

## **Six Beliefs I Have About Inflation**

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I began my study of economics in the 1970s, when inflation was one of the dominant macroeconomic issues of the day. The ongoing struggles to tame inflation focused the mind, and they led me and many of my classmates into careers as macroeconomists. In my first job in the policy world, I spent the summer of 1978 as an intern at the Congressional Budget Office, where I was assigned the task of estimating various specifications for the Phillips curve. The goal was to better understand the forces driving inflation.

Not surprisingly, my thinking about inflation has evolved over time in response to new events and new research. What I will do here is to briefly discuss six beliefs I have about the inflation process. I hold these beliefs tentatively, and I am not entirely sure they are consistent with one another. I chose these specific propositions because they are not universally shared. It could be useful if future work either convinced me I am wrong or convinced others that I am right.

### **1. The Phillips curve is inexorable.**

When I talk with economists who are not macroeconomists, they are often surprised that the Phillips curve remains an important concept. And as a textbook author, I sometimes get the

suggestion that the whole discussion of the Phillips curve be removed from my books on the grounds that the idea is hopelessly out-of-date. By contrast, my own thinking is closer to that of George Akerlof (2002), who in his Nobel prize lecture called the Phillips curve “probably the single most important macroeconomic relationship.”

I have a hypothesis about the source of this disconnect. In the original paper by Phillips (1958) and the famous follow-up by Samuelson and Solow (1960), the Phillips curve was presented as an unconditional relationship—a negative correlation between inflation and unemployment. Some periods, most notably the 1960s, do exhibit a simple downward-sloping scatterplot of points. But that unconditional relationship is long gone. Using data for the past several decades, the scatterplot of inflation and unemployment is now a cloud of points.

My perspective, however, is that the Phillips curve is best considered a conditional relationship. If you think (as most economists do) that monetary shocks—or aggregate-demand shocks more generally—push inflation and unemployment in opposite directions in the short run, then there is a short-run Phillips curve. But this downward-sloping curve is conditional on what shock is hitting the economy. Defined in this way, it is hard to escape the Phillips curve. As far as I know, the only alternative is real-business-cycle theory and its assumption of full monetary neutrality. But my sense is that this approach has few remaining adherents. That means that the short-run Phillips curve is here to stay.

## **2. But the Phillips curve is not a very useful practical tool.**

Even though I will staunchly defend the Phillips curve as a key piece of macroeconomic theory, I am much less committed to it as a practical tool. In 1997, Alan Blinder wrote that “the

empirical Phillips curve has worked amazingly well for decades....I call this fact the ‘clean little secret’ of macroeconometrics.” I checked with Blinder via email, and he would not say the same thing today. The empirical Phillips curve, he told me, is “either dead or in hibernation.”

The empirical Phillips curve was probably not all that reliable even back in 1997. One paper that had a major influence on my thinking is a study by Staiger, Stock, and Watson (1997). They estimated that the NAIRU for 1990 was 6.2 percent, which at the time was fairly conventional. But more importantly, they estimated that the 95-percent confidence interval for the NAIRU went from 5.1 to 7.7 percent. That is a huge range. I have not seen their econometric exercise performed with more recent data. But I am willing to bet, given the breakdown of many Phillips curve equations, that the confidence interval would be even larger today.

Over the years, there have been various attempts to find measures of slack that would produce better-fitting Phillips curve equations than the unemployment rate does. People have used detrended GDP, the short-term unemployment rate, the labor share, the vacancy rate, the quit rate, and the ratio of unemployment to job vacancies. Similarly, there are various approaches to measuring expected inflation and supply shocks. A sizable group of macroeconomists are always ready to suggest a new, better specification every time existing Phillips curves go off track, which occurs all too regularly. The search for a reliable Phillips curve is like the search for the Holy Grail. It engages some of the best people around, they never reach their goal, but somehow, they are never deterred from continuing the pursuit.

The large confidence intervals for the natural rate, together with the apparent futility of this Holy Grail search, lead me to think that we should not expect much from the Phillips curve as a guide for forecasting inflation or for judging the stance of policy.

