

**Comments on
“Managing Disinflations,”
by Stephen G. Cecchetti, Michael E. Feroli, Peter Hooper,
Frederic S. Mishkin, and Kermit L. Schoenholtz
with Matthew Luzzetti and Justin Weidner**



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Introduction

I thank the organizers for inviting me to participate in this year's U.S. Monetary Policy Forum. I have attended many of the forums, and this is the fourth time I have had the honor of being on the program. So I can say based on experience that the forum always chooses a topic of utmost importance for monetary policymaking and always successfully delivers a paper combining solid research and policy recommendations. This year is no exception.

Over the past year, in the wake of rising inflation, the FOMC has taken deliberate action to remove monetary policy accommodation by raising the federal funds rate by 4-1/2 percentage points and reducing the size of the Fed's balance sheet through asset run-off. Returning the economy to price stability is an imperative for sustaining healthy labor markets and the U.S. standard of living. The very high inflation the economy has experienced for almost two years has been painful for households and businesses, especially those with fewer resources. High inflation also imposes longer-run costs on our economy because it distorts the decisions households and businesses make about building human capital and investing in R&D, plants and equipment, and other forms of physical capital. These decisions ultimately affect the pace of innovation, productivity growth, the potential growth rate of the economy, and improvement in our living standards.

Incoming economic information shows that our monetary policy actions are having the intended effect of slowing demand and reducing price pressures. In addition, supply chain disruptions are easing. But inflation remains too high. So the paper is highly relevant for the task at hand as the FOMC manages the necessary disinflation back to our 2 percent goal while minimizing the pain of the journey back to price stability.

In the time I have, I will comment on three aspects of the paper: the empirical estimation of the Phillips curve, the role of inflation expectations, and the lessons for policymakers operating in an uncertain

environment. The views I present will be my own and not necessarily those of the Federal Reserve System or of my colleagues on the Federal Open Market Committee.

The Phillips Curve

In many inflation models used by central banks, inflation is driven by three key factors: a resource utilization gap or marginal cost of production; lagged inflation; and expectations of inflation. Different models put different weights on these fundamental factors, but empirical work across many specifications of such a Phillips curve relationship generally finds that inflation expectations matter and the resource utilization gap or slack matters when it is large. The finding that inflation expectations matter is an important reminder that estimates of a Phillips curve are dependent on the conduct of monetary policy and that reduced-form Phillips curves are not structural.

It is not surprising that the estimated inflation dynamics over the period that includes the high inflation of the 1960s and 1970s and the Volcker disinflation over 1979-1984 differ from those over the period of the Great Moderation from 1985 through 2019 because inflation expectations were not well anchored in the earlier period but were in the latter period. Some of the difference could reflect the nature of the shocks that hit the economy in each period, but it also reflects differences in how monetary policy was conducted. The experience of the 1960s and 1970s taught Fed policymakers the importance of setting policy to prevent the unanchoring of inflation expectations and the role that an explicit numerical inflation target can play in keeping expectations anchored. Now, more generally, there is a greater appreciation of monetary policy independence coupled with transparency and accountability, although that appreciation can ebb and flow with economic developments and should not be taken for granted.

[Figure 1]

The forum paper investigates inflation dynamics by estimating a nonlinear Phillips curve and then embedding that relationship in a simple economic model to simulate inflation since 2019. The authors'

preferred specification is estimated over the sample period from 1962 through 2019. It relates core PCE inflation to a measure of slack based on the vacancy-to-unemployment gap, $v/u - (v/u)^*$, allowing the coefficient on the gap to differ in hot labor markets (when the v/u gap is positive) and in cold labor markets (when the v/u gap is negative).

They find a statistically and economically significant positive relationship between inflation and the v/u gap in a hot labor market and a very small statistically insignificant negative relationship in a cold labor market.

[Figure 2]

This result is the opposite of the findings of several papers in the literature. Two examples are Stock and Watson (2010) and Ashley and Verbrugge (2023). Stock and Watson (2010) documented a key stylized fact, namely, that inflation tends to decline during recessions. In their preferred inflation forecasting model, inflation is related to a stochastic trend inflation rate and an unemployment recession gap, the difference between the current unemployment rate and the minimum unemployment rate over the current and previous 11 quarters. This gap variable measures the severity of economic contractions and the stochastic trend in their Phillips curve is meant to capture longer-term inflation expectations. While their paper is silent on what happens to inflation in booms, they find that inflation is lower in recessions, i.e., when the labor market is cold. In normal times when the gap is small, inflation is driven by its stochastic trend.

