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**Monetary Policy in a Low-Inflation Environment:  
Developing a State-Contingent Price-Level Target**

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FEDERAL RESERVE BANK OF CHICAGO

The views expressed today are my own and not necessarily  
Those of the Federal Reserve System or the FOMC.

# Monetary Policy in a Low-Inflation Environment: Developing a State-Contingent Price-Level Target

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## Introductory Remarks

I would like to thank Eric Rosengren, Jeff Fuhrer and the organizers for giving me the opportunity to speak on this panel today. I would like to use this opportunity to expand the discussion about additional communications tools available to central banks in a low-inflation environment. In a nutshell, I think there are special circumstances when price-level targeting would be a helpful complement to our current and prospective strategies in the U.S. Clearly communicating an expected path for prices would help guide the public's understanding of the Fed's intentions while we carry a large balance sheet and promise continued low interest rates for an extended period.

There are quite a number of academic studies of liquidity trap crises that find either price-level targeting or temporary above-average inflation to be nearly optimal policies;<sup>1</sup> and yet, central bankers and the public generally loathe the idea that even a temporarily higher inflation rate could be beneficial or be consistent with price stability over the longer term.

Nevertheless, with potentially beneficial policies so well grounded in rigorous economic analysis, I cannot stare at our current projections for high unemployment and low inflation and think that these projections are consistent with the best monetary policies to address the Fed's dual mandate responsibilities. Today, I want to expand the discussion of these tools. After all, debate on the merits is healthy.

Of course, these are my views only and not those of my colleagues on the Federal Open Market Committee (FOMC) or in the Federal Reserve System.

## Rationale: Much More Accommodation Is Appropriate

Let me be very clear about the setting for this proposal. In my opinion, much more policy accommodation is appropriate today. In a speech two weeks ago,<sup>2</sup> I stated that I believe the U.S. economy is best described as being in a bona fide liquidity trap. This belief is not a new development for me; instead, it is a dawning realization. Risk-free short-term interest rates are essentially zero. Both households and businesses have an excess of savings relative to the new investment demands for these funds. With nominal interest rates at zero, market clearing at lower real interest rates is stymied.

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<sup>1</sup> An essential reference list would begin with Krugman (1998), Eggertsson and Woodford (2003), Svensson (2003), and Auerbach and Obstfeld (2005).

<sup>2</sup> Evans (2010). See also my interview with *The Wall Street Journal* in Hilsenrath (2010).

In this setting, even a moderate expansion without a double dip will not lead to appropriate labor market improvement.<sup>3</sup> Accordingly, highly plausible projections are 1 percent for core Personal Consumption Expenditure Price Index (PCE) inflation at the end of 2012 and 8 percent for the unemployment rate. For me, the Fed's dual mandate misses are too large to shrug off, and there is currently no policy conflict between improving employment and inflation outcomes. The economic theories that central bankers rely on for evaluating appropriate monetary policy suggest to me that we need lower short-term real interest rates than the current real federal funds rate of -1 percent. Indeed, if the federal funds rate were positive, I would advocate substantial nominal reductions. But we are effectively at zero.

A variety of typical linear Taylor rules suggests around -4 percent. In addition, some calculations for optimal monetary policy simulations I have seen indicate that real rates of -3 or -4 percent between now and the end of 2012 would boost aggregate demand enough to deliver substantially lower unemployment by the end of 2012. If you reach the conclusion that we are in a liquidity trap, or even near a perilous liquidity trap, more accommodation is not data-dependent or a close call.

### **How Does Price-level Targeting Help with Policy Communications?**

If the Federal Reserve decided to increase the degree of policy accommodation today, two avenues could be: 1) additional large-scale asset purchases, and 2) a communication that policy rates will remain at zero for longer than "an extended period." A third and complementary policy tool would be to announce that, given the current liquidity trap conditions, monetary policy would seek to target a path for the price level. Simply stated, a price-level target is a path for the price level that the central bank should strive to hit within a reasonable period of time. For example, if the slope of the price path, which I will refer to as  $P^*$ , is 2 percent and inflation has been underrunning the path for some time, monetary policy would strive to catch up to the path: Inflation would be higher than 2 percent for a time until the path was reattained. I refer to this as a state-contingent policy because the price-level targeting regime is only intended for the duration of the liquidity trap episode. I will be more concrete in just a moment, but first, where does such a policy come from?

