

CHAPTER ELEVEN

SHOULD THE FED ‘STAY BIG’ OR ‘SLIM DOWN’?

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Should the Federal Reserve plan to Stay Big and maintain a superabundance of excess reserves? Or should it plan to Slim Down toward a significantly lower level of excess reserves?

Given the natural growth in currency as one of the Fed’s liabilities, the size of its balance sheet in absolute terms (or relative to its pre-financial-crisis past) is not the relevant question. The policy choice the Fed confronts is whether to maintain a large portfolio of bonds on the asset side of its balance sheet and a correspondingly high level of excess reserves on the liability side, or to reduce significantly both the level of its excess reserve liabilities and its assets.

In my mind, Stay Big would imply maintaining a level of excess reserves that is *inconsistent* with a return to supply-demand dynamics allocating overnight reserve funds within the banking system via price signals. Slim Down, on the other hand, would imply reducing excess reserves to a level *consistent* with supply-demand dynamics eventually reasserting themselves in the allocation of funds among banks.

Compared to the current level of approximately \$1.9 trillion of excess reserves, Stay Big might mean planning to maintain \$500 billion or more, while Slim Down would mean planning on reaching a level of \$100 billion or less.¹ Slim Down could, but need not, mean a return to the operating framework employed by the Fed prior to

1. Board of Governors of the Federal Reserve System, “Factors Affecting Reserve Balances— H.4.1 Release,” June 21, 2018.

the financial crisis and the advent of the Fed's quantitative easing (QE) programs.

The expansion of the Fed's balance sheet under QE was explained as a means of reducing long-term interest rates and stimulating private credit creation.² Changes in the size and composition of the balance sheet were the means by which the Fed sought to stimulate aggregate demand through the "portfolio rebalance channel" to ease credit conditions and, thereby, encourage an expansion of private credit.³ But the explanations offered, so far, in support of Stay Big are not made in the same terms. Rather, the focus has been on the mechanics of the Fed's operating procedures, the management of the very short end of the yield curve, and improving financial stability.

The influence of the Fed's balance sheet on the term structure of interest rates and in stimulating or retarding private credit creation should be central in the debate about whether the Fed should Stay Big or Slim Down. In these terms, the costs of Stay Big appear to be significant while the purported benefits of Stay Big are sketchy and raise more questions than they answer.

SPECIFYING MY PRIORS

My view is that QE1 (2008 to 2010) had a positive impact in liquefying the banking system during and immediately after the financial crisis and that it prevented more, and more rapid, deleveraging of the US financial system. But I am deeply skeptical about the

2. See Ben S. Bernanke, "The Economic Outlook and Monetary Policy," remarks at the Federal Reserve Bank of Kansas City Economic Symposium, Jackson Hole, WY, August 27, 2010 ("bringing down term premiums and lowering the costs of borrowing in a number of private credit markets"); see also Ben S. Bernanke, "Monetary Policy since the Onset of the Crisis," remarks at the Federal Reserve Bank of Kansas City Economic Symposium, Jackson Hole, WY, August 31, 2012 ("Declining yields and rising asset prices ease overall financial conditions and stimulate economic activity through channels similar to those for conventional monetary policy").

3. Bernanke, "Economic Outlook and Monetary Policy."

efficacy of QE2 and QE3 (2010 to 2016) in stimulating aggregate demand.

It is hard for us to know with any confidence what would have happened in the absence of QE. But we do have the imperfect counterfactual of history. Reinhart and Rogoff have provided us with a disciplined, 800-year review of the relevant economic history. They conclude that it has taken approximately eight to ten years for a country's economic activity to recover from a significant financial crisis.⁴ The experience of the US economy over the last decade is entirely consistent with this history. As we did no better "this time," it is hard to conclude that the extraordinary monetary policies pursued by the Fed made much difference. Also, recent work by Greenlaw et al. suggests that the burden of proof for QE's effectiveness in stimulating aggregate demand has not been met.⁵

Thus, in my view, the use of QE "next time" should not be presumed, as former chair Janet Yellen appeared to do.⁶ The effectiveness (in the past) and the appropriateness (in the future) of the use of quasi-fiscal powers by the Fed through QE should be addressed on the merits. The Fed should not simply rely on claiming that the burden of proof is on QE's side, nor rely upon the maintenance of a large balance sheet as implying the benefit of incumbency for QE.

Planning to fight the last war is likely to be a mistake. The political landscape is unlikely always to provide a vacuum in which usurping fiscal powers will be tolerated by either Congress or the executive branch.