In a recent Cleveland Fed working paper, Ashley and Verbrugge (2023) estimate what they call a persistence-dependent Phillips curve, in which the unemployment gap is decomposed into a transitory component, a moderately persistent component, and a highly persistent component. The moderately persistent component behaves similarly to the Stock and Watson unemployment recession gap, while the highly persistent gap captures low-frequency movements in the business cycle, slowly turning positive

during recessions and then negative during expansions. In their preferred empirical specification, these authors find that inflation is lower when the moderately persistent component turns up during recessions. In contrast, the highly persistent component of the unemployment gap typically has little association with inflation except when the unemployment rate is far below the natural rate. So in contrast to today's paper, a cold labor market is associated with lower inflation, and the labor market has to be very hot to boost inflation to the same degree.¹

But even within the forum paper itself there is a tension between the estimated Phillips curve findings and the historical analysis presented in Section 2. The historical analysis documents that the vast majority of disinflations in the U.S. and in other advanced economies have been accompanied by recessions, a finding that differs from the estimated Phillips curve results. Perhaps there is one way to reconcile at least part of the tension. It could be that when labor markets are overheating and inflation is high, policymakers tighten monetary policy to bring labor demand into better balance with supply to alleviate inflation pressures without intending to push the economy beyond that and into recession. Because this is a difficult calibration exercise, policy tends to overshoot and the economy does end up in recession in most disinflations. The implication is that policymakers need to be attentive to the lagged effects of policy actions as they bring inflation down.

If we take the forum paper's estimated Phillips curve results at face value, another implication is that once the economy overheats, it is going to be difficult for monetary policymakers to bring inflation down. This supports the authors' conclusion that monetary policy should be pre-emptive to avoid spurring a hot labor market in the first place.

¹ Other examples of papers that estimate nonlinear Phillips curves include Barnes and Olivei (2003), Peach, Rich, and Cororaton (2011), and Harding, Lindé, and Trabandt (2023).

The persistence of inflation underscores the important role inflation expectations play in inflation dynamics, which is my next topic.

The Role of Inflation Expectations

Inflation expectations have been a central factor in models of inflationary dynamics since the 1960s and 1970s, with the seminal work of Phelps, Friedman, and Lucas, and they play a key role in New Keynesian dynamic stochastic general equilibrium (DSGE) models used to inform and evaluate monetary policy.^{2,3} In addition to their role in helping to forecast inflation, inflation expectations are also an indicator of how credible the public finds the central bank's commitment to achieving its policy goals.

The forum paper uses a behavioral equation for inflation expectations in which those expectations are highly inertial and strongly anchored, unlike they were in the 1960s and 1970s, and it measures these expectations using the Survey of Professional Forecasters. Anchored inflation expectations are highly desirable; they mean that the public finds the longer-run inflation target credible and that fluctuations in inflation will eventually die out. But during a period of very high inflation, the stability of inflation expectations cannot be taken for granted: the real world does not always cooperate with our modeling assumptions.⁴ Research indicates that there is considerable heterogeneity across and even within different groups of agents.⁵ And inflation remains a challenging construct for consumers to fully understand.

² See Phelps (1967), Friedman (1968), Lucas (1972), Fuhrer and Olivei (2009), and Clark and Davig (2009).

³ Work done at the Cleveland Fed and by other researchers finds that including measures of inflation expectations in inflation forecasting models reduces the size of forecast errors. See Faust and Wright (2013), Zaman (2013), Chan, Clark, and Koop (2018), and Tallman and Zaman (2020).

⁴ Mester (2022) discusses the role of inflation expectations in monetary policymaking from a practitioner's perspective.

⁵ For example, the inflation expectations of consumers appear to vary with demographic and socioeconomic factors. According to the Cleveland Fed's indirect consumer inflation expectations measure, women's inflation expectations tend to be higher than men's and older respondents and more educated respondents also report higher inflation expectations. The Cleveland Fed's indirect consumer inflation expectations measure, which started in 2021, is based on a nationwide survey with more than 10,000 responses and is updated on a weekly basis. Instead of asking consumers directly about overall inflation, the survey asks consumers how they expect the prices of the things they buy to change over the next 12 months and how much their incomes would have to change for them to be able to afford the same consumption basket and be equally well-off. See Hajdini, et al. (2022).

