Commentary: The Ins and Outs of LSAPs

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I want to start by thanking the organizers for giving me the chance to comment on this very ambitious and interesting paper. The authors combine theory and empirical work to deliver some sharp results and are willing to stick their necks out to make a number of strong policy recommendations. I will do three things in my comments: first, try to provide a simple way to think about their approach. We will see that the key consideration is the credibility of the identifying assumptions one must make to tease out the effects that they want to separate. After laying out the assumptions, I will then raise some questions about their empirical validity. My basic take is that they have a very useful analytic framework that helps us think more clearly about QE, but when we go to the data, the picture becomes less clear. I will then conclude with some new questions that I believe this analysis opens up

Summary

The following equation comes from Krishnamurthy and Vissing-Jorgensen (2011) and provides a concise way to understand what they are doing.

Real rate$_{risky,illiquid,long}$ = Effective Nominal rate - Expected Inflation

Effective nominal rate $\equiv$ Expected (nominal rate$_{safe,liquid,short}$)+

$\qquad\qquad\qquad$ + Duration adjustment x P$_{duration}$

$\qquad\qquad\qquad$ + Liquidity adjustment x P$_{liquidity}$

$\qquad\qquad\qquad$ + Safety adjustment x P$_{safety}$

$\qquad\qquad\qquad$ + Default adjustment x P$_{default}$

$\qquad\qquad\qquad$ + Pre-payment adjustment x P$_{pre-payment}$

The basic insight is that you can use what amounts to a difference-in-differences approach to identify the channels through which LSAPs operate. For instance, consider the August 2010 FOMC announcement that "'the Committee will keep constant the Federal Reserve's holdings of securities at their current level by reinvesting principal payments from agency debt and agency mortgage backed securities in longer-term Treasury securities." Up until that point there were many market participants who had expected the Fed to let the balance sheet shrink. So this announcement signaled that the mix of assets held by the Fed would be tilted toward longer-term treasuries as opposed to agency bonds or agency MBS. Hence one can compute the change in amount of liquid and safe assets that would be removed from the market to get a baseline prediction about how rates should change. If the model is correct, then those changes should feed through into all asset prices, but because different asset classes have different exposure to these factors we would not expect equal changes in prices. Importantly, they also work out the arbitrage relationships that govern the scarcity values of Treasuries and MBS under their theory of how prices are determined.

I find this way of looking at the data very appealing. It provides a nice, intuitive but rigorous framework for interpreting events. This methodology leads them to four conclusions.

First, they argue that effect that arises through prepayments is very important. They explain how the Fed targets its purchases to deliver this effect. I had not realized the importance of this tactical aspect of the LSAPs and judging from conversations with others at the conference, this point is not widely appreciated.

A second conclusion is that the illiquidity in late 2008 and 2009 can be traced to the undercapitalization of many important parts of the financial system. There are many other studies that have reached this same conclusion looking at other types of evidence. So I think this conclusion is correct and well-understood.

Their other two conclusions should be more controversial. One is that the duration adjustment channel is inconsequential, once the other channels are accounted for. The paper cites various speeches by Federal Reserve officials claiming otherwise. So their view is certainly not shared within the Federal Reserve System. Below I will give some reasons to be cautious in accepting this interpretation.

The last conclusion is that both Treasury and MBS purchases have limited spillover effects. This is closely related to observation about the general duration effect. While the size of the spillovers can be debated, they also emphasize that the Treasury purchases are likely to have ambiguous welfare effects.

The observation about welfare must be qualitatively correct. The theory that explains why removing Treasuries from the marketplace can influence prices assumes that the private sector cannot create substitutes. If this is true, then there must be a special role played by Treasuries that is being rationed when the Fed absorbs them. This does not mean that the total effect of buying the Treasuries is welfare reducing, but surely this partial effect is adverse. This point has not received so much attention and it is worth bearing in mind when thinking about QE.

