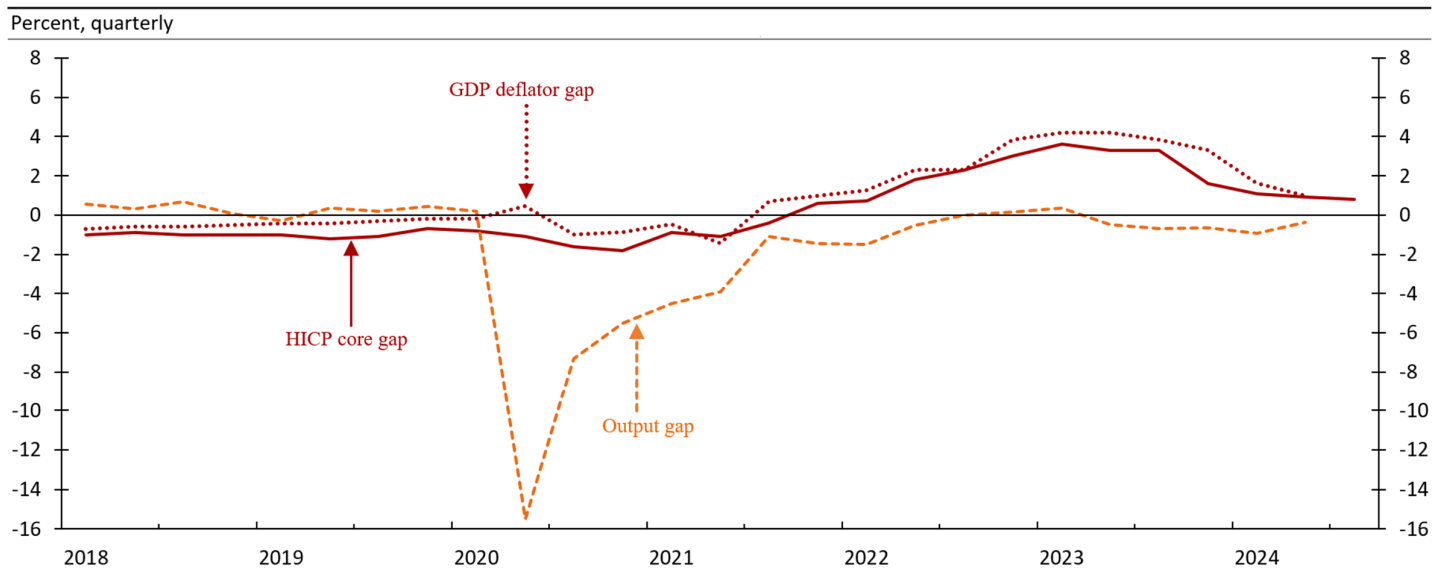
	Policy Rule	2024		2025			
		Q3	Q4	Q1	Q2	Q3	Q4
$r^{LR} = 0.9\%$	Taylor (1993) rule	3.9	3.6	3.5	3.3	3.2	3.0
	Balanced-approach rule	3.9	3.4	3.3	3.1	3.0	2.8
	Balanced-approach (shortfalls) rule	3.9	3.4	3.3	3.1	3.0	2.8
	Adjusted Taylor (1993) rule	3.9	3.6	3.5	3.3	3.2	3.0
	First-difference rule	5.4	5.1	4.2	4.2	3.9	3.8

If long-run equilibrium rate (R^{LR} or R^*) is higher and closer to potential growth, then the current policy easing is about right.