4. Carmen M. Reinhart and Kenneth S. Rogoff, "Recovery from Financial Crises: Evidence from 100 Episodes," *American Economic Review* 104, no. 5 (May 2014): 50–55; see also Carmen M. Reinhart and Kenneth S. Rogoff, *This Time is Different: Eight Centuries of Financial Folly* (Princeton, NJ: Princeton University Press, 2009).

5. David Greenlaw, James D. Hamilton, Ethan Harris, and Kenneth D. West, "A Skeptical View of the Impact of the Fed's Balance Sheet," NBER Working Paper no. 24687, June 2018.

6. Janet L. Yellen, "The Federal Reserve's Monetary Policy Toolkit: Past, Present, and Future," remarks at Federal Reserve Bank of Kansas City Symposium, Jackson Hole, WY, August 26, 2016.

I also believe that much of the current debate about the size of the Fed's balance sheet is misdirected, particularly discussion about floors and corridors for the management of overnight interest rates on reserve balances.

The Fed, like any central bank, can use either administered rates or a targeted market rate as the reference point for the expected path of short-term interest rates. Too much is made of which one can more effectively “control” overnight interest rates. This is a minor issue. Prior to the advent of the euro, the Deutsche Bundesbank shifted back and forth between variable-rate and fixed-rate repurchase transactions and often chose to emphasize either its discount or Lombard rates in its communications.

The Fed has always used a combination of administered and market rates and this will likely always be the case. All that really matters for implementation of monetary policy is that there *be* a reference point for the expected path of short-term interest rates. For this purpose, the Fed can use administered rates, such as interest on excess reserves or the discount rate, or the Fed can use a “market rate” like the federal funds rate.

Even with the extremely high levels of excess reserves at present, the Fed continues to communicate its policy intentions expressed in terms of the federal funds rate.⁷ This is at least suggestive of the idea that the technical framework for monetary operations need not constrain the Fed in how it communicates about the expected path of short-term interest rates.

Given the very high level of excess reserves at present, a decision to move toward Slim Down would, of course, require continued reliance on administered rates for some time, even if intending to put more emphasis on a targeted market rate in the future.

7. See Board of Governors of the Federal Reserve System, “Federal Reserve Issues FOMC Statement,” news release, June 13, 2018.

THE COSTS OF STAY BIG ARE SIGNIFICANT

Maintaining a large Fed balance sheet and a correspondingly high level of excess reserves will be likely to impose significant costs on the effectiveness of monetary policy by constraining the Fed's ability to influence the level of long-term interest rates, by limiting the effectiveness of any future use of the Fed's balance sheet to stimulate the economy, and by impeding the efficient allocation of funds with the banking system via price signals.

Influence on Long-term Interest Rates

Maintaining high levels of excess reserves will be likely to diminish the Fed's ability to influence long-term interest rates and the shape of the yield curve. A perpetually available, super-abundant supply of excess reserves will tend to increase demand for long-term government securities from what it might have been without such a high level of excess reserves. This was precisely one of the key rationales for QE in the first place.⁸

By purchasing government securities (and agency securities) and expanding the supply of reserves, the Fed sought to reduce long-term interest rates both directly, by its own purchases, and indirectly, by encouraging market participants to replace the duration they had lost by purchasing longer-dated instruments themselves.⁹ In this way, QE pushed demand out the yield curve. Stay Big leaves it there.

The market as a whole has a certain demand for duration. It is unlikely that the supply of zero-duration assets (in the form of excess reserves) can by itself change the market preference for

8. See Bernanke, "Economic Outlook and Monetary Policy," and Bernanke, "Monetary Policy since the Onset of the Crisis."

9. *Ibid.*

duration. So by maintaining a Stay Big level of excess reserves, the Fed continues to use its balance sheet to stimulate demand for longer-duration assets, dragging down the level of long-term rates.

Consider the reserve. At some point the Fed might want to see higher long-term interest rates or a steeper yield curve. How would Stay Big enhance the Fed's ability to influence long-term rates *regardless of sign*? How would a high level of excess reserves help the Fed *increase* long-term interest rates?

You can also think of this by analogy to Gresham's Law that "bad money drives out good money." In this case, the super-abundance of the "bad money" of zero-duration central bank liabilities leads to the hoarding of positive-duration "good money" of central government liabilities, pulling down the level of long-term interest rates.¹⁰

Thus, maintaining a large balance sheet is likely to cause the yield curve to be flatter than it otherwise would be.

Perhaps the Fed is happy with the current, almost flat yield curve.¹¹ In that case, perhaps it intends to hold down the level of long-term rates. If so, the Fed should explain that maintaining a high level of excess reserves is an ongoing policy choice aimed at compressing the term premium from what it would otherwise be.

