CHAPTER TWELVE

Anchoring Inflation Expectations in a Low R-star World

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First I want to thank both John Taylor and John Cochrane for inviting me to this event. I did make a bit of a trade. I said that I'd like to have invitations every year for the next ten years while I'm in New York. That gives me a good excuse to come back to Stanford and enjoy not only what is always a great conference but, of course, the amazing Stanford campus. I'm going to miss it and California very much when I'm in New York.

In his introduction, John Taylor mentioned that when I was a graduate student at Stanford, I worked on his multicountry model, which required solving a seven-country, 115-equation rational expectations model. It was very cutting-edge at the time, and it gives me some street cred with the young economists today. When we're interviewing a freshly minted PhD who says, "Oh, I'm working on a very elaborate way of solving a nonlinear model," or something like that, I say, "We were working on nonlinear models with rational expectations nearly thirty years ago." But then I mention we did it in Fortran, and some of that newfound credibility slips away.

One of the reasons the annual Hoover conference is so good is because it brings together policy makers, academics, and people in the private sector to think about the most important long-term issues. Secretary Shultz highlighted this aspect in his comments, as did John in his comments: that this is a way to get away from the

day-to-day debates about the ups and downs of the economy or the markets and really think about the fundamental issues regarding monetary and other policies. We've seen a lot of active discussion already this morning.

Before I go any further, I need to give the standard Fed disclaimer. Given my upcoming transition between jobs, this seems a particularly important time to say this: everything I say reflects my own views, not necessarily the views of the New York Fed, the San Francisco Fed, or any other Fed at all!

I will focus on a narrow question regarding monetary policy strategy. We talked about a lot of really big questions this morning and we're going to talk this afternoon about another important monetary policy question: namely, the operational framework of monetary policy. But I'm going to look at monetary policy framework in terms of its overarching strategy. And I'm going to focus even more narrowly on these questions: How do we best achieve price stability and anchor expectations in the future? What are the implications of some changes in the global economic environment that are going to make achieving those goals more challenging? And finally, what are some of the options that policy makers need to be considering in order to achieve price stability and strong anchored inflation expectations in the future?

Throughout my comments, I will be thinking of this issue in terms of a long-run monetary policy strategy or framework, not about what needs to be done at the next meeting or next year or next two years.

If you go back in time to the 1980s, when the current inflation-targeting framework and similar approaches were developed and put into place, it was in the context of very high and variable inflation across the world. The focus of those strategies was to bring inflation down and create stable, well-anchored inflation and inflation expectations. This focus was completely understandable given the context of the times.

Today, we face a very different set of issues stemming from very low levels of interest rates not only in the United States but around the globe. Crucially, these low rates are not merely a reflection of cyclical monetary policy actions but also reflect longer-term factors that affect interest rates globally.

The outline of my talk is to discuss why interest rates are so low, how I see them moving ahead in the future, what kind of challenges that brings to price stability and anchoring expectations, and, finally, what sort of policy options exist for a persistently low-rate environment.

I'll cover the past, present, and future of the neutral interest rate, often referred to as r-star. This is the neutral real interest rate, that is, the short-term real interest rate that's consistent with an economy growing at its trend rate, consistent with price stability and constant low inflation. If you asked me what the equilibrium neutral real interest rate in the United States was twenty-five years ago, I would have said something like 2 or 2½ percent. In fact, in John Taylor's famous policy rule, 2 percent is the assumed level of the neutral real interest rate.

Such estimates of the neutral rate were reasonable given historical averages over the post-World War II period through the 1990s. However, in the past twenty years or so there has been a clear downward trend in real interest rates, not only in the United States but in many advanced economies.

In thinking about the neutral interest rate, one needs to distinguish cyclical and transitory factors from structural, longer-term factors. After all, we experienced the worst recession and global financial crisis of our lifetimes, and that has been an important cause of low interest rates. But there's been a great deal of research that finds longer-term factors also play a significant role in explaining why rates have been so low.

Admittedly, there's a lot of uncertainty around estimates of the neutral rate. But if you compare today to twenty years ago, a

typical estimate of a neutral real interest rate in the United States is between 0 and 1 percent, instead of 2 to 2½ percent twenty years ago. We've seen similarly large declines in estimates of the neutral interest rate in other advanced economies as well.

