The Federal Reserve's more recent adoption of flexible average inflation targeting is the latest variation on that theme. But it is far too early to judge its success.

Please notice, however, that this entire conventional story about rising inflation makes no mention of expected inflation driving actual inflation. If I may apply Laplace's famous statement, made regarding a far weightier matter, I have no need of that hypothesis.

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COMMENT BY

YURIY GORODNICHENKO The Great Inflation of the 1970s left many enduring marks on macroeconomic thinking and policy. For example, inflation expectations moved from relative obscurity to a key element for policymaking. But what determines inflation expectations? How should we measure inflation expectations? Whose expectations are important? What is the effect of inflation expectations on the economy? How can central bankers use inflation expectations for policy? Although much progress has been made to shed light on these issues, many questions remain open. Historically, there has been strong demand from the central banking community to better understand the interplay between inflation and inflation expectations.[1] But there is a new sense of urgency to get answers given the current developments in the United States and other advanced economies. Indeed, with elevated inflation and inflation expectations, some observers and commentators are concerned that we are on a path to repeat the experience of the 1970s (Irwin 2021). Reis's analysis is thus most timely and highly policy relevant.

His work makes several important contributions. First, after unearthing historical data on inflation expectations for various economic players, Reis documents that inflation expectations started to become unanchored circa 1967, which is well before the time suggested by other analyses. His timing suggests an important role of information rigidities and the credibility of the central bank. Intuitively, if we start in a low-inflation environment and a credible central bank, the public pays little attention to inflation and inflation expectations are relatively insensitive to inflationary shocks. As a result, it takes time for the public to accumulate enough observations to become concerned about inflation and raise their inflation expectations. This also means that the central bank can "spend" its credibility/inattention capital on addressing problems in the economy without igniting inflation concerns but the credibility/inattention capital gives only a temporary space for policy maneuvers. This dynamic contrasts with the credible disinflations where economic players pay attention to inflation and thus revise their (unanchored) inflation expectation quickly in response to incoming data and policy announcements. Second, building on Mankiw, Reis, and Wolfers

1. The following quotes should provide a sense of what the central banking community thinks about inflation expectations. Greenspan (1994) asserted, "I am not saying what [inflation expectations are] a function of. We know it's a very difficult issue, but that is the key variable. It's important, but just because we can't make a judgment as to what these driving forces are in an econometric sense doesn't mean that it's not real." Bernanke (2007) observed, "How should we measure inflation expectations, and how should we use that information for forecasting and controlling inflation? I certainly do not have complete answers to those questions, but I believe that they are of great practical importance. . . . Information on the price expectations of businesses—who are, after all, the price setters in the first instance . . . is particularly scarce." Yellen (2016) noted, "Perhaps most importantly, we need to know more about the manner in which inflation expectations are formed and how monetary policy influences them."

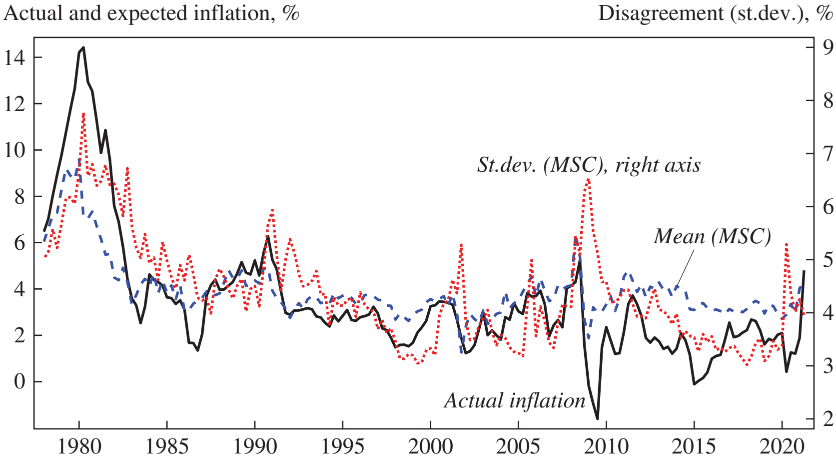
(2004), Reis proposes a useful, real-time indicator for how (un)anchored inflation expectations are. Specifically, he shows that when the right tail of the cross-sectional distribution of inflation expectations starts to increase, one may have an early warning that inflation expectations could be getting unanchored. Because disagreement is largely driven by the right tail of the distribution, one can also use disagreement as an early warning indicator. Third, Reis provides a new perspective on why the Great Inflation happened. In particular, he argues that inflation expectations were poorly understood and measured. For example, inflation expectations were reduced to ad factoring (i.e., unexplained wedges) in macroeconomic models. In a similar spirit, policymakers talked about "inflation psychology" rather than relying on proper measurement of inflation expectations. These factors exacerbated other problems such as poor measurement of output gap (Orphanides 2001), perceived inability of the Federal Reserve to control inflation (Romer and Romer 2013), and energy price hikes (Hamilton 1983) that led to high inflation. Finally, Reis draws some worrying parallels between the 1970s and the current situation.