The Effectiveness of QE "Next Time"

A Stay Big level of excess reserves will be likely to reduce the effectiveness of any future use of QE.

As noted, I am skeptical that QE2 and QE3 stimulated aggregate demand in the economy. I may be wrong. More importantly, former chair Yellen took the position that any and all of the extraordinary actions the Fed took, including specifically QE, should be and will

10. For an extended discussion of the analogy to Gresham's Law, see Peter R. Fisher, "What is Money and Who Says So?" remarks at SUERF/Bank of Finland Conference, Helsinki, July 3, 2015, *SUERF Policy Note*, no. 1 (September 2015).

11. "10-Year Treasury Constant Maturity Minus 2-Year Treasury Constant Maturity," FRED Economic Data, Federal Reserve Bank of St. Louis, June 26, 2018.

be available to the Fed to use in the next downturn—particularly if the Fed is again constrained by the effective lower boundary of interest rates.¹²

But if the Fed does choose to Stay Big, then “next time” it will be starting with an enlarged balance sheet and already high levels of excess reserves.

Having already provided the banking system with a super-abundance of excess reserves, it seems unlikely that adding to that super-abundance will have the same impact of encouraging market participants to shift into longer-duration and riskier credit assets.

There is a debate about whether—in monetary policy and in markets—it is the stocks or the flows that matter. For both purposes, it seems to me that what matters most are changes in expectations. So it is the changes in expected stocks or the changes in expected flows—whatever moves you—that will influence market participants to change the prices of financial assets.

In order to create a comparable sense of “shock and awe” in its impact on market expectations and the level of long-term interest rates, it seems likely that the Fed would feel the need to act bigger, to try to expand its balance sheet even more rapidly.

Already holding a large share of US Treasury securities will likely complicate the execution of further substantial purchases. At its peak, implementation of QE2 and QE3 involved the purchase of \$85 billion worth of government and agency securities per month, a number that was targeted on the theory that more rapid purchases would be likely to impair the functioning of the government securities market.¹³ By maintaining large holdings of Treasury securities, by starting with a bigger balance sheet, the Fed would be likely to hit these “speed limits” more rapidly, reducing

12. Yellen, “The Federal Reserve’s Monetary Policy Toolkit.” Current Fed Chairman Jerome Powell does not appear to have addressed the question of QE next time as explicitly as former chair Yellen.

13. See transcript of Federal Open Market Committee, July 31–August 1, 2012, remarks of Simon Potter, manager, System Open Market Account, p. 43.

the potential efficacy of QE next time compared to whatever it might have been the first time or would be in the event that the Fed started with a smaller balance sheet and a smaller share of Treasury securities already on its balance sheet.¹⁴

The Fed should explain whether, in its view, a Stay Big level of excess reserves and bond portfolio will enhance the effectiveness of any use of QE in the future and, if so, how.

Impact on Short-term Funding Market.

Stay Big will also be likely to impede the efficient allocation of reserve balances within the banking system via price signals. In the current environment, banks have much less incentive to manage their own funding positions and to trade fed funds with one another. While this may not impede the ability of the Fed to communicate about the expected path of short-term interest rates, it will make short-term funding markets less efficient.

By impeding a market allocation of funds in normal times, Stay Big will make it less likely that price signals can serve as a warning sign of financial stress at individual firms. In the past, the relative scarcity of reserve balances and the need for banks to actively manage their balances with the Fed have provided both market participants and the Fed with a source of information about the willingness of banks to lend reserve balances to one another, as reflected in the premium that individual banks may have to pay.

The market for repurchase agreements in government securities does not provide the same information because of the secured nature of these transactions. The market for single-name credit

14. Perhaps the advent of the Trump deficits, caused by the tax cuts enacted by Congress in 2017, will expand the supply of Treasury securities sufficiently to make this less of a worry.

default swaps might provide this information but might also be considered untrustworthy.¹⁵

Given uncertainty about the transition from normal times to times of financial stress, I think it is likely that “next time” market-based price signals about the credit standing of individual firms will be missed.

Possibility of Losses on Bond Holdings

With an enlarged portfolio of bonds, the Fed faces the increased probability of potentially large losses in the event of an appreciable increase in interest rates.¹⁶ Just as the Fed routinely passes on its income from its large asset holdings to the US Treasury, any decline in this income would contribute to wider fiscal deficits. If losses were significant, in extremis, the Treasury would confront whether and how to address any impairment of the Fed's balance sheet. This is really a matter of fiscal policy, not monetary policy, but one that might generate a legislative response that could threaten the Fed's independence.

