

GENERAL DISCUSSION

JOHN COCHRANE: Thank you so much, Arvind. Now let's turn to questions. I particularly welcome questions on what I think are the two most central issues the panel raised. First, should the Fed go back to the system of controlling interest rates by rationing something like \$14 billion of reserves and then letting that interest rate percolate out to the rest of the economy, as John said? Or should the Fed keep a large balance sheet so there's abundant liquidity and instead just set the interest rate on reserves as its operating mechanism for changing interest rates?

The second big question: Let's say we get a recession. Interest rates will be zero within about five minutes. Should the Fed embark on buying more assets? If it does, what should it buy? If the Fed wants 3 percent Treasury interest rates, maybe it should just open up the balance sheet. Bring us your Treasuries, in any quantity. We'll give you 3 percent reserves in return. That will nail the interest rate at 3 percent. Or should the balance sheet size be an independent tool and quantity?

Those seem to me to be the central questions.

DARRELL DUFFIE: First of all, kudos to the entire panel. I want to go to an interaction effect between the liquidity benefits you all spoke about and the monetary policy transmission issues that Arvind focused on. Arvind has a recent paper with Jennie Bai and Charles-Henri Weymuller that has data on the daily or weekly liquidity requirements of banks under the so-called liquidity coverage ratio rule.⁷ This is a new regulation that is now interacting with everything the panel has talked about, because banks on a daily average basis are going to need to meet a very large liquidity requirement. And looking at those data, it looks like the daily volatility of that quantity is on the order of magnitude

7. Arvind Krishnamurthy, Jennie Bai, and Charles-Henri Weymuller, "Measuring Liquidity Mismatch in the Banking Sector." NBER Working Paper no. 22729, October 2016.

of the entire pre-2007 reserves. So if you went back to a small balance sheet and you steered interest rates using a very small rate of reserves, every day there would be a lot of bumping up and down from meeting these liquidity coverage ratio requirements, with banks lurching into and out of the reserves market to quickly meet their liquidity coverage ratio needs. This would make it very difficult for the Fed to steer rates merely by adding or subtracting reserves on a daily balance. They couldn't predict how much reserves they would need to have one day ahead. Arvind and I were recently discussing the implications of this for what would happen if we went back to a small balance sheet. And we ruminated that this would be a difficult issue for the Fed when steering rates.

JOHN TAYLOR: In answer to Darrell, yes, the ups and downs of my chart in Figure 1.2.1 are much larger in the more recent period. Some of the volatility in reserve balances during this period is due to the use of overnight reserve repurchase (ON RRP) agreements, which result in a reduction in reserve balances while the agreements are outstanding. There is a question as to whether that would make it harder for the Fed to influence the Fed's rate, but if you add ON RRP to the chart I think it would indicate that the volatility is lower. Also, the liquidity coverage ratio itself is not nailed in stone.

JOHN COCHRANE: Darrell does have a good point. The old reserve requirement is not the binding constraint—banks have far more reserves than regulations require for their deposits. But now other constraints, such as liquidity and capital, may bind and force banks to hold reserves.

CHARLES PLOSSER: I guess I would just note that we're creating this problem, in part, for ourselves through our regulatory framework. In addition to liquidity ratio requirements, we have an FDIC tax on total assets that drives a wedge between depository and non-depository institutions and thus is inhibiting the ability

of interest on reserves to act as an effective floor for the funds rate and thus other short-term rates. And so, how necessary is that? Are we trying to change institutional and market arrangements to offset the unintended consequences of regulatory constraints imposed to accomplish unrelated objectives? Should the design of monetary policy be the handmaiden of the whims of regulations intended to address other issues? I think we should proceed with caution.

The other comment I'd like to make is about the RRP program. Clearly at some level, the more interest rates and short-term markets the Fed can intervene in to set a price and the interest rate, the more efficient or effective, in one sense I guess, monetary policy might be. But do we really want to move away from a world where markets are setting interest rates to one in which the Fed is playing an ever-bigger role? It seems to me, if you take this idea about improving the efficiency of monetary policy to its extreme, then why shouldn't the Fed intervene in all sorts of asset markets and security markets in order to get the prices where they think they ought to be? Wouldn't that really improve the "effectiveness" of monetary policy? But is controlling every interest rate really the goal? Why would you want to reduce market feedback and information? I'm not so sure that's a road we want to go down. The RRP is just a program to avoid congressional rules that say we can't pay interest on reserves to non-depository institutions. I just think we have to be very careful in wishing for a regime where we're inviting more and more intervention on the part of the Fed or even Congress and regulators, in setting all these prices. So I worry that these arguments are sort of a slippery slope where no limits are defined and institutional discretion could be vastly expanded.

MICHAEL DOTSEY: I have a comment that I'd like Arvind to respond to and then a question for him. In lots of our macro models, it's a quarterly interest rate that the Fed is operating on. And this sort

of intraday volatility is not that important. Given that perspective, where do you think this intraday volatility is important?

