Monetary Policy Actions and Fiscal Policy Substitutes[1]

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Thank you for that generous introduction, Harvey. It's a huge honor for me to be addressing you, and I certainly want to thank Wojciech and Karl for inviting me. Ironically enough, your luncheon speaker tomorrow—Doug Elmendorf—and I lived in the same college dorm back in our freshman year of 1979-80. I'll leave it to you to decide who has aged better—although I caution you that you're handicapped by not knowing the relevant initial conditions.

I became president of the Federal Reserve Bank of Minneapolis last October. During the preceding 22 years, I was a professor of economics at a variety of institutions. I did research in a number of areas, including public finance. My main area of interest, though, was macroeconomics.

There has been a lot of conversation over the past year or two about what we have and haven't learned from macroeconomics. For myself, I believe that one of the most important developments in the field is the use of tools from theoretical public finance to answer key policy questions. To my knowledge, this line of research dates back to the work of Robert Lucas and Nancy Stokey in the 1980s, although I'm sure that some of you might be able to point to even earlier sources. It continues to be a vital area of investigation almost 30 years later—and it will play a key role in my remarks today.

I'll begin by discussing current macroeconomic conditions and the Federal Open Market Committee's recent actions taken in response to those conditions. That discussion will make clear that the committee took those actions because it is not able to cut its interest rate target any further. Motivated by this difficulty, I will pose and answer the following question: What actions can other policymakers take to approximate the impact of an interest rate cut? In

addressing this question, I will rely on recent research being done at the Federal Reserve Bank of Minneapolis by staff researcher Juan Pablo Nicolini and several co-authors. Throughout, I'll be speaking on behalf of myself and no other participant in FOMC meetings.

Let me start with some basic context about how monetary policy gets made in the United States. The Federal Open Market Committee meets eight times per year to determine the path of monetary policy over the next six to seven weeks. The governors of the Federal Reserve Board and the president of the Federal Reserve Bank of New York are permanent members of the committee. Four other presidents of Reserve banks are on the committee, but this group rotates annually. While they do not vote, the other presidents are invited to the FOMC meeting and contribute to the committee's deliberations. Right now, I'm a meeting participant, but I will rotate onto the committee in 2011.

The foundation of the committee's discussions is what is called its dual mandate. By statute, the Federal Reserve is required to follow policies that promote effectively the goals of price stability and maximum employment. The former objective of price stability is generally understood as keeping inflation in a range of around 1.5 to 2.5 percent. The second part of the mandate—maximum employment—is more of a moving target, because employment is shaped by many determinants beyond the Fed's control: demographics, social custom, taxes, technology, and so on.

Over the first three quarters of this year, personal consumption expenditure (PCE) price inflation has averaged roughly 1 percent at an annualized rate. This rate is low relative to the FOMC's target of 2 percent. More troublingly, the inflation rate is drifting downward. Over the

preceding two-year period (from the fourth quarter of 2007 through the fourth quarter of 2009), PCE inflation averaged 1.6 percent per year.

At the same time, unemployment is high: In October, it was 9.6 percent. Here, too, the trend is not comforting. The recession officially ended in June 2009, and in that month, unemployment was 9.5 percent. Unemployment has actually risen slightly during the course of the recovery.

Sufficient growth in output can steadily lower unemployment. But growth has been low in this recovery compared with most. As I mentioned, the recession officially ended in June 2009 and so has been over for five quarters. Over those five quarters, real gross domestic product (GDP) has grown at an annualized rate of under 3 percent. More alarmingly, growth has been decelerating: In the past two quarters, it has averaged less than 2 percent at an annualized rate.

This is the economic situation that confronted the FOMC in its November meeting. Inflation and employment are both too low, and the pace of recovery is too slow. Economic growth is low and softening further. I think it is safe to say that, given this situation, the FOMC would have liked to have been able to cut its target interest rate. But this option is not available. The FOMC's target interest rate is already essentially at zero (more precisely, in a range between 0 and 25 basis points).