Having implemented QE, the Fed has indeed moved into the “fiscal space” and, as already noted, is now dependent on both Congress and the executive branch to tolerate the Fed's use of quasi-fiscal powers. This issue is much broader and more significant than the potential for losses to impair the flow of income to the US Treasury. This is only one way that Congress might become interested in the use of the Fed's balance sheet for fiscal purposes.¹⁷

15. See “Statement on Manufactured Credit Events by CFTC Divisions of Clearing and Risk, Market Oversight, and Swap Dealer and Intermediary Oversight,” US Commodity Futures Trading Commission, April 24, 2018.

16. See Christopher A. Sims, “Fiscal Policy, Monetary Policy, and Central Bank Independence,” remarks at Federal Reserve Bank of Kansas City Economic Symposium, Jackson Hole, WY, August 26, 2016.

17. See Charles I. Plosser, “The Risks of a Fed Balance Sheet Unconstrained by Monetary Policy,” paper prepared for the Hoover Institution Conference on the Structural Foundations

THE BENEFITS OF STAY BIG ARE SKETCHY

Enhanced Financial Stability

It has been argued that maintaining a high level of excess reserves will help prevent excessive maturity transformation and unnecessary private money creation which, in turn, will make the financial system more stable and less prone to crisis.¹⁸ By satisfying more of the market's demand for money with Federal Reserve liabilities, it is reasoned, there will be less demand for private money creation.

Assuming that this is so, how would it work? How would maintaining a high level of excess reserves prevent banks from engaging in maturity transformation and private money creation?

To accomplish this, banks would need to hold such a high level of zero-duration, excess reserve assets that they would be unable to create other, longer-duration credit assets of their own in the form of loans that they would write. To constrain their ability to engage in maturity transformation, between their deposit liabilities and their assets, the level of Fed liabilities would need to be so high as to be an effective constraint on the mismatch that the banking system as a whole incurs between the average duration of bank assets and the average duration of bank liabilities.

If the Stay Big super-abundance of excess reserves were to be so large as to constrain maturity transformation and the creation of private money, so large as to crowd out the ability of banks to create loans and money-like substitutes, then it would be a restrictive

of Monetary Policy, Economics Working Paper no. 17102, Stanford University, Palo Alto, CA, May 4, 2017.

18. See Robin Greenwood, Samuel G. Hanson, and Jeremy C. Stein, "The Federal Reserve Balance Sheet as a Financial Stability Tool," paper prepared for the Federal Reserve Bank of Kansas City Symposium, Jackson Hole, WY, September 2016, cited approvingly by Ben S. Bernanke, "Should the Fed Keep Its Balance Sheet Large?" blog, Brookings Institution, September 2, 2016; also see Bernanke, "Shrinking the Fed's Balance Sheet," blog, Brookings Institution, January 26, 2017.

monetary policy. It would prevent the normal operations of the credit channel and suppress credit creation.

If a large balance sheet is how the Fed intends to stimulate the economy—the E in QE stands for “easing,” after all—the apparent benefit of using high levels of excess reserves to prevent maturity transformation would have the opposite effect. Which is it: Is a large balance sheet an easy monetary policy or a tight one?

An enlarged central bank balance sheet might be neither an effective way to stimulate nor an effective way to restrict maturity transformation and the creation of credit and private money. But it seems unlikely that it could simultaneously be both. This “benefit” of Stay Big appears to be especially sketchy.

Reduced Financial Stress and Stigma

A Stay Big super-abundance of excess reserves could reduce the likelihood of financial stress and the potential stigma, or reluctance, of banks to borrow reserves from the Fed when needed.¹⁹

If the Fed permanently smothers the short end of the yield curve with a quantity of reserves well in excess of the plausible, normal operating needs of the banking system, banks would, indeed, be less likely to find themselves “short” of reserve balances. In effect, Stay Big would “pre-fund” liquidity to those institutions that hold accounts at the Fed. However, we have normally thought of liquidity provision by the central bank, particularly in the lender-of-last-resort context, as a way to *alleviate* financial stress. How would Stay Big prevent financial stress in the first instance?

A super-abundance of reserves might make it difficult for the banking system to be both illiquid and highly leveraged at the same time. Banks might still operate principally on the borrowed liabilities of their deposits and other short-term funding. But by forcing

19. Bernanke, “Should the Fed Keep Its Balance Sheet Large?”

banks to hold high levels of reserve balances on the asset sides of their balance sheets, banks could more readily meet withdrawals of their deposits and reduce the risk of bank runs and panics. In this sense, a high level of excess reserves might operate as a minimum liquidity requirement for the banking system as a whole.

But this seems unlikely to act as a binding constraint on individual banks. It would also not have an impact on nonbank financial firms that lack accounts with the Fed.