Research has identified three big drivers of why real interest rates have been declining for decades. One is demographics. In general, people are living longer around the globe, which typically generates an increase in savings. Another is productivity growth, which has slowed not only in the United States but also around the world. This productivity slowdown reduces the demand for investment. Now, I'm sure there will be questions about measurement issues, but I would point to the research by my colleague John Fernald, who finds that these issues cannot explain the productivity slowdown. The third factor is the heightened demand for safe assets, a topic that was discussed this morning. This has created a wedge between yields on safe government securities or central bank reserves and yields on riskier assets like corporate bonds or equities. This pushes down yields on safe assets like the federal funds rate. These three trends have been occurring for the past couple of decades and together account for the significant decline in the neutral rate we've seen.

In summary, we have seen the neutral interest rate decline from between 2 and 2½ percent to somewhere between 0 and 1 percent. The big question is: Will we see the neutral rate rise back to levels of the past? Or is the downward trend of the past two decades going to continue because of ongoing changes related to demographics? Or is the future likely to look similar to today?

I usually quote Yogi Berra about not wanting to make forecasts, especially about the future. But in this case, although it is very difficult to see into the future, I do want to highlight a few issues that shape my thinking about the likely future course of r-star.

The first driver is demographics. Those are baked in the cake in the sense that we do have a pretty good ability to forecast demo-

graphics in terms of living longer and the slower population growth we've been seeing around the world. So, I don't see hope of a reversal in r-star coming from demographics.

In terms of productivity, that's a harder one. Experts are actively debating whether productivity growth in the last decade or fifteen years of about 1 to 1¼ percent represents a "new normal." That is, periods of 2 to 3 percent productivity growth like we saw in the late 1990s and early 2000s are the outliers. Of course, I live in a region where everyone feels the world is being reinvented every week. And that has led some commentators to predict that we're going to see this huge surge of productivity down the road. Obviously, that could be true. But so far, we haven't seen that, not at all. So far, at least, productivity trends in the United States and around the world are consistent with steady, incremental increases in productivity, not the big surge that some people are hoping for.

The third factor is the demand for safe assets. And this is the one where there is greater uncertainty about how it will go in the future. There's some evidence that the demand for safe assets may be receding a bit, but it has not gone back to historical levels.

Two other considerations also come into play in thinking about the likely future of r-star. The first is fiscal policy. A common question today is whether the recent tax cuts and the spending increases in the United States will push up the neutral rate of interest. The analysis I've seen argues that they may well boost the neutral interest rate, but by no more than a quarter percentage point or so. One reason for this relatively modest effect on r-star is that a lot of the effects of the tax cuts and the spending bill are front-loaded. If you look ahead to five to ten years from now, some key provisions expire and, as a result, the longer-term effect on r-star is muted.

The second is the effects of the changing size of central bank balance sheets. Currently, the Fed owns over $4 trillion of assets. We're in the process of normalizing, that is, reducing our balance sheet. It's going to take a few years to get to the new normal. Arguably,

purchases of assets by the Fed and other central banks boosted economic growth, raising r-star for the time being. As this stimulus is removed, this positive effect on the neutral rate will diminish and r-star may decline.

I don't pretend to have a crystal ball. R-star could move back closer to more historical levels or it could continue to trend down. My best guess is that what we're seeing today—longer-term neutral interest rate or r-star of between 0 and 1 percent—is likely to be with us for the foreseeable future.

I will now turn to some uncomfortable implications of a very low neutral interest rate. The standard argument is that, with a low neutral rate, when the next recession hits we can't lower interest rates, we can't stimulate the economy as much as we would like. And that's absolutely true. But I want to stress another aspect of a low neutral rate—the challenge it creates to anchoring inflation expectations and consistently achieving a desired inflation rate.

When the next recession happens, which will happen someday, if we start with an interest rate of, say, 3 percent, we don't have as much room to cut interest rates to stimulate the economy and get inflation back to its target level. This would be true in most advanced economies, because they are all experiencing this low neutral interest rate.