But the FOMC does have another policy instrument available: its balance sheet. As of the beginning of this month, the FOMC had a portfolio of roughly $2.3 trillion. Over 2 trillion of those dollars are invested in Treasury securities or government-backed securities issued by Fannie Mae, Freddie Mac, and other government-sponsored enterprises. At its November 3

meeting, the FOMC announced that it plans to buy $600 billion of long-term Treasuries in the open market by mid-2011. In exchange for those securities, it will credit the sellers' accounts at the Fed with more reserves. This kind of action is known as quantitative easing, or QE.

The main goal of QE is to lower the long-run *real* interest rate. As you all know, by real interest rate, I'm referring to the interest rate net of expected inflation. More specifically, suppose that the interest rate on a 10-year bond is about 2.5 percent and that people expect inflation to be around 2 percent per year over the next 10 years. Then, the real interest rate is about 0.5 percent per year for the next 10 years.

A low long-term real interest rate stimulates an economy in a number of ways. It spurs consumer spending by allowing consumers to borrow and refinance more cheaply. It makes capital expenditures and hiring more profitable for corporations. Stock prices and house prices rise because those assets become relatively more attractive as investments. Households with these assets become wealthier and demand more consumption. All of these effects should lead to less unemployment and upward pressure on prices.

How does QE go about lowering long-term real interest rates? QE is a sufficiently novel monetary policy tool that different economists may well give different answers to this question. In my view, QE lowers long-term real interest rates in two distinct ways. The first is that QE is a form of nonverbal communication about the FOMC's future plans. Here's what I mean. The November FOMC statement says that the committee will keep the fed funds target range exceptionally low for as long as economic conditions warrant. The statement also predicts that exceptionally low fed funds rates are likely to be warranted for an "extended period" of time. In

this way, the statement provides explicit communication about the FOMC's future plans for short-term rates and so also shapes the level of current longer-term interest rates.

QE provides a significant supplement to this explicit verbal communication. The use of QE indicates that the FOMC is likely to keep its target interest rate lower for an even longer period of time. Indeed, one could readily argue that buying $600 billion of Treasuries is a much more convincing form of communication of the FOMC's plans than any words could ever be.

Thus, QE lowers long-term real interest rates by signaling the FOMC's intentions about future short-term rates. However, QE also lowers long-term real interest rates in a second, more direct, way. The holder of a long-term Treasury is exposed to interest rate risk, because the value of that bond fluctuates as interest rates vary. When the Fed buys $600 billion of long-term bonds, the bond portfolio of the private sector is now less exposed to this kind of risk. As a consequence, private investors will demand a lower premium for holding other bonds that are exposed to interest rate risk, and all long-term yields fall.

In this way, the change to the asset side of the Fed's balance sheet provides stimulus to the economy. But what about the liability side of its balance sheet? QE creates more reserves in banks' accounts with the Fed. The standard intuition is that this kind of reserve creation is inflationary. Banks can only offer checkable deposits in proportion to their reserves. Economists view checkable deposits as a form of money because, like cash, checkable deposits make many transactions easier. In this sense, bank reserves held with the Fed are *licenses* for banks to create a certain amount of money. By giving out more licenses, the FOMC is allowing banks to create more money. More money chasing the same amount of goods—voila, inflation.

Given some of the criticisms of the Fed that have been voiced over the past two weeks, it is important to understand that this basic logic isn't valid in current circumstances. Banks have nearly $1 trillion of excess reserves. This means that they are not using a lot of their existing licenses to create money. QE gives them $600 billion of new licenses to create money, but I do not see why they would suddenly start to use the new ones if they weren't using the old ones.

Some observers have expressed concerns that $1 trillion—which will shortly become over $1.5 trillion—of excess reserves represent what they term "kindling" for some *future* inflationary fire. I believe that these concerns are misplaced for two reasons. First, the Fed has several tools with which to combat incipient inflationary pressures. Most obviously, it can raise the interest rate on excess reserves as a form of tightening. Second, in recent public statements, Chairman Ben Bernanke has explicitly and firmly committed the FOMC to maintaining low inflation. To use his exact words, he said that he has "rejected any notion that we are going to try to raise inflation to a super-normal level."

As I mentioned before, I do not currently vote on FOMC decisions. I did express support for the FOMC's decision at the recent meeting. I believe that QE is a move in the right direction. However, as I have discussed on earlier occasions, I also think there are good reasons to suspect that the ultimate effects of any amount of QE are likely to be relatively modest. That's why I would have greatly preferred for the committee to have been able to cut its target rate rather than using QE. The problem is that its target rate is already essentially at zero, and so it was not possible to cut the target rate any further.