An individual bank might still sell its fed funds to other banks. While a given bank's own regulatory liquidity requirements would be a binding constraint, the total supply of reserves would not. So individual banks would still be able to be both illiquid—up to the point of their liquidity requirements—and highly leveraged. Moreover, the absence of a deep and robust funds market, operating on price signals, would likely make it more difficult for an individual bank in need to purchase fed funds when desired.

Also, to the extent that Stay Big helps make the banking system more liquid and, thereby, less likely to be both highly leveraged and illiquid at the same time, this would only apply to banks that hold accounts at the Federal Reserve. This would do nothing to prevent firms in the nonbank financial sector—the notorious shadow banks—or firms in the corporate sector from being both highly leveraged and illiquid.

This would suggest that “next time” it is more likely that financial stress will emerge outside the banking system than within it. This would make it (even) more likely that, in the event of financial stress next time, the Federal Reserve will be called upon to consider using its powers to lend to nonbanks under Section 13(3) of the Federal Reserve Act.

Overwhelming the fed funds market and impairing the efficient allocation of reserves via price signals within the banking system have the “benefit” of reducing, somewhat, the likelihood that individual banks end up “short” of funds. But whether and how this

might actually reduce the likelihood of stress in the financial system remains to be explained.

IMPROVED “TRANSMISSION MECHANISM”

It has also been suggested that a larger balance sheet that incorporates the Fed's reverse repurchase program (RRP) could improve the transmission of the Fed's intended level of short-term interest rates to other markets more effectively.²⁰

While this may be so, it conflates the size of the Fed's balance sheet with the number and type of the counterparties with whom the Fed acts. The Fed could have an expanded set of counterparties, beyond the banks and primary dealers with whom it dealt in the past, but still seek to influence overnight rates “at the margin” rather than by re-pricing most or all of the enlarged stock of reserves.

The RRP program was designed to help the Fed mop up the super-abundance of excess reserves.²¹ Given that the Fed has a super-abundance of excess reserves, the RRP tool is certainly a useful means of coping. But this is an unpersuasive rationale for maintaining any particular level of excess reserves.

It is important to note that this claim is only about the “transmission mechanism” of monetary policy to other short-term interest rates. I was unaware that anyone thought that this was an especially important constraint on the Fed's effectiveness—other than in the conditions of extraordinarily high levels of excess reserves. The argument that the Fed can better cope with an enlarged balance sheet is not a compelling rationale for maintaining a large balance sheet.

20. Darrell Duffie and Arvind Krishnamurthy, “Passthrough Efficiency in the Fed's New Monetary Policy Setting,” paper presented at the Federal Reserve Bank of Kansas City Symposium, Jackson Hole, WY, September 2016, cited approvingly by Bernanke, “Should the Fed Keep Its Balance Sheet Large?”

21. Ben S. Bernanke, statement prepared for the Committee on Financial Services, US House of Representatives, February 10, 2010, p. 7.

But even if one does consider the transmission of the Fed's policy impulse among short-term rates to be important (other than specifically to address the problem of high levels of excess reserves), one would still want to consider the trade-off between maintaining a Stay Big level of excess reserves for purposes of more effectively transmitting the Fed's signals to other short-term rates against the cost of diminished influence over the level of long-term rates and the shape of the yield curve.

WHAT'S GOING ON?

There are only three tools of monetary policy that matter: (a) the size and composition of the central bank's balance sheet; (b) the price of the central bank's liabilities; and (c) expectations about (a) and (b).

Quantitative easing was justified by the theory that, even at the effective lower boundary of the price of the Fed's liabilities, expectations about the size and composition of the Fed's balance sheet would lower long-term interest rates and stimulate private credit growth and aggregate demand. But keeping the Fed's balance sheet large is now being justified by the theory that doing so will help the Fed reduce volatility in the price of its liabilities, prevent banks from creating too much credit, and reduce the need for banks to manage the liquidity of their asset portfolios.

Maybe these are all "good" things, but they seem more like a sideshow than the main event.

It is possible to imagine that monetary policy can work without the credit channel. We can imagine that somehow expectations about interest rates will operate directly upon our propensities to consume, to invest, and to save without involving the business of dis-saving and private credit and money creation. But even if we can imagine this, it is unlikely that private credit creation will cease to exist. The credit channel will still be out there.

Accepting the economic benefits of the credit channel when it is convenient but ignoring the credit channel when it is inconvenient is a mistake that the Fed could usefully avoid.²²

You may not agree with my assessment of the costs and benefits of Stay Big. But I hope you will ponder whether maintaining a large balance sheet and a super abundance of excess reserves enhances or impedes the transmission mechanism to aggregate demand that we actually have today rather than some other transmission mechanism of your imagination.