	Policy Rule	2024		2025			
		Q3	Q4	Q1	Q2	Q3	Q4
$r^{LR} = 1.8\%$	Taylor (1993) rule	4.8	4.5	4.4	4.2	4.1	3.9
	Balanced-approach rule	4.8	4.3	4.2	4.0	3.9	3.7
	Balanced-approach (shortfalls) rule	4.8	4.3	4.2	4.0	3.9	3.7
	Adjusted Taylor (1993) rule	4.8	4.5	4.4	4.2	4.1	3.9
	First-difference rule	5.4	5.1	4.2	4.2	3.9	3.8
	Federal Funds Rate FOMC projections	5.3	4.4	4.2	3.9	3.7	3.4

5. The case of the ECB

Gaps in the euro area: Inflation deviation from 2% target and output deviation from EC estimate of potential output



Tatar-Wieland 2024

39

In summer 2021, when inflation was already above target, but the policy rate at -0.5%, the ECB announced this:

ECB forward guidance expanded on July 2021

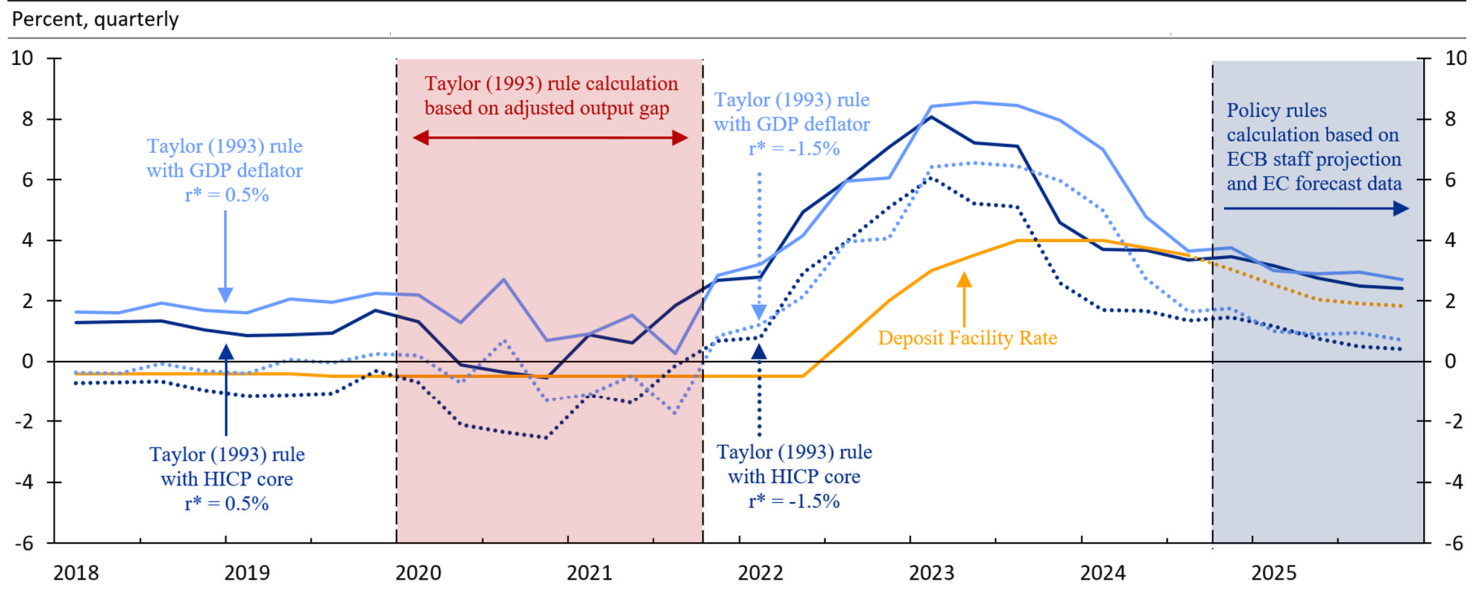
*The Governing Council today revised its forward guidance on interest rates. We did so to **underline our commitment to maintain a persistently accommodative monetary policy stance** to meet our inflation target.*

*In support of our symmetric 2% inflation target and in line with our monetary policy strategy, the Governing Council expects the **key ECB interest rates to remain at their present or lower levels until** we see inflation reaching two per cent well ahead of the end of our projection horizon and durably for the rest of the projection horizon, and we judge that realised progress in underlying inflation is sufficiently advanced to be consistent with inflation stabilising at two per cent over the medium term. **This may also imply a transitory period in which inflation is moderately above target.***

Tatar-Wieland 2024

40

Taylor rules provided ample warning of need for policy tightening in 2021.