Cleveland Fed research finds that consumers regularly report higher forecasts for aggregate inflation than they do for the disaggregated components of inflation and that their future spending plans are tied more to their forecasts for the components than for overall inflation.⁶

[Figure 3]

Over the past two years, short-term inflation expectations moved up with gasoline and food prices, which tend to have an outsized effect on households' inflation expectations.⁷ As energy prices have fallen in recent months, short-term inflation expectations have eased, although they remain well above their pre-pandemic levels. This also raises the possibility that if energy and food prices rise again, short-run inflation expectations could also rise again. Most measures of medium- and longer-term expectations are also somewhat above their pre-pandemic levels, but they appear to be reasonably well anchored at levels consistent with our 2 percent target.

[Figure 4]

Identifying when longer-term expectations are becoming unanchored is not easy. Changes in the skewness of the distribution of responses to surveys of inflation expectations or increases in the dispersion between the 75th and 25th percentiles of the distribution can provide some indication that expectations are becoming unmoored.⁸ As inflation rose, dispersion measures also rose. They are moving back down now, suggesting that inflation expectations are reasonably well anchored. But that should not be taken for granted.

⁶ See Dietrich, et al. (2022).

⁷ For the effect of salient prices on inflation expectations, see Coibion and Gorodnichenko (2015), Cavallo, Cruces, and Perez-Truglia (2017), D'Acunto, et al. (2021), and Campos, McMain, and Pedemonte (2022).

⁸ Reis (2021) analyzes the degree and timing of the unanchoring of inflation expectations during the 1960s and 1970s in the U.S. and discusses the use of dispersion as a sign of unanchoring.

It is good to remember that inflation expectations are determined not only by movements in inflation but also by policymakers' actions to follow through on their strongly stated commitment to return inflation to its longer-run goal. The conduct of monetary policy matters, and research indicates that if policymakers are going to make an error, it is more costly to set policy assuming that inflation expectations are well anchored when they aren't rather than the other way around.⁹ If inflation expectations were to become unanchored, their influence would offset the effect of any beneficial change in the resource gap. Monetary policy would then have to act more forcefully, and the return to price stability would be more painful and costly.

This brings me to my last topic, which concerns monetary policymaking in a world of uncertainty.

Monetary Policymaking under Uncertainty

[Figure 5]

Uncertainty is the norm, not the exception.¹⁰ The economy is constantly being buffeted by shocks that can lead economic conditions to evolve differently than anticipated. Economic data are measured with error and can be revised over time. As the forum paper demonstrates, policymakers also have to contend with model uncertainty. Competing models can be consistent with the observable data but can interpret the data in different ways, producing different dynamics that are relevant for policymaking. Moreover, the underlying structure of the economy can change over time, making some models more relevant in certain periods than in others and complicating forecasting and policy setting in real time. In addition, even if one knew the correct model, some of the important conceptual elements in the model are not directly observable, e.g., the equilibrium interest rate, r^* ; slack, like the output gap or v/u gap used in the

⁹ See De Pooter, et al. (2016).

¹⁰ Mester (2016) discusses the role of uncertainty in monetary policymaking.

paper; the natural rate of unemployment, u^* ; and inflation expectations. These constructs have to be proxied and are subject to mismeasurement, which can affect policy decisions.¹¹

[Figure 6]

Because of these uncertainties, one should expect economic forecasts, and therefore the associated monetary policy paths, to change over time. Those changes can reflect economic developments, a better understanding of the underlying structural elements of the economy, or a combination of both. For example, in the pre-pandemic expansion, the FOMC learned over time that employment growth could be stronger and the unemployment rate lower without generating inflation than one would have thought possible based on the experience of past decades. As the FOMC learned, its assessments of the longer-run unemployment rate came down significantly over time. During this expansion, inflation moved higher and proved to be more persistent than anticipated.

Because of uncertainty, it is useful for policymakers to look at a variety of models that fit the data and consider policy prescriptions that perform well across those models. It is also helpful to look at the prescriptions from a variety of policy rules that are robust across various models and economic circumstances.¹²

Scenario analysis should also play a larger role in policymaking. It is helpful to contemplate different ways the economy could evolve and think about subjective probabilities across the scenarios. Hansen and Sargent's robust control approach confronts head-on the fact that models are only an approximation to reality and they show the benefit of choosing the policy that produces the best outcome in the worst-case

¹¹ Orphanides has laid out a convincing case that mismeasurement of slack and other unobservables like the natural rate of interest led to monetary policy mistakes that contributed to the Great Inflation of the 1970s. See, for example, Orphanides and Van Norden (2005) and Orphanides (2015).