A policy that targets a price-level objective emerges from analyzing standard—modern macroeconomic theory. The desirable properties of the price-level target (or temporarily above-average inflation) become most apparent in analyses that consider liquidity traps.

Figure 1 displays the simplest example of a price path  $P^*$  and its essential attributes. The reader must judge for herself whether this policy could be communicated straightforwardly and transparently to the public; my personal viewpoint is that it is horribly cynical to think that good communication is beyond our ability, especially if that is the best policy. Here are some key elements:

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<sup>3</sup> In the speech cited earlier, I also discussed the relevant evidence on job mismatch and the Beveridge curve. I find unconvincing the argument that the natural rate of unemployment has risen enough to deter additional substantial policy accommodation.

- The first policy component consists of announcing a state-contingent entry into the  $P^*$  policy. I think most of us imagine liquidity traps with double-digit unemployment rates to be relatively rare events, on the order of twice a century or less. Under such circumstances where the central bank is missing both components of its dual mandate by a large margin, there is justification for targeting a higher price-level path in an effective, disciplined, and limited fashion. A credible announcement of the policy is clearly crucial for stimulating the correct expectations by the public.
- The second policy component is to select the parameters for the price-level path: the initial date when the index-path begins and the slope of the path. Given the recognition delay in understanding the implications of the liquidity trap, it seems reasonable that the path would begin at some date in the past. My preference would be to select December 2007, in part because it is the National Bureau of Economic Research (NBER) peak of the business cycle. With regard to the slope, for the sake of concreteness, I will illustratively suggest 2 percent for the average inflation rate; this rate corresponds to the mode of FOMC participants' forecast endpoints for PCE inflation.<sup>4</sup> With this definition of the  $P^*$  path, it is easy to see an emerging "inflation deficit" to date.
- The third policy component is to communicate regularly and often to the public that the intention of the FOMC's policy actions is to achieve this path within a reasonable period of time. At a minimal level, this could simply be a disciplined guarantee regarding how long policy rates will be held at zero; it is an elaboration of what the current "extended period" language means. Other accommodative policies could be used to further build the public's confidence that the Fed is pursuing this price-level path. The task of communicating many operational details would follow the announcement. Indeed, even before reaching the  $P^*$  path, closing the gap would set the stage eventually for adjustments in operational policy, such as altering the size of the Fed's balance sheet, taking reserve-draining actions along the way, and increasing the rate of interest on excess reserves (IOER), among others.
- The fourth policy component is to clearly state the terms for the final, state-contingent exit from the  $P^*$  policy. Determining that the price-level path has been achieved with confidence is a critical determination. Presumably, spending a few months at the price-level path would be more important than simply the first achievement of the path. Once the price-level path is achieved with confidence, the forward-looking monetary policy strategy would return to focusing on 2 percent inflation over the medium term. Future policy misses on either side of 2 percent would be "bygones." Policy would continue to strive for price stability over the medium term, which would be 2 percent PCE

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<sup>4</sup> For the remainder of my comments, I will take 2 percent to be the FOMC's explicit inflation objective over the medium term. This is not a decision that has been taken by the FOMC. I simply use 2 percent to facilitate the development of my comments.

inflation. The past inflation misses would be used to simply inform current analyses of inflation pressures and improve future projections and policy responses.