What does this mean in terms of inflation expectations and price stability? In a recent paper coauthored with my colleague, Thomas Mertens, we examined this issue. Let me give a concrete example. Say that 80 percent of the time, the Fed can hit its 2 percent goal on average, everything is good, no zero lower bound, no constraints on policy, we're okay. But then, say, 20 percent of the time, the economy falls into a recession that's severe enough that the central bank cannot achieve its goals as effectively owing to the lower bound on interest rates. As a result, there is a period of inflation below the 2 percent target. This, of course, is exactly the situation the Fed and other central banks have faced the past seven or eight years.

If you think about that, 80 percent of the time you're at 2 percent and 20 percent of the time, you're at, say, 1 percent inflation. Averaging over the two periods, inflation will be 1.8 percent over the long run. You're 2 percent when things are good, but you're at 1 percent when things are bad. There's an explicit asymmetry as a result of the lower bound. As a result, inflation expectations could become anchored at 1.8 percent, below the desired 2 percent target.

There's a secondary effect of this downward bias to inflation expectations and that is the spillover from expectations back to the present. Even in good times when the current inflation rate is 2 percent, people will still expect that future inflation will average 1.8 percent, and that will affect their decisions today, exacerbating the downward bias to inflation. In other words, you're always swimming upstream, fighting a current of too-low inflation expectations.

In fact, in our model, if the neutral interest rate is low enough, there is no equilibrium inflation rate in the model. The point is that the expectation of possible future constraints on monetary policy affects the ability to achieve the inflation target, even at times when policy is not constrained by the lower bound.

The debate about monetary policy frameworks aims to tackle these problems associated with the lower bound on interest rates. There are three main policy options in terms of thinking about long-run strategy. One is the status quo of inflation targeting, relying mostly on conventional monetary policy and accepting any resulting deterioration in macroeconomic outcomes resulting from the lower bound.

The second is to aggressively follow the same playbook that the Fed and other central banks wrote over the past decade—a combination of rapid rate cuts, large-scale QE (quantitative easing), and strong forward guidance. Some people would argue we've gotten through the last ten years reasonably well, especially given how bad the crises and recession were. In less severe recessions, this recipe may be sufficient to counter the effects of the lower bound.

The third is to think hard about how we can best achieve price stability and maximum employment even in the presence of severe downturns. And that means contemplating a somewhat different regime than inflation targeting. You can call it price-level targeting, or temporary price-level targeting in Ben Bernanke's proposal, nominal GDP-level targeting, or average inflation targeting that basically says our goal is to have inflation average 2 percent over a ten-year span.

It is easy to get caught up in the details of these various proposals—and they're important. But the critical common element of these proposals is that they are designed to attain well-anchored inflation expectations, with the anchor set at the target rate.

What is my view? Well, I gave a talk at the Shadow Open Market Committee some time ago, so I will repeat what I said there. Price-level targeting and its variants have some significant benefits over inflation targeting, especially in the context of the lower bound. For example, if you put a price-level target into a standard Taylor rule, you can potentially achieve better anchoring of inflation expectations and price stability. And this is in no way a radical departure from inflation targeting or the original Taylor rule.

I want to come back to the themes of these conferences the past several years that I've attended. These meetings have emphasized the importance of thinking about policy issues in terms of a long-run, coherent, systematic strategy. One should not think about whether price-level targeting or nominal GDP targeting or any of these alternative approaches is a way to fix a problem that we're in today or deal with a short-run situation. Instead, these are best analyzed and debated with a long-run perspective focused on how we can best achieve our policy goals.

Academics, policy makers, and others from here and around the world all have an important part to play in that discussion, sharing ideas, debating them, and comparing experiences to help

think through these issues. It's also essential to think that we're really trying to solve the same problem that the academics and the policy makers of the 1970s and '80s were addressing, which was how to anchor inflation expectations and attain price stability, both of which are essential to successful monetary policy. What is unique this time is that the problem is inflation that is too low, not too high as in the past.