Tatar-Wieland 2024

41

Conclusions

- Simple policy rules called for higher interest rates in real time in 2021 and well ahead of actual Fed and ECB policy tightening.
- Fed and ECB ignored these signals. Both central banks felt committed to keep rates lower for longer according to their own forward guidance.

A quote by President Lagarde

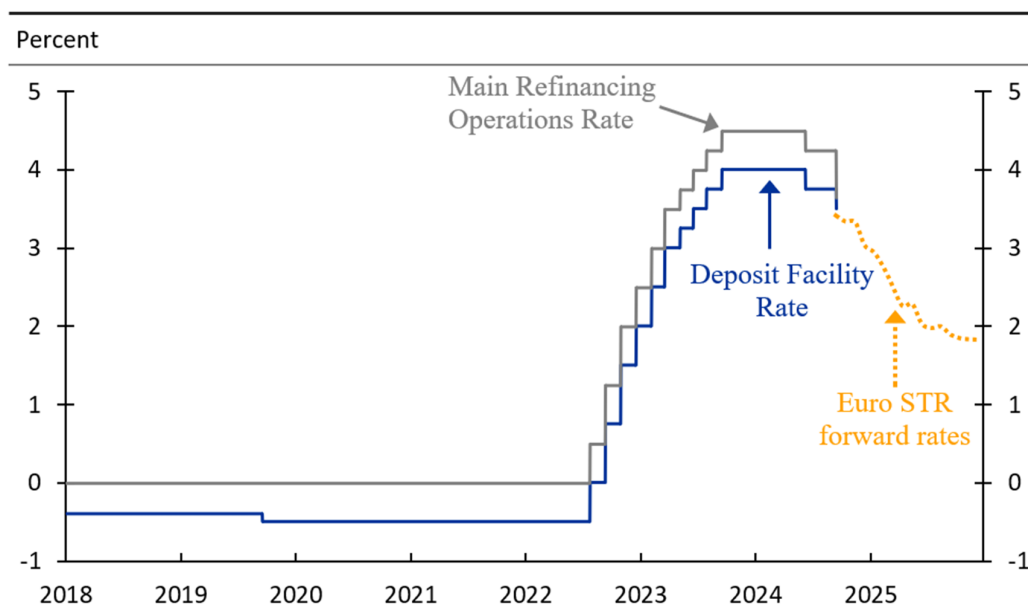
- FT, Oct 27, 2023, *“But what I regret personally is to have felt bound by our forward guidance,”* *“I should have been bolder.”* ... *“But what we should have learned is that we cannot just rely only on textbook cases and pure models. We have to think with a broader horizon.”*