¹² The Cleveland Fed publishes quarterly updates of the outcomes of a set of simple monetary policy rules across several forecasts. See Federal Reserve Bank of Cleveland (2022).

scenario across models.¹³ I found scenario analysis particularly useful during the pandemic when the expected path for the economy depended critically on how the pandemic would evolve.

In terms of the appropriate policy responses in a highly uncertain environment, some results in the literature suggest that when policymakers confront more uncertainty either in their data or in their models, they should be more cautious in acting, i.e., they should be more inertial in their responses.¹⁴ However, subsequent research has shown that this is not generally true. Inertial policies can reduce the direct effect of the mismeasurement, but they can also carry forward policy errors generated by mismeasurement. Sargent (1999) points out that caution does not necessarily mean doing less. When there is uncertainty, it can be better for policymakers to act more aggressively because aggressive and pre-emptive action can prevent the worst-case outcomes from actually coming about.¹⁵ Indeed, I agree with the forum paper's authors that the FOMC acted appropriately to move the policy rate up quickly last year. A more languid reaction to high inflation would have led to worse outcomes.

The forum paper also makes a strong argument that policy should act pre-emptively to prevent inflation from rising and points out that because the FOMC failed to act pre-emptively in 2021 as inflation rose, it then needed to act decisively in 2022 to stabilize inflation expectations. I agree that, in hindsight, the FOMC should have acted sooner, but I do not attribute the inaction to a change in views about the value of pre-emptive monetary policy as suggested by the authors.¹⁶ Even policy that is explicitly forward

¹³ See Sargent (1998) and Hansen and Sargent (2001, 2007, and 2011).

¹⁴ Mester (2016) discusses some of the literature.

¹⁵ Giannoni (2002 and 2007) shows policymakers who are averse to uncertainty will react more strongly to fluctuations in inflation and the output gap than if there were no uncertainty. They would put more weight on stabilizing inflation and the output gap and less weight on stabilizing the nominal interest rate. Walsh (2003, 2022) points out that better economic outcomes are achieved by assuming that high inflation will be persistent and acting accordingly.

¹⁶ Some commentators have suggested that the revised monetary policy strategy adopted by the FOMC in August 2020 and reaffirmed annually since then took a step back from pre-emptive policy. (See, e.g., Levy and Plosser, 2020.) Instead, I view the changes in the strategy statement as an acknowledgment of the uncertainty around assessments of the level of maximum employment. Given that we don't know where u^* is, policymakers should not

looking may end up not being appropriate ex post if the forecasts on which such policy is based are much too optimistic about the likely path for inflation. The FOMC's inflation forecasts were overly optimistic about inflation moving back down, and this contributed to maintaining a highly accommodative stance for monetary policy. Indeed, inaction on the funds rate meant that policy was becoming even more accommodative as inflation rose.

Putting these pieces together for the current economic environment, while it is welcome news to see some moderation in inflation readings since last summer, the level of inflation matters and it is still too high. Policy decisions need to consider the risk around the forecast but also the costs of continued high inflation to households, businesses, and the longer-run health of the economy. The forum paper's projections and recent research from the Cleveland Fed suggest that inflation could be more persistent than currently anticipated by many forecasters.¹⁷ I see the risks to the inflation forecast as tilted to the upside and the costs of continued high inflation as being significant. So in my view, at this point with the labor market still strong, the costs of undershooting on policy or prematurely loosening policy still outweigh the costs of overshooting. But policy also needs to be forward looking, and as inflation comes down, I anticipate that the balance of risks will shift.

To conclude, I really appreciate the opportunity to comment on this fine paper, and I recommend that everyone read it. The authors draw several lessons from their work. Let me add another one, namely, that the economy can evolve differently than expected and monetary policymakers should be prepared for that.

base policy solely on what could be an outdated estimate of this construct. But if inflationary pressures are building, policy can and should take pre-emptive action. As the strategy statement continues to acknowledge, monetary policy actions tend to influence the economy with a lag. This means it can be costly if monetary policy allows an accommodative stance to remain in place when price pressures rise.

¹⁷ See Verbrugge and Zaman (2023).