The last thing that I would say is that, even if you're not convinced that the neutral interest rate is going to stay low, the question of the best policy framework is nonetheless a healthy discussion for all of us to have. We need to make sure that whatever decision we make around frameworks, whether it's at the Federal Reserve or other central banks, we've gone through this process of challenging our assumptions, looking at alternatives, thinking seriously and carefully about them, and coming to good decisions. That's one of the reasons I've advocated for the Fed and other central banks to make this a regular part of how we approach monetary policy strategy. In particular, every five years or so, we should reassess our policy framework along the lines that the Bank of Canada does. They make a very serious and productive effort to think through these issues on a regular basis and, even if the decision at the end of the day is to stay with the status quo, it's better to have gone through that very open, transparent, and accountable way to think about these issues.

GENERAL DISCUSSION

ROBERT HELLER: You talked a lot about achieving the goal of price stability, as mandated by Congress. Well, 2 percent inflation means doubling the price level every thirty-five years. How can you possibly argue that that's price stability? If you look at the beginning of the republic from 1776 until the Federal Reserve was founded, there was no overall change in the price level. And then comes 1913, the Federal Reserve starts doing its thing, and since then, there's been an explosion of prices. And you want more of an explosion of prices. That's not price stability.

JOHN WILLIAMS: I'll take that last part as a question. We obviously have thought hard about the questions, "What is price stability?" and "What is the inflation rate that's consistent with our dual mandate goals of price stability and maximum employment?" I will say, among friends, that the track record before 1913 on economic performance wasn't that great.

But I think you're absolutely right. We don't want high inflation and we don't want variable inflation. Over the last twenty years, we've had relatively low inflation, but the question is, why not lower? The discussions we've had at the FOMC led to the January 2012 statement of long-run goals and strategy, and I think it was framed exactly right. We're trying to achieve both maximum employment and price stability. We can't think of maximum employment as zero unemployment or just the economy having as many jobs as possible, because that's inconsistent with price stability. At the same time, we know that if we shoot for too low of an inflation rate, say zero or one, the concerns about the zero lower bound, deflation risks, or asymmetry of behaviors of wages and prices at very low inflation suggests that that might interfere with achieving our maximum employment mandate over the long term.

It's also a question we debated, by the way. You know, going back to the nineties, the Fed has debated: What should the inflation goal be?

The 2 percent is a compromise between these goals. I personally think it's served us well. A lower inflation rate would make the zero lower bound issues bigger. But it should be among the topics of conversation if we start to have regular reviews of monetary policy strategy.

[UNIDENTIFIED SPEAKER]: When you mentioned the primary reasons for the lower real rates, you mentioned demographics, productivity growth, and safe asset demand. One thing you didn't mention was regulation, and there's obviously a school of thought that more regulation leads to slower growth and so forth. What framework do you use to look at the regulatory impact on the natural rate?

JOHN WILLIAMS: Obviously, productivity growth is influenced by regulation, alongside other issues. Whether you have free trade, free flows of capital markets, and things like that, they all feed into the level of productivity in our economy and the growth rate of that productivity. Changes, whether in regulation or increased investment in infrastructure or education, would affect the potential growth rate of the economy and therefore boost the natural rate of interest. The best solution for this low r-star issue is not a monetary policy solution. It's about increasing the potential of our economy, it's about increasing investments across the board, whether it's in education or infrastructure. I haven't seen that happen as much as is needed to move the dial and boost the natural rate.

[UNIDENTIFIED SPEAKER]: I would love to hear your thoughts on whether you think inflation is driven more by demand factors, as one has thought about it for a long time, or is it being driven more by supply factors and areas like regulation and changes in health care or technology and so on.

JOHN WILLIAMS: I'm an economist. It's both demand and supply! That's the answer to every question in life, right? It depends on what time period you are talking about. If you asked me this question in 2009–10, when inflation was, depending on the measure, 0 to 1 percent, I would attribute that to weak demand. Unemployment was 10 percent, and it stayed very high for a long time. We also saw wage growth stall. So, for that period I would be talking about demand. And in fact, if you look at my speeches from that period, I talked about employment, employment, employment.