### **What Might the Experience with P\* Look Like? Some Favorable Cases**

Let me spend some time discussing alternative outcomes from this state-contingent price-level targeting regime. Remember, the regime is one where policy actions like large scale assets purchases (LSAPs), communications actions, etc., strive to increase monetary accommodation to hit the P\* path within a reasonable period of time. Figure 2 shows the implied inflation rates for a 2 percent P\* path where the current price gap is closed by the end of 2012. Given current forecasts for inflation, this would be a rapid turnaround in the inflation picture. Many questions regarding operational responses during this adjustment would need to be addressed:

- The inflation rates are relatively modest: 2.2 percent core inflation in 2011 and 2.9 percent in 2012. For a policymaker with a symmetric loss function around 2 percent, 2.9 percent is about the same loss as 1 percent. This is not a significant change from current expectations of policy losses. Of course, ensuring commitment to the policy exit is presumably crucial for achieving 2 percent in 2013.
- If short-term interest rates remain near zero during this adjustment, real interest rates would be between -2 and -3 percent. Perhaps that would be enough to improve labor markets and aggregate demand sufficiently, but I personally put more faith in analyses that suggest the liquidity trap is larger than this.
- Consequently, in this scenario at the end of 2012, if resource slack remains substantial and inflationary pressures are returning toward 2 percent over the medium term on account of credible policy commitment, then a standard Taylor-rule prescription may still call for a relatively low federal funds rate. And the size and composition of the Fed's balance sheet might also be consistent with accommodation. How much? The ultimate decisions for monetary policy would continue to focus on our dual mandate responsibilities; but inflation would be nearer our goal of price stability and aggregate demand would be stronger.

As I mentioned, a 2 percent P\* policy that achieves the target path by the end of 2012 might leave unemployment still relatively high given the implied real rates. Figure 3 displays a more aggressive P\* policy that is assumed to close by the end of 2013. This path rises at a 3 percent rate from December 2007 until December 2012, and then reverts to the 2 percent slope, taken as price stability. This path incorporates what Svensson (2003) refers to as an initial "price gap to undo." It allows the eventual price adjustment to incorporate a lower real rate if that is what the economic analysis suggests is most useful to increase aggregate demand. Over the course of this hypothetical adjustment, inflation is about 3, 4, and 3 percent from 2011 through 2013. Thus, policy can generate -3 and -4 percent real rates: This achieves a substantially

higher opportunity cost of holding on to cash-like assets rather than lending and investing excess reserves in productive activities and workforces.

Again, credible commitment to the price path  $P^*$  is, of course, critical to achieving the inflation endpoint of 2 percent over the medium term. In this regard, a reduction in the size of the Fed's dual mandate shortfalls would reinforce the public's perception that the Fed's incentives are appropriately aligned with exiting the  $P^*$  policy with medium-term price-stability in sight.

### **What Might the Experience with $P^*$ Look Like? Some More Challenging Cases**

There are many operational aspects of a  $P^*$  policy that require much more elaboration and study. Nevertheless, let me mention three clear situations that require more complicated responses. It is a hallmark of the uncertain times that we face that these are at polar extremes.

#### *Delayed inflation*

The first challenge is to imagine that inflation continues to remain very low even after an announcement that monetary policy is following a price-level path. As inflation delay continues, the "inflation deficit" account builds. That is, the price gap gets larger, and implied future inflation to attain the  $P^*$  path grows. This would clearly be nerve-wracking for policymakers, and the credibility of our commitment to ever growing inflation rates would be crucial for the success of the policy. If our resolve is credible, well-functioning financial markets should get the message. After all, investors and lenders sitting on cash-like assets would be building up an exposure to adverse future real interest rates. And I would expect the financial press to help communicate these investment risks on a regular basis. (I know I've felt that sting already.)

As cash moves out of investment portfolios into the general economy, inflation will rise as required by the price-level targeting policy.

#### *Smaller resource slack and greater inflation pressures*

The second challenge is to imagine that the degree of resource slack in the economy is much smaller than many presume. One example would be if the structural rate of unemployment was upward of 8 percent. In this case, more accommodation could lead to higher inflation and a rapid closing of the price gap.

