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***“Changing Economic Relationships:
Implications for Monetary Policy and
Simple Monetary Policy Rules”***

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President & Chief Executive Officer
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It is a great pleasure to be here at Chatham House to discuss the economic outlook. Because of the strong economic ties across the Atlantic, it is important to maintain a good dialogue centering on the common challenges we all face – and what those challenges imply for our respective monetary policies.

As I begin, I would note as I always do that the views I will express today are my own, not necessarily those of my colleagues at the Federal Reserve’s Board of Governors or on the Federal Open Market Committee (the FOMC).

In March, the FOMC's monetary policy statement¹ provided two conditions for raising short-term interest rates in the United States. First, the statement indicated that the Committee needs to see "further improvement in the labor market." Second, the Committee needs to be "reasonably confident that inflation will move back to its 2 percent objective over the medium term."

To the first condition, the recent U.S. employment report was disappointing. In March, the U.S. economy created only 126,000 net new jobs, and the unemployment rate was unchanged at 5.5 percent. To the second, core PCE inflation in the United States is 1.4 percent² with no clear indication of when it will return to the Federal Reserve's stated inflation target of 2 percent.

Hence, at this time, I do not think that either condition has been met. Although there has been noticeable improvement in the labor market over the past few years, since March the indicators have been a bit mixed. Furthermore, inflation remains stubbornly below our target of 2 percent.

With sufficiently strong economic growth, improvements in labor markets and increases in inflation would likely follow. But first quarter real GDP growth in the U.S. appears to have slowed to well below the relatively disappointing fourth quarter growth of only 2.2 percent. The unusually cold and snowy winter (which I can surely attest to, living in the Boston area, which this year saw over 110 inches of snow) may have been a temporary slowing factor. Still, it remains difficult to separate the temporary and easy-to-explain from the lasting and more concerning – so in my view, incoming data would need to improve to fully satisfy the Committee's two conditions for starting to raise rates.

Along with the two conditions described in the statement, the Committee also published its latest forecasts. Each quarter, the FOMC provides information on the individual forecasts of the Federal Reserve Governors and Reserve Bank Presidents, brought together in a Summary of Economic Projections (SEP).³ Not surprisingly, many observers tend, it seems, to focus on the interest rate projections from each of the FOMC participants. Yet, I would suggest that there is important additional information in the SEP that tends not to receive the same emphasis.

Today I would like to focus on two aspects of the recent Summary of Economic Projections – two aspects that probably deserved to attract more public discussion than it seems they did. The first matter is the recent striking reduction in the estimates of the unemployment rate that FOMC participants expect to see in the longer run. The second is the reduction in the level of the federal funds rate that participants expect to see in the longer run. Both variables are important, obviously, to FOMC participants as we determine both the timing of the first tightening of this monetary policy cycle, and how much and how quickly the Committee should continue to tighten after the first increase.

I would add that in addition to being relevant for current monetary policy decision-making, these measures are also relevant to the discussion of how best to utilize simple monetary policy rules, a topic discussed by members of Congress and Chair Yellen at recent Congressional hearings. These two variables – longer-run expectations for unemployment and the federal funds rate – are normally assumed to be constant in simple rules such as those proposed by Professor John Taylor.⁴ But in practice, these key variables, held constant by simple rules of thumb, *can* change – and, according to FOMC participants' SEP submissions, *have* changed significantly over the past three years.⁵ The

variability of these two key estimates highlights just one of the many perils of using simple rules to constrain monetary policymaking.⁶

The Fed's Dual Mandate

In the United States, the central bank has a Congressionally assigned dual mandate to achieve maximum sustainable employment and stable prices. In practice, the dual mandate involves maintaining full employment and hitting the inflation target.

These two goals are affirmed each year in the Statement on Longer-Run Goals and Monetary Policy Strategy.⁷ The inflation goal is quite explicit – a 2 percent annualized rate of inflation, as measured by the PCE price index. Full employment, by contrast, has a more ambiguous target. As the statement on monetary goals says, “The maximum level of employment is largely determined by non-monetary factors that affect the structure and dynamics of the labor market. These factors may change over time and may not be directly measurable.”

In practice, this means that the Committee has to make an assessment about the level of unemployment that would be consistent with a stable inflation rate in the longer run – the level of unemployment below which competition for labor bids up wage increases, leading to higher price inflation. Views on the level of unemployment consistent with full employment certainly differ among economists and policymakers – and with good reason, given the difficulties in estimating an unobservable quantity that nonetheless appears to have changed significantly over time.

Figure 1 shows how the Committee's views on unemployment in the longer run have changed over the past three years. The dark blue line provides the midpoint of the

estimates of the participants at the policy meeting. The shaded area provides the range of the central tendency, which excludes the three highest and three lowest estimates of the longer-run unemployment rate. Starting in June of 2012, the midpoint was 5.6 percent, with a quite large range of 5.2 to 6.0 percent. Had participants with estimates at the top of the range not subsequently changed their estimates of unemployment in the longer run, the U.S. unemployment rate would currently be one-half percentage point below their estimates of full employment.