If it is nostalgic to expect that the Fed should be able to explain the benefits of keeping its balance sheet large in terms consistent with how it has explained the transmission mechanism of monetary policy for the last ten years, then call me nostalgic. It seems more than a mere oversight for the Fed *not* to address how Stay Big might affect long-term interest rates, the credit channel, and aggregate demand in the same terms that were used to justify QE in the first place.

22. See Peter R. Fisher, "Financial Stability and the Hemianopsia of Monetary Policy," *Business Economics* 51, no. 2 (2016): 68ff.

GENERAL DISCUSSION

KEVIN WARSH: Lorie, you must be saying, “Why did I sign up for this? Why did I come to Hoover?” [Laughter] Our fellow panelists did not come to bury the Fed, but to praise it. So, let’s give you an opportunity to respond to a set of issues that were raised.

Allow me to frame the question. Randy Quarles rightly said that the Fed has an unenviable task of trying to make monetary policy and regulatory policy at the same time with an existing mix of tools. So, first, is the asset side of the balance sheet going to determine the new equilibrium for the size of the Fed balance sheet? Or will the liability side? That is, will it be driven by the Fed’s decision on optimal monetary policy? Or will the ultimate size of the Fed’s balance sheet be dictated by the optimal amount of reserves demanded by the banks to satisfy regulatory standards?

And second, if the Fed decided to keep larger levels of excess reserves, need they be of the same average duration as the assets currently held on the Fed’s balance sheet?

LORIE LOGAN: Well, let me touch on a couple of things. I’m just first going to go back to Mickey’s presentation. I think in the \$2.2 trillion that you had, and why you came up with such a high number of excess reserves, is because you were taking out the other noncurrency, nonreserve liabilities. So, one of the points I wanted to make here is that people often forget about the other, nonreserve liabilities on the balance sheet that are there. And as I said, if you look at them currently, they make up about \$700 billion. So, I don’t think when you cited those numbers that it was that high for excess reserves.

And then the other point I would make is on the mortgage-backed securities caps. If interest rates were to follow the current market path, even if the FOMC were to raise the caps, it wouldn’t change the pace of the runoff, because toward the end of the year

the prepaids are going to come in well below the cap that we have at the maximum level. So, at that point, the only reason that we would end up reinvesting is if the prepayments come in above the cap, which would likely happen if there was a big shock and interest rates were really to fall. So, I don't think a change in the caps to a higher level would necessarily change the pace of that runoff.

I think there's this larger question about mixing the asset side with the monetary policy framework in the conversation on the panel. As I said, we're going to be moving into a liability-driven size of the portfolio. The size of the portfolio will be driven by the liability side, not the asset side. And you can really think about the asset side in a variety of ways. And some of the concerns about being in a floor system with having some abundant reserves was, well, you'll be starting from a higher level. I think you could structure that asset side with a large proportion of Treasury bills, for example. It doesn't need to be in a portfolio that looks so long-term. So, you would still have the same sort of interest rate risk that you could take if you restructured the asset side of the portfolio. I don't think that that's a limiting factor, and it would also, of course, change your influence that you're having in financial markets.

One of the things I guess I struggled with in the conversation was the price signal. Maybe I just need to talk through that a little bit more. But when I think about the price signal in the old regime that we had pre-crisis, individual bank rates, they could move. It could be because of credit, but it could also mean they just got a payment shock late in the day. And so I think actually, in the other system, the price signal was really confused, because you couldn't tell the difference, necessarily, between those two. And I think during the crisis, we discovered that that price signal didn't turn out to be very useful. The system that we are in now, if that were to happen, it clearly wouldn't be because of the

late-day payment shock, it would be because there was a credit issue with a particular bank. So, maybe I wasn't following the full price signal argument Peter made. But I think the current framework is better in that sense.

And another point that I would make is this large role in the financial markets with the floor system. I guess I'd want to talk more about that too. I agree that we have an abundant supply of reserves, and I don't think to run the floor system we need anywhere near the level of excess reserves that we have now. I think that number can come down quite a bit. And I think that we're doing that with an open market operation, the overnight RRP facility that's enhancing competition in money markets with very little usage. I think last month we might have had a day where it was one and a half billion dollars only. So, I think that that facility being there is not necessarily having a big impact. It's just enhancing competition in money markets, which is a good thing.