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Figure 1. Phillips curve estimates

$$\pi_t = \alpha + \beta \text{ lagged inflation} + (1 - \beta) \text{ inflation expectations} \\ + \gamma_{hot} (\text{v/u gap}_{t-1} > 0) + \gamma_{cold} (\text{v/u gap}_{t-1} < 0) + \Phi \text{ other}_{t-1} + \varepsilon_{\pi,t}$$

	Pre-pandemic (1962-2019)	Stable Inflation (1985-2019)
v/u gap: Hot Labor Market	0.680 (0.05)	0.312 (0.60)
v/u gap: Cold Labor Market	- 0.026 (0.93)	- 0.136 (0.67)
Lagged inflation	0.852 (0.00)	0.610 (0.00)
R²	0.723	0.320

Figure 2. Alternative Phillips curves

- Stock and Watson (2010)

$$\pi_{t+1}^4 = \tau_{t|t} + \gamma_4 \text{ unemployment recession gap}_t + \varepsilon_{t+4}^4$$

$$\text{unemployment recession gap}_t = u_t - \min(u_t \dots u_{t-11})$$

Estimates $\Rightarrow \gamma_4 < 0$

- Ashley and Verbrugge (2023)

$$\pi_{t+12}^{12} - \pi_t^* = \alpha + \beta \text{ lagged inflation}$$

$$+ \lambda_1^+ \text{ gap}_{hi-persistent,t}^+ + \lambda_1^- \text{ gap}_{hi-persistent,t}^-$$

$$+ \lambda_2^+ \text{ gap}_{mod-persistent,t}^+ + \lambda_2^- \text{ gap}_{mod-persistent,t}^-$$

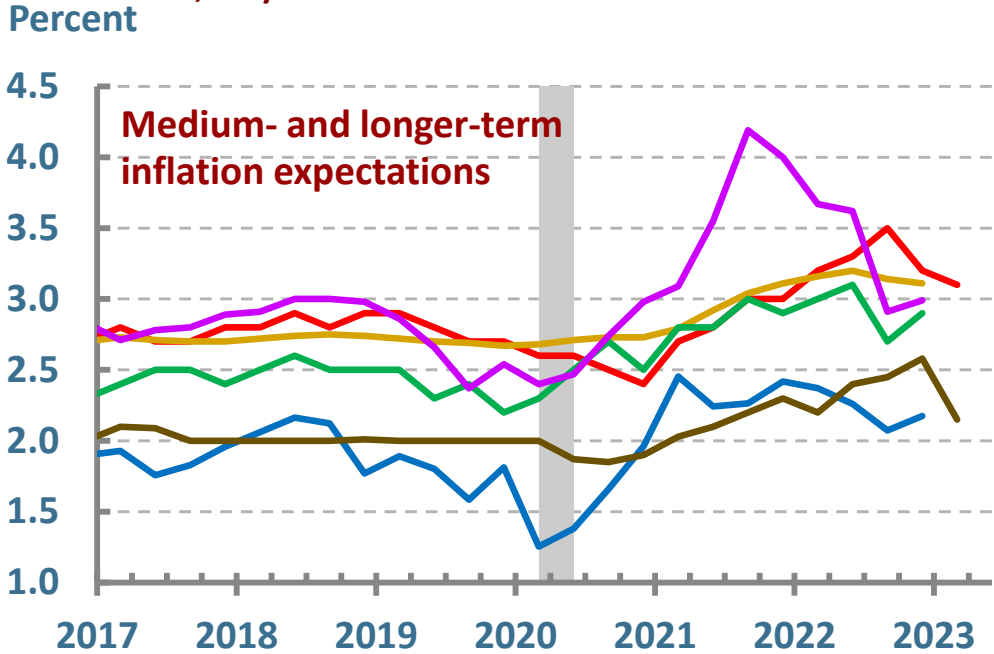
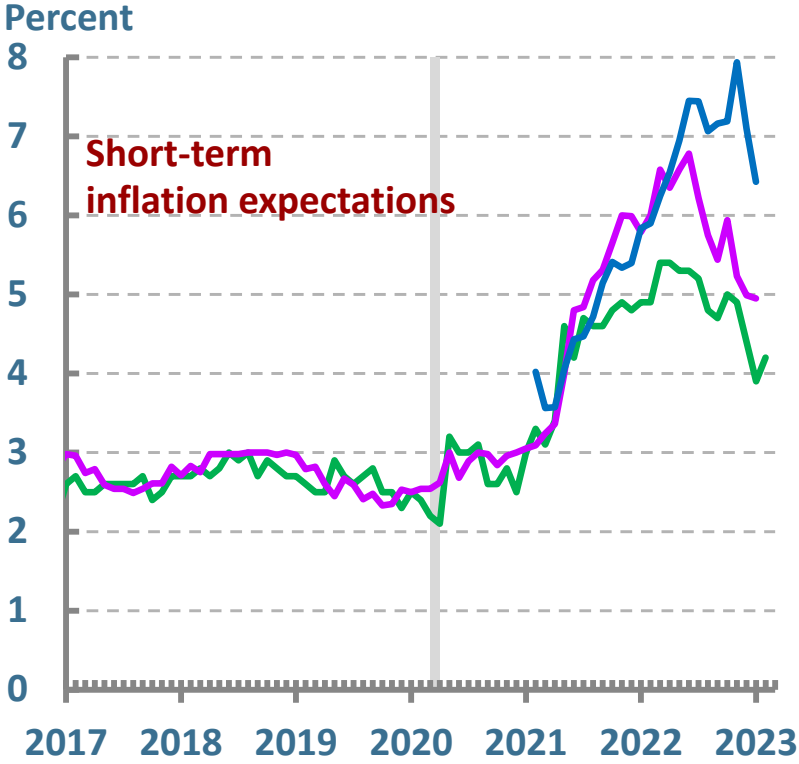
$$+ \lambda_3^+ \text{ gap}_{transient,t}^+ + \lambda_3^- \text{ gap}_{transient,t}^- + \varepsilon_{\pi,t}$$