Some Caveats

Let me now raise a few questions about how seriously we should take the numbers. The whole identification exercise depends on measuring innovations to people's beliefs. Are the assumptions needed to allow the difference-in-differences identification procedure likely to hold?

Certainly casual evidence suggests that the media and the public seems to have a hard time disentangling statements about LSAPs from statements about interest rates and the overall stance of

Table 1
Event Analysis of LSAPs on Currency and
Stock Market Returns

	S&P500 return	Trade Weighted U.S. Dollar Index: Major Currencies (DTWEXM), Index March 1973=100, Daily, Not Seasonally Adjusted	Trade Weighted U.S. Dollar Index: Broad (DTWEXB), Index January 1997=100, Daily, Not Seasonally Adjusted
QE1	**0.0457**	**-0.0287**	**-0.0162**
QE2	-0.0085	0.0067	0.0043
MEP	-0.0294	0.0019	0.0049
QE3	**0.0163**	**-0.0014**	**-0.0008**

monetary policy. But the empirical strategy in the paper becomes much more complicated once we allow for the possibility that the LSAP announcement carries news about the overall stance of policy.

Table 1 shows the response of the S&P 500 stock market index and two measures of the exchange value of the dollar (in the same format as Table 1 of the paper).[1] I see several interesting results in this table. First, QE1 seems to have pretty powerful direct effects on the exchange rate and the stock market. Across those five dates included in the average response reported in the table, the stock market jumped up and the dollar weakened. During QE2 and the maturity extension program, it is interesting that the stock market reaction was negative and the dollar strengthened. Then on the QE3 announcement we saw a positive return on the stock market and a weakening of the dollar. The standard errors here are big, so I don't want to be too bold in my claims, but this does match my anecdotal sense of these programs: QE1 represented a meaningful stimulus and that effect faded, until we got to QE3, which is still small compared to QE1.

But the problem with this interpretation is that it undercuts the identification of the various channels because once the baseline stance of monetary policy is changed you need very strong assumptions about how that effects everything else. We can no longer just compute the effect of an LSAP announcement on duration, liquidity, prepayment, safety and default to back out a predicted effect.

To see this quantitatively, notice in their Table 1 that the signaling effect of QE3 accounts for a 1-basis-point change in five-year and

Table 2
Primary Dealer Survey Responses Before the QE3
Announcement (9/2012)

A) For each listed policy tool, please indicate the probability the tool will be used to signal future policy tightening or to tighten policy at the next FOMC meeting and within the next 1 to 2 years. Please explain.

Change the forward guidance in the FOMC statement on the path of the federal funds rate	25th pctl	0%	0%	20%
	median	0%	5%	30%
	75th Pctl	0%	10%	50%
Provide additional guidance on the likely path for the size and composition of the balance sheet	25th pctl	0%	0%	20%
	Median	0%	5%	30%
	75th Pctl	0%	15%	55%

B) For each listed policy tool, please indicate the probability the tool will be used to signal future policy easing or to ease policy at the next FOMC meeing and within the next 1 and 2 years. Please explain

Change the forward guidance in the FOMC statement on the path of the federal funds rate	25th pctl	70%	75%	75%
	median	75%	85%	90%
	75th Pctl	85%	95%	95%
Provide additional guidance on the likely path for the size and composition of the balance sheet	25th pctl	13%	30%	35%
	Median	25%	45%	50%
	75th Pctl	50%	70%	75%

10-year yields. As we see the stock market showed a positive 1.6 percent return on that announcement, which seems unlikely if the signaling effect is really that small. Of course, all these numbers are inferred from responses on a single day so the uncertainty surrounding these estimates is large. But I still think this exercise points toward being a little cautious in interpreting the evidence.

A second question is how unexpected were these announcements. Table 2 shows some data taken from the Federal Reserve Bank of New York's Survey of Primary Dealers that was distributed on Aug. 31, 2012 (and was returned by Sept. 4). The answers to the first question indicate that essentially none of the respondents thought that by September 2013 a tapering conversation could be a policy tool. But the answers to the second question show that there was quite a bit of disagreement over whether more buying could be on the table.