Today, we're in a very different situation. Unemployment's below 4 percent. As we now know, wage growth is picking up. I do think supply plays a role. Inflation's really near 2 percent, so what are we talking about all the time? We're talking about tenths and half-tenths and .03 percentage point things. But I think some of these changes, the Affordable Care Act and other government program changes from Congress over the past few years, have actually reduced prices of Medicare services, and those tend to spill over into private-sector prices. My colleagues at the San Francisco Fed, Adam Shapiro in particular, have studied this, and their research shows these changes took a couple tenths off inflation in 2016 and maybe 2017. With inflation around 2 percent and the economy around full employment, it's actually some of these special supply factors that are pushing it around more. Right now, the demand seems to be kind of keeping inflation close to 2 percent, but supply is causing some ups and downs.

SEBASTIAN EDWARDS: So—since we think about the long run—what about Ken Rogoff's view that we have to get rid of cash, and once we do that, dealing with the lower zero bound is easier? So, (a) do you think we're going in that direction? There are some countries where basically it is very hard to use currency. Finland is one case. And (b) is that going to help deal with the problem at hand, as Ken and others suggest, or are you more skeptical?

JOHN WILLIAMS: If we can get rid of currency, which has a 0 percent interest rate, then basically you could lower interest rates to minus 1, 2, 3, 4, 5 percent, or whatever was appropriate, because then there wouldn't be this alternate investment with a safe, 0 percent yield. Of course, we know from the ECB, Switzerland, and Sweden that they were able to push interest rates well below zero, even with currency. So, it's not in actual fact a zero lower bound. Despite that, I think everyone understands you can't go to minus 2 or 3 or 4 percent interest rates.

So, what's happened? I've studied what's happening with currency demand in the US and the amount of currency outstanding is growing 6 or 7 percent a year. It's not going away. In the US, a lot of it is hundreds that go outside the country. But even transactional demand is still growing in the US. It would be a really big shift for the US for currency to go away.

There are other innovative ideas. Marvin Goodfriend spoke about this in Jackson Hole, and others have thought about it: Could you create a negative return on currency held at the central bank? Some economists are thinking along those lines. But I would point to some of the research that has examined the experience with negative interest rates. Here's the way I would summarize it. Clearly, negative rates affect rates in capital markets. You see the pass-through from these negative rates into commercial paper rates and bond rates, for example. On the other hand, there seem to be some negative effects, too, in terms of profitability of banks and other parts of the financial system. So, my reading right now is that the boost to the incremental economy you get from lowering interest rates declines as interest rates get below zero.

BEAT SIEGENTHALER: I work for UBS, and in the market we always love a good conspiracy theory. You told us that the price-level targeting discussion was really a long-term discussion, nothing to do with the current situation. But in the market, people would

say, "Well, it is also a very convenient cover right now to accept higher inflation." So, if we go above the 2 percent target, then you could say, "Well, of course, that's because we have a symmetric target and we have undershot for so long." But where would be the limit for inflation? And could the symmetry of the target and the long undershot be a reason to accept a significantly higher inflation in the current situation or more immediate future? Thank you.

JOHN WILLIAMS: I'm going to break that into a couple of pieces. And remember what I said in the beginning, that I'm going to express my own views, and not necessarily those of other people in the Federal Reserve System.

The first, with the symmetric goal, I'm just going to do basic statistics. If you have a 2 percent goal, and you're managing that goal well, you're spending roughly half the time above, half the time below, hopefully, being in the vicinity. And I think that's how I interpret my view of where the economy is, the forecasts that we put out in March and our FOMC statements. It's about an expectation that inflation will be around 2 percent, maybe a little bit above, a little bit below, but averaging roughly around 2 percent.

I started talking about the monetary policy framework question publicly about a year ago, when this was not an active policy issue. Inflation was coming back, we were normalizing monetary policy, this is not a backdoor way to do price-level targeting. I don't think that's a good way to think about this. When you think about frameworks and strategies, you do this in terms of a commitment to a longer-term, consistent, coherent strategy and not as part of an opportunistic effort to achieve some shorter-term goal. And that's the way I think about it. You know, Fed time is not weeks or months. I'm not predicting things, but we'll discuss this over a long period of time. I expect that to happen in other countries so that, like our 2012 decision, we'll have

thought it through, heard all of the different views, and then come to a decision.

Our framework today is inflation targeting. It's a framework that says we want to get inflation back to 2 percent and keep it near that.