Over the past five quarters, the upper end of the central tendency declined significantly. As of the March FOMC meeting, the top of the range was 5.2 percent – and notably, 5.2 percent was the *bottom* of the central tendency until recently. In addition, the spread has narrowed significantly, with the central tendency now lying between 5.0 and 5.2 percent. My own estimate of the longer-run unemployment rate is 5.0 percent, at the bottom of the central tendency. I, too, have changed my estimate over the past three years – from 5.25 percent at the beginning of the period to 5.0 percent now.

A number of factors may be behind the lower estimates for the unemployment rate in both the medium and the longer run.

Looking first at the medium run, one possibility is that the standard unemployment rate usually quoted – the “U-3” measure – may not fully capture the current slack in the labor market. As **Figure 2** shows, the share of workers whose status is “part time for economic reasons” has declined over the recovery but still remains quite elevated by historical standards. These are people who would prefer full-time work, and are likely to continue to seek and find full-time employment as the economy improves.

However, since they are viewed as “employed” in the U-3 measure, they are not counted as part of the unemployment rate.

Turning to the longer run, a reason FOMC participants may have lowered their estimates of the longer-run unemployment rate is the absence of significant wage and price pressures, despite the unemployment rate falling to 5.5 percent. **Figure 3** shows the core PCE rate of inflation. The core rate of inflation has yet to return to 2 percent, and in fact has been below 2 percent for most of the period since the recession. **Figure 4** shows that growth in wages and salaries has remained relatively subdued across occupations since the recession. Wages and salaries are also well below the growth rate seen prior to the recession. The disaggregation by occupational groups also shows that broad occupational categories are not yet hitting significant bottlenecks. The absence of wage and price pressure is consistent with some slack still remaining in the labor markets, even with an unemployment rate that has fallen to 5.5 percent.

It is also possible that demographics have been underappreciated and play some role in the decline in the level of the unemployment rate consistent with negligible inflation pressure. For example, **Figure 5** shows the age distribution of the labor force at 10-year intervals since 1994, indicating that the age distribution has shifted to somewhat older workers on average. Older workers generally experience lower unemployment rates than workers new to the labor force, so the unemployment rate that is consistent with scant inflation pressure may have declined.

Also, the skills of the labor force, as proxied by educational attainment (**Figure 6**), have improved in the United States. There are fewer workers who have not completed high school, and more workers with college or graduate degrees. Skilled

workers tend to have lower unemployment rates than less-skilled workers. This might also be a factor that was underappreciated and may help to explain why there are yet to be significant wage or price pressures.

In sum, the unemployment rate that is consistent with full employment appears to have declined. Estimates of full employment can and do change, which is one reason the FOMC has not provided a numerical estimate for full employment. And simple rules that assume the full employment level of unemployment is *constant* could provide misleading guideposts for setting monetary policy.

Determinants of Interest Rates

Recent Summaries of Economic Projections have also reflected substantial changes in the level of the federal funds rate that FOMC participants expect in the longer run. **Figure 7** shows that both the midpoint of participants' estimates of the federal funds rate in the longer run and the range of the central tendency have moved down over the past three years. Since the FOMC has not changed its inflation target, this would imply that the real federal funds rate is expected to be lower in the longer run.⁸

Figure 8 shows that the reduction in estimates of the federal funds rate in the longer run come at a time when prevailing long-term rates in most developed countries have moved to unusually low levels. I would suggest that seeing longer-term rates (these 10-year government bond yields) well below the stated inflation target may indicate a lack of faith internationally in some central banks' ability to achieve those inflation targets on average over the 10-year period – coupled with the likelihood of very low real rates over the next 10 years. This could be evidence of a global savings glut, as

suggested at one point by former Fed Chairman Ben Bernanke;⁹ or it could reflect inadequate investment opportunities, as suggested by former Treasury Secretary, Professor Larry Summers.¹⁰

Another reason why real rates may have fallen is that households and firms may have become more risk averse as a result of the financial crisis, and increased their precautionary savings. **Figure 9** shows that checkable deposits and currency for households are quite high by historical standards, as are holdings by nonfinancial corporate businesses, shown in **Figure 10**.¹¹

Decreased productivity typically also leads to lower real interest rates, all other things equal. **Figure 11** shows that, indeed, productivity has slowed recently to a pace much lower than experienced on average over the past two decades.

Lower longer-run, or equilibrium, federal funds rates have several implications:

- First, if the longer-run federal funds rate has declined, rates do not need to rise as much to return to “normalized” interest rates. This is one reason that rate increases might not need to follow as steep a path as in previous recoveries.
- Second, lower longer-run federal funds rates imply that in the future, policymakers will have less room to lower interest rates in the event of economic weakness, and will thus be more likely to hit the zero lower bound for interest rates. The zero lower bound constraint on policy interest rates has been more than an academic concern of late, as most developed countries’ central banks have experienced difficulty in providing sufficient monetary stimulus to spur a robust recovery in their economies. This may imply that inflation targets have been set too low. After all, a higher inflation target

would mean a higher longer-run policy rate, which brings with it a lower chance of hitting the zero lower bound.