As it turns out, this is not a challenge for the  $P^*$  policy: A quicker closing of the price gap harkens the exit of the state-contingent price-level policy. The fact that unemployment would remain high would be a signal that increasing aggregate demand alone is not enough to address this problem. But monetary policy would have succeeded in moving closer to price stability with the attending benefits from achieving that policy goal. Confidently switching to the post- $P^*$  policy would enhance credibility for price stability over the medium term. And we would have done all that we could to address the employment situation—which would also enhance Fed credibility, in my judgment.

### *Accelerating inflation once the price gap has been closed*

The third challenge would be if inflation was surprisingly high at the point when the price gap was eliminated and policy reverted to targeting 2 percent inflation over the medium term. I regard this case as extremely unlikely. Recall that we are embarking on this price-level targeting policy in an environment of huge resource gaps, with minimal inflationary pressures. (I actually think that the greater difficulty will be getting inflation going in the first place.) But in the unlikely occurrence that inflation accelerates beyond the levels we anticipate, we have the tools to deal with it. Specifically, relative to initial baseline scenarios, the Fed could more aggressively increase the federal funds rate and interest on excess reserves (IOER), as well as drain liquidity from our balance sheet. Furthermore, any higher inflation would almost surely be associated with stronger economic growth and job creation, so these stronger “exit strategy” actions would be entirely appropriate.

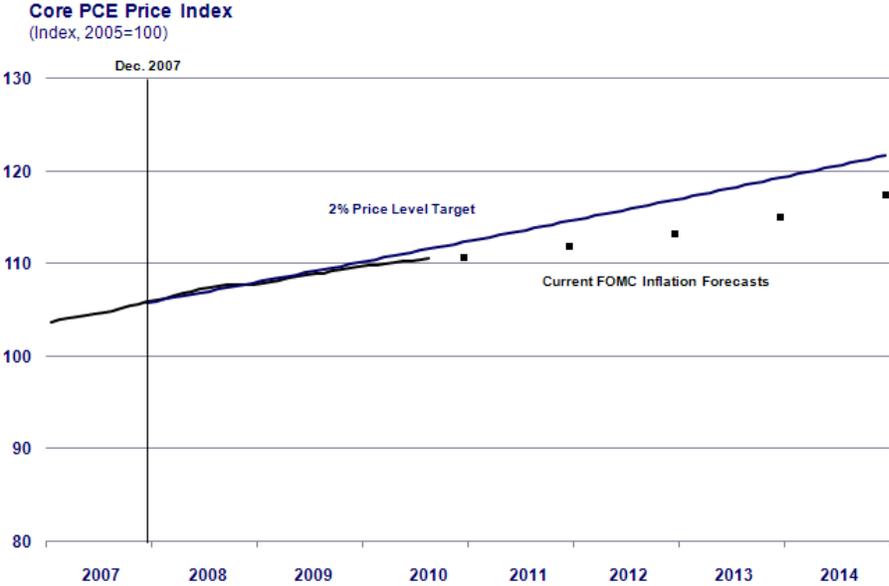
### **Concluding Remarks**

My objective today has been a simple one: to discuss a policy tool that has received almost zero discussion, though it regularly comes out of careful analyses of mainstream economic models that we use to assess monetary policy options. We should put this policy tool on the table and debate its suitability to the current situation in the U.S.