I find Reis's insightful, detailed analysis convincing and helpful for thinking about the rise of the Great Inflation as well as current inflation developments. At the same time, I have a more positive outlook for future inflation, although obviously there is huge uncertainty in any forecast given COVID-19 vagaries. There are several reasons for why we are unlikely to have a repeat of the 1970s and currently high inflation will likely turn out to be transitory.[2]

First, it is true that households' inflation expectations are high now and there is much disagreement about future inflation. This is a source of concern because the same constellation was characteristic of the Great Inflation. However, it is not unusual to have both high mean and high disagreement (figure 1). For example, households' inflation expectations and disagreement increased significantly during the inflation scare of the early 1990s. Yet, an increase in inflation during this episode turned out to be transitory. In a similar spirit, inflation expectations and disagreement ran high in the years preceding the Great Recession but inflation did not become a chronic problem. We also observe that the inflation scare of 2011–2012 had elevated inflation expectations and disagreement but no systematically high inflation emerged. These episodes suggest that rising disagreement can be

2. To keep this discussion related to Reis's work, I will focus on inflation expectations, but there are obviously many other factors to keep in mind. For example, cost of living adjustment (COLA) clauses are not as prevalent in labor contracts now as they used to be during the Great Inflation.

Figure 1. Inflation Expectations in the Michigan Surveys of Consumers



Source: Michigan Surveys of Consumers.

Note: The figure plots time series of actual inflation (CPI, year-on-year), one-year-ahead mean expected inflation in the Michigan Surveys of Consumers, and disagreement (standard deviation) for expected inflation in the survey. Author's calculations.

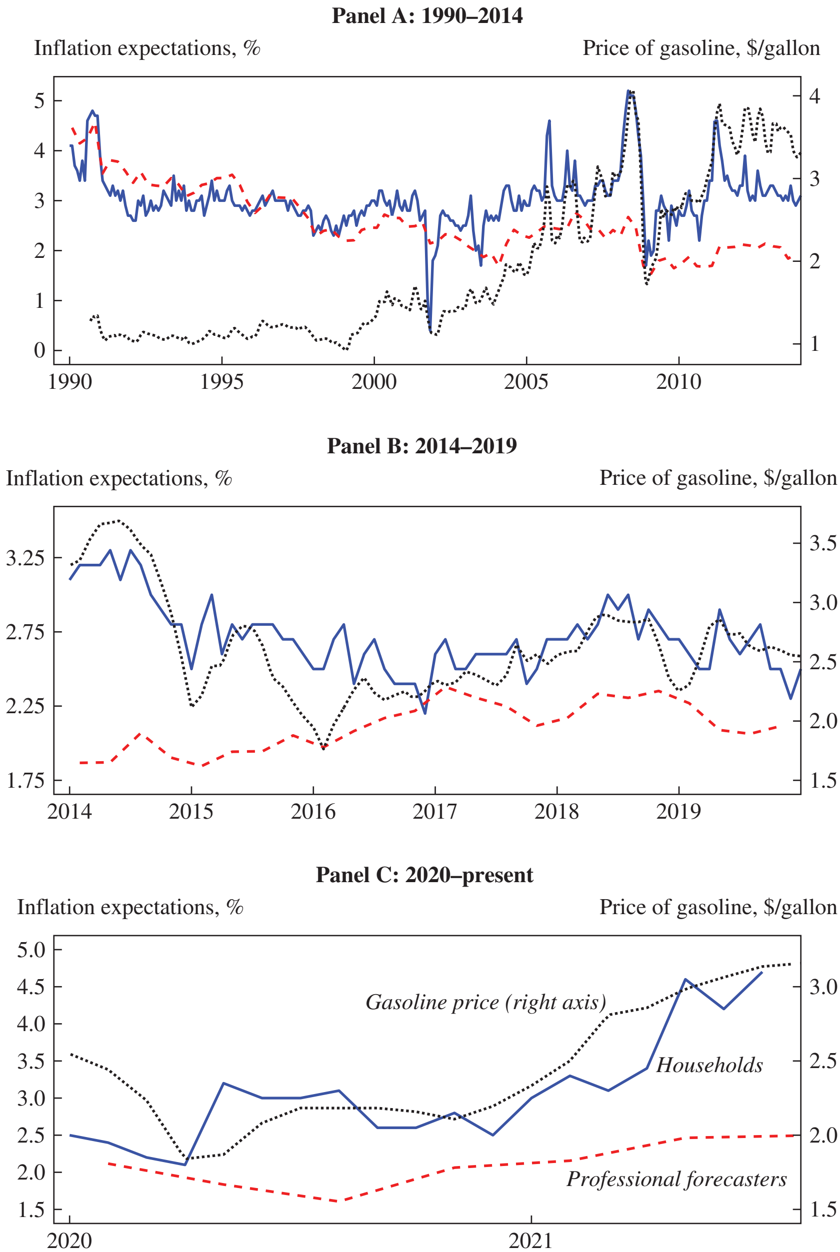
a useful leading indicator of unanchored inflation expectations and high future inflation but like any other leading indicator it can generate false alarms. Interestingly, in each of these episodes there was much talk about runaway inflation and debasing the dollar and so the inflation scares like the one we have today are rather familiar (Chan 2011).