### **3. Disentangling shocks to supply and demand is nearly impossible in real time.**

The poor fit of empirical Phillips curves has an important corollary. Whenever inflation moves away from the Fed target, as it dramatically did in 2022, observers are tempted to attribute the change to a shock to aggregate supply or aggregate demand. That might provide some clue as to how transitory the change is likely to be and how much corrective action the central bank needs to take. The problem is that because we don't know the natural rate of unemployment with much precision, it is hard to disentangle supply and demand. That is true even with the benefit of hindsight, but the task is even more formidable in real time when data are preliminary and incomplete. And it is in real time that policymakers need to respond.

Making matters even more difficult is the key role of expectations. In standard theories of the Phillips curve, expected inflation leads to actual inflation. So, when a shock hits the economy, the indirect effect that works through expectations could be at least as important as the direct effect. And how expected inflation responds to a shock presumably depends on policy, or at least people's perceptions about policy.

The 2022 inflation surge is a case in point. Even now, I don't think we can say for sure what happened. The surge could have resulted from pandemic-related interruptions in supply chains. It could have resulted from excess demand, as the 3.6 percent rate unemployment rate was plausibly below the NAIRU, which may well have been altered by the pandemic experience as workers rethought their relationship with the labor market. Or it could have resulted because expectations responded to monetary and fiscal policy that was too loose for too long. Very likely, the inflation surge was a combination of all three forces, with indeterminate weights.

#### 4. Economists should escape the cult of Calvo.

As long as I am discussing inflation dynamics and the Phillips curve, I cannot help but mention one of my longstanding pet peeves: the excessive reliance on the Calvo (1983) model. To be sure, the Calvo model is an elegant theory of price setting, and I appreciate elegance as much as anyone. But the implied inflation dynamics are inconsistent with the data. The model does not generate nearly enough inflation persistence. (Mankiw 2001) Monetary shocks are widely thought to affect real economic activity with a lag and inflation with an even longer lag. But that is not the case in the Calvo model, where the inflation rate adjusts quickly. That's why people who use the model in empirical exercises typically supplement it with some *ad hoc* fixes, such as automatic indexation of some prices to past inflation. (See, e.g., Christiano, Eichenbaum, and Evans, 2005, and Smets and Wouters, 2007).

Other theories of price setting imply different and more empirically plausible dynamics because they stress different expectations. In the Calvo model, the relevant variable is the *current* expectation of *future* inflation. By contrast, in the Fischer (1977) contracting model, the relevant variable is *past* expectations of *current* inflation. The same is true in the sticky-information model that I explored with Ricardo Reis (2002). When Milton Friedman (1968) proposed the natural rate hypothesis in his AEA presidential address, he was a bit vague about the timing of expected inflation he had in mind. But his discussion seems to me to be more consistent with the timing implicit in the contracting and sticky information theories.

More speculatively, I have also wondered whether the right variable in the Phillips curve may be somewhat different from expected inflation. Maybe something more like an inflation

norm. The nominal-wage increase you expect from your employer, for example, may depend on expected inflation, but it may depend on other things as well, such as the wage increases other workers are getting. Though it is not obvious how to model norms, that seems an avenue worth exploring.

## **5. The monetary aggregates deserve more attention.**

In June 2022, inflation (as measured by the change in the CPI from a year earlier) reached 9 percent. The first economist I know of who predicted an inflation surge of this magnitude was Jeremy Siegel. I saw him interviewed on CNBC on May 14, 2021. At the time, I was worried about inflation as well, and I wrote about my concerns in the *New York Times*. (Mankiw 2021) But I never thought inflation would rise as much as it did. Siegel, it seemed to me, was being alarmist. But he turned out to be right. He made his prediction by looking at M2, which in 2021 had expanded at a rate not seen since the standard time series began in 1960.

It is fashionable these days to ignore monetary aggregates. It may be time to rethink that position. Most arguments that people make to justify ignoring these aggregates don't hold much water.

Some people point out that measuring the quantity of money is hard in a complex financial system such as ours. That is true, but as I have discussed, it is also hard to gauge how much slack there is, and that hasn't stopped people from trying to measure it to judge inflationary pressures.

Other people point out that monetary aggregates have a poor track record in forecasting inflation in recent years (at least before the pandemic surge). That's true as well. But the Phillips

curve also has a poor track record as forecasting tool (Atkeson and Ohanian 2001), and that doesn't stop people from focusing on it.

Still other people note that central bankers these days don't talk much about monetary aggregates in their policy announcements. That's also true, but perhaps they should. In any event, monetary economists should not take their lead from central bankers any more than economists studying optimal taxation should feel constrained by the rhetoric of the House Ways and Means Committee.