Estimates $\Rightarrow \lambda_1^- < 0, \lambda_2^+ < 0, \lambda_3^+ < 0$

Figure 3. Measures of inflation expectations

NY Fed Survey of Consumer Exp, Infl exp over next yr
U Michigan Consumer Infl Exp, over next yr
Clev Fed Indirect Consumer Infl Exp, over next yr

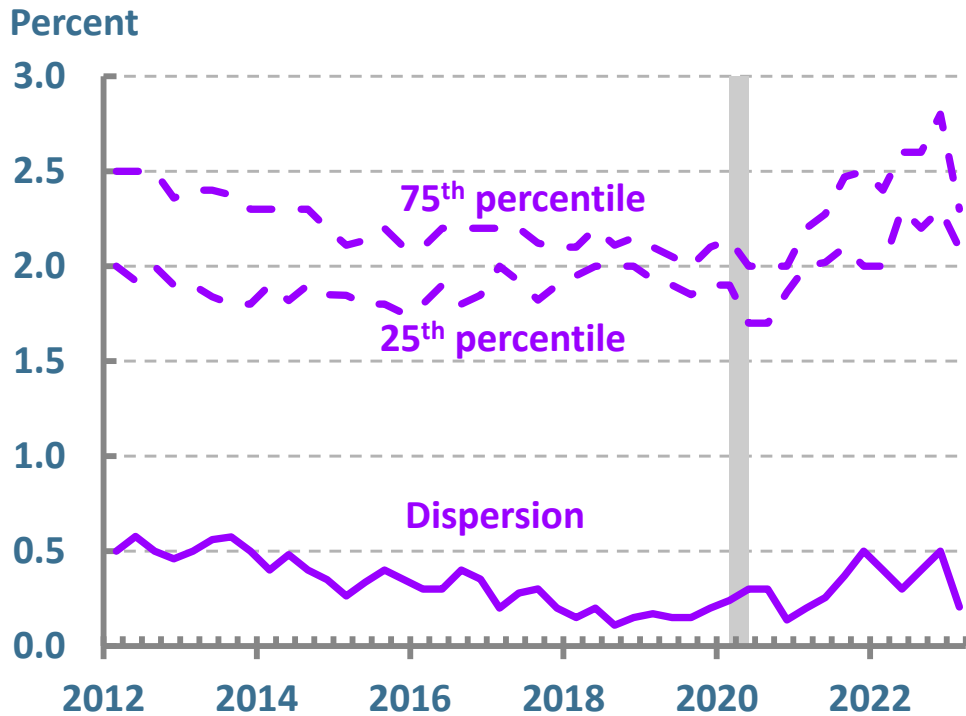
NY Fed Survey of Consumer Exp, Infl exp over next 3 yrs
Atlanta Fed Business Infl Exp, over next 5-10 yrs
U Michigan Consumer Infl Exp, over next 5-10 yrs
BOG Common Infl Exp, scaled by U Mich, over next 5-10 yrs
Infl Comp: 5-yr/5-yr forward
SPF, 10-year PCE Infl