I would just go back to the main point I wanted to draw out today, which is I think that we can implement in either a floor or a corridor system. And I think there is a whole variety of corridor-type systems. It's simplified by just talking about the version that we used pre-crisis, and I don't think this should be surprising, because the committee had undergone a fairly extensive set of work before the crisis to relook at the system and explored a variety of corridor-type regimes. One was the voluntary reserve requirements. But there are a whole host of others that could be considered.

One might improve some of the concerns we had with the pre-crisis system. You know, it had this liquidity tax on reserves, it was not very transparent, it was fairly complex, and there were a lot of times when there were fairly discretionary open market operations that were required. So, I agree we could return to a corridor system. My main point was that if we were going to

return to a corridor system, doing so would probably look different than the one we used, but there are some other ones that we certainly could turn to.

KEVIN WARSH: Thank you, Lorie. Let's turn next to you, Bill. Our audience should know that Bill was in the heart of the beast in the darkest days of the crisis. He overlapped with a couple of us on this panel and was among the designers of the Fed's extraordinary crisis-response facilities. Bill, you've done an exceptional job on this panel atoning for your past sins. [Laughter]

A couple of questions. First, you indicated, in some sense, you were concerned that short-term securities that were issued by the Treasury market might be quasi-substitutes for the Fed's excess reserves. I query whether there could be crowding out or competition among similar situated risk-free securities. Perhaps you could speak to that in addition to responding to other issues raised by our fellow panelists.

WILLIAM NELSON: Happy to. And I don't want to take any incorrect credit for the QE programs. [Laughter] I was the 13(3) facilities all the way. Lorie would be on me in a minute if I tried to take credit for QE.

The point that I was making and discussing with Vice Chairman Quarles was that liquidity regulations are designed so that institutions can hold reserves or can hold Treasuries. And if you want to return to a small Federal Reserve with a smaller balance sheet, with a low quantity of excess reserves, that option needs to be there if you want to have liquidity requirements. So that substitutability within the requirements is very important.

And I was trying to make the case—and I may be alone here—in thinking that if the interest rate on excess reserves was actually 50 to 100 basis points below the fed funds rate, so something back towards a classic, pre-crisis kind of configuration, that banks would actually go a long way to getting their excess reserve holdings down, much more than the forecast in the New

York Fed's survey, or what's being used in their models, because they would have a number of levers that they can turn to do so.

It could, as Lorie and I have discussed, be quite stressful in markets to get there. Like everything in policy design, gradualism, I think, would be very important. This would be something which would have to take place slowly. And as reserves got scarcer and scarcer, you could get banks to substitute, I believe. But not all at once. However, if it's required that banks have to hold a material part of their HQLA as reserves, then you're going to have a big balance sheet. There's no way around it. Only the Fed can provide those reserves. It can only provide those reserves by holding a large portfolio of securities.

KEVIN WARSH: Mickey, the Fed appears somewhat lonely in its belief that quantitative easing has had no material effect on asset prices, which I always found to be a striking judgment at odds with most market participants. I also heard you say that the Fed is overstating the effects of its large balance sheet on the real side of the economy. Please expand on these points, if you would.

MICKEY LEVY: Well, sure. First, I was thinking about Lorie's responses. Look, I have absolutely all the confidence in the New York Fed. The work it did on the overnight reverse repo market and the research you did in rolling it out just show how good and efficient it is. But the broader macroeconomic question is: What's the most efficient way for the Fed to achieve and pursue and maintain its dual mandate? And do you need that broader financial market footprint? Do you need the size of the balance sheet?

Kevin, regarding your question, it just seems clear to me QE3 did not work to stimulate the economy as planned. Going back to when Chairman Bernanke rolled out QE3 and forward guidance, he described the portfolio balance effect in which the Fed would pump a ton of money into the financial system, convince markets that interest rates would stay low, encourage risk taking, and push up asset prices, and all that would stimulate aggregate

demand. Everything worked to stimulate financial markets—bond yields stayed low, the stock market and home prices rose—but if you look at what actually happened in the next four years, nominal GDP growth, the broadest measure of current dollar spending, did not accelerate. Certainly, the unemployment rate fell. But if you went back to mid-2012 and ran simulations of the Fed's macro model based on the actual QE3, lower interest rates, and the actual lower real cost of capital, and the modest increase in the real cost of labor, the results would have been a significant acceleration in economic growth with booming capital spending and relatively weak employment growth. The opposite happened. Once again, the Fed affects the unemployment rate through real economic activity, which didn't respond. I completely agree with Peter. QE1 really helped. But I think we need to do more research on why QE3 really didn't work.

Let me just add one other point on empirical studies of the effects of Fed policy announcements. I think we have to take the economic impacts of the empirical findings with a grain of salt because they tend to be short-run effects with questionable impacts on the economy. The best example is the "taper tantrum": ten-year bond yields rose surprisingly 100 basis points, which definitely affected the Fed's subsequent conduct of monetary policy but didn't have any impact on GDP growth.