#### **6. A target of 2 for inflation is better than a target of 2.0.**

The last belief I want to share concerns the Fed's inflation target. There is a reasonable argument that the Fed should increase its target inflation rate to, say, 4 percent because doing so would ensure that the zero lower bound on interest rates binds less frequently. (Ball 2013) I am ambivalent about this conclusion and won't comment on that debate here. However, I feel strongly that a target of 2 percent is superior to a target of 2.0 percent.

The difference between these targets, of course, is the number of significant digits. If you recall some science class you had in high school, you likely learned that the number of digits a person reports should reflect the precision of his or her estimate. Central bankers often forget that lesson. They sometimes speak as if they are targeting an inflation rate of 2.000 percent.

It would be better if central bankers admitted to the public how imprecise their ability to control inflation is. They should not be concerned if the inflation rate falls to 1.6. That comfortably rounds up to 2. And they should be ready to declare victory in fighting inflation

when the inflation rate gets back to 2.5. As the adage goes, that is good enough for government work.

Maybe the Fed should even ditch a specific numerical target for inflation and instead offer a range. It could say, for example, that it wants to keep the inflation rate between 1 and 3. Doing so would admit that central bankers are not quite as godlike as they sometimes feign. But in the wake of the substantial and largely unexpected inflation surge of 2022, more humility among central bankers and monetary economists would seem to be in order.

## References

Akerlof, George A. "Behavioral Macroeconomics and Macroeconomic Behavior." *The American Economic Review* 92, no. 3 (2002): 411–33.

Atkeson, Andrew, and Lee E. Ohanian. "Are Phillips Curves Useful for Forecasting Inflation?" *Federal Reserve Bank of Minneapolis Quarterly Review* 25, no. 1 (Winter 2001): 2–11

Ball, Laurence M. "The Case for 4% Inflation." *Central Bank Review* 13, no. 2, (2013): 17-31.

Blinder, Alan S. "Is There a Core of Practical Macroeconomics That We Should All Believe?" *The American Economic Review* 87, no. 2 (1997): 240–43.

Calvo, Guillermo A. "Staggered Prices in a Utility-Maximizing Framework," *Journal of Monetary Economics* 12 no. 3 (1983): 383–398.



Christiano, Lawrence J., Martin Eichenbaum, and Charles L. Evans. “Nominal Rigidities and the Dynamic Effects of a Shock to Monetary Policy.” *Journal of Political Economy* 113, no. 1 (2005): 1–45.

Fischer, Stanley. “Long-Term Contracts, Rational Expectations, and the Optimal Money Supply Rule.” *Journal of Political Economy* 85, no. 1 (1977): 191–205.

Friedman, Milton. “The Role of Monetary Policy.” *The American Economic Review* 58, no. 1 (1968): 1–17.

Mankiw, N. Gregory. “The Inexorable and Mysterious Tradeoff between Inflation and Unemployment.” *The Economic Journal* 111, no. 471 (2001): C45–61.

Mankiw, N. Gregory. “The Biden Economy Risks a Speeding Ticket,” *New York Times*, Feb. 28, 2021.

Mankiw, N. Gregory, and Ricardo Reis. “Sticky Information versus Sticky Prices: A Proposal to Replace the New Keynesian Phillips Curve.” *The Quarterly Journal of Economics* 117, no. 4 (2002): 1295–1328.

Phillips, A. W. “The Relation between Unemployment and the Rate of Change of Money Wage Rates in the United Kingdom, 1861-1957.” *Economica* 25, no. 100 (1958): 283–99.

Samuelson, Paul A., and Robert M. Solow. “Analytical Aspects of Anti-Inflation Policy.” *The American Economic Review* 50, no. 2 (1960): 177–94.

Smets, Frank, and Rafael Wouters. “Shocks and Frictions in US Business Cycles: A Bayesian DSGE Approach.” *The American Economic Review* 97, no. 3 (2007): 586–606.

Staiger, Douglas O., James H. Stock, and Mark W. Watson, "How Precise Are Estimates of the Natural Rate of Unemployment?" in *Reducing Inflation: Motivation and Strategy*, C. Romer and D. Romer (Chicago: University of Chicago Press, 1997): 195-246.