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## **Connecting the Dots on Monetary Policy**

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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.

## Connecting the Dots on Monetary Policy

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### Introduction

Good afternoon and thank you. Before I begin my remarks today, I should note that my comments reflect my own views and do not necessarily represent those of my colleagues on the Federal Open Market Committee (FOMC) or within the Federal Reserve System.

For me, the start of each new year marks a time for contemplating the past and for looking forward to the future. As many of you likely do, I begin each year optimistically, resolving to do things better, such as exercising more and eating more healthily. But as the months pass, I generally get sidetracked, despite the best of intentions. Of course, this is the year it will be different.

Recently, when I was putting together my forecast for the economy, I was struck by the realization that in each of the past six years I began with an optimistic view of how fast the economy was going to grow — only to be disappointed with the numbers coming in below my projections. To be candid, my batting average has been similar to my forecasts for exercise and healthy eating. For example, as 2015 began, I was expecting growth for the year to be in the range of 2-1/2 to 3 percent. Instead, it looks like real gross domestic product (GDP) rose roughly 2 percent. As errors go, this isn't a particularly big one. But it is a noticeable one, and continues a string of downside misses that, frankly, has been getting tiresome.

So what about this year? Well, I've scaled things back a bit, and anticipate the economy will grow in the range of 2 to 2-1/2 percent in 2016. So, close to or a bit better than this past year. I also expect the unemployment rate to come down a couple of tenths and end the year at about 4-3/4 percent.

The central point underlying my forecast is that the fundamentals for most components of domestic spending are good. Most importantly, we've seen a substantial improvement in labor markets over the past several years. The unemployment rate is currently 5.0 percent; that's down from its high of 10.0 percent in late 2009. Let me put this into context: One of the two goals for Federal Reserve policy mandated by Congress is to help the economy achieve maximum employment. Along with most of my colleagues on the Federal Open Market Committee, I judge that maximum employment is consistent with an unemployment rate that averages a little under 5 percent over the longer run. Now a few other labor market indicators — such as the large number of people who are employed part time but who would prefer a full-time job and subdued wage growth — suggest there remains some additional resource slack beyond what is indicated by the unemployment rate alone. So I don't think we have quite met our employment mandate. But we certainly have made great progress toward meeting that goal.

Healthy labor markets portend continued job gains, growth in households' income, and buoyant consumer confidence. These developments, along with low energy prices and some further increases in household wealth, should support fairly solid gains in consumer spending. Furthermore, as I'll talk about more in a minute, my forecast also assumes interest rates will stay quite low for some time. This should help bolster consumer spending — for example, low borrowing rates helped push new motor vehicle sales in 2015 to near-record levels. Healthy labor markets and low interest rates will also help housing markets. Indeed, although new home building still remains below what would be considered normal, growth in residential investment has picked up over the past couple of quarters. Another plus for domestic spending is that the recent budget deal should mean we'll see a modest increase in federal spending this year.

Developments abroad, however, are offsetting the positive momentum in domestic fundamentals to some degree. The slow-down in global economic growth — notably in emerging markets — and uncertainty about future prospects have contributed to a rising dollar and declining commodity prices over the past two years. As a result, U.S. manufacturers and agricultural producers that sell their products in global markets face challenges — as do oil, gas and mining companies and their suppliers. That said, if foreign growth prospects and the dollar stabilize, as most expect, these headwinds on domestic growth should dissipate. Still, we should not expect the international sector to be an engine for U.S. growth for some time.

### **My Growth Forecast in Context**

Now, by historical standards, GDP growth in the range of 2 to 2-1/2 percent doesn't seem particularly optimistic. It's in line with the average annualized growth rate of 2.2 percent since the end of the Great Recession. By comparison, GDP growth averaged closer to an annual rate of 3.5 percent over the previous three expansions. What's going on?