- Third, the longer-run federal funds rate is assumed to be constant in most simple policy rules. The fact that the real interest rate may change in both the intermediate and longer runs provides a further rationale for looking beyond simple monetary rules.

Concluding Observations

Figure 12 compares the FOMC participants' forecasts for the federal funds rate expected to prevail at the end of 2015, from the December and the March SEPs. The “dots” indicate that many participants lowered their expectations for the federal funds rate for the end of this year. While this could be due to a weaker near-term outlook for economic growth, it could also be consistent with participants revising their assessments of appropriate policy in light of declining estimates of both the full-employment level of unemployment and the longer-run federal funds rate.

Today I have provided two examples of variables that have changed quite noticeably, but which normally do not change in simple monetary policy rules. This is an argument against the simple rules that several policymakers have proposed. Simple monetary rules cannot capture the full complexity involved in determining appropriate monetary policy, especially during periods when economic relationships may be changing.

As such, rigidly following such rules would, in my view, be misguided. Many of these simple rules would have dictated a tighter policy for some time, even as

employment has fallen short of full employment and inflation has run below our 2 percent goal, more than seven years since the start of the recession. For me, there is wisdom in utilizing a more flexible and comprehensive set of variables and models when considering appropriate monetary policy.

I would emphasize that despite their shortcomings, funds rate equations such as those advocated by John Taylor *do* play a role in monetary policy formulation. In the U.S., they serve as useful benchmarks, because they can often capture rough contours of the historical regularities in central bank policy over specific periods. And the fact that some inputs to the model are difficult to estimate does not render them useless. We face similar uncertainties in estimating all of the economic relationships that operate in our complex economies. But it does highlight that rules are likely best used as guidelines, along with a host of other inputs – the most important of which are good judgment and hard-won experience.

Thank you again for inviting me to Chatham House to share these perspectives on the economy and monetary policy.

¹ <http://www.federalreserve.gov/newsevents/press/monetary/20150318a.htm>

²As measured by the year-over-year percent change in the core PCE or Personal Consumption Expenditures Price Index, excluding food and energy.

³ Summary of Economic Projections, March 2015:
<http://www.federalreserve.gov/monetarypolicy/files/fomcprojtabl20150318.pdf>

⁴ See John B. Taylor (1993), "[Discretion Versus Policy Rules in Practice](#)," *Carnegie-Rochester Conference Series on Public Policy*, vol. 39, pp. 195-214. A more general discussion of policy rules is discussed in John B. Taylor and John C. Williams (2010), "[Simple and Robust Rules for Monetary Policy](#)," in Benjamin

M. Friedman and Michael Woodford, eds., *Handbook of Monetary Economics*, vol. 3B (San Diego: Elsevier), pp. 829-59.

⁵ $FF_t = r^* + \pi_t + 0.5(\pi_t - 2) - (u_t - u^*)$, where FF is the federal funds rate, r^* is the estimated value of the equilibrium real rate, π is the inflation rate, u is the unemployment rate and u^* is the natural rate of unemployment. This example of a simple policy rule relates the federal funds rate to current inflation relative to a 2 percent target and the unemployment rate relative to the natural rate of unemployment. Such simple monetary policy rules rely on significant assumptions, including that r^* and u^* are fixed.

⁶ This is just one of the perils. For example these simple rules do not include a variable that captures large scale asset purchases, one of the major tools used by central banks in developed countries around the world in recent years. Others include the rigidity of assigning fixed emphases (or weights) on inflation versus employment, which may not be optimal in all circumstances. In addition, the notion that assumed or estimated historical response coefficients represent the best that monetary policymakers can do in any circumstances is a very strong assumption. Further, these simple rules do not capture financial stability issues, an area that has been receiving increasing attention since the financial crisis. There is also an issue with the nonlinearity of the rules in general (ex. we do not raise rates when the unemployment rate falls from 10 to 9 percent). In addition, using simply the modal forecast when the risks can be very asymmetric is questionable.

⁷ http://www.federalreserve.gov/monetarypolicy/files/FOMC_LongerRunGoals.pdf

⁸ Others have noted that the real interest rate may be lower. For example, see James D. Hamilton, Ethan S. Harris, Jan Hatzius, and Kenneth D. West (2015), "[The Equilibrium Real Funds Rate: Past, Present, and Future \(PDF\)](#)," working paper (San Diego: University of California at San Diego, March).

⁹ See remarks by Ben S Bernanke, March 10, 2005, "[The Global Saving Glut and the U.S. Current Account Deficit](#)." More recently, see <http://www.brookings.edu/blogs/ben-bernanke/posts/2015/04/01-why-interest-rates-low-global-savings-glut>

¹⁰ <http://larrysummers.com/wp-content/uploads/2014/06/NABE-speech-Lawrence-H.-Summers1.pdf>

¹¹ In part due to low interest rates.