KEVIN WARSH: Peter, let's turn to you for the final word in this segment of our discussion before we take a couple questions from the audience. Peter, the most intriguing part of your remarks centered on the role and responsibility of the Federal Reserve. And to paraphrase you with some license: we central bankers are not fiscal policy makers with tenure. We have a fundamentally different role. I'll give you the last word before we turn to the audience.

PETER FISHER: Well, I certainly agree with that, and I think we've had that theme all day, from the get-go this morning of Raghu

Rajan trying to get us to think about how we're going to contain monetary policy in a somewhat smaller box.

But I also want to note that the Fed's mandate is not just to manage aggregate demand. Section 2A of the Federal Reserve Act is not a Phillips curve-only mandate, whatever the FOMC says; go read Section 2A for yourselves. Providing an elastic currency is a necessary means of ensuring that the monetary and credit aggregates don't contract too quickly. We do need to figure out how to manage the discount window, how to do the elastic currency thing without stigma, but I don't think flooding the system with excess reserves is the best means of doing that.

KEVIN WARSH: So, we're going to take a couple questions from the audience. I see John Cochrane, our fearless leader. His name was invoked, so he gets the first question.

JOHN COCHRANE: Thanks. In 1970, Milton Friedman propounded the optimal quantity of money, which in our current circumstance would be that the Fed pays interest on reserves and floods the market with reserves. Why is that optimal? Well, money is to the economy like oil in a car. It's better to drive a car with the oil full, not to starve it of oil in order to slow it down. Now, Friedman didn't take that prediction seriously, because the Fed would lose control of the price level at zero interest or if it allowed money to pay interest so money becomes a perfect substitute for bonds. We need $MV=PY$. Friedman didn't know about John Taylor, who taught us that by changing interest rates, the Fed can maintain price-level control and give us the optimal quantity of money. In 2008, the Fed tried the experiment, flooding the economy with interest-paying reserves, and lo and behold, it works! You *can* flood the economy with interest-bearing reserves and retain price-level control. We learned something over these years.

That seems to me like a strong argument for maintaining a large balance sheet. Why not? Yes, we may not like the kinds of assets the Fed buys in order to issue reserves. Fine, let them buy

short-term Treasuries. Better yet, let the Treasury issue more short-term debt—ideally, fixed-value floating rate debt.

Other than that, all I've heard is nostalgia. The good old days were kind of nice, but we've learned something. Monetary policy advances. So, I think, the lesson of theory and experience is now pretty clear: keep the large quantity of interest-paying reserves. The asset side can be an all-Treasury short-dated balance sheet. Let's live the optimal quantity of money!

PETER FISHER: I want you to go visit Japan, where the central bank is flooding the system with reserves and hoarding duration and other assets. You can crush the credit channel. You may like what it does to your model of the economy, that we can have fewer Greek letters and not have to worry about modeling a financial system, but I just don't think it actually will help us manage the economy going forward. We can imagine that we want to go to a place where the only financial intermediation is done by the central bank, and that central bank money is the only money we use, but I don't think that is either necessary or desirable.

ANDREW LEVIN: This question is for Lorie Logan, although maybe Bill Nelson can also weigh in. You showed a chart of balance sheet projections with alternative trajectories—the same chart that Vice Chair Quarles showed earlier. The first decision point or “kink” is only six months away, the second kink is about eighteen months away, and the third kink is a bit further off. So, it seems like there should be some sense of urgency in addressing the questions that have been raised this afternoon. Market participants need to be able to anticipate what's coming so that the process isn't disruptive. That means that there isn't necessarily much more time to clarify the Fed's “new normal” for the balance sheet, especially given Bill's concern that moving soon would foreclose some other options.

LORIE LOGAN: I think with the chart, we do have more than six months, if that larger projection were to hold. So, I think there

is time. We're monitoring a whole variety of factors in money markets to understand whether we're getting anywhere close to showing some signs of scarcity, and I don't think we're seeing anything in those.

I think the point is that we don't know, and I think those projections were just dealer estimates. So, the broader point is we have to be watching for signs of scarcity, and I think we have a variety of measures, and we aren't seeing any signs of that. So, I think there's still time for the committee to continue to learn by monitoring what's happening in money markets today.

KEVIN WARSH: I want to just thank my fellow panelists. The robustness of the discussion inside the Fed system is, we should hope, no less robust than the discussion we just completed. We especially appreciate Lorie's attendance, because she is compelled to implement the decisions of the board and the FOMC.