Of course, the financial crisis and the ensuing Great Recession had far-reaching negative effects. And even though we've come a long way in healing those wounds, some related headwinds still remain and will take some time to dissipate. But other factors could also be in play that mean lower long-run growth may be a troubling feature of the U.S. economy even after the effects of Great Recession are behind us. Broadly speaking, an economy's long-run growth potential depends upon increases in its productive resources and the technological improvements that enable those resources to produce more. One important productive resource is labor. Here, demographic trends are working against us. The U.S. Census Bureau projects that the population aged 16 and over will grow a little less than 1 percent per year for the rest of this decade; this is lower than what we experienced during the late 1990s, when average annual growth of the adult population was 1.3 percent.

Moreover, our population is greying. Over the next 10 years, the share of the population that is 65 or older is expected to increase about 4 percentage points from 15 to 19 percent.

This aging of the population and other long-running trends have been bringing down the fraction of the population that is actually in the labor force since about 2000. The labor force participation rate has also likely been pushed somewhat lower by what was, for many years, a poor labor market.<sup>1</sup> However, the labor force participation rate dropped approximately 2-1/2 percentage points even as labor market conditions began to improve. And estimates suggest the decline will continue, reducing the growth of available workers in the long run by 0.3 percentage points per year.<sup>2</sup> Slower growth in available workers translates into less potential output growth.

As I just mentioned, economic growth over the longer run also depends upon technological progress. Unfortunately, we can't measure technological progress directly. Instead, it is inferred as a residual only after accounting for other tangible reasons for growth in a measure that is referred to as total factor productivity (TFP). By its very nature, TFP is not measured precisely, and it's difficult to discern its underlying trends. Nonetheless, there have been noticeable shifts in estimated TFP growth in the past several decades. From the early 1970s to the mid-1990s, the growth rate of TFP slowed down from its post-World War II highs. With the advances in information technology and their widespread adoption, we experienced a surge in TFP growth from the mid-1990s to the mid-2000s. Since then, however, TFP growth has reverted to its pre-1994 pace.<sup>3</sup> Moreover, there is concern among many analysts that it may now be persistently lower than in the past. If this weaker TFP growth proves to be the new normal, potential economic growth would decline in tandem.

Whether these factors that hold down the potential growth rate of the economy are temporary or more permanent is a matter of considerable debate. But if you come down on the side that these are quite persistent developments, then you must conclude that we face a lower potential growth rate today than we did in previous post- World War II expansions.

This assessment is reflected to some degree in the economic projections of FOMC participants. Four times a year, the FOMC releases its Summary of Economic Projections (SEP), which gives FOMC participants' forecasts of key economic variables over the next three years and for the longer run.<sup>4</sup> As recently as January 2012, FOMC participants assessed the long-run potential growth rate of the economy to be in the 2-1/4 to 3 percent range.<sup>5</sup> Today, the median participant believes that longer-run real GDP growth is only 2.0 percent. Even the most optimistic of my colleagues places this number only slightly higher at 2.3 percent.

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<sup>1</sup> The labor force participation rate dropped 1 percentage point while the unemployment rate escalated during the downturn.

<sup>2</sup> This projection contrasts with what happened during the late 1990s, when increasing labor force participation was raising available labor supply by 0.1 to 0.2 percent per year.

<sup>3</sup> For example, Congressional Budget Office (2015) and Fernald (2014) provide estimates of TFP growth and discuss the changes that have taken place in the past.

<sup>4</sup> For the most recent summary, see Federal Open Market Committee (2015b).

<sup>5</sup> See Federal Open Market Committee (2012).

When measured against these benchmarks, my forecast of GDP rising in the range of 2 to 2-1/2 percent in 2016 doesn't look so bad. It's simply saying that the economy will expand near its longer-run productive capabilities. This number may be disappointing — we would certainly like stronger sustainable growth — but there is nothing much that monetary policy can do about working-age population growth, labor force participation trends, and technical progress. These trend estimates are the benchmarks we must take as given when deciding how to set monetary policy.

### **Lower Potential Growth, Lower Equilibrium Interest Rates**

That is not to say, however, that these benchmarks do not influence policy. Importantly, lower potential output growth implies lower returns to investment. As a result, the equilibrium real interest rates, which are consistent with fully employed resources, are lower in an economy with lower potential output growth. And, of course, lower real rates imply lower nominal rates even when inflation is at its target. So, the equilibrium federal funds rate, which is associated with a neutral monetary policy — policy that is neither expansionary nor contractionary — is lower in an economy with a lower potential output growth. Therefore, the FOMC must take estimates of potential output growth into account when calibrating the stance of monetary policy.