I think this (and lots of other evidence) casts doubt on the idea that there is a representative "market participant." Once we allow for the possibility for disagreements among different actors, the empirical work becomes much more complicated. In a world with heterogeneous beliefs about the direction of policy, we would need to model

the responses of different agents and to understand the value of duration, liquidity, prepayment, safety and default for these agents.

So my punch line is that while I like the analytic framework for organizing one's thoughts, I think that some effects can still not be confidently identified so that there is still room for reasonable people to disagree about the relative importance of some of the channels.

Assessing the Effects of Unconventional Monetary Policy

Despite these caveats, I believe the framework in this paper opens up some bigger questions that all the central banks that are undertaking QE type policies will need to wrestle with. So let me take up two of these questions that I find particularly interesting.

First, what can we say about the nature of scarcity effects that are critical in the transmission of the LSAPs to other asset prices and the economy? Regarding the MBS effects, it seems that this depends heavily on the current U.S. institutional arrangements. The Federal Reserve after Dodd-Frank is more constrained in what it can buy than many other central banks. If the Fed could buy REITs or ETFs or other assets that were very non-substitutable with Treasuries, then it would have many more options. In other countries, these alternatives do exist. In that case, the logic in this paper would still apply if by buying those assets the central bank could distort the amounts outstanding in the hands of the public. In particular, in cases where someone was using repo finance and the central bank can distort the cheapest to deliver securities, you might get similar effects as found for MBS in the United States. Though in countries where all mortgages are floating rate these effects might be less relevant.

Regarding U.S. Treasuries and the safety premium, it looks like this effect will be present and potentially important at least in the near term. But over the medium term that is less clear. I can see three forces that could change this. First, suppose there is a reconsideration of the regulatory regimes around the world. If we alter the risk weights that banks face for holding all sovereign debt, could that take away the edge that the dollar has? Second, it seems inevitable that the financial sector will try to use engineering to create more safe securities if the premium for doing so is large enough. Finally, what

would happen if the dollar was threatened as the world's reserve currency? Eichengreen (2102) makes a compelling case that the dollar's position is more fragile than is commonly believed. If we moved to a truly multipolar currency regime, that would also reduce the scarcity value of the dollar. I am not suggesting that any of these changes are likely in the short run, but over the medium term I do think we ought to be thinking about what happens in these scenarios.

A second issue raised by this paper is how to think about monetary policy transmission in a world with heterogeneity and disagreement. The authors argue one of the defects of current Fed policy is the lack of a fully specified rule for the conduct of unconventional policy. I see the reasons for the FOMC's ambiguity somewhat differently than the authors.

Some of it probably is due to the unfamiliarity of this tool. Hundreds of thousands of person-hours have been devoted to studying conventional monetary policy. Tools like LSAPs have simply not been subject to nearly as much scrutiny. It is hardly surprising that our understanding of the costs and benefits of these policies are less well-understood than conventional policy. It is laudable in my view that so many policymakers are willing to admit this and it is natural to be more cautious in using such tools.

In addition, I think many people really fail to appreciate how much turnover there is on the FOMC itself. One of the great ironies of the dysfunctionality of the current process surrounding Fed appointments is that partisans justify holding up appointments by arguing that the stakes for appointing someone for 14 years are necessarily high. But in fact, for Fed Governors appointed since 1988, the typical Governor stays for about five years and Alan Greenspan is the only person to serve longer than nine years! So the current situation where several positions on the FOMC are open or are about to come open, is much more common than politicians and the public might appreciate. The likelihood of a newly appointed Governor serving even 10 years is very low. This turnover further amplifies the difficulty of using tools with uncertain costs and benefits since newcomers cannot simply rely on consensus to guide their votes.