Second, the Federal Reserve raised interest rates in the 1990s and 2000s thus possibly averting problems with inflation—and thus the alarms could appear false because of the policy response—but the Federal Reserve did not raise interest rates in 2011–2012 and this later episode is likely more informative for understanding the current environment than the 1970s. Indeed, similar to 2011–2012, the Federal Reserve has interest rates at the zero lower bound, the economy is recovering after a major crisis, there is much underemployment, and energy prices are high. On the other hand, fiscal policy appears to be more expansionary now but, at the time of the writing, it remains to be seen whether fiscal support will be withdrawn quickly as was done after the Great Recession. Importantly, inflation expectations of households stayed high well after 2011—more on this shortly—but the hike in actual inflation was short-lived. In fact, the economy struggled afterward with persistently low inflation, which is consistent with disinflationary pressures due to massive, persistent underemployment after the Great

Recession via the Phillips curve. In other words, although various shocks could have raised inflation and inflation expectations in 2011, the systematic disinflation force dominated the longer-run dynamics. Given that current employment is well below the prepandemic level (at present, the employment to population ratio is roughly at the level that was observed at the trough of the Great Recession), one may project that the same systematic force will weigh down on inflation in the coming years.

Third, inflation expectations of households are remarkably sensitive to changes in energy prices. Panel A of figure 2 shows that, since the early 1990s, households' inflation expectations track the price of gasoline closely. Note that in this relationship it is the *level* of gasoline prices rather than the *change* in gasoline price that matters for what people think about future inflation. Panel B of figure 2 illustrates that, although potentially evolving over time, this relationship applies to recent prepandemic years as well when policymakers were concerned about a possibly overheating economy. When oil prices collapsed in 2014, households revised their inflation expectations downward. Panel C focuses on the COVID-19 crisis and documents that again households' inflation expectations and the price of gasoline co-move strongly. On the other hand, professional forecasters have inflation expectations with weak sensitivity to energy prices, and they see little chance of high inflation on the horizon. Why would households—and likely firms, although there is more uncertainty here given the dearth of high-quality surveys of business executives and managers—be so reactive to the price of gasoline? One may interpret this empirical pattern as a sign of success: by delivering low, stable inflation for many years, the Federal Reserve made inflation an uninteresting subject to the general public. Consistent with this view, surveys find that the public is largely unaware of monetary policy (Binder 2017; Lamla and Vinogradov 2019; Coibion, Gorodnichenko, and Weber 2019). Instead, the public appears to use salient prices of frequently purchased, relatively homogenous goods as a shortcut for forming their inflation expectations (Coibion and Gorodnichenko 2015; Cavallo, Cruces, and Perez-Truglia 2017; D'Acunto and others 2021). In this case, inflation expectations of households could not only depart materially from the predictions of rational and well-informed agents like professional forecasters but also become more volatile and sensitive to short-term shocks that drive energy prices. For example, in 2008, energy prices shot up and household inflation expectations increased by 2 percentage points. This ignited familiar talk about the return of the 1970s. But this increase in expectations reversed itself as soon as gasoline prices fell a few months later. Hence, to the extent energy markets experience transitory difficulties