Of course, there are other reasons why equilibrium interest rates are likely lower than they were before the crisis. For example, former Fed Chair Ben Bernanke has discussed frequently the global savings glut. As the world population has aged and as residents of fast-growing emerging economies have grown wealthier, the saving rate in most countries has increased. This has resulted in a larger pool of funds seeking safe, profitable opportunities for investment. However, domestic investment opportunities in most of these countries have not kept pace with the increased saving rates. This higher supply of investable funds relative to domestic demand has driven down interest rates worldwide. In addition, former Treasury Secretary Lawrence Summers has expanded on these influences, speculating that soft aggregate demand worldwide has discouraged structural investment and capital stock growth — his view of the “secular stagnation” hypothesis. These two ideas are closely related.

All of these factors imply that the federal funds rate consistent with a neutral stance for monetary policy may be lower than we used to think. How big might these changes be? Well, in December, FOMC participants' projections for the longer-run nominal federal funds rate were in the range of 3 to 4 percent, with the median projection at 3.5 percent.<sup>6</sup> Three years ago, when forecasts of potential growth were higher, the Committee was projecting the long-run funds rate would be in the range of 3-1/4 to 4-1/2 percent — about 50 basis points higher than today's estimates.<sup>7</sup>

### **What Is Next for Monetary Policy?**

So we are likely headed toward a lower resting point for the federal funds rate than before. What is the path to that level likely to look like over the next several years?

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<sup>6</sup> Federal Open Market Committee (2015b).

<sup>7</sup> Federal Open Market Committee (2012).

As I'm sure you are aware, in December the FOMC voted to increase the target range for the federal funds rate by 25 basis points to 1/4 to 1/2 percent. It was the first time since June 2006 that the FOMC has raised its policy rate. As Chair Janet Yellen explained during her press conference after the meeting, "With the economy performing well and expected to continue to do so, the Committee judged that a modest increase in the federal funds rate target is now appropriate, recognizing that even after this increase monetary policy remains accommodative."<sup>8</sup>

Yellen's words underscore the intention for the stance of monetary policy to remain accommodative for some time, and the Committee's latest statement anticipates making gradual adjustments during policy normalization.<sup>9</sup> But, if we are near our employment mandate and the prospects for growth look solid, why are we expecting to take this gradual approach? What is different during this tightening cycle?

One issue is that the equilibrium, or the neutral, federal funds rate can move over the business cycle for a variety of reasons, and can be either above or below its long-run level. Currently, we think some remaining fallout from the financial crisis and international headwinds mean that the neutral level of the federal funds rate today is even lower than it will be in the long run. By some estimates, the equilibrium inflation-adjusted rate is currently near zero. This rate should rise gradually as the headwinds fade over time. But until they do, monetary policy rates must be even lower than they otherwise would be to provide adequate accommodation for economic growth.

### **Persistently Low Inflation**

But that is only part of the answer to why monetary policy rates are below long-run neutral levels. The other part is that we have yet to achieve our inflation goal. We need to pursue a sufficiently accommodative monetary policy if we are to achieve the inflation goal over the medium term.

Thus far, my remarks have focused on only one aspect of our policy goals: full employment. But monetary policy has another objective: The other goal Congress has set for us is the achievement of price stability. The FOMC interprets this objective to mean that inflation should average 2 percent over the medium term as measured by the Price Index for Personal Consumption Expenditures (PCE).

We have not done well relative to this objective. Over the past eight years, PCE inflation has averaged 1.5 percent, with the latest reading at just 0.4 percent. We often look at core inflation, which strips out the volatile food and energy components, as a good indicator of where total inflation is likely to be headed over the next year or so. Well, core inflation has been just 1.3 percent over the past 12 months.

Overall inflation is being held down in part by lower energy prices. The higher dollar is also weighing on both total inflation and core inflation. I expect these effects to dissipate as we move through the year. Further improvements in labor markets and growth in

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<sup>8</sup> Yellen (2015).