Table 3
Primary Dealer Survey before the June 2013 FOMC Meeting

Please provide your expectation for the monthly pace of purchases that will be in effect after each of the below FOMC meetings

			Monthly pace of Longer-Term Security Purchases ($Billions)	
			Treasuries	Agency MBS
2013	June 18-19	25th Pctl	45	40
		Median	45	40
		75th Pctl	45	40
	July 30-31	25th Pctl	45	40
		Median	45	40
		75th Pctl	45	40
	September 17-18	25th Pctl	35	30
		Median	45	40
		75th Pctl	45	40
	October 29-30	25th Pctl	30	30
		Median	45	40
		75th Pctl	45	40
	December 17-18	25th Pctl	25	25
		Median	30	30
		75th Pctl	35	40

Putting all these observations together, I conclude that over the next few years, knowledge of how LSAPs operate likely to change, as is the composition of the FOMC. So I do not see how the current FOMC could credibly bind future committees to operate according to a rule with respect to unconventional policy. I think we may just have to live with the kind of policy ambiguity that currently exists.

Heterogeneity of beliefs and disagreement might also help us understand the asset price movements around the June FOMC meeting. Table 3 shows additional data from the Federal Reserve Bank of New York's Survey of Primary Dealers.

As the table shows, even among these very sophisticated observers there are meaningful differences in the pace of asset purchases by the end of the year. Under some theories about QE, all that matters is the stock of securities held by the Fed, so that any disagreements about flows of purchases might not matter; whether tapering starts in September or December will not make much difference in the total stock of securities held by the Fed. But if markets are segmented so that not all potential buyers are in the market at all times, and different buyers have different beliefs about future Fed behavior, then the

impending flows might matter. I recognize this is a subtle issue, but let's grant this possibility.

Suppose the differences in Table 3 are indicative of the views of buyers in the market and that the people who have the most confidence that the Fed would be actively buying at $85 billion per month were funding purchases using leverage; the most obvious way to do so would be to make purchases funded via repos. Because they are most confident about the future buying they will be willing to pay more than others to buy the securities.

Now imagine what happens if the Fed lays out plans for exiting sooner than these people anticipated. If this leads other buyers to reassess so that interest rates rise, then the value of the bonds falls and the cost of funding them with repos falls too. In the extreme, where these investors have deployed maximum leverage to fund them, the initial optimists could even be forced to sell. The next set of buyers will be less confident about high prices, which means that not only will they be willing to bid less for the securities, but they will be less prone to use leverage to fund them. This kind of endogenous re-pricing is a mechanism highlighted by Geanakoplos (2010) and seems like a natural story for what happened in June.[2]

But if this view is correct, it means that the exit from QE could be pretty bumpy, because every time uncertainty is resolved, the demands by levered investors will need to be recomputed. Perhaps each one of these cases would lead to another "Geanakoplos moment." This conjecture suggests that the interaction between forward guidance and QE might naturally raise volatility in asset markets.

The Fed's surprise decision not to begin tapering purchases at the September FOMC meeting should allow us to test this conjecture. If the Geanakoplos interpretation is correct, the Fed will likely be doomed to going through a replay of the June volatility when it does try to shift the stance of policy to begin tapering.

Conclusions

This is a very creative and interesting paper. Regardless of what one makes of the empirical estimates, the decomposition that they

propose helps clarify how QE in the U.S. works. The emphasis on the MBS scarcity channel seems new and underappreciated. The paper will deservingly be well-cited.

The paper opens up various new issues for consideration. One that I am particularly interested in is how QE, forward guidance and differences of opinion influence the level and volatility of asset prices.

Endnotes

[1]I thank Annette Vissing-Jorgensen for sharing these calculations.

[2]I realize there are many other stories. Many private sector observers say that the June volatility was a one-time adjustment and that it will not be repeated. So I am not suggesting that my hypothesis is the only, or even the most likely explanation.

References

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