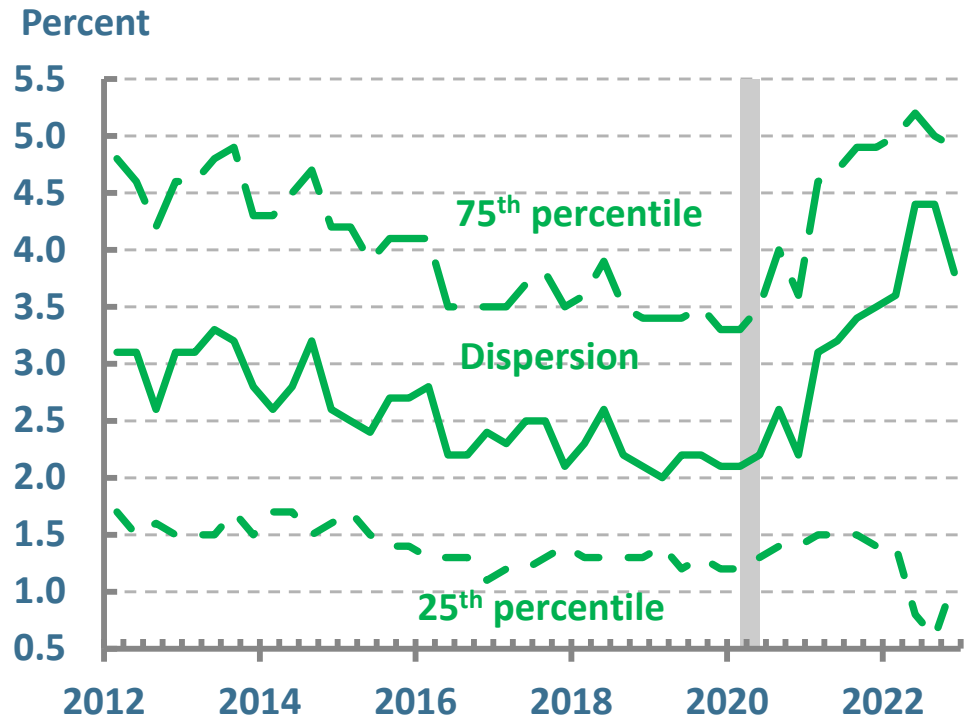
Source: Federal Reserve Board; Federal Reserve Banks of Atlanta, Philadelphia, and New York; University of Michigan via Haver Analytics
 Short-term infl exps: Monthly data (wkly avg for Clev Fed);
 Last obs. Feb 2023 for U Mich, Jan 2023 for NY Fed and Clev Fed
 Long-term infl exps: Quarterly data (last month of qtr for NY Fed, U Mich, and Infl Comp);
 Last obs. 2023Q1 Atl Fed, SPF; 2022Q4 otherwise

Figure 4. Dispersion across responses in surveys of longer-term inflation expectations

Survey of Professional Forecasters:
quarterly forecasts of
annual average PCE inflation over the next 10 years



University of Michigan Surveys of Consumers:
expected inflation over next 5 to 10 years



Dispersion = 75th percentile minus 25th percentile

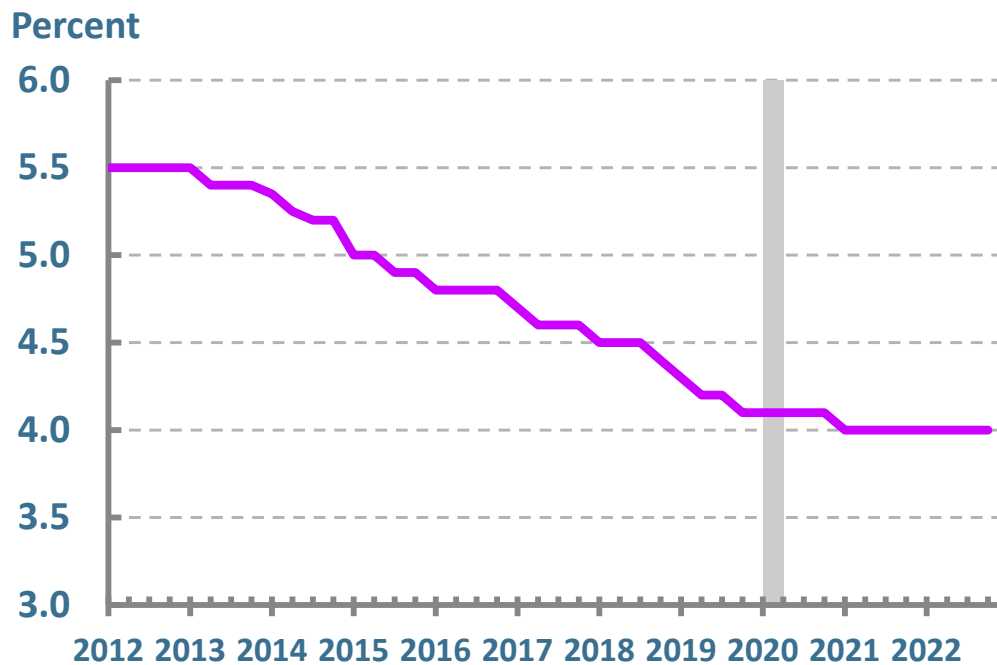
Source: Federal Reserve Bank of Philadelphia and University of Michigan
Quarterly data for SPF and last month of each quarter for U Mich:
5 Last obs. 2023Q1 for SPF and December 2022 for U Mich