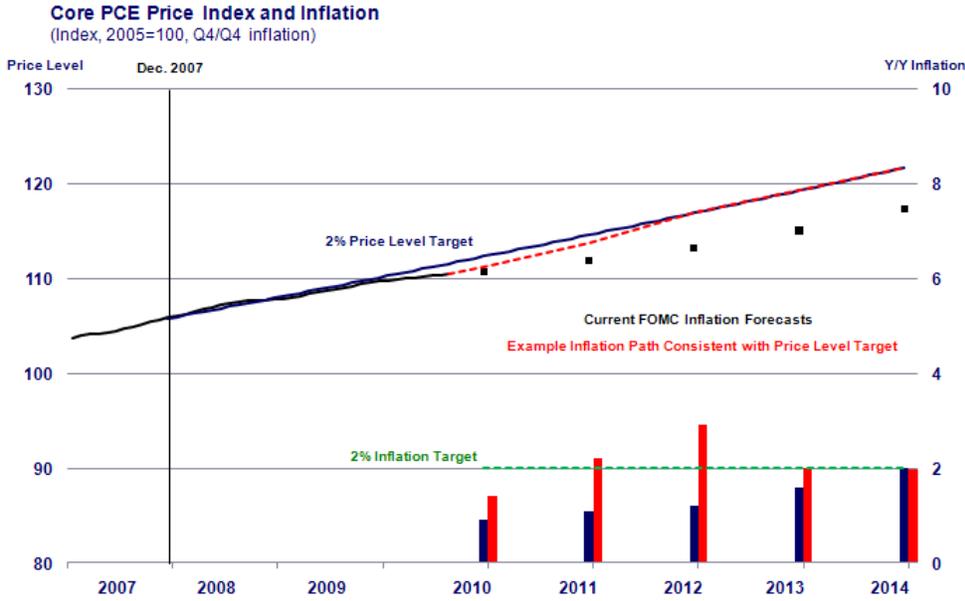
Most critiques I have heard of this type of policy tool involve the risk of runaway inflation expectations or the loss of hard-earned credibility. My response is to continually fall back on the discipline of the state-contingent exit plan. A central bank exercising this policy would have to credibly convey to the public that this policy will end when the price gap is closed. An important risk would be the temptation to keep policy easy if the labor market has not reached the vicinity of full employment. Depending on the parameters of the  $P^*$  path, inflation expectations and the size of resource slack, the price gap could close before unemployment is reduced toward 6 percent or lower. Nevertheless, credibility requires exiting the  $P^*$  policy at this point. Doing so ensures that this is a conservative policy, with prudent risk-mitigants against outcomes that monetary policy is unable to improve upon.

But I am more hopeful for this policy's potential to improve upon our current liquidity trap economic conditions. I hope that my comments have helped expand the debate over the past few weeks.

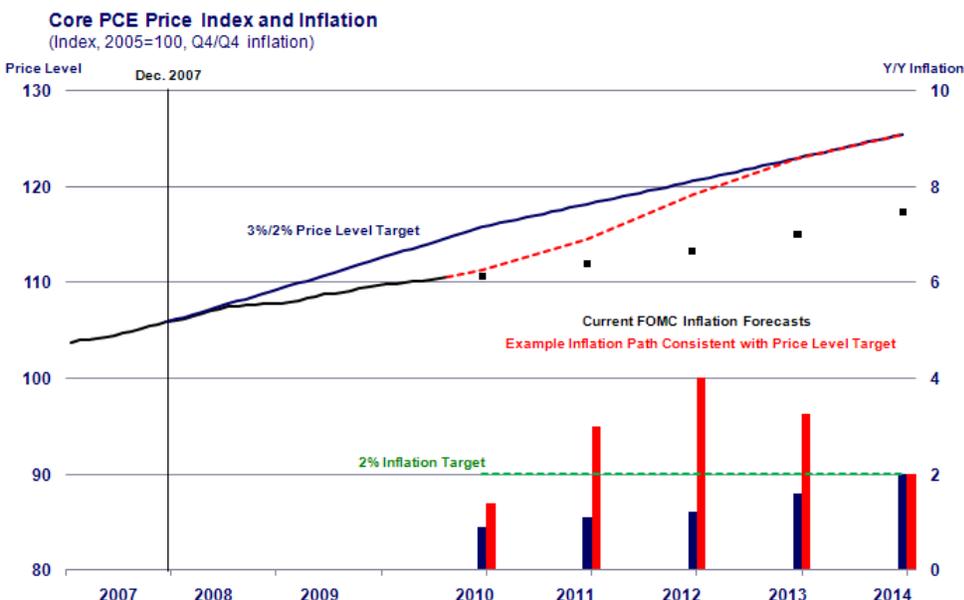
# Figure 1: Price Stability



# Figure 2: State-contingent Price Level Targeting



## Figure 3: A “Catch-up” Policy



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