<sup>9</sup> Federal Open Market Committee (2015a).

economic activity should also boost inflation. And so I see inflation moving up gradually to approach our 2 percent inflation target within the next three years.

However, there are some downside risks to this forecast. We might see further declines in energy prices or greater appreciation of the dollar. In addition, undershooting our 2 percent inflation target for as long as we have invites the risk of the public beginning to expect persistently low inflation in the future. If this mindset becomes embedded in decisions regarding wages and prices, then getting inflation back to 2 percent will be that much more difficult. Here, I find it troubling that the compensation for prospective inflation built into a number of financial market asset prices has drifted down considerably over the past two years. More recently, some survey-based measures of inflation expectations, which had previously seemed unmovable, have also edged down. So to achieve our inflation target — and to provide a buffer against downside risks — it is appropriate that we follow a gradual path to policy normalization.

What is the gradual path that FOMC participants anticipate? Here is the well-known “dot plot,” which shows FOMC participants’ views of the appropriate target federal funds rate at the end of each of the next three years and in the longer run. Each participant’s fed funds rate forecast is shown as a distinct dot at each of these time horizons. The chart I’m showing here is the most recent one we did for last December’s FOMC meeting.

## Appropriate Pace of Policy Firming

**Federal Funds Rate at Year-End**  
(percent)



*Source: Interest rate projections are from the December 16, 2015 FOMC Summary of Economic Projections. Market expectations are from OIS futures as of January 4, 2016.*

Focus for a moment on the median policy projections, indicated by the red dots. Most of my colleagues thought that it would be appropriate to raise the target federal funds rate

at our last meeting. By the end of 2016, the median participant envisioned the fed funds rate to be about a percentage point higher than it is today. With eight FOMC meetings a year, this path is consistent with the target federal funds rate, on average, increasing by 25 basis points at every other FOMC meeting. By historical standards, this is certainly a gradual path. It is even slower than the so-called measured pace of increases over the 2004–06 tightening cycle, which was 25 basis points per meeting.

Overall, I think appropriate policy is consistent with some of the most accommodative dots on the chart. One reason I arrive at this conclusion is because I am less optimistic about the inflation outlook than most of my colleagues. Given the persistently-low-inflation record of the past six years and given how slowly inflation evolves when it is at such low levels, it may be difficult to return inflation to target over the next two or three years. So I'm in favor of very gradual policy normalization to help ensure that we meet our inflation goal within a reasonable amount of time. Moreover, as I have argued many times, prudent risk management calls for a slower removal of accommodative monetary policy. From my perspective, the costs of raising the federal funds rate too quickly far exceed the costs of removing accommodation too slowly. So taking both of these concerns into account — and considering how I think economic conditions will evolve over time — I believe that policy should plan to follow an even shallower path for the federal funds rate than currently envisioned by the median FOMC participant.

I would like to conclude by noting that as much as we would like to be able to convey the exact timing and magnitude of future policy actions, there is no single, predetermined rate path that is consistent with a gradual approach. This is because while our goal is clear — to reach our dual mandate targets — our view of the road ahead may need to be modified. It is what you hear FOMC participants and market commentators often refer to as being “data dependent.” To use a metaphor, it's a little like my golf game. My plan is to hit a drive smack down the center of the fairway; stick an iron close to the pin; and drain a putt for the birdie. But my actual shot-making depends upon how well I judge the crosswinds or if that unfair bounce off the sprinkler head leaves me with a nasty lie in the fairway bunker. As I stand on the tee and think through my approach, one thing is certain: I have to play the next shot from wherever I end up. Adjustments may need to be made.

So it is with monetary policy. My views are not set in stone. If the incoming data move my inflation projections up, I would adjust my policy views in tandem and would raise my federal funds rate projection more quickly than I currently envision. If we were hit by an unexpected shock that set back the growth outlook, I would favor a more accommodative policy than I envision today. This is what it means to be data dependent. Of course, I will not be alone in taking this approach. As the December FOMC statement announcing the policy change made clear over the coming months and years, “the actual path of the federal funds rate will depend on the economic outlook as informed by incoming data.”<sup>10</sup>

Thank you.

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<sup>10</sup> Federal Open Market Committee (2015a).



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