And my question concerns excess reserves supplying safe assets. If we put out excess reserves and take these ten-day Treasury bills, that's not going to do much. So there's got to be some kind of maturity mismatch in order to supply safe assets with reserves. So what's the relationship between the right amount of maturity mismatch and the right amount of operations we should do?

ARVIND KRISHNAMURTHY: On the first question, the financial world has a bunch of activity that happens at a high frequency and ends up affecting security prices. The repo market is the perfect example of this. I would say that is a flaw of the macro model. It is missing important prices and quantity relations that are present in the world. And once you consider these, you start thinking about the issues I have pointed to as potentially important.

On the second question, I think you are asking, How much maturity mismatch should the Fed have? That's a fair question. I don't have an answer for that. One thing I can say is an important input would be to measure something like a safe asset premium. And there is a cost to be factored in, which relates to the points that Charlie and John brought up—that is, how much risk the central bank can take on its balance sheet. A cost-benefit trade-off would tell you how much maturity mismatch the central bank should take on.

PETER FISHER: Let me just make a few points, all intended to be provocative. I share John's perspective that we could go back and manage it with quantities; it's not impossible. We could just reengineer the system and go back to the way we were. I think we're arguing about whether it's desirable. I'll share two perspectives.

One, to Charlie's angst, a sort of good news and bad news. The good news is, once upon a time we had a Congress that

cared about whether the Fed was going to do credit policy. It limited the instruments the Fed could use in open market operations to US Treasuries and agency mortgage-backed securities, because they cared about that. They didn't want the Fed doing that. We should all look carefully across the Atlantic to Europe, which made the terrible mistake when setting up the monetary union of treating each and every sovereign borrower as presenting equally good credit, and you got the same number of euros representing par on German government debt as on Spanish and Portuguese. And the mechanics of the crisis accelerated when they had to reverse that. So you can really mess things up by not understanding market prices and by what you do with your balance sheet.

To Arvind, I want to offer one thought. When I ran the open market desk, I was proud of the insight that I should care about intraday volatility and zero was the wrong number. And in retrospect, I suspect I repressed volatility too much, even though I was aware that the market was only going to work when I allowed it to have a certain amount. And so I'm deeply skeptical of the view that volatility is bad and the Fed can find the optimal level of volatility in the money markets by pressing it as low as possible.

So the Fed is running a large maturity mismatch across its balance sheet, by issuing short-dated liabilities and holding long-dated assets. You seem to think that, somehow, the Fed doing so will reduce the extent to which private financial intermediaries run maturity mismatches (engage in maturity transformation) across their own balance sheets. At best, this seems to me to be a very inefficient way of controlling private maturity transformation, and more likely, it is simply irrelevant: won't private intermediaries simply adjust the rest of their balance sheets to achieve their desired maturity mismatch?

ARVIND KRISHNAMURTHY: On the first comment about zero volatility, I would rephrase that as a footprint issue. How much of a footprint should the Fed have? If the Fed has too large a footprint, it is decreasing incentives for the private sector to do price discovery. So I share your view. Zero is probably not the right answer. Somewhere in the middle should be the right answer, as always. It strikes me that \$14 billion in reserves was too far on the other side. Something healthy in the middle sounds like the right answer.

On the second point, the proposal of using the Fed's balance sheet to counteract the financial sector's maturity mismatch, which is what I was laying out, is a tool. It exists and can be used by the Fed. I think what you're suggesting is, maybe capital requirements, rather than the Fed's balance sheet, should be the tool used for financial stability. I understand that perspective, but we also know that capital requirements are an imperfect tool. For example, they only hit the regulated banking sector. Whereas something like using the Fed's balance sheet alters a market price, which is the price signal that drives maturity mismatch and would counteract any sector's maturity mismatches.

GEORGE SHULTZ: Governor Plosser indicated in his remarks that this large sum could be something that could finance, say, infrastructure or some other thing that comes along. In other words, the Fed has a honeypot to finance things. I think that's a very bad idea. Once used, there would be a great demand for the Fed to create another honeypot. It's a handy way of getting things you couldn't otherwise get. That, for me, is an argument for getting rid of it and learning to operate in the old-fashioned way.

CHARLES PLOSSER: I agree with you a hundred percent. The design of institutions is important. You want designs that enable and incentivize good outcomes, but you also should have constraints that reduce the likelihood of huge mistakes. Allowing a central

bank's balance sheet to be unrelated to monetary policy invites abuses by the fiscal authorities (such as credit allocation or off-budget financing) or by the monetary authorities (credit allocation or discretionary interventions). You must understand the incentives at work and have well-defined constraints that act to limit potential abuses. That's the slippery slope. The incentives of different parties, when I was talking about how institutions matter—the incentives created here can be dangerous, and we need to be careful about them.