Figure 2. Inflation Expectations and the Price of Gasoline



Sources: Michigan Surveys of Consumers, https://data.sca.isr.umich.edu/tables.php; Survey of Professional Forecasters, https://www.philadelphiafed.org/surveys-and-data/real-time-data-research/survey-of-professional-forecasters; and Federal Reserve Economic Data, https://fred.stlouisfed.org/.

now, one may also predict that households' inflation expectations will abate in the future.

Fourth, the mapping from inflation expectations to actions is likely to be more nuanced than posited by mainstream models. Specifically, the standard New Keynesian framework predicts that increased inflation expectations should stimulate current consumption as households substitute intertemporally. But if current consumption increases and hence raises the cost of producing goods, inflation expectations should rise further, which in turn spurs another round of increased consumption. This spiral is particularly dangerous for an already overheated economy, thus prompting the central bank to step on the brakes at the first signs of rising future inflation. According to this account, inflation should be associated with economic booms but households have a stagflationary view of the world (Kamdar 2018): they associate high inflation with high unemployment. Consistent with this stagflationary view, randomized controlled trials (Coibion and others 2019; Coibion, Gorodnichenko, and Weber 2019) find that exogenously raised inflation expectations of households lead to less frequent purchases of durable goods. As a result, while households act on their inflation expectations, the inflation-spending spiral appears to be a weaker propagation force than thought before. Furthermore, as the economy improves, one may predict that households will revise their inflation expectations down, thus further alleviating concerns about runaway inflation.

Does this mean we can't relive the 1970s? In the famous words of Yogi Berra, "it's tough to make predictions, especially about the future," which is particularly relevant in light of COVID-19 uncertainties. But we can learn from the past mistakes and the 1970s taught us a number of lessons. Few central bankers now believe that inflation is outside their control. Measurement of inflation expectations has improved dramatically. Macroeconomic theory made great strides in incorporating and modeling inflation expectations. Of course, we do not have complete answers but we know enough to not step on the Great Inflation rake again. In my view, the main risk now is a premature withdrawal of fiscal/monetary support for the recovering economy, a mistake that inflicted unnecessary pain in the aftermath of the Great Recession (Coibion, Gorodnichenko, and Koustas 2013).

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GENERAL DISCUSSION Robert Hall commented that extending the analysis from a concern of expectations—the first moment of the conditional distribution of future inflation—to the entire distribution is a big step forward. Hall also notes that Ricardo Reis does not say anything about current inflation. Reis noted that monetary policy response to changes in expectations may make inflation persistently higher, and he was exploring whether the whole distribution is a leading indicator for changes in the inflation regime.

Olivier Blanchard noted that the emphasis on expected inflation may be excessive in the current context. A central issue is whether workers who have seen prices increase and their purchasing power eroded will want to catch up and ask for higher wages. This is quite independent of their expectations about future inflation. If they do get increases in nominal wages, which are easier to get in a tight labor market, this might start a wage price spiral, give more momentum to inflation, and make it harder to decrease later.

Laurence Meyer considered what happened in 1968–1974 and suggested that this tells us nothing about what's relevant today; rather, it's an example of bad theory and bad policy, to which Reis responded that his point in the paper is that the bad policies were partly a result of ignoring inflation expectations data, missing their drift during that time. While this may or may not be where we are currently, it is a valuable lesson still today.

Meyer wondered why Reis does not mention the Index of Common Inflation Expectations (CIE), a weighted average of market-based and survey measures, which is a better measure of inflation expectations.[1] Meyer argued that, in contrast to what Reis suggests, the data show that inflation expectations are remarkably stable, as one would expect, and that we should not pay this kind of attention to quasi-supply shocks, although he agreed that there are many possible outcomes for inflation going forward and that supply shocks make inflation expectations difficult to predict.

1. See Hie Joo Ahn and Chad Fulton, "Index of Common Inflation Expectations," FEDS Notes, September 2, 2020 (Washington: Board of Governors of the Federal Reserve System), https://www.federalreserve.gov/econres/notes/feds-notes/index-of-common-inflation-expectations-20200902.htm.