Figure 5. Monetary policymaking needs to confront uncertainty

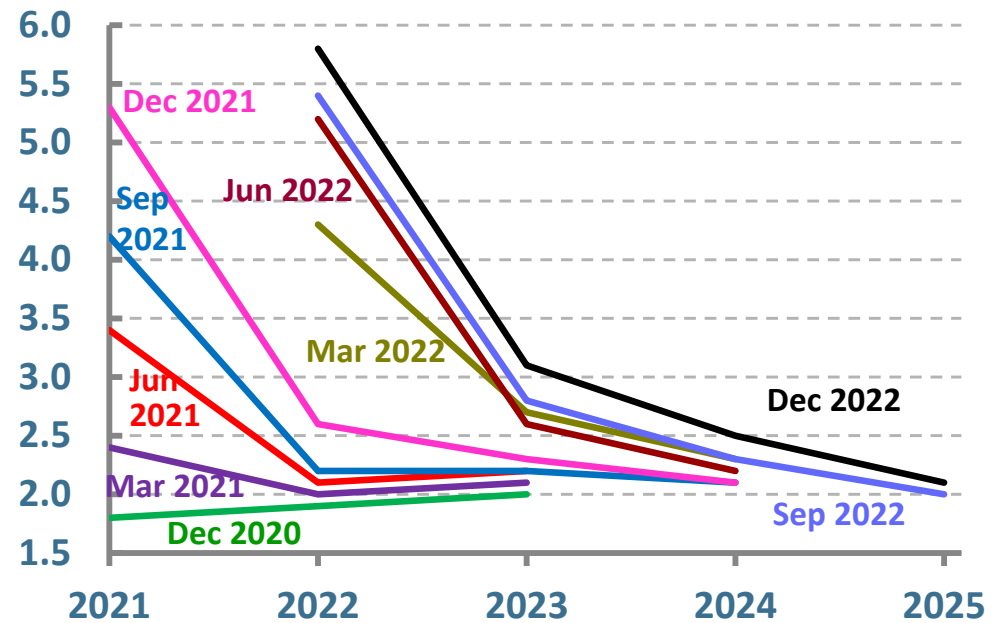
- Voltaire (1700s): “Uncertainty is an uncomfortable position, but certainty is an absurd one.”
- Alan Greenspan (1996): “... uncertainty is not just a pervasive feature of the monetary policy landscape; it is the defining characteristic of that landscape.”
- Alan Greenspan (2004): “Because monetary policy works with a lag, we need to be forward looking, taking actions to forestall imbalances that may not be visible for many months. There is no alternative to basing actions on forecasts, at least implicitly. It means that often we need to tighten or ease before the need for action is evident to the public at large, and that policy may have to reverse course from time to time as the underlying forces acting on the economy shift. This process is not easy to get right at all times, and it is often difficult to convey to the American people, whose support is essential to our mission.”

Figure 6. Model uncertainty and forecasting errors

SEP Median Longer-Run Unemployment Rate



SEP Median PCE Inflation



Source: FOMC Summary of Economic Projections
Last obs. December 2022

Figures for
Comments on “Managing Disinflations”
by Stephen G. Cecchetti, Michael E. Feroli, Peter Hooper,
Frederic S. Mishkin, and Kermit L. Schoenholtz
with Matthew Luzzetti and Justin Weidner

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*** The views expressed here are my own and not necessarily those of the Federal Reserve System or my colleagues on the Federal Open Market Committee.**