Given this constraint on monetary policy, I believe it is important to ask if it is possible to synthesize the effects of a one-year interest rate cut of, say, 100 basis points using fiscal policy tools. In his current and past work, Minneapolis Fed staff researcher Juan Pablo Nicolini and his co-authors have answered this question in the affirmative.[2] Their key insight is that there is a broad equivalence between monetary and fiscal policy. They argue that the essence of an FOMC interest rate cut is that it makes current consumption cheaper relative to future consumption. With that in mind, the fiscal authorities can use the time path of consumption taxes to accomplish this same change in relative prices.

In the remainder of my remarks, I'll illustrate this insight by describing one particular fiscal policy plan that is equivalent to a 100-basis-point cut by the Fed. The proposal has three parts. The first part is a permanent consumption tax of 100 basis points, instituted with a one-year delay.[3] The second part is a permanent decrease in labor income taxes of 100 basis points, also instituted with a one-year delay. The third part is an investment tax credit undertaken in 2011. The Nicolini et al. results demonstrate that, in a wide class of economic models, the effects of this three-part plan would be equivalent to the effects of a 100-basis-point interest rate cut.

It's useful to explain the underlying mechanism using the kind of example that all Econ I students have grown to love. Suppose widgets cost $1 each in 2011. Suppose, too, that you can

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[2] See Correia, Isabel, Juan Pablo Nicolini, and Pedro Teles, "Optimal Fiscal and Monetary Policy: Equivalence Results," *Journal of Political Economy* 116 (February 2008), pp. 141-70. (Also available online at http://www.minneapolisfed.org/research/sr/SR403.pdf.) See also Correia, Isabel, Emmanuel Farhi, Juan Pablo Nicolini, and Pedro Teles, "Policy at the Zero Bound," working paper (October 2010), online at http://economics.uchicago.edu/ZeroBoundChicagoNov2010-1_nicolini.pdf.

[3] My scheme makes current consumption cheaper by imposing a permanent tax on future consumption. In contrast, in late 2008, Robert Hall and Susan Woodward proposed making consumption goods cheaper in 2009 than in future years by eliminating all state sales taxes for one year. They suggested that this reduction could be financed by the federal government. (See http://woodwardhall.wordpress.com/2008/12/).

earn 1 percent interest over the coming year, but that inflation is also expected to be 1 percent. With that interest rate, and that inflation rate, any dollar that you save from 2011 into 2012 can also buy a widget. So, with each dollar, you face the trade-off of buying a widget today or buying a widget next year.

Next, let's understand how an interest rate cut affects this baseline trade-off. Suppose the Fed were able to cut its target interest rate by 100 basis points, without affecting expected inflation all that much. The bank would pass that interest rate cut along, and that means that your bank interest rate would fall from 1 percent to zero. Widgets still cost $1 in 2011, and they still cost $1.01 in 2012. But with the interest rate of zero, you would now have to save $1.01 to be able to buy a widget in 2012. The cut in the interest rate has made buying widgets in 2011 cheaper relative to buying widgets in 2012.

Thus, if the Fed were able to cut its target interest rate, saving would become less attractive and borrowing more attractive. Consumers would demand more widgets today. Firms would hire workers to produce more widgets today. Unemployment would decline.

But now let's go back to the benchmark case without the interest rate cut. Recall that expected inflation is 1 percent and that your bank is paying you an interest rate of 1 percent. In that context, think about the three-pronged fiscal policy change that I described earlier. The first part is that the fiscal authorities institute a 1 percent tax on consumption goods that starts in 2012 and lasts for the foreseeable future. Widgets still cost $1 in 2011. Inflation is 1 percent and the tax is 1 percent, and so widgets cost $1.02 in 2012. Given the interest rate of 1 percent,

you must save $1.01 in 2011 to get a widget in 2012. Just as with the interest rate cut, widgets have become 1 percent cheaper today relative to the future.