JOHN COCHRANE: I might add that the question is not just the quantities; it's the prices. The Bank of Japan is now buying stocks. And there's a lot of worry among the regulatory people that someone might sell stocks and the stock prices would go down. There would also be incentives for the Fed to buy in order to prop up stock prices.

JOHN TAYLOR: That was the reason for the MBS.

JOHN COCHRANE: Yes. And if that expands to stock and real estate and who knows what, that's even more dangerous.

WILLIAM NELSON: I also think the FOMC should go back to operating policy the way it used to. I'll add another perspective on one of the reasons.

I'm sensitive to the political risk of having a lot of reserves and paying a lot of interest. Another point I'd make is sort of the "if it ain't broke, why fix it" argument. Precrisis, the Fed operated in a small market. It conducted small reverse repos with broker-dealers. Those transactions were not that important to the broker-dealers. They weren't an important way they funded their balance sheet. Those transactions were transmitted to the interbank market for reserves, a whole different set of institutions, so that the market would clear. That was a small market. The banks did not see themselves in any sense as getting those reserves from the Fed, and the federal funds rate was transmitted beautifully to the other money market instruments in the

rest of the economy. And there were lots of studies on whether the intraday volatility mattered, and of course we know as financial economists that it doesn't matter because it averages out almost immediately.

The alternative, as I see it, is the Fed being on either side of transactions throughout the economy. Instead of being a small, unimportant player, imagine that it is on both sides of a giant repo market, of LIBOR. It is engaged in all kinds of transactions that will leave a much larger footprint in the economy. I think the political risk they will be exposed to by being seen to be out there is also much higher. I see a risk to independence. I'm curious about perspectives on that issue.

I'm also sympathetic to the financial stability argument, and to the fact that the liquidity coverage ratio will increase the demand for the high-quality liquid assets (HQLA). But treasuries are also HQLA, so as the Fed sells Treasuries and reduces the quantity of reserves—it's kind of an open question what exactly will happen. And what I see as an important question the Fed faces now, as it pivots to reducing the size of its balance sheet toward the end of the year, is looking to see when market rates begin to open up and assessing the gap between that and interest on excess reserves (IOER). Maybe banks are going to want to hold a large quantity of reserves, because reserves are a convenient way to hold HQLA. Nonbanks, of course, can't hold reserves, but they can come to the RRP. But at the same time, I'm confident that if IOER was a hundred basis points below the fed funds rate, as was sort of a normal precrisis level, banks would find ways to economize on their reserves and meet their HQLA needs by other means or term out their borrowing beyond thirty days.

I agree that there's going to be a trade-off coming. I don't think the Fed can have a sort of smallish balance sheet floor system, which is one of the options people used to think they

could have, and it's a good active debate, I think, to have as to how small it should be.

STEVE LIESMAN: I wonder if the panelists might address the size of the balance sheet relative to the current macro evidence. You've got a \$4.4 trillion balance sheet, 2 percent inflation, an unemployment rate that's right around what's thought to be the potential 4.5 percent, and an economy growing right around potential 2 percent. What's wrong with that?

JOHN TAYLOR: I like those numbers.

But first, we're talking about other things that can be caused by the policy. Charlie and I gave a long list. And whether you could design the system so you don't get into that situation.

Second, it's not so much the size of the balance sheet; it's the large amount of excess reserves. It's the reserve balances that I showed you in Figure 1.2.1. The balance sheet could be large because of lots of currency being used. So reserve balances are the number to focus on. And I think all of the proposals we're working on here, including how you would have to operate this to have the connect between interest rate and reserves, are designed to prevent problems. Also I argue that the QE we had was not that helpful. Maybe it was counterproductive. Maybe it still is counterproductive. Lots of work is being done along those lines.

STEVE LIESMAN: Is the current economic performance telling you something about the necessary size of the balance sheet?

JOHN TAYLOR: The current size of the balance sheet is not informed by a particular unemployment number or a particular inflation number. It's informed by a desire to have monetary policy that is not limited in its purpose. It's a very expansive purpose, and many dangers could come from that—loss of independence, damage to other parts of the economy. So it's a question of wouldn't it be better—and I think it would—if we ran monetary policy like we did in the past? Obviously, the world is somewhat

different. But Peter Fisher agrees we could do that, and I haven't heard reasons why we can't. There are issues around interest rate pass-through, but you don't want the pass-through to be exact. There's all sorts of things that happen from one market to another. There are many reasons for volatility. I think the question that Darrell raises about the volatility now is, to some extent, due to the different system for determining the interest rate. If you had to guide the supply of reserves so the interest rate was being determined by supply and demand, most likely you'd be offsetting a lot of those movements, and they would be smaller.

JOHN COCHRANE: I'd like to add that we have learned that huge amounts of reserves paying interest don't cause inflation. That was a worry we had going into this that turned out not to be true.