Tatar-Wieland 2024

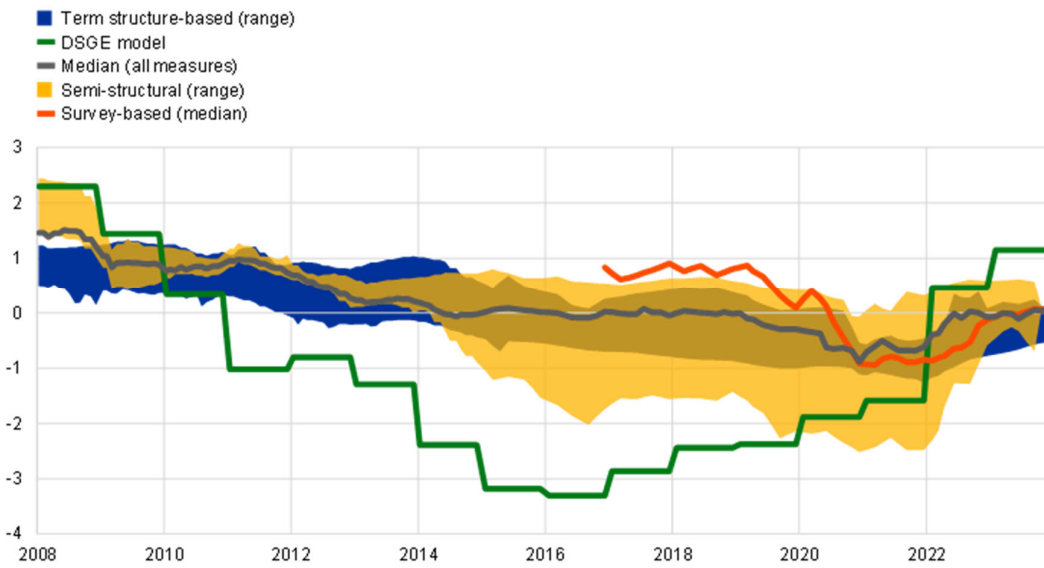
42

Appendix

The policy tightening in the euro area

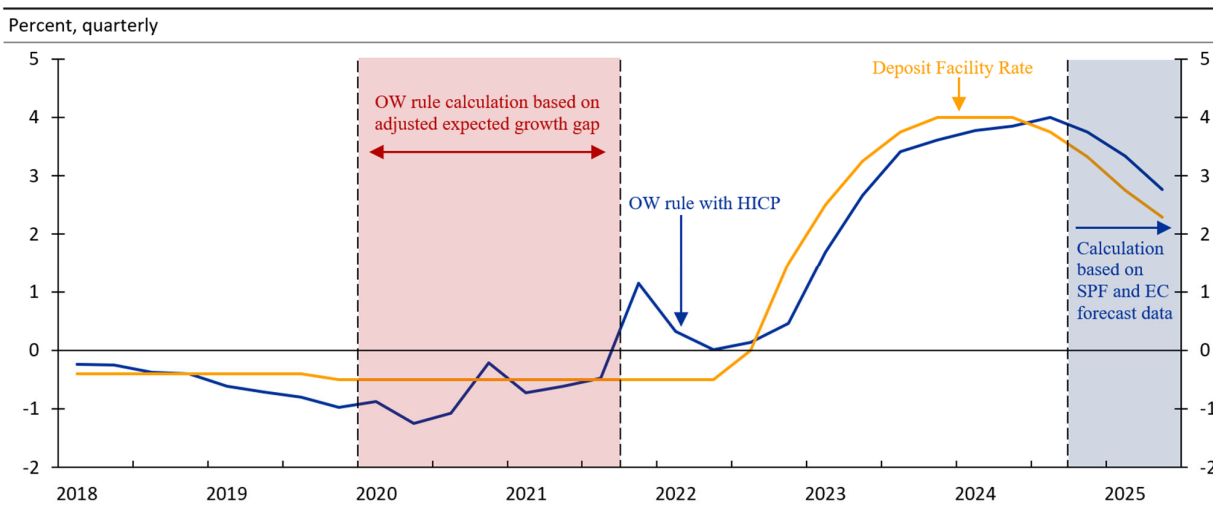


R* estimates for the euro area from ECB Bulletin (2024)



A difference rule that does not require an estimate of R*: Orphanides-Wieland (2013) with SPF forecasts

$$\Delta i_t = 0.5(\pi_{t+3|t} - \pi^*) + 0.5(q_{t+2|t} - q_{t+2|t}^*)$$



A difference rule that does not require an estimate of R^* : Orphanides-Wieland (2013) rule with recent outcomes

$$\Delta i_t = 0.5(\pi_{t-1} - \pi^*) + 0.5(q_{t-1} - q_{t-1}^*)$$