This change in relative prices means that the increase in the consumption tax will stimulate consumption demand in 2011. Why, then, do we need a labor income tax reduction in 2012? The problem is that a consumption tax that begins in 2012 distorts labor supply decisions in a way that interest rate cuts don't. Consider a worker who makes $20 an hour in 2012 after the various taxes on labor income. If the consumption tax goes up, that worker can buy fewer widgets with each hour of work. Hence, the consumption tax distorts that worker's decision about how much labor to supply to the market.

That's why we need the second part of the plan, under which the fiscal authorities lower taxes on labor income by one percentage point beginning in 2012. With this tax decrease, the worker makes 1 percent more per hour after taxes. The increase in after-tax wages exactly offsets the decrease in purchasing power generated by the consumption tax, and a worker can again buy 20 widgets with each hour of work. As a result, the new plan makes consumption goods cheaper in 2011, but does not provide any additional distortion to labor supply decisions.

At this point, I've talked through the first two parts of the proposal—the permanent increase in consumption taxes and the permanent decrease in labor income taxes. Why do we need a third tax change? Unlike an interest rate cut, the consumption tax that begins in 2012 will deter investment in 2011. The third prong of the proposal is that the fiscal authority should correct this problem by offering an appropriately sized temporary investment tax credit in 2011. The key is that the tax credit need only apply in 2011. In 2012 and thereafter, there is no disincentive effect on investment because the consumption tax is constant.

To summarize, I have described how to construct a three-pronged fiscal policy that is designed to have the same economic effects as a 100-basis-point cut by the Fed. The 1 percent permanent consumption tax that begins in 2012 stimulates consumption demand in 2011. The permanent reduction in labor income taxes ensures that this new consumption tax does not deter labor supply. Finally, the investment tax credit makes sure that the new consumption tax does not deter investment in 2011.

I'll make two additional comments about this plan. First, how much would this three-pronged change in taxes cost the American taxpayer? The exact answer to this question would depend on a host of details—details that many of you know a lot more about than I do. But let me offer a very rough calculation. Annual consumption is about $10 trillion, and annual labor income is about $8 trillion. I've sketched a plan that involves increasing the tax rate on consumption by 1 percentage point and lowering labor income taxes by 1 percentage point. So, the first two parts of the plan would add about $20 billion per year to government revenue beginning in 2012.

The plan also involves an appropriately sized investment tax credit. Private gross investment is about $2 trillion. To offset the effect of the consumption tax in 2012, the fiscal authority needs to provide a 1 percent subsidy to this entire amount. Hence, the investment tax credit involves a one-time cost in 2012 of $20 billion. These calculations, while obviously very rough, do indicate that the plan has the potential to be fiscally responsible.[4]

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[4] I've focused on a one-year interest rate cut. How can the fiscal authorities mimic the impact of a two-year interest rate cut? The rule is that the yearly interest rate equals the size of the change in the consumption tax rate. In particular, suppose that the fiscal authorities acted in 2010 to implement a 1 percent tax on consumption in 2012, with a subsequent more permanent 2 percent tax that begins in 2013. This path of taxes, combined with the appropriate labor income tax reductions and investment tax credits, functions like a two-year interest rate cut that begins in 2011.

Second, I've not discussed distributional considerations. Raising consumption taxes by 1 percentage point and lowering labor income taxes by 1 percentage point for all Americans would tend to redistribute the burden of taxes toward lower-income citizens. For this reason, I believe that it would be desirable to redesign the labor income tax reduction to make it more progressive.

Overall, I believe that this analysis has both policy and intellectual aspects. From a policy point of view, I've deliberately focused on a rather narrow aspect of fiscal policy—namely, how it can be used to mimic monetary policy. That narrow focus seems appropriate to me, given my role in the policy process. I find the resultant policy to be attractive because it may be able to generate macroeconomic stimulus without increasing the deficit.

From an intellectual point of view, the analysis demonstrates the remarkable power of public finance in addressing important macroeconomic questions. Of course, this last lesson is hardly new. As I mentioned at the beginning of my talk, over the past 30 years, macroeconomists have used the tools and methods of public finance to address a host of important questions, ranging from optimal stabilization policy to optimal unemployment insurance. I'm proud to say that a great deal of that work has been done at the Federal Reserve Bank of Minneapolis.

Thanks for your attention. I'll be happy to take your questions.